Mungret Link Streets Project

Part 8 Planning Particulars Report

Nov 2019

Limerick City and County Council
229383711-MMD-0000-XX-RP-C-0004_P4

5 Eastgate Avenue
Eastgate
Little Island
Co Cork T45 EE72
Ireland

T +353 (0)21 480 9800

mottmac.com

Merchant's Quay,
Limerick,
V94 EH90

Mungret Link Streets Project

Part 8 Planning Particulars Report

Nov 2019

Issue and revision record

Revision	Date	Originators	Checkers	Approvers	Description
P1	April 2019	J Hawe/ E O'Mullane	J Hawe	J Hawe	First Issue (Client Review)
P2	May 2019	J Hawe/ E O'Mullane	J Hawe	J Hawe	Second Issue (Client Review)
P3	May 2019	J Hawe/ E O'Mullane	J Hawe	J Hawe	Issued for Planning
P4	Nov 2019	C Hourihane	M Murphy	M Murphy	Issued for Planning

Information class: Standard

1 Introduction 1

1.1 Proposed Development 1
1.2 Benefits of the Proposed Development 1
1.3 Planning and Development Regulations 1

2 Planning Policy and Context 3

2.1 National & Regional Planning Policy 3
2.2 County Development Plan 3
2.3 Local Area Plan 4

3 Description of the Proposed Road Development 6

3.1 Location 6
3.2 Road Type 8
3.3 Demolition 8
3.4 Junctions 8
3.5 Road Closures / Re-Alignments 9
3.6 Earthworks / Excavation 9
3.7 Drainage 9
3.8 Flood Risk 10
3.9 Public Utilities 11
3.10 Signage 11
3.11 Vehicle Restraint Systems 11
3.12 Pedestrian/Cycleway Facilities 11
3.13 Traffic Management 11
3.14 Construction Phase 12
3.14.1 Construction Phase Management 13

4 Consultation 14

4.1 Introduction 14
4.2 Public Consultation 14
4.2.1 Plans and Particulars 14
4.2.2 Submissions or observations 14
4.2.3 Notice of Proposed Development (Newspaper & Site) 14

5 Environmental Impacts 15

5.1 Environmental Impact Assessment Screening 15
5.2 Environmental Scoping 15
5.3 Appropriate Assessment Screening 16
5.4 Human Beings 16
5.4.1 Introduction 16
5.4.2 Methodology 16
5.4.3 Existing Environment 16

5.4.4 Identification of Potential Impacts 18
5.4.5 Proposed Mitigation Measures 18
5.4.6 Residual impacts 19
5.5 Biodiversity 19
5.5.1 Introduction 19
5.5.2 Methodology 19
5.5.3 Description of Existing Environment 19
5.5.4 Identification of Potential Impacts 25
5.5.5 Proposed Mitigation Measures 26
5.5.6 Residual impacts 28
5.6 Water Quality and Surface Drainage 28
5.6.1 Introduction 28
5.6.2 Methodology 28
5.6.3 Description of the Existing Environment 29
5.6.4 Identification of Potential Impacts 29
5.6.5 Construction Phase 30
5.6.6 Operation Phase 30
5.7 Soils, Geology and Hydrogeology 30
5.7.1 Introduction 30
5.7.2 Methodology 30
5.7.3 Description of Existing Environment 30
5.7.4 Identification of Potential Impacts 31
5.7.5 Proposed Mitigation Measures 32
5.7.6 Residual impacts 33
5.8 Landscape and Visual 33
5.8.1 Introduction 33
5.8.2 Methodology 33
5.8.3 Description of Existing Environment 33
5.8.4 Identification of potential Impacts 34
5.8.5 Proposed Mitigations Measures 34
5.9 Cultural Heritage 35
5.9.1 Introduction 35
5.9.2 Methodology 35
5.9.3 Description of Existing Environment 36
5.9.4 Proposed Mitigation Measures 42
5.9.5 Residual impacts 43
5.10 Noise 44
5.10.1 Introduction 44
5.10.2 Methodology 44
5.10.3 Acceptable Noise Limits 44
5.10.4 Description of Existing Environment 45
5.10.5 Identification of potential Impacts 45
5.10.6 Proposed Mitigation Measures 46
5.10.7 Residual impacts 46
5.11 Air Quality 46

5.11.1 Introduction 46
5.11.2 Methodology 46
5.11.3 Description of Existing Environment 46
5.11.4 Identification of potential Impacts 47
5.11.5 Proposed Mitigation Measures 47
5.11.6 Residual impacts 48

6 Land Acquisition and Accommodation Works 49

Appendices 50

A. Notice of Proposed Development (Newspaper & Site) 51

B. Appropriate Assessment Screening Document 52

C. OPW Flood Map Report 53

1 Introduction

The proposed Mungret Link Streets Project is located in the townland of Mungret to the west of Limerick City and in the vicinity to the R510 Regional road and the R859 Regional Road. The proposed scheme is a key element of public infrastructure to enable the delivery of the Mungret-Loughmore Masterplan which is a significant objective of the Southern Environs Local Area Plan.

1.1 Proposed Development

The Mungret Link Streets project consists of the provision of ca. 1.7km of new public road within the Mungret / Loughmore Common area of County Limerick. The project includes the following associated infrastructure:

- Driving Lanes,
- Cycleways,
- Footpaths,
- Roadside Parking,
- Surface water drainage / sustainable urban drainage, and
- Street lighting

The purpose of the project is to accommodate the future construction of new residential development in Mungret, Limerick (Limerick 2030 housing), within lands zoned for residential development under the Southern Environs Local Area Plan 2011 – 2017 (Extended until May 2021).

Ducting for the provision of services detailed below will also be installed to facilitate the future implementation of the area masterplan.

- Foul water drainage connection into Limerick Main Drainage Scheme
- Water mains
- Gas Mains
- Telecommunications

The Limerick 2030 housing project will, in itself, likely be subject to Environmental Impact Assessment in accordance with Part 10 of the Planning and Development Regulations, 2001 as amended.

1.2 Benefits of the Proposed Development

The completion of the proposed road development will allow for the private development of the Mungret / Loughmore Common area in accordance with the Mungret Masterplan as outlined in the Southern Environs Local Area Plan (LAP).

1.3 Planning and Development Regulations

The proposed road development is considered under Part VIII of the Planning and Development Regulation, 2001 as amended.

This Planning Report has been prepared by Mott MacDonald as part of the Planning Procedure under Part VIII of the Planning and Development Regulation, 2001. It is accompanied by an Appropriate Assessment screening report and drawings. The following drawings should be read in conjunction with this report:

Table 1: Documentation to be read in conjunction with this report

Document Number	Document Title
229383711-MMD-0100-XX-DR-C-0001-P02.	Horizontal Layout Sheet 1 of 2
229383711-MMD-0100-XX-DR-C-0002-P02.	Horizontal Layout Sheet 2 of 2
229383711-MMD-0100-XX-DR-C-0003-P02.	Overall Horizontal Layout
229383711-MMD-0100-XX-DR-C-0013-P01	Longitudinal Sections of Road 1 and Road 2

2 Planning Policy and Context

2.1 National & Regional Planning Policy

The Mid West Area Strategic Plan 2012-2030 was developed to facilitate and inform the implementation of the statutory processes. It was developed by the constituent Planning Authorities of the Mid-West Region (Clare County Council, Limerick City and County Councils and North Tipperary County Council) and the Mid-West Regional Authority. It was developed as a non-statutory, 20-year, integrated land-use and transport strategy for the region. It provides an evidence base which can inform transport and planning policy and infrastructure investment decisions in the Region to 2030.

The objectives outlined in the Mid-West Area Strategic Plan 2012-2030 include;

- Identify and promote investment in key infrastructural projects identified to serve the needs of the region including new roads and improvements to the National Secondary and Regional road network, rail, air, port, infrastructure and water services. Such proposals to include an equitable distribution of resources throughout the region;

2.2 County Development Plan

The Limerick County Development Plan 2010-2016 (CDP) came into effect on the 29th of November 2010 and sets out the Council's overall strategy for the proper planning and sustainable development of the County to 2016 and beyond. The CDP sets out an overall vision for the county in a range of goals which are supported by aims and objectives.

One of the core objectives highlighted in the CDP is the need to improve the county's transport infrastructure as it acknowledges there is a need for a modern and comprehensive infrastructure to facilitate real economic and social development.

- Policy IN P1: Integration of transport with land use

The Council shall seek to develop a robust evidence-based framework of decision making in infrastructure and development management, to ensure the efficient and timely provision of suitable facilities for access when and where needed. The Council shall also require that the facilities and the land uses they would serve are mutually integrated so as to make optimum use of investment in transport infrastructure. To this end the Council shall seek in particular to implement the provisions of the emerging Mid-Western Area Strategic Plan (MWASP) once fully assessed and adopted.

The CDP promotes the development of public transport facilities through the following objectives;

- Objective IN O3: Quality bus services and facilities

It is an objective of the Council to:

a) promote suitable facilities and co-operate with other agencies and neighbouring local authorities in developing a high quality and coherent system of bus facilities. Measures that will be promoted include bus lanes, quality bus corridors, appropriate shelters, and real time information at bus stops;

b) identify and pursue opportunities for bus corridors, bus priority measures and transport hubs in Local Area plans, taking into account MWASP findings and recommendations.
c) ensure adequate provision for bus routes and facilities in development proposals as appropriate, including in road construction and alteration and in the layout of all developments. Bus Eireann shall be consulted on all proposed residential schemes, retail centres and major employment centres, and on all changes to roads and layouts which may impinge on existing bus facilities or affect or provide opportunities to improve bus facilities.
d) protect bus lanes/quality bus corridors on the following routes:
    i) From Raheen roundabout to link with the city boundary at the Ballinacurra road, as identified in the Southern Environs Local Area Plan.
    ii) Castletroy as identified in the Castletroy Local Area Plan 2009.
    iii) The Castletroy bus lane will also extend beyond the boundary of Castletroy Local Area Plan to the junction of the R455 with the M7

The CDP defined Castletroy as a Tier 1-The Gateway, The City and City Environs and recognised that these areas accommodate a wide range of services, employment, leisure, and retail facilities of Regional significance for the surrounding catchment area. Limerick City and Environs act as a core driver of the Region and a focal point for attracting investment into the area that would energise the entire Region. As such there is a presumption in favour of development in the City Environs to promote its sustainability. The relevant policies and objectives to this scheme are as follows:

- Policy SS P6:

It is policy of the Council to ensure that sufficient land is zoned within the city environs so that, as part of the Limerick Gateway, they will act as the primary focus for investment in infrastructure, housing, transport, employment, education, shopping, health facilities and community.

Furthermore, the CDP promotes the development of pedestrian and cycling.

The plan states that

Cycle facilities shall be incorporated into the design and layout of developments schemes as appropriate including road schemes and development schemes in accordance with the National Cycle Policy Framework, Department of Transport, 2009, and any subsequent documents to be released on foot of same, providing guidelines and standards.

- Objective IN O8: Cycle and pedestrian facilities
- It is an objective of the Council to encourage the successful incorporation of safe and efficient cycle and pedestrian facilities, and accessible cycleways, footpaths and pedestrian routes into the design schemes for residential, educational, employment, and recreational developments. Consideration will be given in these schemes to existing or proposed routes where applicable.

2.3 Local Area Plan

Southern Environs Local Area Plan 2011 – 2017 (extended until May 2021)

The Southern Environs Local Area Plan (LAP) is a legal document consisting of a public statement of Limerick County Council's planning policies for the Southern Environs area. This plan replaces the previous 2005 - 2011 Southern Environs Local Area Plan. The aim of this LAP is to establish a framework for the planned, coordinated and sustainable development of the

Southern Environs and for the conservation and enhancement of its natural and built environment over the next six years and beyond.

On 16th May 2016 Limerick City & County Council extended the duration of the Southern Environs Local Area Plan 2011-2017 for a further five years, until May 2021

The development of the Mungret Link Streets Project is a key element of public infrastructure to enable the delivery of the Mungret-Loughmore Masterplan (a significant objective of the Southern Environs Local Area Plan Specifically Objective MLO2: Mungret – Loughmore Land Use Zoning).

The plan states;

The Mungret – Loughmore Opportunity Area is located in the west of the Southern Environs around the former institutional grounds of Mungret College. It includes the townlands of Baunacloka, Dromdarrig, parts of Moneteen, and Loughmore. It also includes Mungret village, and an area defined by Moore's lane and the N69. The boundary to the north is the regional road R859 Quinn's Cross to Mungret and the N69. The eastern boundary consists of lands along the regional road R510 Quinn's Cross to Raheen roundabout. The southern boundary runs along the regional road R526 Raheen – Patrickswell and the Caher road. The lands contain a mix of land uses as follows: 'Residential Development Area', 'Mixed Use', 'Open Space and Recreation', 'Education and Community Facilities', 'Enterprise and Employment and 'Retail/Commercial' and 'Special Control Area'.

The scale and nature of these lands merit a strategic approach. The objective is to guide, promote and facilitate, but not prescribe future development in the area. The designation seeks to establish parameters for development proposals providing an overall design concept addressing open space, transport, and social infrastructure. This approach aims to maximise the development potential of the area bearing in mind the principles of sustainability and the criteria as determined by the Sustainable Urban Residential Development – Guidelines for Planning Authorities and the accompanying Design Manual, DEHLG, May 2009 and the Retail Planning Guidelines, and accompanying Design Manual, DECLG, 2012.

Mungret - Loughmore Masterplan Objectives

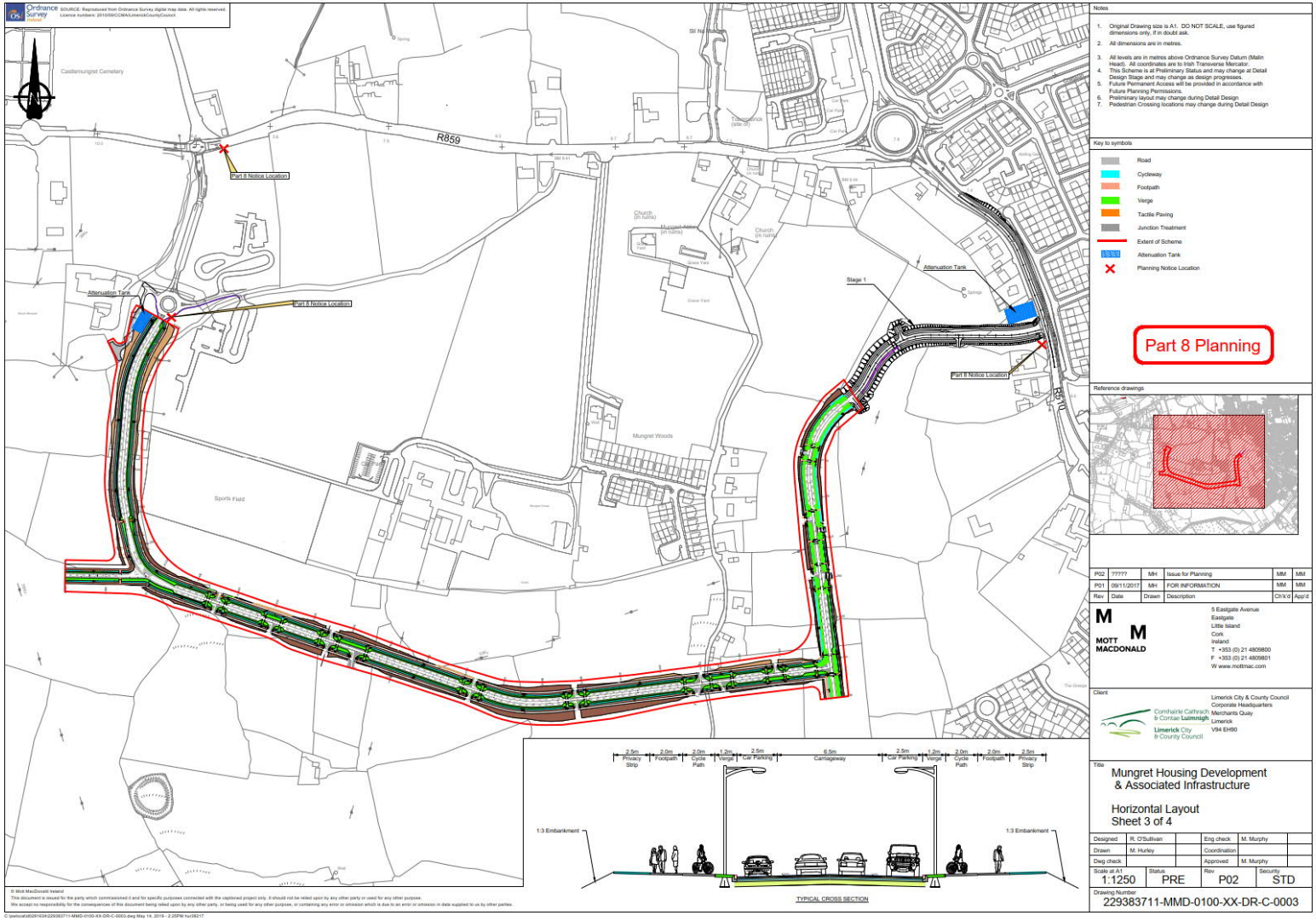
Objective MLO2: Mungret – Loughmore Land Use Zoning. It is an objective of the Council to facilitate the development of the area identified as the Mungret – Loughmore Opportunity Site in accordance with the masterplan outlined on Map 6 of this LAP, the policies and objectives set out in the Limerick County Development Plan and in this LAP.

3 Description of the Proposed Road Development

3.1 Location

The Mungret Link Street Project is located in the west of the Southern Environs around the former institutional grounds of Mungret College. It includes the townlands of Baunacloka, Dromdarrig, parts of Moneteen, and Loughmore. It also includes Mungret village, and an area defined by Moore's lane and the N69. The boundary to the north is the regional road R859 Quinn's Cross to Mungret and the N69. The eastern boundary consists of lands along the regional road R510 Quinn's Cross to Raheen roundabout. The lands contain a mix of land uses as follows: 'Residential Development Area', 'Mixed Use', 'Open Space and Recreation', 'Education and Community Facilities', 'Enterprise and Employment and 'Retail/Commercial' and 'Special Control Area'.

Figure 1: Mungret Link Streets Project

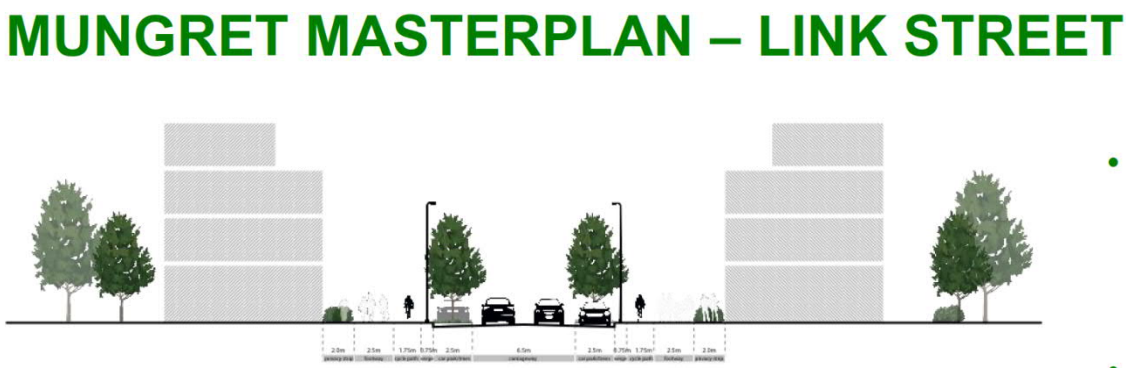


Source: Mott MacDonald 2019

3.2 Road Type

The proposed road will consist of a Single Carriageway road (6.5m carriageway road consisting of two lanes 3.25 meters wide), it will also include 2.5m wide parking bays, a delineation strip and 2.0m wide Cycleways adjacent to a 2.0m footpaths

The design speed of the road is 50kph. The posted speed limit is expected to be 50kph



The proposed layout and cross sections are shown on drawings 229383711-MMD-0100-XX-DR-C-0001-P02 and 229383711-MMD-0100-XX-DR-C-0002-P02 .

A preliminary design has been prepared in accordance with the principles outlined in the Design Manual for Urban Roads and Streets (DMURS) published by the Department of Transport, Tourism and Sport (DTTAS).

The preliminary design has also taken cognisance of the Local Area Plan Movement and Accessibility Policy to provide facilities for pedestrians and cyclist as well as vehicular traffic.

3.3 Demolition

No demolition is anticipated.

3.4 Junctions

One primary link road junction, 5 primary/secondary link road and 14 primary/tertiary link road junctions are planned as part of the project as follows;

Table 2: Schedule of Junctions and Accesses

Junction Type	Location/Name	Description
Access	Road 1 Chainage 0+330	Primary/Secondary link road junction - Standard urban T junction
Access	Road 1 Chainage 0+430	Primary/Tertiary link road junction - Pedestrian friendly urban cross road junction
Access	Road 1 Chainage 0+500	Primary/Tertiary link road junction - Pedestrian friendly urban T junction
Access	Road 1 Chainage 0+570	Primary/Secondary link road junction - Pedestrian friendly urban cross road junction
Access	Road 1 Chainage 0+610	Primary/Tertiary link road junction - Pedestrian friendly urban T junction
Access	Road 1 Chainage 0+760	Primary/Secondary link road junction - Pedestrian friendly urban cross road junction

Junction Type	Location/Name	Description
Access	Road 1 Chainage 0+890	Primary/Tertiary link road junction - Pedestrian friendly urban cross road junction
Access	Road 1 Chainage 1+050	Primary/Secondary link road junction - Pedestrian friendly urban cross road junction
Access	Road 1 Chainage 1+070	Primary/Tertiary link road junction - Pedestrian friendly urban T junction
Access	Road 1 Chainage 1+140	Primary/Tertiary link road junction - Pedestrian friendly urban T junction
Access	Road 1 Chainage 1+210 / Road 2 Chainage 0+360	Primary link road junction - Pedestrian friendly urban T junction
Access	Road 2 Chainage 0+090	Primary/Secondary link road junction - Pedestrian friendly urban T junction
Access	Road 2 Chainage 0+175 and Chainage 0+190	Primary/Tertiary link road junction - Pedestrian friendly urban staggered cross road junction
Access	Road 2 Chainage 0+250	Primary/Tertiary link road junction - Pedestrian friendly urban cross road junction

3.5 Road Closures / Re-Alignments

It is not proposed to extinguish any public rights of way (road closures).

3.6 Earthworks / Excavation

The construction involves various earthworks throughout the length of the proposed road development. Various heights of cutting and filling will be required to construct the mainline, sideroads and other associated works. These can be seen on the proposed road development drawings (referenced in Table 1).

Based on investigation undertaken so far, the ground conditions across the site are generally expected to comprise stiff clays overlying Limestone rockhead. These conditions are expected to constitute adequate founding strata for the proposed embankments and the carriageway. Protection of the underlying rock will be required due to its Karst features.

3.7 Drainage

The proposed road drainage will facilitate the efficient removal of surface and sub-surface water while minimising the impact of runoff on the receiving environment using Sustainable Drainage Systems (SuDS). The following standards have been referenced in the development of the drainage strategy and will be used in the preparation of the detailed design;

- NRA Design Manual for Roads and Bridges (NRA DMRB) Volume 4 Geotechnics and Drainage – Section 2 Drainage
- The Greater Dublin Strategic Drainage Study: Volume 2 New Development, Dublin City Council, March 2005
- Guidelines for Road Drainage, Department of the Environment, Heritage and Local Government, April 2004
- CIRIA Guidance Document C697: The SuDS Manual

The principle type of drainage systems will be kerb and gully which will be integrated into the existing drainage network. In the unlikely event that kerbed sections are not present; filter drains will be used. Sub-surface drainage will be provided by narrow filter drains. Where the adjoining land slopes towards the distributor road, earthworks drainage will be provided through open v-ditches.

- The Modified Rational Method will be used to determine pipe size diameters at detail design stage. Simulation modelling is used to assess flood risk for extreme events and to justify pipe size and gradients, while also ensuring adequate levels of service. Table 3 below summaries the criteria which are applied for the drainage design.

Table 3: Surface Water Pipe Design Criteria

Parameter	Surface Water Carrier Pipes
Minimum Depth	1.2m cover under highways[1] 0.9m under accesses[1]
Maximum Depth	6.0m
Minimum Pipe Diameter	225mm
Runoff Factors for Pipe Sizing	100% paved and roof surfaces 70% of the plan area of cuttings 0% of pervious surfaces
Rainfall for Initial Pipe Sizing	50mm/hr rainfall intensity
Maximum Velocity (pipe full)	2.5m/s
Minimum Velocity (pipe full)	1.0m/s (may be relaxed to 0.75m/s)
Pipe Roughness (kS)	0.6mm

Notes: [1] Cover may be reduced with appropriate bedding surround i.e. concrete

Longitudinal sealed carrier drains will be designed to accommodate a 1 in 1 year storm in-bore without surcharge. The design will be checked against a 5-year storm intensity to ensure that surcharge levels do not exceed the levels of chamber covers. Rainfall intensities will be factored by 10% to account for the future effects of climate change in accordance with the GDSDS.

Road tie-ins to existing local and regional roads will utilise the existing drainage network where road gradients and levels permit.

In order to reduce the impact of the development on the natural hydrological state of a catchment, the design will aim to replicate the Greenfield runoff response through the provision of attenuation storage using SuDS systems. To protect against flooding, attenuation storage will be designed with a limiting discharge throttle rate of QBAR (Greenfield runoff rate) for all extreme events up to 100 years in accordance with Table 6.3 of the GDSDS Volume 2 Chapter 6. It is proposed that the level of the attenuation pond bund is higher than the 100 year flood level to avoid difficulties during the operation period and also to reduce the risk of the river inundating the units during extreme flood events. This will mitigate against the risk of sedimentation and also ensure that the attenuation storage is operational during extreme flood events as required by the GDSDS.

Drainage from the road will be to two attenuation basins; one servicing the eastern extent of the road and one servicing the western extent of the road. The road drainage has been designed to accommodate drainage from future residential development within lands zoned for development under the Southern Area Local Area Plan 2011-2017 (as extended). The attenuation basins will drain in to the existing drainage networks associated with the R859 and R510 roads.

3.8 Flood Risk

A flood report downloaded from the Web site www.floodmaps.ie showed no flood events in the immediate vicinity of the proposed scheme, there were however, some recorded events with the 2.5km radius of the site that the report examined. The closest of these were flooding on the main street of Mungret Village to the east of the site and recorded flooding in Loughmore

Common to the south. None of these events show any effect on the development site. A copy of this flood report has been included in Appendix C.

3.9 Public Utilities

The design of the proposed road improvement scheme will include for the provision of road lighting for the full length of the proposed road improvement scheme including interactions with the existing local public lighting network.

Local electricity diversions and alterations will be made as necessary to facilitate the new proposed road development.

The design of the new proposed road improvement scheme will include for the interaction with foul sewers and Watermains in the vicinity of the proposed road development.

The design of the new proposed road improvement scheme will include for the interaction with telecommunications in the vicinity of the proposed road development.

The design of the new proposed road improvement scheme will include for the interaction with gas mains in the vicinity of the proposed road development.

Ducting will be provided for any future extension of services such as telecommunications and electricity.

3.10 Signage

Appropriate signage and road markings as required, and regarding the Traffic Signs Manual will be provided.

3.11 Vehicle Restraint Systems

Vehicle restraint systems (VRS) are not anticipated however should VRS be required they will be installed in accordance with the TII Publications following consideration of the principles of the Conference of European Directors of Roads (CEDR) document “Forgiving Roadsides Design Guide” and Transport Infrastructure Ireland (TII) document “A Guidance Document for the Implementation of the CEDR Forgiving Roadsides Report”.

3.12 Pedestrian/Cycleway Facilities

A 2.0-metre-wide footpath and a 2.0-meter cycleway are proposed on both sides of the carriageway. Crossing points will be provided as necessary.

3.13 Traffic Management

Traffic management will be required during the construction phase of the works. A detailed traffic management plan will be produced by the Contractor following consultation and agreement with the Gardaí and Limerick City and County Council.

The Traffic Management Plan will comply with the requirements of “Chapter 8 of the Traffic Signs Manual” issued by the Department of Transport (Temporary Traffic Measures and Signs for Roadworks)”.

The Contractor will also take account of the “Guidance for the Control and Management of Traffic at Road Works” issued by the Department of Transport in the implementation of the plan and the “Guidelines for Managing Openings in Public Roads” issued by the Department of Transport, Tourism and Sport.

The traffic management plan will at a minimum include the following;

- Site Traffic and Parking,
- Safe Access and Egress,
- Other Road Users, particularly cyclists and pedestrians,
- Local Residents,
- Existing Entrances,
- Emergency Services,
- Working Hours,
- Safety & Security,
- Speed Limits,
- Restrictions to Traffic,
- Safe Working Widths,
- Safety Zones.
- Temporary Traffic signs and Signals

3.14 Construction Phase

Subject to Part 8 approval being secured, it is anticipated that the construction phase will commence in 2020 and is expected to last between 10 and 12 months.

It is envisaged that normal working hours during the construction phase will be between 07:00 and 19:00 with works carried outside of these times being the subject to the approval of Limerick City and County Council (with particular attention being paid to minimising the potential for noise and light pollution/nuisance). The average number of construction workers on-site will vary from 10 to 30 workers for the duration of the works.

The construction machinery that may be utilised during the works will consist of the following types:

- Track excavators;
- wheeled excavators
- Dumpers;
- Tractors;
- Paving machine;
- Rollers
- Road sweeper;

Delivery trucks to site for a development of the scale proposed would typically number five per day for the duration of the works increasing to ten delivery trucks per day during the pavement phase of the works.

A preliminary indicative construction programme for the proposed road development is detailed in Table 4 below. The table is for information only and is based on the currently available information. The contractor will be responsible for scheduling construction activities and as such, the durations detailed below may be subject to change.

Table 4: Preliminary Indicative Construction Schedule

Construction Phase	Activity	Approximate Timeline
Site Clearance	Removal of vegetation (such as hedgerows and trees) and topsoil	2 - 4 weeks
Footpaths, kerbing, accommodation works, drainage and utilities	Construction of footpaths, installation of kerbing. Installation of drainage pipes	26 - 30 weeks

Construction Phase	Activity	Approximate Timeline
	and ducting and construction of chambers and manholes. Building of walls and constructing entrances to land owners and properties adjacent to the scheme.	
Pavement construction	Laying of bituminous layers to levels and tying-in to existing roads.	8 – 12 weeks
Installation of road markings and signage	Installation of safety barrier, road markings and signage	2 – 4 weeks
Landscaping	Planting of grass verges and small shrubs	2 – 4 weeks

3.14.1 Construction Phase Management

A Construction Environmental Management Plan (CEMP) will be developed and implemented by the nominated Contractor during the construction phase of the project. The CEMP will be regularly reviewed to ensure that construction environment impacts such as traffic, noise, lighting, waste management and dust are being effectively controlled and minimised.

The CEMP will include the mitigation measures detailed in this report. Typically, the plan may include a Traffic Management Plan, Dust Minimisation Plan, Water Management Plan and a Construction and Demolition Waste Management Plan (CDWMP). The CDWMP will be developed in accordance with *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects* (Department of Environment, Heritage and Local Government, 2006) and will include details of how waste, including contaminated material if encountered, will be contained, transported, and managed in accordance with the *Waste Management Act 1996, as amended.*

4 Consultation

4.1 Introduction

This chapter outlines the consultation undertaken as part of the preparation of the design and documentation being brought forward for Part 8 approval.

4.2 Public Consultation

4.2.1 Plans and Particulars

Plans and particulars of the proposed works will be available for inspection, or purchase at a fee not exceeding the reasonable cost of making a copy, during normal office hours, Monday to Friday (excluding Bank Holidays), from 22nd November 2019 up to and including 20th December 2019 at Customer Services, Limerick City and County Council, Merchant's Quay, Limerick, the Planning and Environmental Services Department of Limerick City and County Council, Dooradoyle, Co Limerick.

4.2.2 Submissions or observations

Submissions or observations in relation to the proposed development, dealing with the proper planning and sustainable development of the area in which the works will be constructed may be made in writing to The Administrative Officer, Design and Delivery Section, Limerick City and County Council, Merchant's Quay, Limerick on or before 17:00 hours on the 13th January 2020.

All comments, including names of those making comments, submitted to the Council in regard to this development will form part of the statutorily required report to be presented to the monthly meeting of Limerick City and County Council. Accordingly, they will also be included in the minutes of that meeting and may appear in the public domain.

4.2.3 Notice of Proposed Development (Newspaper & Site)

In accordance with Article 81.1a of the regulations notice of the proposed development was placed in the approved newspaper The Limerick Leader on the 22nd November 2019. A copy of the newspaper notice is contained in Appendix A of this report.

In accordance with Article 81.1b of the regulations site notices have been erected on the land on which the proposed development would be situated. The site notice locations are shown on the scheme drawings. A copy of the site notice is contained in Appendix A of this report.

5 Environmental Impacts

5.1 Environmental Impact Assessment Screening

An Environmental Impact Assessment Screening exercise was carried out by Mott MacDonald on behalf of Limerick County Council. The Study concluded that the scheme is not a type or nature of significance to require an Environmental Impact Assessment.

5.2 Environmental Scoping

In order to identify the relevant environmental topics to be addressed in this environmental assessment a scoping exercise was undertaken. The outcomes of this assessment are presented in Table 5.

Table 5: Environmental Scoping

Section	environmental topics	Scope In or Out
Human Beings	The proposed development is located within a Peri-urban area to the west of Limerick City. Due to the nature of the work, location, and the potential of impact during the construction phase a desktop assessment was undertaken.	Scope In
Biodiversity	Due to the marginal nature of this area with some elements of ecology, a desk based, and field assessment was undertaken to identify any valuable habitats or species and to identify the presence of invasive species. In addition, an AA Screening was undertaken to determine potential impacts of the proposed development on nearby Natura 2000 sites in view of their conservation objectives.	Scope In
Water	Loughmore Common Turlough pNHA is located approximately 100m south of the Mungret Link Streets project. In order to assess the potential for an impact on this watercourse a desktop assessment and field studies were undertaken.	Scope In
Soils Geology & Hydrogeology	The proposed road developments will include excavation works during the construction phase. There is therefore potential for impacts on the soil geology and hydrogeology within the development site. As a result, a desktop assessment has been undertaken.	Scope In
Landscape & Visual	Due to the nature of the works and the close proximity of sensitive receptors a desktop assessment has been undertaken to assess the visual impacts of the scheme.	Scope In
Cultural Heritage	There are a number of cultural heritage sites and features within close proximity to the proposed development. A desktop assessment was therefore undertaken to assess the potential impacts on these features.	Scope In
Noise	Due to the nature of the works and the proximity of sensitive receptors a desktop assessment has been undertaken to assess the noise impacts of the scheme.	Scope In
Air Quality	Due to the nature of the works and the potential of impact on air quality during the construction and operation phases a desktop assessment was undertaken.	Scope In

5.3 Appropriate Assessment Screening

Articles 6(3) and 6(4) of Council Directive 92/43/ECC on the Conservation of natural habitats and of wild fauna and flora habitats (the 'Habitats Directive') require that where a plan or project, either individually or in combination with other plans or projects, is likely to have a significant effect on a Natura 2000 Site, and where that plan or project is not directly connected with or necessary to the nature conservation management of the site, it shall be subject to 'Appropriate Assessment' to identify any implications for the Natura 2000 site in view of the site's conservation objectives. Natura 2000 sites include Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Sites of Community Importance (SCIs) which have been adopted by the (EU), but not yet formally designated by the governments of Member States, as well as candidate SPAs, SACs and SCIs.

The first stage in the Appropriate Assessment process is Stage 1 Screening for Appropriate Assessment. This assessment was undertaken to determine whether the proposed works; alone, and in-combination with other projects, are likely to have significant effect on the conservation objectives of the European sites within the Zone of Influence.

The overall conclusion of the Stage 1 Screening for Appropriate Assessment was that there are no significant effects as a result of the proposed development on the European sites. Progression to Stage 2 in the Appropriate Assessment process is therefore considered not to be necessary. A copy of the Stage 1 Screening for Appropriate Assessment is provided in Appendix A of this report. It is acknowledged, however, that the Planning Authority is the competent Authority in this instance for Stage 1 Screening of the proposal for Appropriate Assessment.

5.4 Human Beings

5.4.1 Introduction

This section assesses human environment and material assets affected by the proposed road development arising from the construction and operation phases, and specifies mitigation measures to reduce potential impacts, where appropriate.

5.4.2 Methodology

A desk-based assessment was undertaken to determine the existing environment in relation to Human Beings and Material Assets. The appraisal has been undertaken in consideration with the following:

- Central Statistics Office (CSO), (www.cso.ie);
- Strategic Masterplan and Urban Design Strategy for Mungret, Limerick Twenty Thirty (Masterplan)
- Southern Environs Local Area Plan 2011 – 2017 (Extended until May 2021) (Southern Environs LAP)
- Limerick County Development Plan 2010 – 2016 (Limerick CDP)

5.4.3 Existing Environment

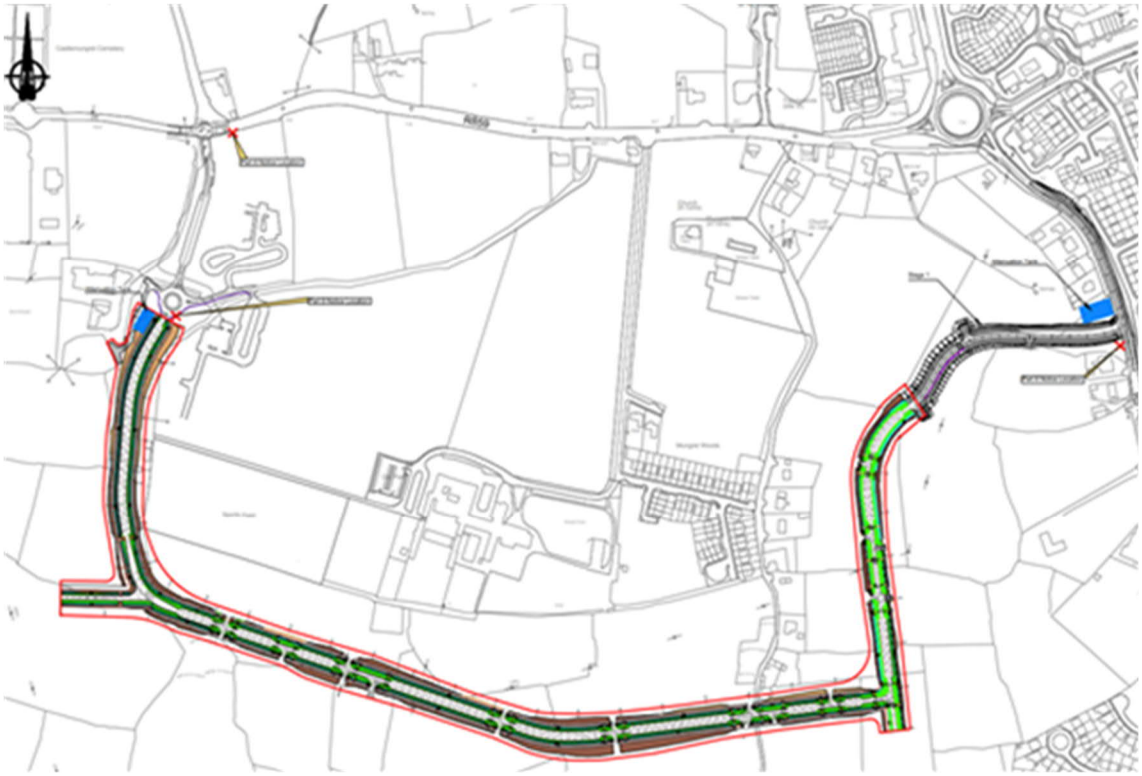
5.4.3.1 Current Land Use

The proposed development site is located in agricultural grasslands within the Mungret/ Loughmore Common area, approximately 4.5km south-west of Limerick city.

The proposed development site is currently used for agricultural purposes and the fields are lightly grazed by cattle. Residential development occurs to the east and south-west of the site. The R526 regional road is located along the south-east border and the R859 regional along the northern border of the site. Mungret House and Woods are located towards the centre of the site. A school and sport fields are located at the north-western corner of the site.

Refer to Figure 2 for the site layout

Figure 2: Mungret Link Street Scheme



5.4.3.2 Population

The population of the Southern Environs of Limerick city in 2011 was 17,310 which includes the Mungret area (Southern Environs LAP). Southern Environs LAP described the area as having one of the fastest population growth rates of anywhere in the county and has shown continued increase over the last two decades.

5.4.4 Identification of Potential Impacts

5.4.4.1 Construction Phase

During the construction phase there is likely to be a disruption to local traffic in the area. There will be an increase of construction vehicles using the local roads and the possibilities of road diversions. However, a Traffic Management Plan will be established which will minimise the impacts.

There may be negative impacts on some of the commercial and retail properties located in the immediate environs of the proposed development, where general construction nuisance will be experienced.

Local labour will be employed, as far as practicable, which will result in a positive short-term impact for the local economy of the area through the generation of jobs within the construction sector

5.4.4.2 Operational Phase

The road scheme will improve the area's infrastructure and improve road safety within the area, providing an additional link with cycle lanes from the R859 to the R510. Allowing for the additional growth and development in the area strengthening outlined in the Masterplan.

5.4.5 Proposed Mitigation Measures

5.4.5.1 Construction Phase

The following construction phase mitigation measures will be put in place to ensure impacts on the human environment are minimised as far as practicable:

- An Environmental Operating Plan (EOP) will be prepared which will include measures for the provision of information to the public, communication and complaints procedures, maintenance of access, and traffic management procedures. This will serve to minimise potential impacts on existing residential and commercial areas;
- Local businesses and residents will be informed in advance of the date of commencement of construction works and will be provided with information on the intended construction programme where appropriate;
- A Traffic Management Plan will be included in the EOP as part of the implementation of the Mitigation Strategy. Traffic management measures will be undertaken in compliance with any relevant authorities including the Gardaí Síochána. Information on alternative access / traffic arrangements will be provided to local residents and land owners in advance of construction commencing;
- Access to private properties will be maintained at all times during the construction phase, and temporary accesses and appropriate signage etc. will be put in place.

5.4.5.2 Operational Phase

None are required

5.4.6 Residual impacts

With the implementation of the proposed mitigation measures during the construction phase, it is not anticipated that there will be any significant adverse impacts in terms of human being and visual assets. No impacts are envisioned during the operational phase.

5.5 Biodiversity

5.5.1 Introduction

The following section identifies the habitats and species of ecological importance which may be impacted by the development, to determine their nature conservation value and to assess and mitigate where necessary any potential impacts on local flora and fauna arising from construction and operational phases of the proposed development. Furthermore, the presence of invasive species near the development site was also assessed to determine the risk that such species could be spread during the construction phase of the project and to recommend mitigation measures where required.

5.5.2 Methodology

A desktop-based review of the designated sites, habitats and protected and notable species in the area of the proposed development was undertaken. Records of protected species and non-statutory designated sites were obtained from the following publicly available publications, reports and online database:

- National Parks and Wildlife Services (NPWS) (www.npws.ie)
- National Biodiversity Data Centre (www.biodiversityireland.ie)
- Environmental Protection Agency (www.epa.ie)

This assessment was supported by a field surveys carried out by Mott MacDonald Ecologists on the on 15th September 2017, and on the 6th and 7th of June 2018, a habitat survey was carried out having regard to the following guidance;

- Best Practice Guidelines for Habitat Survey and Mapping (The Heritage Council, 2011)
- A Guide to Habitats in Ireland (Fossitt - The Heritage Council, 2000)
- Guidelines for Assessment of Ecological Impacts of National Roads Schemes (National Road Authority 2009)

The site was also searched for evidence of invasive plant species listed in Part 1 of the Third Schedule of S.I No. 477 of 2011, European Communities (Birds and Natural Habitat Regulations 2011).

5.5.3 Description of Existing Environment

The project is located within lands comprising improved agricultural grassland, GA1, (dominated by rye-grass, *Lolium* spp.) in current use as grazing for beef cattle. The agricultural fields are separated by mature hedgerows, WL1, which comprise hawthorn (*Crataegus monogyna*) and blackthorn (*Prunus spinose*), with intermittent ash (*Fraxinus excelsior*) and elder (*Sambucus nigra*), and with an undergrowth of bramble (*Rubus fruticosus agg.*). The lands are in general of lower ecological value due to the low species diversity.

Loughmore Common Turlough pNHA is located approximately 100m south of the Mungret Link Streets project. Environmental features of greater value which might be affected by the project are described hereunder.

Figure 3: Habitat Map

Source: Mott MacDonald Field Survey 2018

Loughmore Common Turlough pNHA

The southern spur of the original Mungret Link Streets projects was originally planned to pass through Loughmore Common Turlough pNHA, a site of national importance, (between approximate road chainage 0+260 and 0+440). This would have resulted in associated loss of ca. 0.0033km^2 of agricultural grassland within the pNHA (which has a total area of 0.2849 km^2) along the footprint of the road however it is now no longer part of the development under consideration due to the ecological sensitivity of this particular location. The section of road that passes through the pNHA would be required to be designed to allow the free movement of turlough flood waters between lands bisected by the road. Thus, whilst this is not currently anticipated to have any effect on the surface movement of turlough waters it is considered important that this section of road is not progressed until there is conclusive information associated with the hydrological/hydrogeological functioning in the area.

The lands to be traversed by the road comprise heavily grazed agricultural grassland. Further west, beyond the road alignment, the habitat presents with species typical of wetter conditions with a high frequency of hard rush (*Juncus inflexus*), common sedge (*Carex nigra*) and compact rush (*Juncus conglomeratus*). The turlough was observed to be dry on the day of site walkover and no wetland birds were observed using the site.

The original southern spur passed along the periphery of an area of large sedge swamp, immediately south of the Loughmore Canal, within the pNHA boundary. This swamp is ca. 0.5ha in area. This would have resulted in the permanent loss of a narrow strip of this habitat ca 0.03ha in area along the eastern periphery of the swamp. This habitat is wet under foot and is dominated by reed canary-grass (*Phalaris arundinacea*). This habitat is evaluated as of local importance (higher value) given its high biodiversity within the local context.

The protected species *Vertigo moulinsiana* (Desmoulin's whorl snail) is often associated with tall-growing vegetation of reed-beds and swamps. The sedge swamp at Mungret is suitable habitat for this species. A targeted whorl snail survey was carried out by Mott MacDonald Ecologists on 18th of October 2018 within the swamp habitat. Striated whorl snail (*Vertigo substriata*) was recorded within the sedge swamp habitat, however no whorl snail protected under Annex II of the Habitats Directive was recorded.

The rare plant species opposite-leaved pondweed (*Groenlandia densa*) has been recorded in Loughmore Canal in the past. Road drainage design will ensure no change in the natural hydrology of the canal. No field signs of otter were observed along the canal during the site walkover.

Scrub Habitat, WS1, and Mature Trees

There are several areas of blackthorn (*Prunus spinose*) and hawthorn (*Crataegus monogyna*) scrub within the site as follows: the disused cattle path at Baunacloka (Photo 1), ringfort LI013-011, ringfort LI013-007, enclosure LI013-133 and enclosure LI013-008.

The ringforts and enclosures are included on the National Monument Service Records. The road alignment is outside of the zone of notification for these records.

Photo 1 Disused Cattle Path

Source: Mott MacDonald 15/09/2017

5.5.3.1 Badgers

The scrub habitats within the site are in use by badger (Figure 6 and 7) and act as stepping stones within the agricultural lands. One disused badger sett (annex set with one entrance) was observed within the ringfort LI013-01. Badger paths, snuffle holes and prints were observed within the study area, particularly in proximity to Mungret House. These scrub areas are of local

importance (higher value). The ringforts and enclosures will not be affected by the project. No badger setts were observed during site walkover at this location. The loss of this habitat will not significantly affect the movement of badger in the area given that it is immediately adjacent to a busy residential area and less likely to be in use by badger.

Photo 1 Badger Sett Entrance

Source: Mott MacDonald 15/09/2017

Photo 2 Badger Prints

Source: Mott MacDonald 15/09/2017

5.5.3.2 Bats

The field boundaries within the site typically comprise hawthorn / blackthorn scrub and have low bat roost potential. There are however several mature trees throughout the site which have a high potential to act as bat roosts (Figure 2 and Photo 3). Confirmed bat roosts cannot be removed unless in accordance with a derogation afforded under the Wildlife Act 1976 as amended. The detailed design of the landscaping and lighting for the road project will be informed by the findings of bat survey(s) such that commuting routes are maintained by the use of hop-over landscape planting and that lighting is controlled according to bat usage (while having regard to health and safety requirements).

Photo 3 High Bat Potential Tree

Source: Mott MacDonald 15/09/2017

5.5.3.3 Protected Flora and Fauna;

No Floral Protection Order (FPO) species were recorded within the survey area onsite during the field survey. However, a review of protected species data from the National Biodiversity Data Centre (NBDC) within the 2km grid, (R55L and R55G), encompassing the proposed development was carried out and the results are listed in Table 6. No mammals or birds or evidence of same were recorded during the site survey. However, the hedgerows and treelines within the site are likely to provide potential habitat for bird and bat species.

Table 6: Protected Species Recorded in NBDC 2Km Grid

Name	Date of record Title of dataset	Title of Dataset	Location in relation to the Project site	Designation
Common Frog *(Rana temporaria)*	31/07/1974	Reptiles and Amphibians Distribution Atlas 1978 (An Foras Forbartha)	Frog have been recorded within the 10km square grid which encompasses the Project.	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex V || Protected Species: Wildlife Acts
Common Linnet *(Carduelis cannabina)*	31/12/2011	Bird Atlas 2007 - 2011	Linnet have been recorded within the 10km and 2km square grids which encompasses the Project.	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Common Wood Pigeon *(Columba palumbus)*	31/12/2011	Bird Atlas 2007 - 2011	Wood pigeon have been recorded within the 10km and 2km square grids which encompasses the Project.	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex II, Section I Bird Species || Protected Species: EU Birds

Name	Date of record Title of dataset	Title of Dataset	Location in relation to the Project site	Designation
				Directive >> Annex III, Section I Bird Species
Meadow Barley *(Hordeum secalinum)*	31/12/1998	BSBI tetrad data for Ireland	Meadow Barley was previously recorded approximately 1.6km south-east of the Project site boundary.	Protected Species: Flora Protection Order || Threatened Species: Endangered
Opposite-leaved Pondweed *(Groenlandia densa)*	31/12/1999	BSBI tetrad data for Ireland	Opposite-leaved pondweed has been recorded approximately 1km south of the Project.	Protected Species: Flora Protection Order || Threatened Species: Endangered
Eurasian Badger *(Meles meles)*	24/03/2010	Road Kill Survey	A dead badger was recorded on the R510 regional road approximately 1km south of the Project site boundary.	Protected Species: Wildlife Acts
Eurasian Red Squirrel *(Sciurus vulgaris)*	31/12/2012	Irish Squirrel Survey 2012	A red squirrel was previously recorded approximately 1.7km south-east of the Project site boundary.	Protected Species: Wildlife Acts
European Otter *(Lutra lutra)*	23/04/2009	Road Kill Survey	A dead otter was recorded on the R526 regional road approximately 1.2km south-east of the Project site boundary.	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex II || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
Pipistrelle *(Pipistrellus pipistrellus sensu lato)*	16/06/2014	National Bat Database of Ireland	Soprano pipistrelle bat was previously recorded 2km south-east of the Project site boundary.	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
Eastern Grey Squirrel *(Sciurus carolinensis)*	31/12/2012	Irish Squirrel Survey 2012	An Eastern grey squirrel was previously recorded approximately 1.7km south-east of the Project site boundary.	Invasive Species: Invasive Species || Invasive Species: Invasive Species >> High Impact Invasive Species || Invasive Species: Invasive Species >> EU Regulation No. 1143/2014 || Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)

Source: National Biodiversity Data Centre

5.5.3.4 Protected and Invasive Species

No invasive plant species were recorded within the survey area during the filed surveys.

5.5.3.5 Designated Sites

The proposed project will be located within agricultural grasslands within the Mungret/ Loughmore Common area, approximately 4.5km south-west of Limerick city.

Loughmore Common Turlough pNHA (000438) is located 100m to the south of the site. Loughmore Canal which forms part of the pNHA site flows in east to west direction south of the project site.

The Lower River Shannon SAC (002165) is 1.7km north of the project. The River Shannon and River Fergus SPA (004077) is ca. 1.7km north of the proposed project site. Curraghchase Woods SAC (000174) is 12.6km east and Tory Hill SAC (000439) is ca. 8.8km south of the proposed work site.

The Appropriate Assessment Screening concluded that that there is no potential for significant effects on the integrity of Natura 2000 sites within the potential Zone of Impact from the proposed development, either alone or in-combination with other plans and/or projects.

5.5.4 Identification of Potential Impacts

Potential impacts to fauna and flora during both the construction and operational phases of the project were assessed. The assessment was based on the requirements of the Guidelines for Assessment of Ecological Impacts of National Roads Schemes (National Road Authority 2009).

5.5.4.1 Construction phase

The construction phase will include site clearance and removal of vegetation. The proposed road development is located on land consisting predominantly of agricultural grassland (GA1) which is considered to be of low ecological value. Sections of hedgerows and treelines will be removed to facilitate the proposed road link. The treelines and hedgerows were identified as important foraging and commuting sites for bats. The loss of foraging and commuting route has the potential to impact local bat populations within the area.

The treeline located immediately west of the school and sports fields was identified as having High bat roost potential. A beech tree located within the treeline was confirmed as an active bat roost during the emergency survey. The roost is unlikely to be a maternity or nursery roost. The destruction of the roost is therefore likely to constitute a moderate impact on bat populations within the area.

The derelict farm sheds located south-west of the school will be removed to facilitate the proposed Project. The sheds were identified as having ‘Moderate’ bat roost potential. No bats were recorded emerging or entering the sheds during the bat surveys, however there is potential that bat may utilise the sheds in the future. There is therefore potential for the removal of the sheds to impact roosting bats.

Treelines and hedgerows within the study area are also likely to provide suitable nesting sites for breeding birds. Removal of hedgerows and treelines within the study area would have a moderate effect (depending on the area vegetation cleared) on the carrying capacity of the local environment for nesting birds.

During the construction phase, there will be a temporary increase in noise within the vicinity of the study area. The noise generated by the construction machinery, and also the physical presence of the machinery and personnel on site, is likely to deter wildlife from the vicinity of the works. The construction activities from initial mobilisation to substantial completion is estimated to be 12 months. The total number of construction staff will vary but is expected to peak at approximately 30 persons.

The existing background noise levels within the study area is low and characteristic of rural-agricultural areas. The background noise levels increase slightly towards the outer site boundaries which are located in proximity to regional roads and residential areas.

A badger sett was identified approximately 320m from the Project. The set was not currently in use however there is potential that the sett may be utilised in the future. The NRA guidelines (NRA, 2005) state that no construction works should be undertaken within 50m of active setts and no blasting or piling should be undertaken within 150m of active setts. As the sett occurs 320m from the proposed works area there is no potential for disturbance.

A bat roost was confirmed within a beech tree located at the north-western corner of the site. The treeline is also used as a foraging and commuting route by two species of bat. All other

treelines within the study area were identified as having Negligible suitability to support bat roosts but it is likely that the linear habitats are used as foraging and commuting routes by bats. The derelict farm sheds were identified as having 'Moderate' bat roost potential.

Highway sounds, both from construction and operation can create a loud noise environment that may potentially interfere with bats' abilities to hear and respond to the many other biologically important sounds that surround them (The California Department of Transportation, 2016). Therefore, in the event that construction works are undertaken after sunset and before sunrise when bats are active, in proximity to the treelines and confirmed bat roost, there is potential for disturbance to the bats. During the construction phase there is the potential for fuel leakages from construction vehicles on site which can impact on nearby watercourse.

No sites of international or national importance (SACs, SPAs and NHAs) will be directly or indirectly impacted by the proposed road development. The closest designated site is Lower River Shannon Special Area of Conservation (SAC) (Site Code 002165) which is located approximately 2km north of the proposed development site and has no hydrological or physical connectivity to the proposed development site.

5.5.4.2 Operation Phase

During the operational phase there will be a change in noise levels in the area due to a redistribution in traffic along the new road. The proposed road however is situated in an peri-urban area and is in close proximity to the R859 to the R510. Due to the nature of the existing environment any changes in road traffic noise impacts on the local ecology are unlikely to be significant

The opening of the road may result in traffic related mortality of mammals; however, the risk of traffic related mortality of mammals during the operation of the road is considered low. Traffic on the roads will be slow flowing due to the presence of a number of internal junctions.

Street lighting will be installed along the proposed roads which will result in an increase of artificial lighting within the immediate surrounding area. An increase in light can deter nocturnal fauna, in particular bat species. Lighting can impact bats' roosting sites, commuting routes and foraging areas (Bat Conservation Ireland, 2010). A treeline located west of the school was assessed as having high bat roost potential. A bat roost was confirmed within the beech within the treeline. The treeline was also confirmed to be used as a foraging and commuting route by two species of bat. Direct illumination of a bat roost or commuting and foraging routes is likely to affect bat emergence from the roost, alter feeding patterns, and deter bats from commuting along affected corridors, ultimately affecting the bat population.

5.5.5 Proposed Mitigation Measures

Mitigation which will be employed to ensure no significant effects on biodiversity from the Project are described hereunder.

Mitigation is prescribed in accordance with the hierarchical hierarchy set out in the CIEEM guidelines; *Guidelines for Ecological Impact Assessment in the UK and Ireland Terrestrial, Freshwater and Coastal (2016)* which states that a sequential process should be adopted to avoid, mitigate and compensate ecological impacts.

5.5.5.1 Construction Phase

The working area will be demarcated prior to commencement of construction to define the limits of site works. This will ensure that all works will be contained within the proposed road development site boundary.

Birds

Under subsection 1 of Section 40 of the Wildlife Acts 1976 to 2012, it is not an offence to clear vegetation in the course of road or other construction works or in the development of preparation of sites on which any building or other structure is intended to be provided. However, the Contractor shall aim to limit disturbance to breeding birds and their nests/eggs as far as possible. A pre-construction survey will be undertaken by an ecologists/ornithologist who will identify any nests present along the proposed road route. Where an amber or red listed species nest is identified, the nest will be isolated until such a time that the chicks have fledge or where breeding has failed.

Bats

A bat roost was confirmed within a beech tree located immediately west of the primary school and sports field. In the event that the tree is required to be removed to facilitate the proposed road link a derogation license under the Wildlife Act should be sought from NPWS prior to the works commencing. Proposed mitigation measures agreed with NPWS as part of the derogation license will be implemented to minimise impacts to bats.

The remaining trees within the treeline were identified as having high bat roost potential and should be retained where possible. If the trees are required to be felled a pre-construction bat survey of the remaining trees within the treeline should be undertaken to determine the presence or absence of bat roosts. If a bat roost is confirmed a derogation license should be sought from NPWs in order to fell the tree(s).

All trees required to be felled to facilitate the Project should be felled in accordance with NRA guidelines.

In the event that the derelict farm sheds are required to be removed to facilitate the Project, a pre-construction bat survey of the derelict farm sheds should also be undertaken to determine the presence of any new bat roosts. If a bat roost is confirmed within the derelict sheds a derogation license to destroy the building will be required from NPWS.

The Project will inevitably result in the loss of a number of potential bat roosts in particular with the clearance of the treeline located west of the school and the derelict farm sheds. It is therefore recommended that bat boxes are installed to provide alternative, safe roosting sites for bats. The bat boxes should be designed in accordance with Bat Conservation Ireland guidelines; *Bats and Bat Boxes Guidance Notes for: Agri-environmental Scheme (2015).* The bat boxes should be erected prior to the construction works commencing and should be placed in lit up areas.

Dust generating activities will be minimised and roads providing access to the site compound and work areas will be maintained free of excessive dust and mud as far as is reasonably practical. A Dust Minimisation Plan will be prepared for the construction phase of the project, refer to section 12.5.1 of the Air Quality Chapter for detailed account of the mitigation measures.

To minimise the impact of construction noise associated with the proposed development, noise reduction measures will be in place during the construction phase and shall comply with British Standard 5228 "*Noise Control on Construction and open sites Part 1. Code of practice for basic information and procedures for noise control*". Furthermore, good practice guidelines such as CIRIA's Environmental Good Practice onsite will be employed where relevant.

Hydrocarbon spill kits and drip trays will be maintained on site during the construction phase to reduce any run-off which might occur. The operator should put in place an emergency

response procedure for hydrocarbon spills and appropriate training of site staff in its implementation.

To limit the risk of loss of elevated levels of sedimentation on storm water run-off no stockpiling of soil or other material will be located within 10m of any watercourse. Stockpiles will also be kept for the shortest possible time where possible and securely sheeted.

A maintenance schedule and operational procedure will be established by the Contractor for silt and pollution control measures during the construction period. This will be undertaken in consultation with the relevant statutory authorities.

5.5.5.2 Operational Phase

Lighting

Lighting requirements in proximity to the confirmed bat roost (if retained) or to the bat boxes should be designed in accordance with the Bat Conservation Ireland guidelines; *Bats and Lighting Guidance Notes: Planners, engineers, architects and developers.* Low pressure sodium or high-pressure sodium lights should be used instead of Metal Halide & Mercury vapour lights. Directional lighting and light shields should be used where possible to minimise light spill.

Landscaping

Compensatory hedgerow planting is recommended at all sections where treelines and hedgerows are intersected by the road, in order to maintain linear habitats for bats. The close planting of tall, heavy standard trees should be planted at either sides of the proposed roads to create hop-over which will encourage bats to fly over the road. Compensatory planting should also be planted along the length of the scheme to increase linear habitats along the road link. Similar, native hedgerow species to that found in the surrounding environment should be used. No ash will be planted due to ash dieback disease.

5.5.6 Residual impacts

It is considered that the potential for adverse impacts associated with the construction phase of the proposed road development will be ameliorated through the effective implementation of appropriate mitigation measures. It is not anticipated that there will be any adverse residual impacts in term of ecology associated with the proposed road development during the operational phase.

5.6 Water Quality and Surface Drainage

5.6.1 Introduction

The aim of this section is to assess any impacts of the proposed developments on the water quality of nearby watercourses and to outline required mitigation measures where required.

5.6.2 Methodology

A desktop-based review of the water quality of watercourses within close proximity to the development site was undertaken.

- Environmental Protection Agency (www.epa.ie); and
- Water Framework Directive (www.wfdireland.ie).

5.6.3 Description of the Existing Environment

There are no watercourses recorded within the footprint of the Road Improvement Scheme.

Drainage from the road will be to attenuation basins. The attenuation pond on the eastern side of the proposed road was designed to accommodate the runoff of the proposed road. An attenuation pond on the western side of the road will be built to accommodate a 1:100 year event with a storage volume of 500m^3. The attenuation basins will be drained to the local drainage network. The road drainage has been designed to accommodate green field runoff from phase 1 of the future residential development proposed within the masterplan.

5.6.4 Identification of Potential Impacts

Potential impacts to the water quality of nearby watercourses during both the construction and operational phases were assessed having regard to the Guidelines for the crossing of water courses during the construction of National Road Scheme (National Road Authority 2008).

5.6.4.1 Construction Phase

Nearby watercourses may be impacted on by hydrocarbon spills and leakages of construction machinery and vehicles. The proposed link road is located approximately 100m north of the Loughmore Common pNHA, no works will occur within the pNHA. The implementation of a Construction Environmental Management Plan (CEMP) will ensure that there is no potential for impacts on this turlough resulting from the construction of the proposed scheme.

The design of the road scheme has been developed with no significant element of the road in cut, which means that the project will not impact the hydrological flow in the area, resulting in no potential for desiccation or drying out of the turlough.

It should be noted that there is evidence that Loughmore Common pNHA is already significantly degraded due to desiccation. An application has been made to the National Parks and Wildlife Service (NPWS) by a local landowner to get the site removed from the pNHA listing. However, considering the distance of the nearest water body, which is located ca.100m from the proposed development, and due to the lack of hydrological connectivity the impact on water quality is considered extremely unlikely.

5.6.4.2 Operation Phase

During the operational phase run-off of hydrocarbons and heavy metals generated by normal road usage, application of road salts during de-icing, application of pesticides on embankments and spillage of hydrocarbons and other chemicals following accidents may have an adverse impact upon the water quality of nearby watercourses if the appropriate mitigation is not applied. However, as the nearest water body is located ca. 100m away and is not hydrologically connected to the development site, the impact of run-off reaching the water body is considered extremely unlikely.

All surface water collected will be treated in a sustainable manner to minimize the impact on water quality and prevent habitat degradation and flooding. The drainage system will follow the *'Drainage Design for National Road schemes – Sustainable Drainage Options (NRA, 2014)'.*

5.6.4.3 Proposed Mitigation Measures

5.6.5 Construction Phase

Refer to the recommended mitigation measures outlined in section 5.4.5.1 of the ecology section.

5.6.6 Operation Phase

Refer to the recommended mitigation measures outlined in section 5.4.5.2 of the ecology chapter.

5.6.6.1 Residual impacts

It is considered that the potential for adverse impacts associated with the construction and operational phases of the proposed development will be ameliorated through the effective implementation of appropriate mitigation measures. Therefore, it is not anticipated that there will be any adverse residual impacts.

5.7 Soils, Geology and Hydrogeology

5.7.1 Introduction

The aim of this section is to assess any impacts of the proposed road development on the soil, geology and hydrogeology of the existing environment, and to outline the mitigation measures which have been proposed.

5.7.2 Methodology

A desktop based review of the geology and hydrology of the Mungret Street Links Project and the general surrounding area was undertaken. Records of soil/hydrology quality was obtained from the following publicly available online database and guidelines:

- Geology Survey of Ireland (www.gsi.ie)
- EPA, Envision Maps (Soils and Subsoils) (www.epa.ie)

5.7.3 Description of Existing Environment

5.7.3.1 Geology and soil

The Geological Survey of Ireland (GSI) 1:100,000 scale mapping indicates that the bedrock of proposed road development site is composed of Dinantian limestone.

5.7.3.2 Hydrogeology

The hydrogeology is described from the GSI web-mapping. The bedrock aquifer underlying the majority of the proposed road development area is classified by GSI as: Lm - Locally Important Aquifer – Bedrock which is generally Moderately Productive.

5.7.3.3 Groundwater vulnerability

Groundwater vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities. The vulnerability of groundwater largely depends of the type and thickness of the overlaying subsoil. Groundwater is most at risk where the subsoils are absent or thin.

The criteria for determining groundwater vulnerability, as developed by the GSI and Department of Environmental and Local Government (DoELG), are shown in Table 7 below:

Table 7: Vulnerability Mapping Guidelines

Vulnerability Rating	Hydrogeological Conditions				
	Subsoil Permeability (Type) and Thickness			Unsaturated zone	Karst Features
	High permeability (Sand/Gravel)	Moderate permeability (e.g. Sandy subsoil)	Low permeability (e.g. clayey subsoil, clay, peat)	Sand/Gravel aquifers only	<30m radius
Extreme (E)	0-3.0m	0-3.0m	0-3.0m	0-3.0m	-
High (H)	>3.0m	3.0-10-m	3.0-5.0m	>3.0m	N/A
Moderate (M)	N/A	>10.0m	5.0-10m	N/A	N/A
Low (L)	N/A	N/A	>10.0m	N/A	N/A

According to the GSI web-mapping the aquifer vulnerability at the proposed road development is largely classified as H (High).

Following the vulnerability mapping guidelines areas classified as having 'High' vulnerability rating indicates subsoil depth of >3m to 10m, of high to moderately permeable deposits such as gravel and/or sandy subsoils. Areas classified as having 'High' vulnerability are vulnerable to contamination and require a certain measure of protection.

The design of the proposed road development has been completed to minimise cut and spoil generation and will not require deep excavations.

5.7.3.4 Groundwater Wells

According to the GSI groundwater well database there are three wells located in close proximity to the proposed road development. The closest well is located approximately 800m from the eastern boundary of the proposed road development.

5.7.3.5 Geological Heritage

There are no geological heritage sites within the footprint of the proposed development. The closest heritage site is Mungret Quarry which is located 1.5km north-west of the proposed development.

5.7.4 Identification of Potential Impacts

Potential impacts to the geology and hydrology in the existing environment during both the construction and operational phases were assessed having regard to the *Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (National Road Authority 2008).*

5.7.4.1 Construction Phase

Vegetation clearance and topsoil stripping will be required during the construction phase, which may lead to erosion of the underlying strata and transport of soil particles in overland flow.

Accidental spillages from construction machinery/vehicles can negatively impact on the soils in the absence of mitigation.

The proposed road development is located predominantly in an area overlaying a Locally Important Aquifer area and is predominantly rated as 'moderate' vulnerability to contamination. It is therefore unlikely that groundwater will be impacted on during the construction phase. In the areas rated as 'high' vulnerability there is an increased risk that ground water is more vulnerable to contamination. However, the proposed road developments are located on relatively flat topography and significant excavation works are not required to facilitate the construction of the scheme.

Groundwater can also be impacted on by hydrocarbon spills and leakages from construction machinery and vehicles.

5.7.4.2 Operational Phase

During the operation phase traffic and maintenance vehicles will use the proposed road. These vehicles could potentially leak relatively small volumes of fuel, oil, fluid etc. and/or be a source of heavy metals. Without adequate control, these could reach and contaminate the underlying soils.

Surface water run off could transport potential contaminants from the hard standing areas to the adjacent soil impacting on soil quality. Without appropriate measures, this could potentially be a source of contamination.

5.7.5 Proposed Mitigation Measures

5.7.5.1 Construction Phase

All land affected by the road improvement scheme will be reinstated in so far as practicable. Vegetation will also be planted in areas which will reduce the effect of erosion.

Prior to the construction phase commencing temporary surface drainage and silt control measures will be established. Run-off from the working site or any areas of exposed soil will be channelled and intercepted at regular intervals for discharge to silt-traps.

To prevent impacts on both soil and groundwater in the area hydrocarbon spill kits and drip trays will be maintained on site during the construction phase to reduce any run-off which might occur. The operator will also put in place an emergency response procedure for hydrocarbon spills and appropriate training of site staff in its implementation.

Furthermore, all hydrocarbons and chemicals will be stored in bunded areas, away from drains. Oil booms, oil soakage pads and spill kits will be available on-site to enable a rapid and effective response to any accidental spillage.

5.7.5.2 Operational Phase

Planting and landscaping will be carried out on along the length of the scheme and along all exposed soil areas to limit the potential for soil erosion.

Adequate drainage systems will be put in place alongside the road to ensure effective drainage. The drainage system will follow the *'NRA Design Manual for Roads and Bridges (NRA DMRB) Volume 4 Geotechnics and Drainage – Section 2 Drainage'*.

5.7.6 Residual impacts

With the implementation of the proposed mitigation measures during the construction and operational phase it is not anticipated that there will be any significant adverse impacts to the soil, geology and hydrology in the existing environment. Therefore, it is not anticipated that there will be any significant adverse residual impacts.

5.8 Landscape and Visual

5.8.1 Introduction

This chapter considers the potential impacts on landscape character and visual amenity arising from the construction and operation of the proposed road development, and specifies mitigation to reduce potential impacts, where appropriate.

5.8.2 Methodology

The appraisal has been undertaken having regard to the guidance contained in the *Guidelines for Landscape and Visual Impact Assessment,* third edition (Landscape Institute with the Institute of Environmental Management and Assessment, 2013).

The proposed Road Scheme is located within the administrative boundary of Limerick County Council. A review of the Southern Environs LAP and Limerick CDP was undertaken to establish if there are any relevant landscape related designation which may influence this assessment. A review of aerial imagery was also undertaken in conjunction with site visits and consideration of layout of the proposed road development.

5.8.3 Description of Existing Environment

As discussed in previous chapters the proposed development is located within the Mungret/ Loughmore Common area, approximately 4.5km south-west of Limerick city. . The R526 regional road is located along the south-east border and the R859 regional along the northern border of the site. Mungret House and Woods are located towards the centre of the site. A school and sport fields are located at the north-western corner of the site.

Limerick CDP has classified the Mungret Project area under the landscape character type *Shannon Costal Zone.*

The proposed development is located on the periphery of a built up area and there are no scenic views or prospects present within the immediate environs. The closest scenic route is located close to Croome approximately 10km south.

5.8.3.1 Visual Receptors

Sensitive visual receptors adjacent to the proposed road development footprint include some residential properties. Mungret College and associated demesne, medieval buildings and structures on the site of Mungret historic town.

5.8.3.2 Trees for Preservation

It is a policy of the Council to preserve and maintain the existing stands of mature trees and field boundaries as identified in the Southern Environs LAP. The Southern Environs LAP indicates that there are a number of trees and treelines located in the Mungret area that are to be maintained, preserved and incorporated into new developments.

5.8.4 Identification of potential Impacts

Potential impacts on the landscape and visual environment during both the construction and operational phases were assessed having regard to the document entitled: *A Guide to Landscape Treatments for National Road Schemes in Ireland (NRA).*

5.8.4.1 Construction Phase

Site clearance will largely consist of the removal of agricultural land; however, a small area of hedgerows and treeline removal will be required during the construction phase to facilitate the proposed new road. The loss of trees may impact on the visual and landscape character of the area.

The proposed developments may visually impact the residential properties which are located nearby. The construction phase however, will be temporary (4 to 6 months) and is situated on low lying ground.

Mungret College and associated demesne, medieval buildings and structures on the site of Mungret historic town, is located north of the proposed road development. The protected views are further to the north from Mungret College and screened to a large extent from the road by the college and associated buildings and landscaping.

Considering the temporary nature of the works and the existing screening which surrounds sensitive receptors, visual impacts are considered as a 'slight effect' as the proposed works will cause a noticeable change in the character of the environment but without affecting its sensitivities.

5.8.4.2 Operational Phase

During the operational phase there will be an increase in artificial lighting in the area along the proposed road, which may impact on the surrounding sensitive visual receptors.

5.8.5 Proposed Mitigations Measures

5.8.5.1 Construction Phase

The removal of trees will be kept to a minimum and only required where no alternative route is possible.

As mentioned, the construction phase will be short term in nature and unlikely to cause significant adverse impact to the landscape and visual receptors. Working hours will be between 07:00 to 19:00 with any works carried outside of these times undertaken only following the approval of the Local Authority.

5.8.5.2 Operational Phase

The lighting used will be low impact and directional limiting any landscape and visual effects.

The roadsides will be landscaped which will help to integrate the proposed road development within the existing landscape character and reduce its visual impact.

5.8.5.3 Residual impacts

With the implementation of the proposed mitigation measures during the construction and operational phases it is not anticipated that there will be any significant adverse impacts on the

landscape and visual aspects in the existing environment. Therefore, it is not anticipated that there will be any adverse residual impacts.

5.9 Cultural Heritage

5.9.1 Introduction

This section considers the potential for adverse impacts on cultural heritage and archaeological features as a result of the proposed road development and provides details on mitigation measures, where considered necessary.

5.9.2 Methodology

A desktop based review identified elements of known cultural heritage sites and features within close proximity of the proposed road development was undertaken. The assessment area included the proposed road development site as well as a buffer zone of 250 metres from the centre line of the proposed works, as recommended in the *Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes*. Records of archaeology was obtained from the following publicly available online database and relevant statutory documents:

- National Inventory of Architectural Heritage (NIAH) (www.buildingsofireland.ie);
- National Monument Service (www.archaeology.ie); and
- Limerick County Development Plan 2010 -2016 (as extended)
- Southern Environs Local Area Plan 2011-2017 (extended to 2021)

5.9.3 Description of Existing Environment

A number of recorded sites of archaeological and cultural significance have been recorded within 250m of the proposed development, refer to Table 8 for the locations of all sites.

Table 8: Records within 250m of the Proposed Development

Description	SMRS	Townland Name	Notes from Archaeology.ie	Easting (ITM)	Northing (ITM)
Enclosure	LI013-005----	Caheranardrish	Situated on level pasture. The monument is heavily masked by dense scrub. Sub-oval area (diam. 22m N-S; 21.7m E-W) enclosed by an earth-and-stone bank. The bank (int. H 0.68m; ext. H 0.68-0.82m; Wth. 0.9-1.3m) is best preserved from NNE to NNW. There is a break in the bank at S (Wth. 2.7m). The interior slopes gently down to the S. The monument and an area of scrub to S has been enclosed by a stone wall which runs immediately to N, E and W and c. 30m to S of the monument, creating a trapezoidal buffer between two fields.	553356	653578
Ringfort - Rath	LI013-007----	Dromdarrig	Situated on level pasture, immediately W of a field boundary. The monument is heavily masked by dense scrub cover. A circular area (diam. c. 40m) is enclosed by two concentric earth-and-stone banks with an intervening fosse (Wth. 1.8m). The inner bank (Int. H 0.1m; Wth. 1.62m) is generally well preserved. The outer bank (Int. H 0.1m; ext. H 0.26m; Wth. 1.15m), best preserved at W, S and SE, has been incorporated into the field boundary from WSW to WNW. There are concentrations of loose stone in the SE quadrant of the interior and atop the outer bank from SE to E. There is a possible entrance at SSW where the height of the inner bank dips (Wth. 8.1m). The interior is level and strewn with fallen deciduous trees.	553594	653187
Enclosure	LI013-008----	Dromdarrig	In undulating pasture, on a gentle W-facing slope, c. 80m NE of a rath (LI013-007----). The monument is indicated on the 1924 OS 6-inch map as a sub-oval platform (diam. c. 40m N-S by 30m E-W) defined by a scarp from NNW to SE. The monument has been levelled and was not evident when inspected.	553695	653259
Ringfort - Rath	LI013-011----	Baunacloka	Situated on a gentle rise overlooking undulating pasture to N and S. The monument is heavily masked by dense scrub vegetation. Indicated on the 1924 OS 6-inch map as an oval area (c. 35m E-W; c. 30m N-S) enclosed by a bank. Parts of a scarped edge is evident amidst the overgrowth (Wth. 1.8m; H 0.4m) in the N and W arcs of the enclosure. An area immediately W of the monument has been quarried in the past.	554414	653143
Enclosure	LI013-131----	Gouldavoher	Situated in gently undulating pasture, immediately S of an overgrown track, c. 20m W of another possible enclosure (LI013-132----). Not marked on the OS 1924 OS 6-inch map but identified on an aerial photograph during preliminary archaeological work on the N20 Limerick South Ring Road (OS 2, 2910) as a cropmark of a circular enclosure. An incomplete sub-oval or circular depression (diam. c. 20m E-W; D 0.4m) at this location may be the remains of the enclosure.	554640	653619
Enclosure	LI013-132----	Gouldavoher	Situated in gently undulating pasture, immediately W of the R510 road and S of an overgrown track, and c. 20m E of another possible enclosure (LI013-131----). Not marked on the OS 1924 OS 6-inch map but identified on an aerial photograph during preliminary archaeological work on the N20 Limerick South Ring Road (OS2 925, 1/5000, no. 2910)	554702	653660

			as a cropmark of a circular enclosure. The SW arc of a circular depression (C 9.5m N-S) at this location may be the remains of the enclosure.		
Enclosure	LI013-133----	Baunacloka	Situated in gently undulating pasture. Not marked on the OS 1924 OS 6-inch map but identified on an aerial photograph during preliminary archaeological work on the N20 Limerick South Ring Road (OS 2, 2910) as a cropmark of a 'small semi-circular feature against field fence' (SMR). There was no evident trace of such a feature when the site was inspected.	554404	653250
Church	LI013-009002-	Dromdarrig	National monument in state ownership No. 85. A monastery was founded here by Neasán of Mungret (Mungairit) whose feast day fell on the 25th of July (Ó Riain 2011, 514-5). Mungret Church described in the Urban Survey (Bradley et. al. 1989, 188-95) as following: 'This church is located in a small graveyard east of Church C ("the abbey") (LI013-009005-) and 90m south of Church A (LI013-009005-). It measures 8.6m north/south by 4.1m east/west internally and the masonry consists of large coursed limestone blocks with dressed limestone quoins. It is set on a plinth c. 25cm wide and 15cm high. The east gable is almost intact, c. 6.5m high with a tall splayed very narrow pointed window with limestone jambs and pointed rear arch (modern). The north and south walls (T 0.85m) were originally c. 3.5m high but are now broken down especially at the west end. The south wall has two tall narrow splayed windows which are missing their arches and rear arches. The west wall has an unsplayed doorway which may be modern. Like Church A the building cannot be assigned a precise date, but it is possibly of pre-Norman origin.' Church described in 1904-5 as following; 'The second church lies to the south-east of the last. The east gable and sides remain. It is 14 feet [4.26m] by 12 feet [3.65m], the west end nearly levelled; the east window-slit and two broken south windows remain' (Westropp 1904-5, 368).	554318	653867
Graveyard	LI013-009003-	Dromdarrig	Situated immediately E of a public road, overlooking gently undulating pasture. Pre-Norman church (LI013-009001-) 90m to N, Mungret Abbey Church (LI013-009005-) and graveyard (LI013-009004-) immediately W of public road which forms W boundary of graveyard. Sub-rectangular shaped area (30m NW-SE; 20-30m NE-SW) enclosed by a mortared stone wall (int. H 0.9m; ext. H 1.4m). In the N half of the site is a ruined stone church (LI013-009002-). Several grave plots share the orientation of this church NW-SE, but there are also others which are orientated E-W. The graveyard is still in occasional use.	554319	653863
Church	LI013-009005-	Dromdarrig	National monument in state ownership No. 85. A monastery was founded here by Neasán of Mungret (Mungairit) whose feastday fell on the 25th of July (Ó Riain 2011, 514-5). Mungret Church described in the Urban Survey (Bradley et. al. 1989, 188-95) as following: 'Situated in a graveyard (LI013-009004-) in Dromdarrig townland, this consists of a chancel, nave and residential tower at the west end. The chancel is of thirteenth century date, the residential tower is of fifteenth century date, but the date of the nave cannot be determined. Leask (1933) terms this building "the abbey" but as there is no evidence for the existence of an abbey at Mungret in the thirteenth century, it seems more correct to regard it as the parish church of the medieval borough. Lewis (1837, ii, 415) states that there was a tower and gateway some 300 yards to the east of the graveyard, but it is unclear whether this was part of the ecclesiastical complex or not. The north and south walls of the CHANCEL appear to have been refaced in the fifteenth century and the east wall alone retains its original thickness. The gable is c. 7.5m high and is built of roughly coursed rubble limestone. The north and south walls have been thickened by the addition of some 5O-60cm to their external face and are built of roughly dressed and coursed limestone masonry with a basal batter c. 1.5m high externally. They are c. 4-5m high internally with a later parapet on average some 5O-70cm high but surviving up to 1.5m in places. Drainage chutes project externally. The east window is a pointed twin-light with chamfered and rebated jambs of red and brown sandstone, splayed internally and having a pointed rear arch with chamfered sandstone jambs while the embrasure itself is outlined with sandstone jambs. The mullions are of modern limestone. The north wall has a small round headed splayed window with limestone jambs	554266	653860

(blocked by later external thickening) which lacks its rear arch. The west end of the wall has additional thickening to accommodate a mural stairs rising to a gallery or loft over the west end of the choir. The stairs were originally entered from the nave through a flat lintelled door in the north east internal angle; this is now blocked and the stair well (stairs missing) is now entered through a large opening in the north wall of the choir. The stairs are lit at gallery level by a small rectangular loop in the external north wall. The gallery is entered from the stairs through a rectangular door with dressed limestone jambs in the north wall opposite this in the south wall at gallery level another opening led to a mural chamber in the west end of the south wall (similarly thickened externally). This has a garderobe at the west end and is lit by large and small rectangular loops in the external south wall. The south wall has a trefoil headed piscina with chamfered sandstone jambs and sill (missing its bowl) and four splayed lancet-like windows which are blocked by later external facing. The first from the east had a pointed rear arch; the second was a single light with pointed rear arch and sandstone jambs; the third was a twin-light window with shouldered head and chamfered limestone jambs set within a rectangular opening with dressed limestone jambs in the external wall face and a lintelled rear arch. The fourth has a narrow pointed light with limestone jambs, now blocked. The cross-wall, c. 8m high, is gabled with the coping stones of the original chancel still visible. It was subsequently widened when the north and south walls were thickened. At ground level there are three voussoirs for a doorway most of which has been replaced by a large unsplayed opening c. 4-5m high. The masonry of the NAVE consists of roughly coursed rubble limestone with limestone quoins (three are sandstone). The north and south walls are c. 3.5m high and the east and apart from the large modern opening already mentioned, and it seems to be largely rebuilt. The north wall has a tall parallel sided door, missing its arch but with a segmental rear arch, roughly centrally placed. Three-quarter round limestone shafts, c. 1.5m high on the external angles of the reveals are apparently inserted, and not in their original position. East of the door is a narrow rectangular window/loop with undressed limestone jambs, splayed with flat lintelled rear arch. The south wall has a large rectangular door, now blocked, with a relieving arch above, roughly centrally placed with a window to either side. That on the east is rectangular, with limestone jambs (undressed) and is splayed with flat lintelled rear arch. That to the west is now blocked, but another splayed loop, missing its arch and rear arch has been inserted above; this appears to be contemporary with the loft over the west end of the nave and connected with the residence to the west.
The RESIDENTIAL TOWER is a gabled building of two floors, oriented north-south, with a belfry some 12.5m high on the north. The south gable is 7m high and the west wall c. 4m high. The masonry is roughly dressed and coursed limestone with dressed limestone quoins. It is entered by two doors at its east end. At the north end of the west wall of the nave is a flat lintelled door with dressed limestone jambs giving access from the nave, while the other door, now blocked, is located in the external south wall of the nave. It is also flat lintelled and has chamfered limestone jambs with pyramidal stops and an angled flat lintelled embrasure in the south-east angle of the residence. The east wall also has, at ground level, a flat lintelled recess with inclined sides, possibly a blocked west door of nave(?). Base of one side has a chamfered limestone jamb, possibly inserted. The north wall has a small rectangular splayed loop with chamfered limestone jambs and flat rear arch. The south wall has a small rectangular splayed window with shouldered head and chamfered limestone jambs and flat lintelled rear arch. There is also a blocked unsplayed embrasure with flat lintelled rear arch, probably a blocked window or door, although there is no sign of it externally. The west wall has a small recess and a blocked unsplayed embrasure with flat lintelled rear arch, probably a blocked window, though not visible externally. The first floor was supported on corbels in the north and south walls and put-logs in the west wall (none visible in the east wall). The west and east walls have tall flat lintelled doors, now blocked. The north and south walls have splayed rectangular windows with chamfered limestone jambs and flat lintelled rear arch. There is a chimney flue in the east wall at a high level although it is not clear where the fireplace was. The belfry is a narrow tower, c. 12.5m high of four floors with parapet above. The masonry is roughly dressed coursed limestone with large dressed limestone quoins and a cavetto string course between the 2nd and 3rd and 3rd and 4th floors externally. It is entered through the door in the embrasure in the north-east angle of the residence. A straight stairs rise to a small flat lintelled chamber c. 2m above

			ground level lit by a small splayed rectangular loop in the north wall. The first floor was apparently entered only from outside the church through a flat lintelled door with dressed limestone jambs in the east wall although there is a possible blocked door in the south wall leading to the first floor of the residence. The second, third and fourth floors were apparently of timber supported on ledges in the internal walls and communication was presumably by internal ladders. The second floor is featureless. The third floor has a large rectangular opening with dressed limestone jambs, now blocked, in each wall. The fourth floor has rectangular windows with chamfered limestone jambs in each wall, those in the south and west walls are damaged and there appears to have been a parapet above.'		
Standing stone	LI013-148----	Moneteen	The Archaeological Survey of Ireland (ASI) is in the process of providing information on all monuments on The Historic Environment Viewer (HEV). Currently the information for this record has not been uploaded. To access available information for research purposes please make an appointment in advance with the Archive Unit (open Fridays 10.00 am – 5.00 pm), Department of Culture, Heritage and the Gaeltacht, The Custom House, Dublin 1 D01W6XO or email nmarchive@chg.gov.ie.	553381	653839
Fulacht fia	LI013-221----	Caheranardrish	The Archaeological Survey of Ireland (ASI) is in the process of providing information on all monuments on The Historic Environment Viewer (HEV). Currently the information for this record has not been uploaded. To access available information for research purposes please make an appointment in advance with the Archive Unit (open Fridays 10.00 am – 5.00 pm), Department of Culture, Heritage and the Gaeltacht, The Custom House, Dublin 1 D01W6XO or email nmarchive@chg.gov.ie.	553271	653574

Name	Date	Townland Name	Notes from Archaeology.ie	Easting (ITM)	Northing (ITM)
Mount Mungret	1810 - 1830	Moneteen	Detached three-bay two-storey over half-basement former glebe house, built in 1826, having canted bay window to south-east elevation and single-bay two-storey pitched-roof addition to north elevation. Hipped slate roof with projecting eaves and rendered chimneystacks. Rendered walls, with panelled plinth course to canted bay window. Square-headed window openings having painted stone sills and two-over-two pane timber sliding sash windows, timber panelled shutters visible internally. Round-headed recess to north-east ground floor window. Square-headed window openings to canted bay having moulded render surrounds with one-over-one pane timber sliding sash windows. Segmental-headed window openings to basement level having replacement uPVC windows. Square-headed window openings to addition to north having replacement uPVC windows. Round-headed door opening with lined-and-ruled surround having timber panelled door with plain fanlight. Approached by flight of limestone steps in two stages with painted rendered curving wall-banisters. Recent cast-iron railings to basement area. http://www.buildingsofireland.ie/niah/search.jsp?type=record&county=LC&regno=21901311	553526	653782
Mungret College	1850 - 1870	Dromdarrig	Attached thirteen-bay three-storey former college, built in 1858, with Ionic portico and slightly projecting end bays to front, six-bay return to west and nine-bay return to east. Two-bay two-storey addition to south-west. Hipped slate roof with terracotta ridge tiles and joint tiles, decorative timber eaves course. Rendered chimneystacks. Cast-iron rainwater goods. Flat-roofed portico to centre with carved limestone Ionic columns. Four-sided scrolled with foliate imagery and decorative beading. Approached by three limestone steps. Snecked limestone ashlar to ground and first floor with tooled	553924	653587

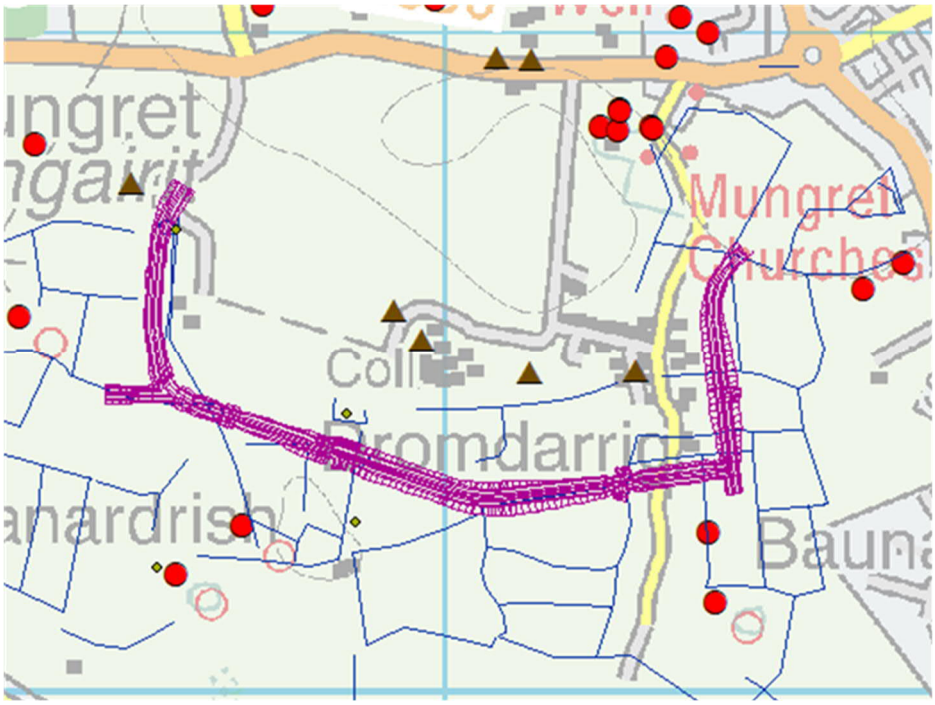
			limestone stringcourse dividing. Lined-and-ruled rendered walls to second floor. Limestone projecting plinth course. Square-headed recesses marking blocked window openings to ground and first floor side elevations. Square-headed window openings with two-over-two pane and six-over-six pane timber sliding sash windows. Some replacement uPVC windows. Square-headed door opening with carved date plaque on carved limestone cornice, supported by carved scrolled consoles. Carved limestone roll moulded surround and timber panelled door to opening. Recently inserted square-headed door opening with timber panelled door to west elevation. Courtyard and outbuildings to rear comprising ten-bay two-storey west range with multiple-bay single-storey south-west range, six-bay-two storey east range, and eight-bay single-storey south range. East range comprising attached range of buildings, with hipped slate roofs and rendered chimneystacks. Coursed rubble limestone walls. Square-headed window openings with tooled limestone sills. Two-over-two pane timber sliding sash windows and replacement timber framed casement windows to openings. Square-headed door openings with timber battened doors. Attached recent nine-bay single-storey pitched-roofed building to courtyard area. Hipped roof to south range, with partial roof collapse in areas and rippling ridge in places. Coursed limestone rubble walls with some blocked segmental-headed window openings forming recesses. Segmental-headed window openings with tooled limestone surrounds and limestone sills. Replacement timber framed multiple-pane windows. Square-headed opening with sliding timber battened door. Square-headed door openings with timber battened door. Square-headed ventilation openings with wire mesh. West range comprising hipped slate roof with cast-iron rainwater goods. Coursed limestone rubble walls, with smooth render to first floor level west elevation. Square-headed window openings with some six-over-three pane timber sliding sash windows and some replacement timber casement windows. Cast-iron bars to window openings. Separated from south-west range by round-headed carriage-arch with open-work bellcote over. Snecked ashlar walls with tooled limestone voussoirs to arch opening. Moulded cornice to bellcote. Round-headed opening to bellcote. South-west range having hipped replacement-slate roof with recent rooflights and rendered chimneystacks. Snecked ashlar walls. Round-headed openings with tooled limestone voussoirs and timber battened doors. Building complex attached to collegiate-church and set in landscaped grounds. Multiple-arched coursed limestone rubble folly-shrine to south-east. http://www.buildingsofireland.ie/niah/search.jsp?type=record&county=LC&regno=21901312		
Mungret College Chapel	1880 - 1900	Dromdarrig	Detached ten-bay three-storey former college and collegiate chapel, built c. 1890, comprising ten-bay three-storey south block with central two-bay gabled breakfront and gablets. Chapel comprising four-bay nave with three-bay canted chancel to north and seven-bay side aisle to west. Recent five-bay single-storey addition to east, and nine-bay three-storey extension to rear (south) attached by single-bay three-storey link. Now in use as offices. Pitched slate roofs with terracotta ridge tiles and tooled limestone chimneystacks, wrought-iron decorative cross finial with quatrefoil motif to chancel and tooled limestone cross to south block breakfront apex. Slated dormer roofed vents to church block roof. Flat felted roof to east addition and hipped slate roof to rear extension and link. Rusticated ashlar limestone parapet to church block and side aisle. Carved limestone eaves course to south block. Rusticated limestone walls with tooled limestone continuous sill courses. Tooled limestone quoins. Tooled limestone statuary recess to breakfront having ogee-headed opening with pointed arch over having decorative tooled limestone foliate finial. Gilded figural statue on demi-hexagonal plinth with stepped capital and pointed corbel. Limestone ashlar buttresses to nave. Smooth rendered walls to rear additions having render stringcourse. Panelled cement rendered walls to east addition. Cinquefoil window opening to third floor westernmost gable of south block, having tooled limestone surround with stained glass window. Pointed arch window opening having tooled limestone surround with one-over-one pane timber-sliding sash window. Shouldered square-headed openings to third floor south block having replacement tooled limestone surround and two-over-two pane timber sliding sash windows. Pointed arch tooled limestone recess over openings to breakfront having circular recess. Flattened pointed arch openings to ground and first floors, having paired pointed arch window openings with tooled limestone surrounds having quatrefoil recess to tooled surround. Tooled limestone hood moulding over.	553967	653543

			Tooled limestone mullions, having leaded fixed pane windows with coloured glass leaded borders. Pointed arch window openings to nave and chancel having tooled limestone surrounds with hood mouldings, having alternate cinquefoil and quatrefoil glazed mullion patterns supported on ogee-headed openings, having stained glass windows. Ogee-headed window openings to side-aisle, paired openings to north, with tooled limestone surrounds and stained glass windows. Three-bay porch to south-west corner, with ogee-headed window openings having tooled limestone surrounds and stained glass windows. Square-headed window openings to east addition having timber framed windows. Square-headed window openings to rear extension having render sills and two-over-two pane timber sliding sash windows. Shouldered pointed arch door opening with timber panelled door to church block porch. Inserted square-headed door opening into flattened-pointed arch headed window opening to ground breakfront, having paired pointed arch window openings over with tooled limestone surround having quatrefoil, tooled limestone hood moulding, tooled limestone mullions and leaded fixed pane overlight with coloured glass leaded borders. Secondary rectangular overlight with timber framed fixed pane windows. Timber panelled double-leaf door approached by cement wheelchair ramp with aluminium railings. Set in landscaped grounds and attached to the older agricultural college. http://www.buildingsofireland.ie/niah/search.jsp?type=record&county=LC&regno=21901313		
	1790 - 1810	Baunacloka	Detached four-bay two-storey farmhouse, built c. 1800, with dormer windows. Now disused. Pitched slate roof, partially collapsed. Lined-and-ruled rendered walls. Square-headed window openings, dormer to first floor, having some exposed red brick surrounds. Square-headed door opening with red brick voussoirs. Openings blocked with cement blocks throughout. Coursed limestone rubble boundary wall to west. Square-headed loop window openings and some vertical joins to wall. http://www.buildingsofireland.ie/niah/search.jsp?type=record&county=LC&regno=21901315	554295	653496
Mungret College	1870 - 1890	Dromdarrig	Freestanding single-bay single-storey folly built c. 1880. Flat roof with rendered crenellated parapet and eaves course. Lined-and-ruled rendered walls with pilasters to corners and render plinth course. Circular rainwater drain hole to rear elevation. Segmental-arched window opening to south with rendered sill and surround, having cast-iron bars. Segmental-headed door opening to west having render surround. http://www.buildingsofireland.ie/niah/search.jsp?type=record&county=LC&regno=21901314	554133	653493

Source: www.archaeology.ie, www.buildingsofireland.ie

The assessment of potential impacts has been undertaken in consideration with the guidance contained in the NRA *Guidelines for the assessment of Archaeological Heritage Impacts of National Road Scheme.*

Figure 4: Recorded Sites of Archaeological and Cultural Significance



Source: OSI and Archaeology.ie

5.9.3.1 Construction Phase

The proposed development is outside of the Zones of Notification for all records and will not impact on any known recorded structures and monuments within the area due to the distance from the proposed development site. However, the proposed development will require excavations during the construction phase which have the potential of uncovering unrecorded artifacts of archaeological or cultural heritage significance.

5.9.3.2 Operational Phase

No potential impacts are envisioned during the operation phase.

5.9.4 Proposed Mitigation Measures

5.9.4.1 Construction Phase

Section 19 of the *National Monuments (Amendment) Act 1994* sets out the procedures for dealing with the discovery of an unrecorded archaeological object or site. Should any items of archaeological significance be identified these procedures should be followed.

During the site excavation and clearance phase of the project it is recommended that a qualified archaeologist should be present on site to identify the presence of any undiscovered elements of archaeology.

5.9.4.2 Operational Phase

None are required.

5.9.5 Residual impacts

With the implementation of the proposed mitigation measures during the construction phase, it is not anticipated that there will be any significant adverse impacts in terms of cultural heritage. No impacts are envisioned during the operational phase.

5.10 Noise

5.10.1 Introduction

This section presents an assessment of potential noise impacts on the surrounding environment arising from the construction and operation of the proposed road development, and specifies mitigation measures to reduce potential noise impacts, where appropriate.

5.10.2 Methodology

The noise assessment was undertaken having consideration to the following documents:

- National Roads Authority Guidelines*, Guidelines for Treatment of Noise and Vibration in National Road Schemes, National Roads (2004); and*
- National Road Authority "*Good Practice Guidance for Treatment of Noise during the Planning of National Road Scheme*, March 2014;
- British Standard BS 5228:2009+A1:2014 *Code of Practice for Noise and Vibration Control on Construction and Open Sites* (2009+A1:2014).

5.10.3 Acceptable Noise Limits

5.10.3.1 Construction Noise Limits

In assessing the potential impacts on noise from construction sites, reference has been made to the National Roads Authority Guidelines, *Guidelines for Treatment of Noise and Vibration in National Road Schemes (NRA 2004)*. The NRA Guidelines specifies noise levels that are typically considered to be acceptable in terms of construction phase noise. These limits are set out in Table 9 below.

Table 9: Maximum Permissible Noise Levels at the Facade of Dwellings during Construction

Days and Times	Noise Levels (dB re. 2x10-5 Pa)	
	LAeq(1hr)	LAmax
Monday to Friday 07:00 to 19:00hrs (Day-time)	70	80
Monday to Friday 19:00 to 22:00hrs (Night-time)	60*	65*
Saturdays 08:00 to 16:30hrs	65	75
Sundays & Bank Holidays 08:00 to 16:30hrs	60*	65*

Note * Construction activity at these times, other than that required for emergency works, will normally require the explicit permission of the relevant local authority

5.10.3.2 Operational Phase Noise Limits

In 2002, Directive 2002/49/EC relating to the assessment and management of environmental noise was adopted by the European Parliament and Council. The Directive describes environmental noise as "*unwanted or harmful outdoor sound created by human activities, including noise emitted by means of transport, road traffic, rail traffic, air traffic, and from sites of industrial activity*". Ambient or environmental noise covers long-term noise, from transport and industry sources, as distinct from noise caused by neighbours, construction sites, etc.

One of the features of the Directive is the introduction of the L_{den} noise criteria. This criteria is used to assess noise on a round the clock basis (day, evening & night) and provides penalties

for noise created during the evening and night periods. Transport Infrastructure Ireland (TII) has produced strategic noise maps of the noise zones around all major infrastructure throughout Limerick County.

5.10.4 Description of Existing Environment

The proposed development site is located in an peri-rural area in close proximity to a number of educational and residential properties, refer to Figure 2, in section 5.4.2 for the site location and the surrounding environs.

5.10.5 Identification of potential Impacts

The potential for impacts arising from the proposed development are assessed hereunder.

5.10.5.1 Construction Phase

Subject to Part 8 approval being secured, During the construction phase, temporary elevated noise levels are to be expected in the vicinity of the proposed road developments.

It is understood that there are four different elements to the construction works; these include:

- Road construction;
- Construction of facilities e.g. footpaths, kerbing, accommodation works, drainage and utilities;
- Installation of road markings and signage;
- Landscaping.

BS 5228:2009+A1:2014 sets out algorithms for the calculation of noise exposure from construction plant. The choice of plant and construction methods is, subject to constraints, within the control of the contractor. Detailed analysis, using the methods of calculation within the standard cannot be performed before the contractor has been appointed and decisions on the construction programme have been made. However, the NRA guidelines give indicative noise levels that are considered to be typically acceptable, though more stringent limits are appropriate where pre-construction noise levels are low. These limits are set out in Table 12.1 above.

Limits are suggested both for the 1-hour “A” weighted equivalent continuous noise level ($L_{Aeq,1hr}$) and for the maximum noise level (L_{Amax}). While limits are suggested for evening working and for working daytimes on Sundays and Bank Holidays it is assumed that the explicit permission of the relevant Local Authority would be required before non-emergency works are conducted at these times.

5.10.5.2 Operational Phase

As noted previously the noise levels within the study area are typical of peri-rural area where the predominant noise is from road traffic.

It is predicted that at 20-30% of cars will be redirected onto the new proposed road. This figure represents only 20% of the traffic on the nearby R859 to the north and 30% of the traffic on the R510 to the east and is therefore not predicted to be significant.

5.10.6 Proposed Mitigation Measures

5.10.6.1 Construction Phase

The contractor will adopt good site practice to minimise noise impacts, as advised within BS5228:2009+A1:2014, to achieve the noise criteria set out in the NRA *Guidelines*.

The noise level limits outlined in Table 9 will be adhered to and these requirements will be included in the terms and conditions for the contractor.

5.10.6.2 Operational Phase

None are required.

5.10.7 Residual impacts

With the implementation of the proposed mitigation measures it is not anticipated that there will be any significant adverse impacts in terms of noise.

5.11 Air Quality

5.11.1 Introduction

This section assesses potential air quality impacts arising from the construction and operation of the proposed road development, and specifies mitigation measures to reduce potential impacts, where appropriate.

5.11.2 Methodology

A desktop assessment was carried out to determine the potential impacts on air quality during the construction and operational phases of the proposed road development. Records of air quality was obtained from the following publicly available online database:

- Environmental Protection Agency (www.epa.ie); and
- National Roads Authority Guidelines, *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (2011).*

5.11.3 Description of Existing Environment

The European Union introduced a new approach to the monitoring, assessment, and management of air quality in 1996 through the framework directive on air quality (96/62/EC). The basic principle of the framework directive is that each country is divided into zones and that the monitoring, assessment, management and reporting of air quality is undertaken in relation to these zones.

For the purposes of the Directive, Ireland has been divided into four zones as follows and limit values are set for individual pollutants, which need to be met by a specific attainment date;

- Dublin (Zone A);
- Cork Urban Area (Zone B);
- Specified population centres > 15,000 in habitants (Zone C) ; and
- Non-Urban areas (Zone D).

The proposed road developments are located wholly within Zone C.

The air quality index express complex air quality information in simple terms, i.e. Very good, Good, Fair, Poor and Very poor. The index is based on a maximum of four parameters; the one-hour average of SO_2 (sulphur dioxide), NO_2 (nitrogen dioxide) and O_3 (ozone), combined with the rolling 24-hour average of PM_{10} (particulate matter with diameter less than ten microns).

The closest air monitoring site to the proposed road development is Shannon Estuary monitoring station. The current air quality is rated as “Good” as set out in the index.

5.11.4 Identification of potential Impacts

5.11.4.1 Construction Phase

During the construction phase the impact of dust will be the most significant air quality impact. Dust emissions can lead to elevated PM_{10} and $PM_{2.5}$ concentrations and may also cause dust soiling if not mitigated against.

Construction machinery and vehicle emissions may also impact on the air quality I the surrounding environment. However, considering that the construction works will be localised and temporary in nature the impact is considered low and not significant.

5.11.4.2 Operational Phase

The dominant source of air pollution during the operation of the proposed road development will be from traffic movements along the road network. The works will result in improved traffic flow. It is unlikely that the work will change the existing traffic number using the local roads but will ensure less traffic congestion and as a result will improve the air quality in the vicinity of the scheme.

5.11.5 Proposed Mitigation Measures

5.11.5.1 Construction Phase

A Dust Minimisation Plan will be prepared for the construction phase of the project, as construction activities are likely to generate some dust emissions. This Plan will include the following dust related mitigation measures:

- Site roads shall be regularly cleaned and maintained as appropriate. Hard surface roads shall be swept to remove mud and aggregate materials from their surface while any un-surfaced roads shall be restricted to essential site traffic only. Furthermore, any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions;
- Vehicles using site roads shall have their speeds restricted where there is a potential for dust generation;
- Vehicles delivering material with dust potential to an off-site location shall be enclosed or covered with tarpaulin at all times to restrict the escape of dust;
- Vehicles exiting the site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads, to ensure mud and other wastes are not tracked onto public roads;
- Public roads outside the site shall be regularly inspected for cleanliness and cleaned as necessary. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.
- Material handling systems and site stockpiling of materials shall be designed and laid out to minimise exposure to wind;

- Water misting or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods;
- At all times, the procedures put in place will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, appropriate measures will be implemented to rectify the problem; and
- The Dust Minimisation Plan will be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures.
- Provided the dust minimisation measures outlined above are adhered to, the air quality impacts during the construction phase will be not be significant.

5.11.5.2 Operational Phase

None are required.

5.11.6 Residual impacts

With the implementation of the proposed mitigation measures during the construction and operational phases it is not anticipated that there will be any significant adverse impacts to the air quality in the existing environment.

6 Land Acquisition and Accommodation Works

Land acquisition by Limerick City and County Council will be required in order to construct this proposed road development.

The proposed development area consists predominantly of a combination of urban edge land uses with some unused scrub fields.

The preliminary design has been progressed to permit planning and land acquisition procedures to be undertaken. In this regard, the preliminary design of the road alignment, cross-section, pedestrian and cycle facilities, fencing, drainage, utilities, have been considered in order to ascertain the required land acquisition.

The land area to be acquired is approximately 70,000 m^2

Limerick City and County Council will acquire the necessary lands to construct the proposed road development through agreement with the relevant landowners in the area.

Accommodation works in the form of private entrances; single field accesses and boundary treatment will be required along the route and will be designed in consultation with the affected landowners.

Appendices

A. Notice of Proposed Development (Newspaper & Site) 51
B. Appropriate Assessment Screening Document 52
C. OPW Flood Map Report 53

A. Notice of Proposed Development (Newspaper & Site)

PLANNING AND DEVELOPMENT ACTS 2000 (as amended)
PLANNING AND DEVELOPMENT REGULATIONS 2001 (as amended)

Part 8 Development

Mungret Local Infrastructure Housing Activation Fund (LIHAF) Delivery Stage 2

In accordance with Part XI of the Planning & Development Acts 2000 (as amended) and Part 8, Article 81 of the Planning and Development Regulations 2001 (as amended), notice is hereby given that Limerick City and County Council proposes to carry out the following development:-

Construction of a new 1700-metre length of road with verge, footpaths, cycleway, on-street parking, public lighting and associated services at the townlands of Baunacloka, Dromdarrig, Caheranardrish, and Moneteen, Mungret Co. Limerick.

The proposed development comprises:-

- Surface water drainage / sustainable urban drainage
- Foul water drainage connection into Limerick Main Drainage Scheme
- Watermains
- Telecommunications and utility services
- Roads, footpaths, cycleway, street lighting and landscaping

Limerick City & County Council has carried out an Environmental Impact Assessment (EIA) Screening Report in accordance with the requirements of Article 120(1B)(b)(i) and has determined that there is no real likelihood of significant effects on the environment. Accordingly, it has been determined that EIA is not required in respect of this proposed development. Nonetheless, a person may within 4 weeks from the date of the notice, apply to An Bord Pleanála for a screening determination.

Limerick City & County Council has carried out an Appropriate Assessment (AA) Screening Report and has determined a that a full Appropriate Assessment is not required in respect of this proposed development.

Plans and particulars of the proposed works will be available for inspection from 22nd November 2019 up to and including 20th December 2019 during office hours at the Customer Services Desks, Limerick City and County Council, Corporate Headquarters, Merchant's Quay and County Hall, Dooradoyle, Limerick and online at http://mypoint.limerick.ie

Submissions or observations in relation to the proposed development, dealing with the proper planning and sustainable development of the area in which the works would be situated, will be accepted up to 17:00 hours on the 13th January 2020 in writing to Design & Delivery Services, Limerick City and County Council, Corporate Headquarters, Merchant's Quay, Limerick V94 EH90 or online via http://mypoint.limerick.ie

Joe Delaney, A/Director of Services, Limerick City & County Council

PLANNING AND DEVELOPMENT ACTS 2000 (as amended)
PLANNING AND DEVELOPMENT REGULATIONS 2001 (as amended)

Part 8 Development

Mungret Local Infrastructure Housing Activation Fund (LIHAF) - Delivery Stage 2

SITE NOTICE

In accordance with Part XI of the Planning & Development Acts 2000 (as amended) and Part 8, Article 81 of the Planning and Development Regulations 2001 (as amended), notice is hereby given that Limerick City and County Council proposes to carry out the following development:-

Construction of a new 1700-metre length of road with verge, footpaths, cycleway, on-street parking, public lighting and associated services at the townlands of Baunacloka, Dromdarrig, Caheranardrish, and Moneteen, Mungret Co. Limerick.

The proposed development comprises:-

- Surface water drainage / sustainable urban drainage
- Foul water drainage connection into Limerick Main Drainage Scheme
- Watermains
- Telecommunications and utility services
- Roads, footpaths, cycleway, street lighting and landscaping

Limerick City & County Council has carried out an Environmental Impact Assessment (EIA) Screening Report in accordance with the requirements of Article 120(1B)(b)(i) and has determined that there is no real likelihood of significant effects on the environment. Accordingly, it has been determined that EIA is not required in respect of this proposed development. Nonetheless, a person may within 4 weeks from the date of the notice, apply to An Bord Pleanála for a screening determination.

Limerick City & County Council has carried out an Appropriate Assessment (AA) Screening Report and has determined a that a full Appropriate Assessment is not required in respect of this proposed development.

Plans and particulars of the proposed works will be available for inspection from 22nd November 2019 up to and including 20th December 2019 during office hours at the Customer Services Desks, Limerick City and County Council, Corporate Headquarters, Merchant's Quay and County Hall, Dooradoyle, Limerick and online at http://mypoint.limerick.ie

Submissions or observations in relation to the proposed development, dealing with the proper planning and sustainable development of the area in which the works would be situated, will be accepted up to 17:00 hours on the 13th January 2020 in writing to Design & Delivery Services, Limerick City and County Council, Corporate Headquarters, Merchant's Quay, Limerick V94 EH90 or online via http://mypoint.limerick.ie

Signed:

Joe Delaney, A/Director of Services,
Limerick City & County Council, Merchant's Quay, Limerick

DATE OF ERECTION OF SITE NOTICE: **21st November 2019**

B. Appropriate Assessment Screening Document

MOTT MACDONALD

Mungret Link Streets Project

Screening for Appropriate Assessment

14 May 2019

Mott MacDonald
5 Eastgate Avenue
Eastgate
Little Island
Co Cork T45 EE72
Ireland

T +353 (0)21 480 9800
mottmac.com

Mungret Link Streets Project

Screening for Appropriate Assessment

14 May 2019

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
P1	27/03/2018	E. Johnston	R. Mansfield	M. Murphy	For Issue to Client
P2	21/03/2019	N. Lynch	R. Mansfield	M. Murphy	For Issue to Client
P3	14/05/2019	N. Lynch	R. Mansfield	M. Murphy	Drawings and Descriptions Updated

Document reference: 229383711-MMD-3000-XX-RP-C-003 P2

Information class: Standard

Contents

1 Introduction 1
1.1 Context 1
1.2 Requirement for Appropriate Assessment 1

2 Project Description 1
2.1 Location 1
2.2 Project Overview 1
2.2.1 Construction Phase 2
2.2.2 Operation Phase 3

3 European Sites with Connectivity to the Project 4
3.1 Summary of European Sites with Source Pathway Receptors 4
3.2 Assessment of Likely Effects 6

4 In Combination Effects 7

5 Assessment of Significance 8

6 References 10

1 Introduction

1.1 Context

This Report for Screening for Appropriate Assessment has been prepared by Mott MacDonald Ireland Limited on behalf of Limerick City and County Council for the proposed Mungret Link Streets project. The Mungret Link Streets project will provide 1.7km of new public road within the Mungret/Loughmore Common area of County Limerick. Further details on the Project are provided in Section 2.

1.2 Requirement for Appropriate Assessment

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive) requires that where a plan or project is likely to have a significant effect on a European Site, while not directly connected with or necessary to the nature conservation management of the site, it will be subject to 'Appropriate Assessment' to identify any implications for the European site in view of the site's Conservation Objectives. Specifically, Article 6(3) of the Habitats Directive states:

The Project is not associated with the 'management' of a European Site having regard to Article 6 of the Habitats Directive. Therefore, the Project must undergo screening for Appropriate Assessment in accordance with Regulation 42(1) of the European Communities (Birds and Natural Habitats) Regulations 2011.

This report is to assist Limerick City and County Council in their Screening assessment under the Habitats Directive for the proposed Mungret Link Streets project.

This screening for Appropriate Assessment has been carried out in accordance with the following European Commission and national guidance:

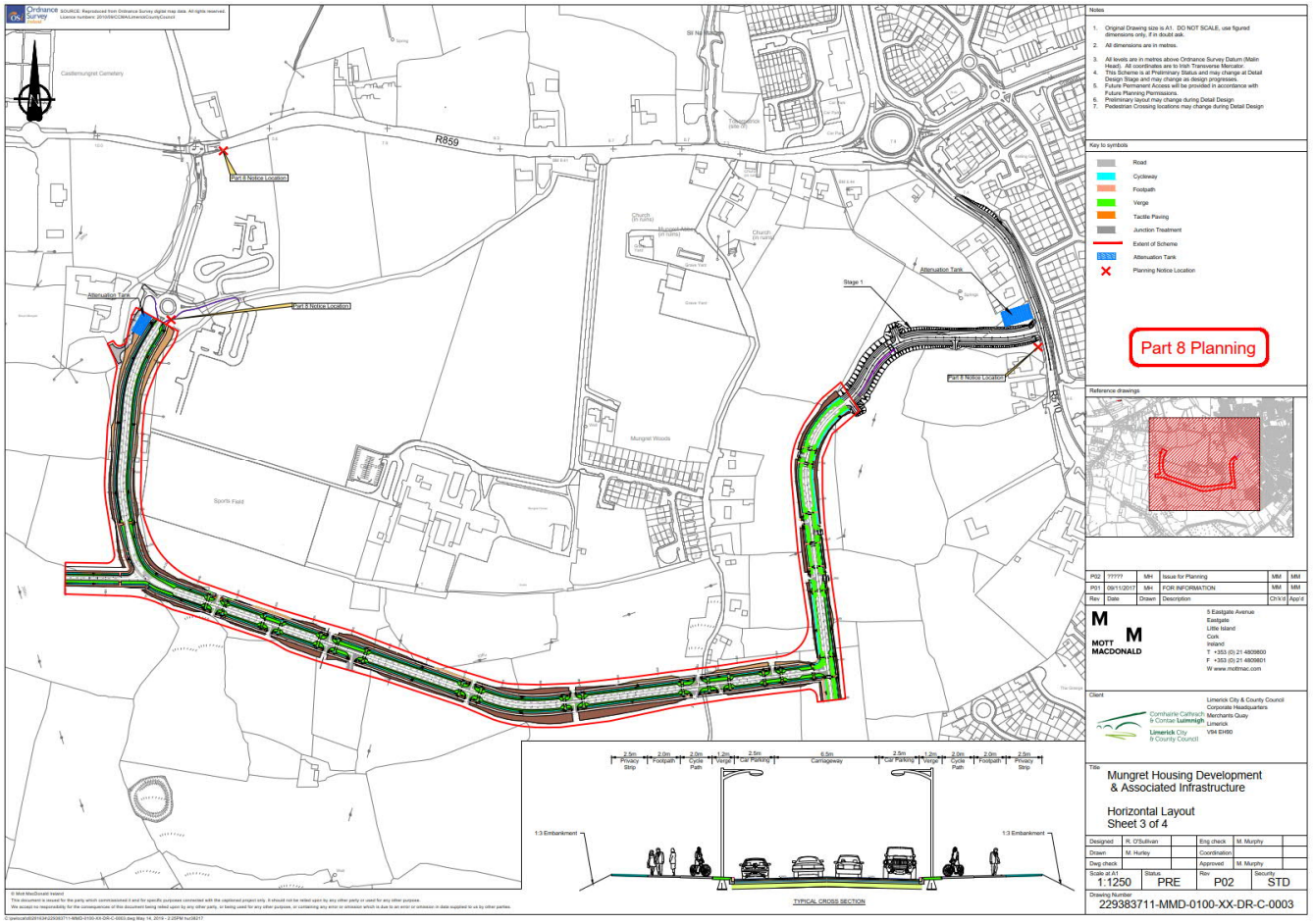
- EC (2001) Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC
- DEHLG (2009) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities (Revised 2010)
- EC (2018) Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC Commission Notice C(2018) 7621

2 Project Description

2.1 Location

The proposed project will be located within the Mungret/ Loughmore Common area, approximately 4.5km south-west of Limerick City (Figure 1).A drawing of the proposed road is shown below in Figure 1.

Figure 1:Mungret Links Scheme

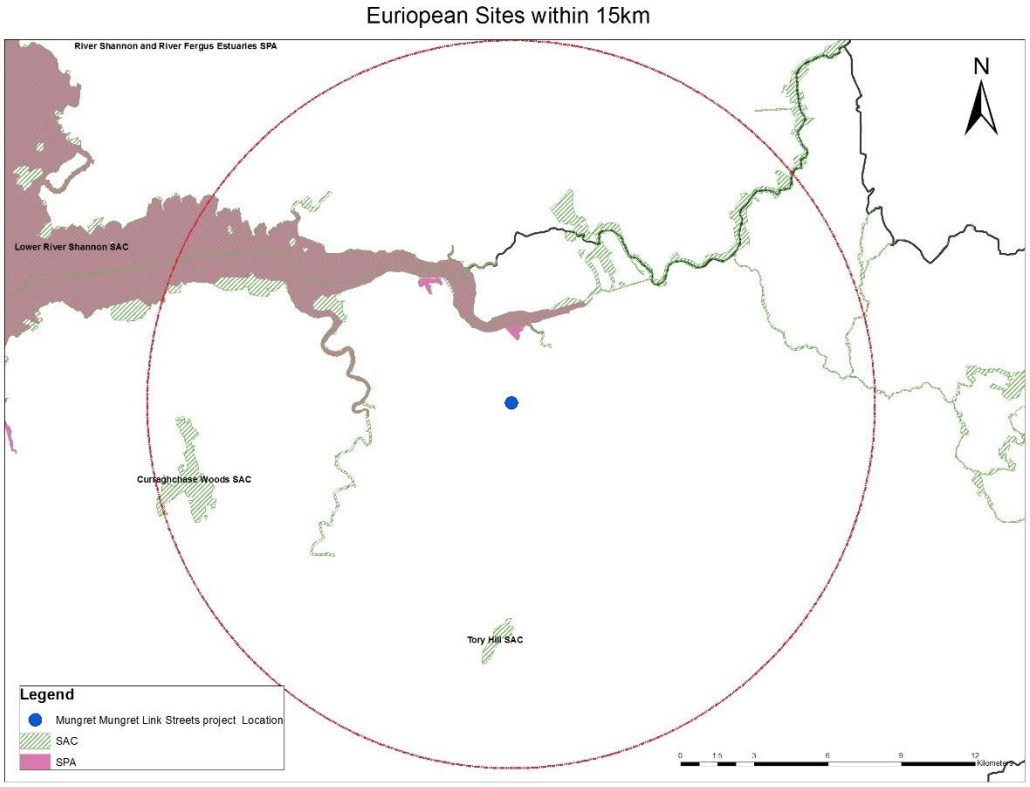


Source: Mott Macdonald 2019

The boundary of the Loughmore Common Turlough pNHA (site code 000438) is located ca. 180m to the south of the proposed new road. The proposed development lands are currently used for agricultural purposes and the fields are lightly grazed by cattle. These agricultural lands are bound to the east and south-west by urban lands. The R526 regional road is located to the south-east of the proposed new road and the R859 regional road to the north. Mungret House and Woods is located immediately north of the proposed new road. A school and sport fields are located immediately to the north-west of the road.

The Lower River Shannon SAC (site code 002165) is 1.7km north of the project. The River Shannon and River Fergus SPA (site code 004077) is ca. 1.7km north of the project. Curraghchase Woods SAC (site code 000174) is 12.4km west and Askeaton Fen Complex (002279) is 10.5km west of the project. Tory Hill SAC (000439) is ca. 8.8km south of the project.

Figure 2: European Sites within 15km



2.2 Project Overview

The Mungret Link Streets project consists of the provision of ca. 1.7km of new public road within the Mungret / Loughmore Common area of County Limerick. The project includes the following associated infrastructure:

- Driving Lanes,
- Cycleways,
- Footpaths,
- Roadside Parking,
- Surface water drainage / sustainable urban drainage, and
- Street lighting

The purpose of the project is to accommodate the future construction of new residential development in Mungret, Limerick (Limerick 2030 housing), within lands zoned for residential development under the Southern Environs Local Area Plan 2011 – 2017 (Extended until May 2021).

Ducting for the provision of services detailed below will also be installed to facilitate the future implementation of the area masterplan.

- Foul water drainage connection into Limerick Main Drainage Scheme
- Water mains
- Gas Mains
- Telecommunications

The Limerick 2030 housing project will, in itself, be subject to Environmental Impact Assessment in accordance with Part 10 of the Planning and Development Regulations, 2001 as amended. The potential for combined environmental effects with the Mungret Link Streets project is considered in this assessment.

2.2.1 Construction Phase

The project will require the excavation of lands which are in agricultural use. A number of field boundaries will be removed to accommodate the road. These comprise hedgerows of hawthorn (*Crataegus monogyna*) and blackthorn (*Prunus spinose*), with intermittent ash (*Fraxinus excelsior*) and elder (*Sambucus nigra*), and with an undergrowth of bramble (*Rubus fruticosus agg*.).

Several old farm sheds will be removed to accommodate the road. The works area will be accessed via the R859 and R510 roads.

Excavation works will generate sediment-laden surface water runoff from the works areas. This will be to the surrounding agricultural lands.

During the construction phase, there will be a temporary increase in noise within the vicinity of the works. The existing background noise levels within the study area is low and characteristic of rural-agricultural areas. The background noise levels increase slightly towards the outer site boundaries which are located in proximity to regional roads and residential areas.

During the construction phase there is potential for spills and leaks of oils, fuels and chemicals from storage areas, plant, and equipment used during construction to impact on the surrounding habitats. Accidental spills of fuels, oils and construction materials (e.g. concrete) can affect habitat quality.

It may be necessary to use artificial lighting during the construction works. Lands to the north of the proposed road have existing artificial lighting.

2.2.2 Operation Phase

There will be an increase in noise and dust due to the presence of the road. There is potential for leaks of fuel, oil, fluid etc. from vehicles using the road and/or be a source of heavy metals. Without adequate control, these could reach and contaminate the underlying soils.

Surface water run off could transport potential contaminants from the hard-standing areas to the adjacent soil impacting on soil quality. Without appropriate measures, this could potentially be a source of contamination.

Drainage from the road will be to two attenuation basins.; one servicing the eastern extent of the road and one servicing the western extent of the road. The road drainage has been designed to accommodate drainage from future residential development within lands zoned for development under the Southern Area Local Area Plan 2011-2017 (as extended). The attenuation basins will drain in to the existing drainage networks associated with the R859 and R510 roads.

- The construction activities required to deliver the proposed road will cause a short-term localised increase in existing noise levels.

- Site preparation works will expose topsoil to erosion by wind and rain. There is potential therefore for the generation of dust and sediment-laden surface water runoff from site. The Contractor will be obliged under contract to prepare a CEMP to ensure control of dust and site runoff.

Operation Phase

- Surface water runoff from the development lands will be captured in attenuation basins, infiltration basins and swales. Petrol interceptors will be operated and maintained. The potential for water pollution is therefore low.

- The drainage will be designed to attenuate runoff rates so as not to affect the local hydrology. The potential for pollution from these urban drainage systems is low given that they are designed to capture sediment / hydrocarbons in advance of discharge to the environment.

3 European Sites with Connectivity to the Project

3.1 Summary of European Sites with Source Pathway Receptors

Site Name and Code	Distance to European Site	Qualifying Interest/ Special Conservation Interest		Source-Pathway-Receptor
Special Areas of Conservation (SAC)				
Lower River Shannon SAC (002165)	Located ca. 1.7km north of the Project	**Annex I Habitats** [1110] Sandbanks which are slightly covered by sea water all the time [1130] Estuaries [1140] Mudflats and sandflats not covered by seawater at low tide [1150] Coastal lagoons [1160] Large shallow inlets and bays [1170] Reefs [1220] Perennial vegetation of stony banks [1310] Salicornia and other annuals colonising mud and sand [1330] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1410] Mediterranean salt meadows (*Juncetalia maritimi*) [3260] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [6410] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [91E0] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-*	**Annex II Species** [1029] *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1095] *Petromyzon marinus* (Sea Lamprey) [1096] *Lampetra planeri* (Brook Lamprey) [1099] *Lampetra fluviatilis* (River Lamprey) [1106] *Salmo salar* (Salmon) [1349] *Tursiops truncatus* (Common Bottlenose Dolphin) [1355] *Lutra lutra* (Otter)	No potential for disturbance to protected species or habitat damage within the SAC due to distance between the proposed project and the European Site. Drainage from the attenuation basin will be to the existing drainage of the R859 and R510. No records of otter were recorded during a field survey carried out by Mott MacDonald ecologists in 2018, however records by the NBDC show recordings of otter in the area in 2009. There is no hydrological connection between the project and the SAC.

Site Name and Code	Distance to European Site	Qualifying Interest/ Special Conservation Interest		Source-Pathway-Receptor
		Padion, Alnion incanae, Salicion albae)		
Curraghchase Woods SAC (000174)	12.6km east of the project	[91E0] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91J0] Taxus baccata woods of the British Isles	[1303] *Rhinolophus hipposideros* (Lesser Horseshoe Bat)	There is no potential for direct habitat damage due to distance between the sites. Bat Conservation Ireland[1] recommend that where a lesser horseshoe bat roost is located within 6km of a project, the effects on lesser horseshoe bat must be assessed further. The SAC is 12.6km from the proposed works and as such is determined not to have potential to affect lesser horseshoe bat having regard to Bat Conservation Ireland guidelines. There is no hydrological connectivity between the project and the SAC.
Tory Hill SAC (000439)	8.8km south of the project	[6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [7210] Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7230] Alkaline fens		There is no potential for direct habitat damage due to distance between the sites. There is no hydrological connectivity between the project and the SAC.
Special Protection Areas (SPA)				
River Shannon and River Fergus Estuaries SPA (004077)	Ca. 1.7km north of the Project	[A017] Cormorant (*Phalacrocorax carbo*) [A038] Whooper Swan (*Cygnus cygnus*) [A046] Light-bellied Brent Goose (*Branta bernicla hrota*) [A048] Shelduck (*Tadorna tadorna*) [A050] Wigeon (*Anas penelope*) [A052] Teal (*Anas crecca*) [A054] Pintail (*Anas acuta*) [A999] Wetland and Waterbirds		No potential for disturbance to protected birds or habitat damage within the SPA due to distance between the proposed project and the European Site. The Loughmore Common Turlough is located adjacent to the proposed project. The turlough is noted to be desiccated (ref pNHA site synopsis 000438) which is thought to be due to drainage of the surrounding land. The turlough therefore has low potential to support the wetland birds of the SPA. A bird survey was carried out by competent ecologists in 2018. It was noted that Loughmore Common Turlough provides suitable winter habitat for Lapwing

[1] Bat Conservation Ireland (2012) Bats and Appropriate Assessment Guidelines, Version 1, December 2012. Bat Conservation Ireland, www.batconservationireland.org.

Site Name and Code	Distance to European Site	Qualifying Interest/ Special Conservation Interest	Source-Pathway-Receptor
			and Golden Plover. Breeding pairs of Snipe were present. Due to the distance of the project from the pNHA (ca. 100m) and the screening provided by hedgerows there is no visual or audible effect anticipated on the birds using the pNHA. There is no hydrological connectivity between the project and the SAC.

3.2 Assessment of Likely Effects

There are no European Sites within the zone of influence of the proposed Mungret Link Streets project.

4 In Combination Effects

Article 6(3) of the Habitats Directive requires that:

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

It is therefore required that the potential impacts of the proposed Mungret Link Streets project considered in combination with any other relevant plans or projects.

It is of note that as part of the Limerick Southern Environs Local Area Plan there is further development being tabled for this area. While this report deals only with the proposed road it will be necessary to further investigate any effects should the housing plan commence. The development will be subject to planning and environmental legislation.

The project will result in permanent habitat loss in the immediate area of the project. The habitat is agricultural grassland adjacent to the Loughmore Common Turlough pNHA, which as mentioned previously, has the potential to support wetland birds which are qualifying features of interest of the River Shannon and River Fergus Estuaries SPA (004077). While the project does not have the potential to affect the birds using the area due to natural screening by hedgerows and treelines, any future developments will be investigated in this respect and in compliance with planning and environmental legislation.

A site walk over carried out by Mott MacDonald ecologists in 2018 did not note any evidence of otter prints, scat or holts within the project site. Guidelines written by the National Roads Authority recommend a distance of 150m between a work site and an active otter holt. The canal which has the potential to support an otter holt is >360m South of the project (National Roads Authority, no date).

5 Assessment of Significance

5.1 Summary

The current assessment investigates the potential for significant effects European Sites arising from the proposed link road at Mungret.

The assessment considers the potential for the proposed development, either alone or in combination with other projects or plans, to have significant adverse effects on the qualifying interests and special conservation interests of European Sites in view of their conservation objectives.

It is concluded that there is no potential for significant effects on European Sites from the proposed works, either alone or in-combination with other plans and/or projects due to the absence of source-pathway-receptor connectivity between the Mungret Link Streets project and European Sites.

The findings of this report for Screening for Appropriate Assessment are summarised in the Findings of no Significant Effects Matrix hereunder.

Table 5: Findings of No Significant Effects Matrix

Name of project or plan	Mungret Links Street Project
Name and location of European sites	The Lower River Shannon SAC is located ca. 1.7km North of the proposed work site. The River Shannon and River Fergus SPA (004077) is located 1.7km North of the site.
Description of the project or plan	The Mungret Link Streets project consists of the provision of ca. 1.7km of new public road within the Mungret / Loughmore Common area of County Limerick. The project includes the following associated infrastructure: • Driving Lanes, • Cycleways, • Footpaths, • Roadside Parking, • Surface water drainage / sustainable urban drainage, and • Street lighting The purpose of the project is to accommodate the future construction of new residential development in Mungret, Limerick (Limerick 2030 housing), within lands zoned for residential development under the Southern Environs Local Area Plan 2011 – 2017 (Extended until May 2021). Ducting for the provision of services detailed below will also be installed to facilitate the future implementation of the area masterplan. • Foul water drainage connection into Limerick Main Drainage Scheme • Water mains • Gas Mains • Telecommunications
Is the project or plan directly connected with or necessary to the management of the site?	No.
Are there other projects or plans that together with the project or plan being assessed could affect the site?	The project will be put in place in advance of the housing development which will be progressed under separate planning application. The Mungret Street Links Project includes the infrastructure necessary to support the residential development within the zoned lands and has been sized and designed accordingly.

	This assessment has determined no effects on European sites from the Mungret Street Links Project. Therefore, there is no potential for in combination effects.
The assessment of significance of effects	
Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 site.	No likely effects were determined from the proposed works.
Explain why these effects are not considered significant	No likely effects were determined therefore there can be no alteration of the conservation condition or objectives of the European Site due to the proposed works.
List of agencies consulted: provide contact name and telephone or e-mail address	None
Response to consultation.	N/A
Data collected to carry out the assessment	
Who carried out the assessment?	Noreen Lynch Ecologist with Mott MacDonald
Sources of data?	Refer to references section
Level of assessment?	Desktop study and site survey

6 References

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

DEHLG (2010) Freshwater Pearl Mussel *Second Draft* Munster Blackwater Sub-Basin Management Plan.

Kelly, F.L., Matson, R., Connor, L., Feeney, R., Morrissey, E., Coyne, J. and Rocks, K. (2014) Water Framework Directive Fish Stock Survey of Rivers in the South Western River Basin District. Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24, Ireland. Institute of Air Quality Management (2014) Guidance on the Assessment of the Dust from Demolition and Construction, Version 1.1

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

O'Gorman, N.M., Rooney, S.M., Cierpial, D. and King, J.J. (2015) National Programme: Habitats Directive and Red Data Book Species Executive Report 2014. Inland Fisheries Ireland, 3044 Lake Drive, Citywest, Dublin 24, Ireland.

Rooney, S.M., O'Gorman, N.M., Cierpial, D. and King, J.J. (2014) National Programme: Habitats Directive and Red Data Book Species Executive Report 2013. Inland Fisheries Ireland, Swords Business Campus, Swords, Co. Dublin, Ireland.

National Roads Authority (no date) *THE TREATMENT OF OTTERS PRIOR TO THE CONSTRUCTION OF NATIONAL ROAD SCHEMES*. Available at: https://www.tii.ie/tii-library/environment/construction-guidelines/Guidelines-for-the-Treatment-of-Otters-prior-to-the-Construction-of-National-Road-Schemes.pdf (Accessed: 28 March 2019).

mottmac.com

C. OPW Flood Map Report

OPW *National Flood Hazard Mapping*

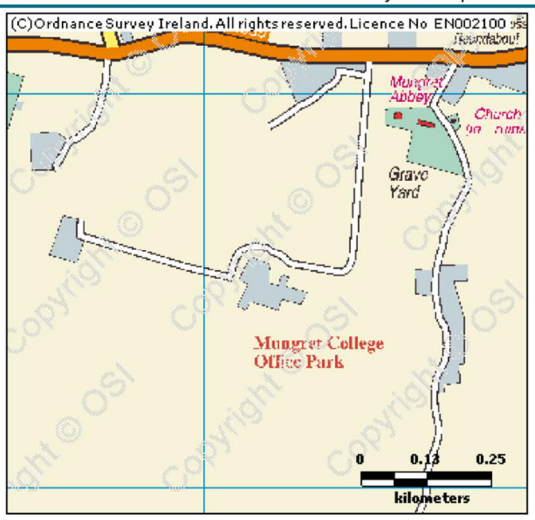
Summary Local Area Report

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

The map centre is in:

County: Limerick

NGR: R 540 535



Map Scale 1:10,458

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.

7 Results

1. Shannon Adjacent Dock Road Limerick Dec 1999 — Start Date: 25/Dec/1999
County:Limerick — Flood Quality Code:2
Additional Information: Reports (3) Press Archive (1) More Mapped Information

2. Ballynaclough River Limerick Dec 1999 — Start Date: 25/Dec/1999
County:Limerick — Flood Quality Code:3
Additional Information: Reports (3) More Mapped Information

3. Raheen Dooradoyle, Limerick Feb 1990 — Start Date: 01/Feb/1990
County:Limerick — Flood Quality Code:1
Additional Information: Reports (1) More Mapped Information

4. Turlough - Loughmore Common Limerick — Start Date:
County:Limerick — Flood Quality Code:3
Additional Information: Reports (3) More Mapped Information

5. Mungret Village, Co. Limerick — Start Date:
County:Limerick — Flood Quality Code:4

Report Produced: 21-May-2019 12:47

Additional Information: Reports (1) More Mapped Information

6. Dooradoyle Limerick recurring — Start Date:
County: Limerick — Flood Quality Code:4

Additional Information: Reports (1) More Mapped Information

7. Dooradoyle-St Nessans/Fr Russell recurring — Start Date:
County: Limerick — Flood Quality Code:4

Additional Information: Reports (1) More Mapped Information

Report Produced: 21-May-2019 12:47