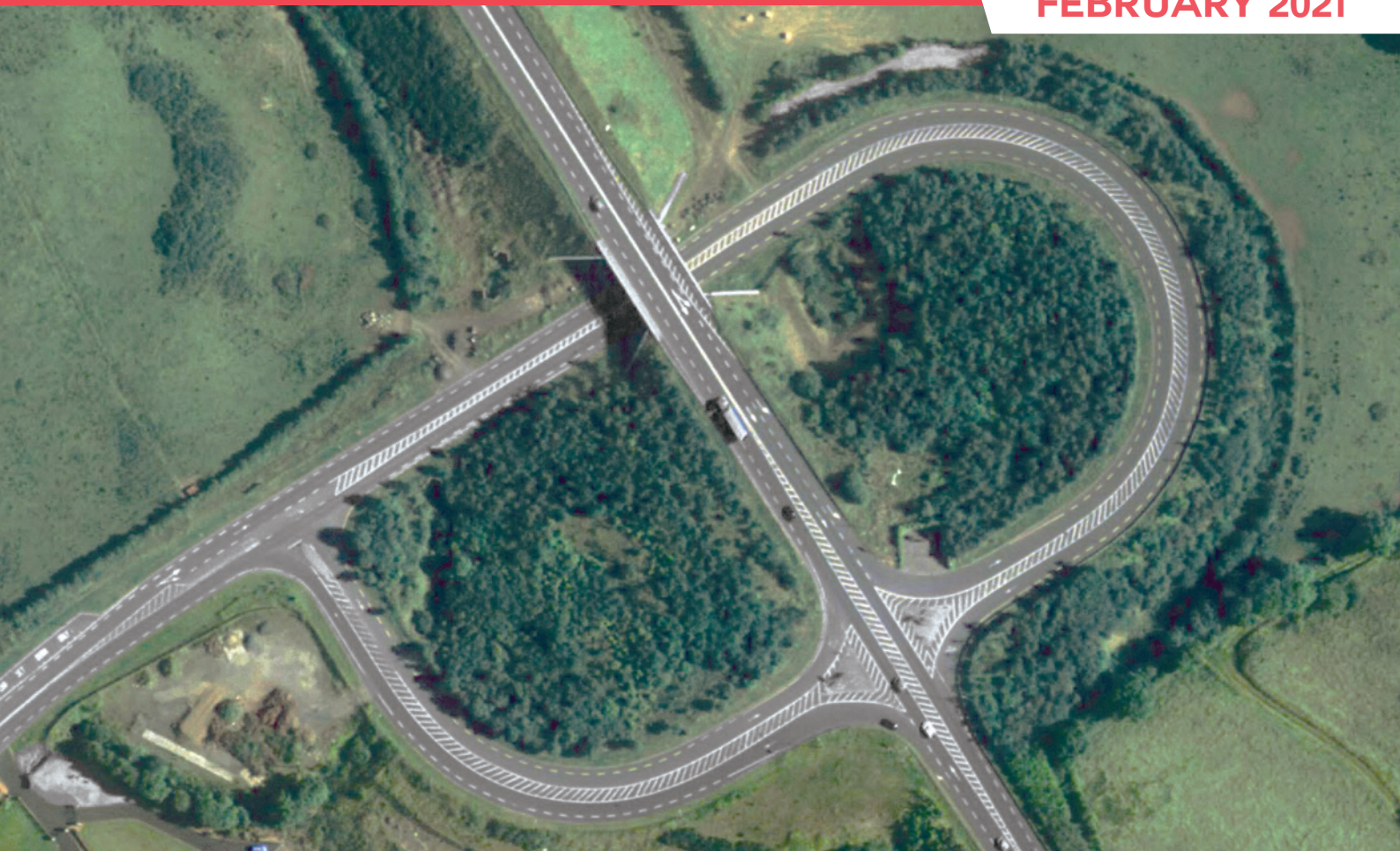




ARDEE TO CASTLEBLAYNEY ROAD SCHEME

FEBRUARY 2021



OPTION SELECTION REPORT

VOLUME 5 - STAGE 2 ENVIRONMENTAL
APPRAISAL REPORT



An Roinn Iompair
Department of Transport



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Project Ireland
2040



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N2 Ardee to Castleblayney Road Scheme

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Overarching Structure of Option Selection Report

Volume Ref. No. & Title	Contents
Volume 0 – Executive Summary	
Volume 1 – Main Report	
Volume 2 – Drawings	Part A – Route Corridor Drawings Part B – Constraints Drawings
Volume 3 – Constraints Study Report	Main Report
Volume 4 – Phase 2 Stage 1 Working Paper Report	Main Report & Associated Appendices
Volume 5 – Stage 2 Environmental Appraisal Report	Main Report & Associated Appendices
Volume 6 – Engineering Appendices	Part A – Traffic Modelling Report Part B – RSA Stage F Part 1 Report Part C – RSA Stage F Part 2 Report Part D – Cost Benefit Analysis Report
Volume 7 – Non-Statutory Post Consultation Reports	Part A – Public Consultation 1 – Study Area & Constraints Part B – Public Consultation 2 – Route Corridor Options Part C – Public Consultation 3 – Emerging Preferred Corridor
Volume 8 – Project Appraisal Balance Sheet	PABS

Note: The associated Constraints Drawings referred to in this Report are provided in Volume 2 (Drawings).

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1. Introduction

1.1 Overview of this Volume

The Option Selection Report is Phase 2 of Stage 2 of the eight-phase process outlined in the TII Project Management Guidelines. There are four key phases to the Planning and Design process as illustrated in Table 1.1. The report has multiple volumes outlining the constraints in the Study Area and how ultimately the Preferred Route Corridor Option was selected.

Table 1.1: Project Manager’s Manual – Planning and Design Project Phases

Project Stage	Scope	Key Outputs	Consultation
Phase 1: Concept and Feasibility	Develop and investigate the feasibility of the Project and project management structure. •	Project Execution Plan (including Communications Strategy) Feasibility Working Costs Project Brief	PC1: Event – Project Constraints (June 2019)
Phase 2: Option Selection	Stage 1: Preliminary Options Assessment 17 Feasible Route Corridor Options were identified and assessed to select six Route Corridor Options to progress to Stage 2.	Stage 1 Working Paper Report	-
	Stage 2 – Project Appraisal Matrix Further Examination of six Route Corridor Options to determine a Preferred Option.	Stage 2 Options Assessment Report	PC2: Event – Introduction of six Route Corridor Options (October 2019)
	Current Stage of the Project		
	Stage 3 – Project Balance Sheet Final detailed appraisal of the preferred Route Corridor Option emerging from Stage 2.	Project Appraisal Balance Sheet	PC3: Event – Public Display of Emerging Preferred Route Corridor (Autumn 2020)
Phase 3: Design and Environmental Evaluation	Develop the Project design and complete a full Environmental Impact Assessment (EIA) of the Proposed Route	Design Report Environmental Impact Assessment Report (EIAR) Appropriate Assessment Transport Modelling Report	Consultation on Planning Submission including EIAR is part of Phase 4
Phase 4: Statutory Processes:	Compile documentation and participate in oral hearing(s) as required by the statutory processes to ensure that the proposed Project is developed in accordance with planning and environmental legislation.	An Bord Pleanála (ABP) / Competent Authority Decision	Consultation on Planning Submission including EIAR

As detailed in Table 1.1, an initial environmental assessment was undertaken during the Phase 2, Stage 1 process, whereby 17 no. Feasible Route Corridors were identified within the Study Area and comparatively assessed to select six Route Corridor Options to progress to Stage 2 of the Phase 2 process. Details of the Stage 1 assessment process can be found in Volume 4 -Phase 2 Stage 1 Working Paper Report.

This document is Volume 5 (Stage 2 Environmental Appraisal Report) and contains the details of the environmental assessment that has been undertaken as part of the Stage 2 assessment which involved a comparative assessment of the six Route Corridor Options to identify a Preferred Route Corridor. The Option Selection Report (Volume 1) should be read in its entirety so that a full understanding can be gained on all of the six Main Criteria of the Stage 2 Appraisal process. This document presents the Stage 2 Environment Appraisal of the six Route Corridor Options in relation to a number of environmental topics (listed in Table 1.2); some of the details in this document have been summarised in Volumes 1 (Main Report) and Volume 3 (Constraints Study Report) of the Option Selection Report. The Environment Appraisal Criteria for this Stage 2 assessment is outlined in detail in the section below against the environmental *topics*, or 'Sub-Criteria' identified in the TII's *PAG Unit 7.0 – Multi-Criteria Analysis PE-PAG-020301 (October 2016)*. A summary of the Stage 2 Environment Appraisal is provided in Section 9.6 of Chapter 9 (Stage 2 – Project Appraisal Matrix) in the Option Selection Report.

1.2 List of Environmental Topics

Environmental Impact Assessment is a process and includes information gathered throughout all planning and design phases of the project. The assessment of alternatives (Phase 2) is a key part of Environmental Impact Assessment. While an Environmental Impact Assessment Report will be prepared at Phase 3 (Design and Environmental Evaluation) of the project, for the Preferred Route Corridor Option and is not required at this stage of the process, the Option Selection Report and all associated information gathered during Phase 1 and 2 of the project will contribute to it and the environmental topics considered in this report are based on the topics that will be considered in the Environmental Impact Assessment.

TII have identified a number of environmental topics (environmental criteria) to be assessed as part of the Phase 2 Stage 2 assessment within the PAG Unit 7.0 guidelines. TII have also published specific guidelines for a number of these environmental topics, detailing guidelines for assessment at various stages of national road schemes. Where available, these guidelines will be used in addition to EIA guidelines and principles to ensure consistency throughout the various stages as far as reasonably practical. In the absence of TII guidelines for a specific topic EIA guidelines and principles will be used.

There is no single definitive list of environmental topics for inclusion in an Environmental Impact Assessment process. The 2014 Environmental Impact Assessment Directive (2014/52/EU) as transposed into Irish law, outlines factors for inclusion in an Environmental Impact Assessment Report (which will be completed at Phase 3). These factors have been elaborated on by TII and EPA guidelines and professional judgement plays a role. In assessing a road scheme, the following are taken into account:

- National Legislation – The European Union (Roads Act 1993) (Environmental Impact Assessment) (Amendment) Regulations 2019 (SI 279/2019)¹;
- National Guidelines – Guidelines on The Information to be Contained in Environmental Impact Assessment Reports Draft August 2017²;
- National Transportation Guidelines – TII Publications PE-PAG-02031 Project Appraisal Guidelines for National Roads Unit 7.0 – Multi Criteria Analysis (October 2016)³; and
- National Transportation Planning and Construction Guidelines for Transportation Projects – TII guidelines on environmental topics⁴; and
- National Transportation Guidelines – TII's Project Manager's Manual (PMM) for Major National Road Projects PE-PMG-02042 (February 2019)⁵.

¹ The 2014 EIA Directive has been transposed into national legislation. The 2019 Regulations have amended the 1993 Roads Act and will be the legislative basis of the assessment.

² This is a suggested list from the 2017 EPA Guidelines.

³ Table 7.1.3 (Phase 2 Stage 2), Page 21.

⁴ <https://www.tii.ie/technical-services/environment/>

⁵ This division of constraints does not correlate with the legislation and other guidelines and so will not be used in Phase 2.

Table 1.2 clarifies how the Stage 2 Option Selection environmental criteria identified in Unit 7.0 of the TII PAG have been structured throughout the chapters of this report to allow consistency with the 2014 EIA Directive and national EIA legislation at Stage 3. As well as being addressed in this Option Selection Report, these topics will also be included and addressed in more detail in the Environmental Impact Assessment Report which will be conducted during Phase 3 (Design and Environmental Evaluation) of the Preferred Route Corridor. Please note that there are additional topics that will be assessed at Phase 3 in the Environmental Impact Assessment Report, as required by the 2014 EIA Directive. These include major accidents and disasters, and interactions (including cumulative assessment).

Table 1.2: Stage 2 Environmental Appraisal – Topics and Chapters

National Legislation: The European Union (Roads Act 1993) (Environmental Impact Assessment) (Amendment) Regulations 2019 ⁶	PAG Unit 7.0 Environmental Criteria	Volume 5 Environmental Appraisal Report Chapters⁷
Population & Human Health	Air Quality and Climate Noise Waste Non-agricultural properties Agriculture	Chapter 2 Air Quality and Climate Chapter 3 Noise Chapter 4 Landscape and Visual Chapter 6 Waste Chapter 10 Material Assets (non-agricultural) Chapter 11 Agriculture (Volume 1 Physical Activity)
Biodiversity	Biodiversity – Flora and Fauna	Chapter 5 Biodiversity – Flora & Fauna
Land & Soils	Soils and Geology Hydrogeology Agriculture	Chapter 7 Soils, Geology and Hydrogeology Chapter 11 Agriculture
Water	Hydrogeology Hydrology	Chapter 7 Soils, Geology and Hydrogeology (i.e. groundwater) Chapter 8 Hydrology (i.e. surface water)
Air ⁸	Air Quality and Climate	Chapter 2 Air Quality and Climate Chapter 3 Noise
Climate	Air Quality and Climate	Chapter 2 Air Quality and Climate
Material Assets	Non-agricultural properties	Chapter 10 Material Assets (non-agricultural) Chapter 11 Agriculture
Cultural Heritage	Archaeology and Cultural Heritage	Chapter 9 Cultural Heritage
Landscape	Landscape	Chapter 4 Landscape and Visual

⁶ The 2014 EIA Directive has been transposed into national legislation. The 2019 Regulations have amended the 1993 Roads Act and will be the legislative basis of the assessment.

⁷ Other topics will be included in the EIAR including Cumulative Effects, and Major Accidents and Disasters. Matters highlighted in the 2014 EIA Directive such as interactions of effects, emissions of heat and radiation, and the vulnerability of the project to risks of major accidents and/or disasters have been considered at this Option Selection Stage. It has been determined that there will be no significant effects because of the nature of the road scheme and those matters will not be differentiating factors between Route Corridor Options.

⁸ Noise is not specifically identified in the EIA Directive or national legislation but as noise is transmitted through air, it is taken to be included here.

Each assessment chapter outlines the methodology for the assessment, the relevant constraints and the findings of the Option Selection process that was followed. The findings within each assessment chapter are relevant to that chapter and form one element of the overall Option Selection process. Details on the overall option selection process are presented in Volume 1 of the Option Selection Report.

Some chapters reference Figures (e.g. Figure 5.1) and these are presented in Volume 2 of the Option Selection Report.

Any appendices referred within the chapter (e.g. Appendix 7.1) are presented at the back of this document.

1.2.1 Sustainability

Sustainability is not specifically identified as a topic in the 2014 EIA Directive nor guidance documents for inclusion in an Option Selection Report, but it has been at the core of the process for this scheme. This section will outline how sustainability has been addressed on the scheme and in what section of the Option Selection Report further details can be found.

1.2.1.1 United Nations Sustainable Development Goals

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. It has established 17 Sustainable Development Goals (SDGs) illustrated in Figure 1.1, which are an urgent call for action by all countries in a global partnership. They recognise that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests.

Figure 1.1: United Nations Sustainable Development Goals



(Reproduced from <https://www.un.org/sustainabledevelopment/>)

The Sustainable Development Goals will be embedded into the aims of the proposed scheme. Those which are important to the development of the N2 Ardee to Castleblayney scheme and how they will be achieved are:

- **GOAL 1: No Poverty:** Economic growth must be inclusive to provide sustainable jobs and promote equality. The proposed scheme aims to improve access to employment and amenities to all people in the study area and in the wider strategic Dublin-Derry route;
- **GOAL 3: Good Health:** Ensuring healthy lives and promoting the well-being for all at all ages is essential to sustainable development. The proposed scheme aims to improve access to health care and amenities to all people within the study area;
- **GOAL 6: Clean Water and Sanitation:** Clean, accessible water for all is an essential part of the world we want to live in. The proposed scheme will aim to ensure the protection of water quality in the study area when constructing new or enhancing existing transport networks;
- **GOAL 8: Good Jobs and Economic Growth:** Sustainable economic growth will require societies to create the conditions that allow people to have quality jobs. The proposed scheme will be important in facilitating access to quality jobs by enhancing the strategic Dublin-Derry route;
- **GOAL 9: Innovation and Infrastructure:** Investments in infrastructure are crucial to achieving sustainable development. The proposed scheme ensures that the most appropriate investments are made in transport infrastructure within the study area;
- **GOAL 11: Sustainable Cities and Communities:** There needs to be a future in which cities provide opportunities for all, with access to basic services, energy, housing, transportation and more. The proposed scheme aims to reduce inequalities and improve accessibility for all people within the study area in relation to access to health care, employment, amenities etc.;
- **GOAL 13: Climate Action:** Climate change is a global challenge that affects everyone, everywhere. The proposed scheme aims to support mitigation of the impacts of the transport sector on climate change as a whole as well as ensure the future adaptability of scheme to the localised impacts of climate change;
- **GOAL 14: Life Below Water:** Careful management of this essential global resource is a key feature of a sustainable future. The proposed scheme will ensure that water quality within the study area is protected where possible;
- **GOAL 15: Life on Land:** Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss. The proposed scheme will aim to ensure that terrestrial habitats in the study area are protected whenever possible, and where practicable, there may be opportunities to enhance or restore; and
- **GOAL 17: Partnerships for the Goals:** Revitalize the global partnership for sustainable development. Partnerships across government departments, private sector and the public will be required to ensure the success of the aims the proposed scheme.

The UN Sustainable Development Goals have informed the EPA's Key Actions for Ireland within the EPA's publication, 'Ireland's Environment 2016; An Assessment'. Those important to future transport planning and investment in the context of the wider environmental protection and sustainable development agenda are:

- **Environment and Wellbeing:** Recognition of the benefits of a good quality environment to health and wellbeing;
- **Climate Change:** Accelerate mitigation actions to reduce greenhouse gas emissions and implement adaptation measures to increase our resilience in dealing with adverse climate impacts;
- **Implementation of Legislation:** Improve the tracking of plans and policies and the implementation and enforcement of environmental legislation to protect the environment;
- **Restore and Protect Water Quality:** Implement measures that achieve ongoing improvements in the environmental status of water bodies from source to the sea;
- **Sustainable Economic Activities:** Integrate resource efficiency and sustainability ideas and performance accounting across all economic sectors;
- **Nature and Wild Places:** Protect pristine and wild places that act as biodiversity hubs, contribute to health and wellbeing and provide sustainable tourism opportunities; and,
- **Community Engagement:** Inform, engage and support communities in the protection and improvement of the environment.

These key actions will be integrated into the assessment process of the proposed scheme throughout all phases of the project.

1.2.1.2 Climate Change

The environmental impacts from greenhouse gases emissions occur at a global level with targets for their reduction being set at a national level. The climate is changing because of emissions of greenhouse gases emissions resulting from human activity, with global consequences. In any infrastructure development, greenhouse gases will be emitted in three main ways:

- **Change of land use** – different land types store carbon and other greenhouse gases (e.g. bogs and woodlands) by changing the land type by building a road these gases will be released into the atmosphere;
- **Use of materials** – the type of materials selected at the construction phase will generate greenhouse gases e.g. concrete and steel production will result in carbon dioxide; the extraction of gravel for construction will result in emissions; electricity used during construction, etc. Large earthworks result in more change in land use and more construction effort resulting in more emissions; and
- **Vehicle emissions** – these include emissions from construction vehicles and from traffic using the proposed scheme.

At this Phase of the project, there are limited details on the construction phase of the proposed scheme. This is the case for all national road schemes; options are determined, then route corridors laid out, and then at Phase 3 a road alignment is designed. When the road alignment is designed, the types and amount of materials will be known; in addition to what land will be affected and what level of construction will be required. At this Phase of the project (Phase 2), the climate change effects of the project can only be assessed based on the available information and this can be built on at the next Phase of the project when further and more detailed assessment will be undertaken with more detailed information which will be available.

At the next Phase of the project (Phase 3), the proposed scheme will be designed. Mitigation measures are being incorporated into the design of the Scheme to reduce greenhouse gas emissions. Example measures would include:

- Seek a balance of earthworks so that construction effort is minimised and avoid carbon-rich habitats (e.g. bogs and woodlands) as far as possible;
- The incorporation of sustainable drainage systems to manage road runoff and provide resilience against potential future flood events associated with climate change;
- The use of energy efficient road lighting to reduce energy consumption;
- The inclusion of new and/or improved cycleways and walkways to improve connectivity and journeys for pedestrians and cyclists and promote alternative modes of transport; and
- The production of an Outline Construction Environmental Management Plan (Outline CEMP) which will involve:
 - Developing and implementing a management plan to reduce energy consumption and associated greenhouse gas emissions during construction;
 - The recording and reporting of energy consumption and materials used during construction;
 - Implementing measures to manage material resources, such as using materials with lower embedded greenhouse gas emissions and recycled or secondary materials;
 - The sustainable reuse of soils and aggregates won from excavation and demolition activities, where feasible, to minimise greenhouse gas emissions associated with importation of materials.

1.2.1.3 Climate Resilience

Infrastructure projects can impact climate change (e.g. produce more greenhouse gases) but also be affected by it. The Environmental Protection Agency⁹ states that climate change in Ireland will result in many changes including more extreme weather events, increased flooding, and more extreme temperatures. These changes will need to be considered in the design and assessment of the proposed scheme.

The impacts to the proposed scheme could include:

- Increased frequency and severity of unsuitable conditions, for example due to very hot weather or very wet weather during construction activities involving laying pavement materials and the delivery of construction plant, thereby increasing the need to repeat certain works;
- Material and asset deterioration due to high temperatures;
- Flood risk (surface, groundwater, fluvial and snow/ice melt) on the network and damage to drainage systems with the potential for increased runoff from adjacent land contributing to surface water flooding;
- Increased slope instability from prolonged/heavy precipitation leading to subsidence; and
- Storm damage to structures.

The proposed scheme will be designed to minimise the impacts from climate change as far as is reasonably feasible. Potential effects as a result of more extreme temperature fluctuations, an increase in the frequency of storms and the risk of more flash flooding will be mitigated through the design of the proposed scheme, the selection of materials used for its construction and operational procedures. The proposed scheme's drainage, for example, will be designed to be resilient to the increase in predicted levels of precipitation, whilst materials specification will consider the ability of the product to withstand a wide range of temperature scenarios. Proposed landscape planting will take into account the foreseeable changes in climate and will include climate resilience plants.

⁹ <http://www.epa.ie/climate/communicatingclimatescience/whatisclimatechange/whatimpactwillclimatechangehaveforireland/>

1.2.1.4 Sustainability within the Option Selection Report

Table 1.3 outlines how sustainability has been addressed throughout this Option Selection Report. Sustainability is a wide-ranging topic and Table 1.3 is not intended as an exhaustive list but as a guide to some of the key topics. The assessment of sustainability issues has been completed at a level of detail appropriate to this phase of the project. Further details on design, materials and impacts will be available at the next phase of the project and they will be assessed appropriately at that time. This is in-line with legislative requirements and national and international guidance.

Table 1.3: Sustainability within the Option Selection Report

Sustainability Topic	Section of Option Selection Report
Public Transport and Traffic Management Alternatives and Options	Volume 1, Chapter 3 Consideration of Alternatives and Options (Sections 3.4 and 3.5)
Community Involvement	Volume 1, Chapter 6 Non-Statutory Public Consultations
Accessibility and Social Inclusion Appraisal	Volume 1, Stage 2 – Project Appraisal Matrix (Section 9.7)
Integration Appraisal	Volume 1, Stage 2 – Project Appraisal Matrix (Section 9.8)
Physical Activity Appraisal	Volume 1, Stage 2 – Project Appraisal Matrix (Section 9.9)
Change of Land Use	Volume 5, Chapter 5 Ecology; Chapter 7 Soils, Geology and Hydrogeology; Chapter 8 Hydrology; and Chapter 11 Agriculture
Vehicle Emissions	Volume 5, Chapter 2 Air Quality and Climate
Use of Materials	Volume 5, Chapter 6 Waste
Human Health	Volume 1, Stage 2 – Project Appraisal Matrix (Section 9.9). Volume 5, Chapter 2 Air Quality and Climate; Chapter 3 Noise; Chapter 4 Landscape and Visual; Chapter 6 Waste; Chapter 10 Material Assets (non-agricultural); Chapter 11 Agriculture;

1.3 Specialists and Sub-Consultants

Jacobs is the lead consultant throughout this process, however a number of sub-consultants have been commissioned to undertake the assessment for some environmental topics. The sub-consultant responsible for each assessment is detailed at the beginning of the relevant chapter as are detailed in Table 1.4.

Table 1.4 Responsible Consultants by Environmental Topic

Chapter	Responsible Consultant
Chapter 2 Air Quality and Climate	AWN Consulting Limited
Chapter 3 Noise	AWN Consulting Limited
Chapter 4 Landscape and Visual	MacroWorks Limited
Chapter 5 Biodiversity – Flora & Fauna	Scott Cawley Limited
Chapter 6 Waste	Jacobs
Chapter 7 Soils, Geology and Hydrogeology	Jacobs
Chapter 8 Hydrology	Jacobs
Chapter 9 Cultural Heritage	Archaeological Management Solutions Ltd (AMS)
Chapter 10 Material Assets (non-agricultural)	Jacobs
Chapter 11 Agriculture	Philip Farrelly & Co.

2. Air Quality and Climate

2.1 Introduction

AWN Consulting Limited has been commissioned to conduct an air quality assessment for six Route Corridor Options proposed for the N2 Ardee to Castleblayney Road Scheme (N2 A2C). This report assesses the various Route Corridor Options in-line with Transport Infrastructure Ireland Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes” (TII, 2011).

2.2 Methodology

2.2.1 Assessment Criteria

Transport Infrastructure Ireland’s (TII) document entitled “Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes” (TII, 2011) provides guidance on the Option Selection assessment procedures in “Chapter 2 - Option Selection”. The primary aspects of the assessment relate to existing ambient air quality, proximity of sensitive locations and a review of the overall significance of potential changes in air quality. The objective at this stage of the Option Selection process is to indicate whether there are likely to be significant air quality impacts associated with each of the proposed Route Corridor Options. In the current assessment, the number of residential properties and non-residential properties (schools, hospitals, and care homes) within 50m of the carriageway of each Route Corridor Option were identified, as required by TII guidelines¹⁰ referenced above. There is one such non-residential property identified - the Castleross Retirement Home adjacent to the existing N2. Traffic data obtained for the opening year of 2027 and design year of 2042 were used in the model as per the TII Guidelines (2011). Please see Table 2.4 below for traffic and residential property numbers. Using the results from this exercise, a comparison of the proposed routes has been carried out based on a calculation of the Index of the Overall Change in Exposure to Nitrogen Oxides (NO_x) and Particulates (PM₁₀) resulting from each individual Route Corridor Option.

The “Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes” was then used to inform the Stage 2 project appraisal matrix. The comparative evaluation of Route Corridor Options was assisted by scoring of impacts to sensitive receptors¹¹ using the Stage 2 project appraisal matrix suggested in the Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis¹². An assessment was undertaken on each Route Corridor Option to include both a quantitative and qualitative assessment. The overall effect of each Route Corridor Option is scored based on the seven-point scale as shown in Table 2.1 and a number was assigned according to the level of significance of the effects.

Table 2.1: Key for Scoring Effects

Score	Significance of Effect
7	Major or Highly Positive
6	Moderately Positive
5	Minor or Slightly Positive
4	Not Significant or Neutral
3	Minor or Slightly Negative
2	Moderately Negative
1	Major or Highly Negative

¹⁰ This is calculated as 8m – 58m from the centreline in-line with TII guidelines. Please see Section 2.3, page 10, final paragraph on page.

¹¹ For the purposes of this assessment, sensitive receptors include residential properties and nitrogen sensitive ecological sites as per TII Guidelines for Treatment of Air Quality during the Planning and Construction of National Road Schemes (2011).

¹² TII. 2016. Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis. PE-PAG-02031.

2.2.2 Assessment of Traffic

Table 2.2: Traffic Flow Data

Option	Maximum AADT (2027)	Maximum AADT (2042)
Do Minimum	14,947	16,753
Option A (Yellow)	13,978	15,569
Option B (Yellow+Blue)	13,837	15,469
Option C (Green)	15,222	16,560
Option D (Orange)	12,572	13,811
Option E (Orange + Link 1 +Green)	11,551	12,549
Option F (Orange + Link 2 +Green)	12,073	13,529

A Traffic Modelling Report (see Volume 6, Part A of this Option Selection Report) has been completed in accordance with the TII Guidelines for this scheme. The data presented in Table 2.2 above has been taken from that Report and shows the maximum AADT. Figures 5.3 to 5.9 of Volume 6, Part A also demonstrate how the AADT varies along the draft indicative alignment. This is due to junctions and changes in the local road network and so traffic will change in the Study Area as a result of the proposed scheme. Even in the Do Minimum (the existing N2) traffic levels do not stay the same along its length due to variance in journey origin and destinations.

Table 2.2 shows the maximum AADT for each of the Route Corridor Options. It was determined that using these figures would allow a reasonable worst-case assessment. Further assessment will be required at Phase 3 as this assessment at Phase 2 is indicative. Undertaking a reasonable worst-case assessment will ensure that the air quality effects of the Route Corridor Options are not underestimated and helps to ensure that the impacts to sensitive locations are fully addressed. However, further design and assessment work are required for the proposed scheme at Phase 3.

Please note that the Do Minimum figures are for the existing N2, which has many accesses and junctions through connections of local roads. An indicative alignment within Option A (Yellow) will have less junctions and accesses to make it safer, as a result traffic will be altered as a result of road and junction changes. In Table 2.2 above the maximum AADT values are marginally lower Option A (Yellow) than the existing N2 (Do Minimum). This will not be the case for the entire length of the scheme. It is the case for one location outside of Carrickmacross, which can be seen on Figure 5.3 and Figure 5.4 of Volume 6, Part A. The difference between the Do Minimum and Option A (Yellow) is due to the potential closures of existing accesses and junctions onto the existing N2. Traffic flow along Option B (Yellow+Blue) will result in a similar outcome at this location. Changes in the road network will result in changes to vehicle movements and journeys. Safe access will be provided to the proposed scheme at appropriate locations, however it will not be possible to maintain every current access and junction. The impact of changes in traffic flows along the local road network will be assessed at Phase 3 (EIA). The Environmental Impact Assessment Report at Phase 3 will include an assessment of the effects from any disruption as a result of changes to journeys.

The assessment presented in this chapter has completed a reasonable worst-case assessment based on the maximum AADT - as shown in Table 2.2. By using this method, the assessment is robust and does not underestimate the air quality effects from the indicative alignments within the Route Corridor Options. Further assessment will be required at the next Phase of the project in order to understand the detailed effects. There will be changes to the air quality assessment as the design of the alignment takes shape (These will be addressed in the Environmental Impact Assessment Report for the project at Phase 3).

2.3 Existing Environment

2.3.1 Air Pollution Sources

The major source of air pollution within the Study Area is road traffic, predominantly that from the existing N2. Air quality is variable and subject to significant spatial variation, with concentrations generally falling significantly with distance from major road sources. Based on professional judgement it is considered that the highest levels of air pollution are experienced along the existing N2 with the remainder of the Study Area generally experiencing rural background concentrations of pollutants.

A review of IPPC/IED licences issued by the EPA for the region show that there are a number of IPPC/IED licenced facilities with emissions to the atmosphere within the Study Area for this project (EPA, 2019a).

- Mr A Boylan, Intensive Agriculture. No significant emissions to Air. Licence: P0842. Location: Tullyvaragh Upper, Broomfield, Castleblayney, Monaghan.
- Messrs P. J. and M O'Reilly, Intensive Agriculture. No significant emissions to Air. Licence P0945 Location: Annalitten, Castleblayney, Monaghan.
- Rye Valley Foods Limited: NO_x emissions. Licence P0806 Location: IDA Industrial Estate, Carrickmacross, Monaghan. Only impacting Option A (Yellow) and Option B (Yellow+Blue).
- Kingspan Insulation Limited; Licence P0057-03. Location: Castleblayney, Monaghan. – Air emissions equal across all options therefore no impact on specific Route Corridor Option.

2.3.2 Meteorological Data

A key factor in assessing temporal and spatial variations in air quality are the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (World Health Organisation, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM₁₀, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than PM_{2.5}) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles (PM₁₀ - PM_{2.5}) will actually increase at higher wind speeds. Thus, measured levels of PM₁₀ will be a non-linear function of wind speed.

There are no meteorological stations in close proximity to the scheme. Ballyhaise meteorological station is the most representative station available. It is located approximately 35km west of Castleblayney.

Long-term hourly observations at Ballyhaise meteorological station provide an indication of the prevailing wind conditions for the region (Met Éireann, 2020). Results indicate that the prevailing wind direction is south-westerly to westerly in direction with a mean wind speed of approximately 3.2m/s over the period 2014-2019.

2.3.3 EPA Monitoring Data and Background Concentrations

As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones have been defined in Ireland for air quality management and assessment purposes. In terms of air monitoring, the Study Area is categorised as Zone D (rural areas and towns with a population of less than 15,000).

Air quality monitoring programs have been undertaken throughout Ireland in recent years by the EPA and Local Authorities. The most recent EPA annual report on air quality monitoring undertaken throughout Ireland is entitled "Air Quality in Ireland 2018"¹³. The TII Guidelines (2011) state that the local air quality assessment should focus on NO₂ and PM₁₀, as these are the pollutants of greatest concern with respect to road traffic conditions. A review of data from representative Zone D locations in Ireland can be used to provide an indication of the prevailing air quality conditions within the Study Area. All proposed Route Corridor Options are all contained within Zone D.

¹³ EPA, 2019. Air Quality in Ireland. Available at: <https://www.epa.ie/pubs/reports/air/quality/Air%20Quality%20In%20Ireland%202018.pdf>

NO₂ monitoring was carried out at two rural Zone D locations in Ireland; Emo, County Laois and Kilkitt, County Monaghan in recent years (EPA, 2019a). Both sites were used by the EPA to establish annual averages. The NO₂ annual average in 2018 was 3 µg/m³ at both rural sites. Hence long-term average concentrations measured at all locations were significantly lower than the annual average limit value of 40 µg/m³. The maximum 1-hour limit value of 200 µg/m³ (measured as a 99.8th percentile i.e. 18 exceedances are allowed per year) was not exceeded in any year for any of the Zone D locations. The average results at rural Zone D locations over the last five years suggests an average of 3 µg/m³ as a background concentration. Based on the above information, a conservative estimate of the current background NO₂ concentration for the region of the scheme is 5 µg/m³.

Long-term PM₁₀ measurements carried out at the rural Zone D location in Kilkitt in 2018 gave an average level of 9 µg/m³ (EPA, 2019a). As, Kilkitt is in County Monaghan it is considered more relevant to the scheme than the site at Emo. Results are also available for Kilkitt to observe the trend in concentrations over the last five years. The average result at Kilkitt over the last five years is 9 µg/m³. Based on the above information a conservative estimate of the current background PM₁₀ concentration for the region of the scheme is 10 µg/m³.

There was no monitoring for PM_{2.5} at Kilkitt. The results of PM_{2.5} monitoring at the representative station of Claremorris (also in Zone D) in 2018 indicated an average PM_{2.5}/PM₁₀ ratio of 0.50. Results are also available for Claremorris to observe the trend in PM_{2.5}/PM₁₀ ratios over the last five years. The average result at Claremorris over the last five years is 0.54 µg/m³. Based on this information, a conservative ratio of 0.6 was used to generate a background PM_{2.5} concentration for the region of the scheme of 6 µg/m³.

2.3.4 Impacts on Sensitive Receptors

The number of receptors sensitive to air quality within 50m of the carriageway of each of the proposed Route Corridor Options has been determined, as per TII guidelines. Receptors for the purpose of this assessment are regarded as residential buildings. The results of this exercise were used for calculation of the Index of Overall Change in Exposure (see Section 2.2). The number of sensitive receptors along each route are included in the detailed in the assessment tables below.

2.3.5 Impacts on Sensitive Ecosystems

The EC Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the "Habitats Directive") requires an Appropriate Assessment to be carried out where there is likely to be a significant impact upon a European protected site. TII requires the Air Quality Specialist to liaise with an ecologist on schemes where there is a European protected site within 2km of the route. However, as the potential impact of a scheme is limited to local level, detailed consideration need only be given to roads where there is a significant change to traffic flows (>5%) and the designated site lies within 200m of the road centre line. Where these two requirements are fulfilled, the assessment at the Option Selection stage involves a calculation of nitrogen oxides (NO_x) concentrations using the UK DMRB screening method as recommended by TII (2011).

The Lough Naglack proposed Natural Heritage Area (pNHA) (site code 000561) is within the 24m of the centreline of Option A (Yellow) and Option B (Yellow+Blue) as it is adjacent to the existing N2. It is considered a sensitive ecological receptor with respect to these Route Corridor Options as it is a pNHA. At the closest point, Option A (Yellow) and Option B (Yellow+Blue) routes pass within the 24m of the pNHA and could result in a significant contribution of NO_x concentrations and NO₂ dry deposition within the pNHA.

2.3.6 Climate Change

According to the Environmental Protection Agency¹⁴, transportation accounts for about 20% of Ireland's greenhouse gas emissions – agriculture is responsible for 34%, energy production 17%, residential 10% and the remainder is a mixture of industrial, commercial and a very small amount of natural sources. In road transportation in 2018, petrol use decreased by 9.2% while diesel use increased by 4.6% and biofuels use decreased by 4.0%, when compared to the previous year. Looking at the underlying drivers, the number of passenger diesel cars increased by 7.7% in 2018 while the number of passenger petrol cars decreased by 4.5%, commercial vehicle numbers increased by 1.7% and employment grew by 2.3% between Q4 2017 and Q4 2018 (latest data available at the timing of writing).

The Environmental Protection Agency¹⁵ has identified that despite increasing use of public transport, the private car remains the dominant mode of transport in Ireland, accounting on average for 74% of all journeys, rising to 79% outside of Dublin. The roads network is an essential piece of national public infrastructure that has developed to serve the settlement patterns unique to Ireland, which is characterised by a large proportion of rural clusters, one-off housing, and ribbon development along roads. A key challenge, therefore, is to balance connectivity and sustainable settlement patterns with ensuring that the rural population has access to employment and services to avoid social exclusion.

The 2016 Paris Agreement sought to strengthen the global response to climate change, and aims to limit global warming to well below 2°C and is pursuing efforts to limit it to 1.5°C. The EU committed to a reduction of 40% in Greenhouse Gas emissions by 2030. The Irish Government set the target of a 20% reduction on 2005 levels by 2020, and a minimum of 80% reduction on 1990 levels by 2050¹⁶.

In 2019, the Government has declared a Climate Emergency making it the second country in the world to do so. The 2019 Climate Action Plan¹⁷ for the nation set out a wide range of measures to meet Ireland's targets across all sectors, including transportation. By 2030 Ireland was committed to 100% of all new cars and vans being electric vehicles (Battery Electric Vehicle or Plug in-Hybrid Electric Vehicles) with an eventual ban on all new petrol and diesel vehicles. This will mean a significant decrease in emissions as a result of vehicles.

Part of TII's overarching strategy is to ensure the national road infrastructure is safe, sustainable, and resilient. Part of this requires the assessment of the environmental impact of roads schemes in line with the 2014 EIA Directive and the national EIA Regulations. A robust assessment allows for climate change to be considered alongside other interrelated environmental factors including air quality, soils and geology, biodiversity, surface and groundwater, noise and vibration, and population and human health. Examples of practical steps for mitigating the potential climate impact of road schemes at construction stage include the recycling/reuse of pre-existing road materials and the use of materials produced as close to the scheme location as possible.

The proposed N2 scheme will result in greenhouse gas emissions during its construction and through vehicles driving the new route. This will be considered fully at Stage 3 within the Air Quality and Climate assessment as part of the EIAR. Climate Change is a key factor in the design and assessment of the proposed scheme and will be included as part of the sustainable development assessment, where social, economic, and environmental factors are all considered.

¹⁴ <http://www.epa.ie/ghg/transport/>

¹⁵ https://www.epa.ie/media/Chapter10_Environment_Transport.pdf

¹⁶ <https://www.oireachtas.ie/en/committees/32/climate-action/>

¹⁷ <https://static.rasset.ie/documents/news/2019/06/climate-action-plan.pdf>

2.4 Route Corridor Option Comparison

2.4.1 Assessment of Impacts on Sensitive Receptors

The calculation of the Index of Overall Change in Exposure allows a comparison of the overall air quality impact on people from each Route Corridor Option to be carried out. The Index is based on identifying the number of sensitive receptor locations (e.g. residential properties) within 50m of the carriageway of the corridor that would experience a significant change in traffic for each of the routes. The change in emissions between the Do-Something and the Do-Minimum is influenced by changes in traffic flow, composition, and speed. The analysis was carried out using the methodology of TII¹⁸ using the UK DMRB air dispersion model^{19,20}.

Pollution from traffic sources increases at low traffic speeds and during congested traffic conditions. An improvement in the road infrastructure is likely to improve traffic flow, relative to the current alignment.

2.4.2 Assessment of Impacts on Sensitive Ecosystems

Certain types of ecosystems can be affected by changes in air quality, particularly changes in Nitrogen levels. In line with TII Guidance, sensitive ecosystems within 200m of the Route Corridor Options have been identified. For this scheme, Lough Naglack pNHA is the only identified ecosystem sensitive to air quality. It is located at 24 m from the centreline of Option A (Yellow) and Option B (Yellow+Blue). The way the effect to sensitive ecosystems is assessed is to calculate the change in NO_x concentrations and NO₂ depositions, that result in changes from traffic flows.

The contribution in NO_x concentrations is predicted to be 21.3 µg/m³ and 20.6 µg/m³ for Option A (Yellow) and Option B (Yellow+Blue) respectively in the worst-case year of 2042. The Route Corridor Options contributions within the pNHA to the NO₂ dry deposition rate was also calculated. The maximum increase in the NO₂ dry deposition rate is 0.98 Kg(N)/ha/yr and 0.97 Kg(N)/ha/yr in 2027 for Option A (Yellow) and Option B (Yellow+Blue) respectively. In 2042 the maximum increase in the NO₂ dry deposition rate is 1.12 Kg(N)/ha/yr and 1.08 Kg(N)/ha/yr for the Option A (Yellow) and Option B (Yellow+Blue) Route Corridors respectively. This is summarised in Table 2.3 below.

Table 2.3: NO_x and NO₂ dry deposition rate at Lough Naglack pNHA in 2027 and worst-case year 2042

	Option A (Yellow)	Option B (Yellow+Blue)
Contribution of Route Corridor Options to NO _x concentrations within the pNHA in the worst-case year of 2042	21.3 µg/m ³	20.6 µg/m ³
Contribution of Route Corridor Options to NO ₂ dry deposition rate within the pNHA in 2027	0.98 Kg(N)/ha/yr	0.97 Kg(N)/ha/yr
Maximum increase in the NO ₂ dry deposition rate in 2042 as a result of Route Corridor Options	1.12 Kg(N)/ha/yr	1.08 Kg(N)/ha/yr

The calculated changes in NO_x concentrations and NO₂ depositions show that because of their proximity, Option A (Yellow) and Option B (Yellow+Blue) could have impacts on the Lough Naglack pNHA area. It should be noted that the existing N2 is immediately adjacent to the pNHA area.

¹⁸ Transport Infrastructure Ireland(TII) (2011) Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes

¹⁹ UK Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 1 LA 105 Air quality (UK Highways Agency 2019)

²⁰ UK DEFRA (2007) Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1 - HA207/07 (Document & Calculation Spreadsheet)

The TII guidelines state in Appendix 9 that where the development is expected to cause an increase of more than $2 \mu\text{g}/\text{m}^3$ and the predicted concentrations (including background) are close to, or exceed the standard, then the sensitivity of the habitat to NO_x should be assessed by the project ecologist. The NO_x impact does meet the threshold to require assessment by the project ecologist, however, the current N2 alignment also runs along this section and is also within 24m at the closest point to the pNHA. The pNHA is likely already experiencing elevated levels of NO_x from the existing N2 alignment. Comparing the impact of Option A (Yellow) and Option B (Yellow+Blue) with the existing Do-Minimum scenario the impact is not considered to be significant.

2.4.3 Comparison of Route Corridor Options

2.4.3.1 Air Quality

A summary of the calculated Index of Overall Change in Exposure for both NO_x and PM_{10} for the proposed routes is provided in Table 2.3. Detailed results of the analysis for each route for both 2027 and 2042 assessment years are provided in Table 2.4 and Table 2.5. The lower the exposure index as a result of any Route Corridor Option, the better from an air quality perspective – i.e. the smaller the exposure index score, the smaller the air quality effects from the Route Corridor Option. It is predicted that receptors along the Route Corridor Options have the potential to experience a minor negative impact on the local air quality. A significance of minor negative overall effect has been assessed on all Route Corridor Options because of the relative traffic levels and the existing air quality concentrations. None of the Route Corridor Options are predicted to have a significant effect in terms of air quality and there are no predicted exceedances of air quality standards.

While not predicted to have a significant impact, it should be noted that one of the residential receptors for Option A (Yellow) and Option B (Yellow+Blue) is Castleross retirement home. This is classed as single receptor for the purpose of the assessment however due to the nature of the occupancy and higher density of people living in it, it is considered a highly sensitive receptor. The Option A (Yellow) and Option B (Yellow+Blue) have the highest numbers of receptors within 50m of the proposed carriageway alignment.

2.4.3.2 Climate Change

The TII Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes²¹ does not provide an assessment method for Option Selection based on climate impacts. However, since this guidance was published there has been an increased focus on the impacts of climate change and the anthropogenic contribution to it. The preference for a single scheme is based on the scheme length, volumes of traffic utilising the road, traffic speed and the percentage of HGVs. The impact of the proposed Route Corridor Options on a national level was carried out using the regional methodology of TII²² using the UK DMRB air dispersion model^{23,24}. Climate pollutants are considered to have a national impact rather than localised impact. Therefore, unlike with air quality impacts, the number of receptors in close proximity to the route is not considered in the assessment. The results of the regional assessment for CO_2 have been used to score the Route Corridor Options in relation to their potential impact on climate. The results show that Option D (Orange), Option E (Orange+Link1+Green) and Option F (Orange+Link2+Green) are predicted to have lower emissions than Option A (Yellow), Option B (Yellow+Blue) and Option C (Green), as illustrated in Table 2.7.

²¹ Transport Infrastructure Ireland(TII) (2011) Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes

²² Transport Infrastructure Ireland(TII) (2011) Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes

²³ UK Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 1 LA 105 Air quality (UK Highways Agency 2019)

²⁴ UK DEFRA (2007) Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1 - HA207/07 (Document & Calculation Spreadsheet)

Table 2.4: Detailed Results for NO_x Assessment

Route Corridor Option	AADT (2027)	No. Receptors (0-50m of carriageway)	Link Length (km)	Change in NO _x Emission Rate (kg/km/yr)	2027 NO _x Exposure Index
Option A (Yellow)	13,978	67	31.3	4,798	321,478
Option B (Yellow+Blue)	13,837	54	31.2	4,750	256,488
Option C (Green)	15,222	18	29.8	5,069	91,237
Option D (Orange)	12,572	4	30.4	3,799	15,194
Option E (Orange+Link1+Green)	11,551	5	30.1	3,371	16,857
Option F (Orange+Link2+Green)	12,073	3	30.5	3,524	10,571
Route Corridor Option	AADT (2042)	No. Receptors (0-50m of carriageway)	Link Length (km)	Change in NO _x Emission Rate (kg/km/yr)	2042 NO _x Exposure Index
Option A (Yellow)	15,569	67	31.3	5,664	373,854
Option B (Yellow+Blue)	15,469	54	31.2	5,469	289,859
Option C (Green)	16,560	18	29.8	6,025	108,450
Option D (Orange)	13,811	4	30.4	4,741	18,963
Option E (Orange+Link1+Green)	12,549	5	30.1	4,179	20,893
Option F (Orange+Link2+Green)	13,529	3	30.5	4,227	12,680

Table 2.5: Detailed Results for PM₁₀ Assessment

Route Corridor Option	AADT (2027)	No. Receptors (0-50m of carriageway)	Link Length (km)	Change in PM ₁₀ Emission Rate (kg/km/yr) Do Something	2027 PM ₁₀ -Exposure Index (0-50m)
Option A (Yellow)	13978	67	31.3	111	7,430
Option B (Yellow+Blue)	13,837	54	31.2	110	5,928
Option C (Green)	15,222	18	29.8	119	2,148
Option D (Orange)	12,572	4	30.4	95	380
Option E (Orange+Link1+Green)	11,551	5	30.1	86	431
Option F (Orange+Link2+Green)	12,073	3	30.5	90	270
Route Corridor Option	AADT (2042)	No. Receptors (0-50m of carriageway)	Link Length (km)	Change in PM ₁₀ Emission Rate (kg/km/yr)	2027 PM ₁₀ Exposure Index
Option A (Yellow)	15569	67	31.3	126	8,470
Option B (Yellow+Blue)	15,469	54	31.2	124	6,705
Option C (Green)	16,560	18	29.8	134	2,420
Option D (Orange)	13,811	4	30.4	110	438
Option E (Orange+Link1+Green)	12,549	5	30.1	98	492
Option F (Orange+Link2+Green)	13,529	3	30.5	104	311

Table 2.6: Summary of Index of Overall Change in Exposure For Each Route Corridor Option

Route Corridor Option	2027 NO _x Exposure Index	2027 PM ₁₀ Exposure Index
Option A (Yellow)	321,478	7,430
Option B (Yellow+Blue)	256,488	5,928
Option C (Green)	91,237	2,148
Option D (Orange)	15,194	380
Option E (Orange+Link1+Green)	16,857	431
Option F (Orange+Link2+Green)	10,571	270
Route Corridor Option	2042 NO _x Exposure Index	2042 PM ₁₀ Exposure Index
Option A (Yellow)	379,518	8,470
Option B (Yellow+Blue)	295,328	6,705
Option C (Green)	108,450	2,420
Option D (Orange)	18,963	438
Option E (Orange+Link1+Green)	20,893	492
Option F (Orange+Link2+Green)	12,680	311

Table 2.7: Detailed Results for CO₂ Assessment

Route Corridor Option	AADT (2027)	Link Length (km)	CO ₂ Emissions Rate (kg/yr)
Option A (Yellow)	13,978	31.3	55,522
Option B (Yellow+Blue)	13,837	31.2	54,942
Option C (Green)	15,222	29.8	56,453
Option D (Orange)	12,572	30.4	44,233
Option E (Orange+Link1+Green)	11,551	30.1	39,337
Option F (Orange+Link2+Green)	12,073	30.5	41,632

Route Corridor Option	AADT (2042)	Link Length (km)	CO ₂ Emissions Rate (kg/yr)
Option A (Yellow)	15,569	31.3	64,588
Option B (Yellow+Blue)	15,469	31.2	62,786
Option C (Green)	16,560	29.8	65,599
Option D (Orange)	13,811	30.4	53,329
Option E (Orange+Link1+Green)	12,549	30.1	47,006
Option F (Orange+Link2+Green)	13,529	30.5	48,984

2.5 Conclusions

It is predicted that receptors along the new Route Corridor Options have the potential to experience a minor negative effect on the local air quality and for the purposes of comparative assessment all Route Corridor Options have been given a score of 3 based on the PAG Unit 7.0 criteria scoring. This is due to the existing air quality in the area and the relative levels of traffic. In addition, there are no predicted exceedances of air quality standards for any of the Route Corridor Options. All of the Route Corridor Options are of a similar length and have similar traffic levels. The assessment which has been undertaken in line with TII Guidance, has shown that all of the Route Corridor Options will result in similar effects. Because these effects are not significant and each Route Corridor Option will have similar effects, all six Route Corridor Options have been assessed to have a Minor Negative effect in terms of Air Quality.

The climate assessment has been determined by the proposed Route Corridor length and predicted AADT levels. Therefore, the lower the predicted AADT and the shorter length the lower the impact in terms of climate. However, there are only minor differences between Route Corridor Options therefore all Route Corridor Options receive the same PAG Unit 7.0 Performance Score / Significance of Effect with respect to climate.

It has been assessed that there will be no significant air quality effects on any sensitive ecosystems.

Table 2.8: Summary of Significance of Effect and Performance Scores for Each Route Corridor Option– Air Quality and Climate

Route	PAG Unit 7.0 Significance of Effect	PAG Unit 7.0 Performance Score
Option A (Yellow)	Minor or Slightly Negative	3
Option B (Yellow+Blue)	Minor or Slightly Negative	3
Option C (Green)	Minor or Slightly Negative	3
Option D (Orange)	Minor or Slightly Negative	3
Option E (Orange+Link1+Green)	Minor or Slightly Negative	3
Option F (Orange+Link2+Green)	Minor or Slightly Negative	3

3. Noise

3.1 Introduction

AWN Consulting Limited have been commissioned to undertake the Stage 2 Route Corridor Option assessment relating to noise for the proposed N2 Ardee to Castleblayney Road Scheme.

The Stage 2 noise assessment has been conducted in accordance with the relevant guidance and requirements contained in the TII documents:

- Guidelines for the Treatment of Noise and Vibration in National Road Schemes (TII 2004);
- Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes (TII 2014);
- TII Project Management Guidelines 2010; and
- TII Project Appraisal Guidelines (TII PAG) for National Roads Unit 7.0 - Multi Criteria Analysis PE-PAG-02031, October 2016.

The six Route Corridor Options have been assessed with reference to their Potential Impact Ratings (PIR) based on property counts of Noise Sensitive Receptors between 0 and 300m from the centreline of the Route Corridor Option, as per the 2014 TII Guidelines, as illustrated in Table 3.1. These counts have included Residential Properties, Sports Clubs; Retirement Homes; Community Centre; Youth Services; Places of Worship; and, Schools / Colleges²⁵. The likely traffic noise levels at all receptors along each Route Corridor Option has been calculated from the draft indicative road alignment for each Route Corridor Option, and the likely need for noise mitigation has also been considered in this assessment.

3.2 Methodology

3.2.1 Assessment Criteria

To establish a methodology for the assessment, the following approach has been adopted in line with the guidelines set out in Chapter 5 of TII 2004 and Chapter 2 of TII 2014 documents.

The assessment of potential noise impacts for the Stage 2 options assessment is based primarily upon receptor counts (Quantitative), the likely changes in traffic flows and the likely requirement for mitigation measures (Qualitative).

In terms of operational noise, the 2014 Guidelines set the design goal for road traffic noise for new national roads in Ireland, where feasible, to meet:

- Day-evening-night 60dB L_{den} (free field).

Both documents acknowledge that it may not always be sustainable to achieve this design goal. In such circumstances, nevertheless, a structured approach should be taken in order to as far as practicable, ameliorate road traffic noise through the consideration of measures such as the alignment, physical mitigation e.g. earth mounds, noise barriers) or low noise road surfaces.

3.2.1.1 Potential Impact Rating Based on Property Counts

The following steps have been followed to assess the Potential Impact Rating (PIR) of each of the Route Corridor Options under consideration.

²⁵ NB Different types of properties are included for and air and noise assessments. This is because of their sensitivities to the two different types of impacts.

Property counts have been conducted within four bands either side of the centreline of each Route Corridor, i.e. 0 to 50m, 50 to 100m, 100 to 200m and 200 to 300m. Using this information, the Potential Impact Ratings (PIR) for each of the six Route Corridor Options has been established. This study includes all existing residential properties and other noise sensitive buildings adjacent to each Route Corridor excluding commercial properties.

The number of properties (i.e. noise sensitive receptors) in four bands either side of centreline of each of the Route Corridor Options have been counted. A weighting value for each distance band has been applied with a weighting factor of 4 for the closest distance band (0 to 50m) down to 1 for the furthest distance band (200 to 300m) in line with the 2014 TII Guidelines. The number of receptors in each band is multiplied by the appropriate rating factor and the total in each of the four band is summed to derive the PIR score for the route. The Route Corridor Option with the lowest PIR has the lowest nominal potential noise impact. This process is summarised in Table 3.1 below.

Table 3.1: Summary of the PIR Methodology (as per TII Guidelines)

Distance Band	Number of Properties in Band (P)	PIR Weighting Factor (W)	PIR Score (PxW)
0-50m	A	4	Ax4
50-100m	B	3	Bx3
100-200m	C	2	Cx2
200-300m	D	1	Dx1
PIR Score			$(Ax4)+(Bx3)+(Cx2)+(Dx1)$

Whilst the PIR assessment above provides information on the number of noise properties in the vicinity of each Route Corridor Option, the Guidelines acknowledge that the PIR process only provides an initial high-level screening for the options assessment. This is particularly true for studies where on-line upgrades form part of the Route Corridor Options. Consideration must also be given to the potential traffic noise levels at properties to further determine potential overall noise impacts.

In addition to PIR Score, other factors which also dictate the potential noise impact from an option relate to its vertical alignment (cuttings, embankments, at grade, tunnels etc.), road traffic flows and potential for noise mitigation, which is outlined in Section 3.2.1.2 below.

3.2.1.2 Likely Need for Noise Mitigation Measures

The operational noise footprint for a given route alignment is dependent on a range of factors including traffic volumes, traffic speed, road surface type and the vertical alignment, where available. For the Stage 2 assessment, traffic flows in Annual Average Daily Traffic (AADT) flows, percentage HGVs and indicative working horizontal and vertical alignments have been provided by the design team.

To analyse the potential noise impacts associated with the six Route Corridor Options, the number of properties likely to require noise mitigation (i.e. the potential number of properties likely to be exposed to traffic noise levels at or above 60dB L_{den} along each Route Corridor) was determined using the following methodology:

- The potential traffic noise levels associated with each option has been established considering the vertical and horizontal alignments in addition to Annual Average Daily Traffic flows (AADT) and percentage HGV for the design year; and
- Each Route Corridor draft indicative road alignment (road centre lines and cut and fill lines) was overlaid into a 3D model of the existing topography;
- Traffic flows for each option were obtained from the AADT information provided by the traffic consultants for the year 2042 i.e. Design Year. These values along with % HGV are presented in Table 3.2. In all cases, the highest proportion of HGVs along that section has been assumed to ensure the worst-case scenario was considered.
- A standard hot rolled asphalt road surface was used for all options;
- Using guidance from the TII 2014, noise levels at all properties within 600m of the road alignment were established using predictive noise modelling; and
- Noise levels were calculated at the same assessment locations for the Do Minimum scenario for the year 2042. This was undertaken to calculate changes in traffic noise at properties along sections of on-line Route Corridors (i.e. along the existing N2), and to determine the requirement, if any, for noise mitigation based on the three conditions noted above.

Table 3.2: Traffic Flow Data for Design Year

Option	AADT (2042)	% HGV
Do Minimum	16,753	18%
Option A (Yellow)	15,569	25%
Option B (Yellow+Blue)	15,469	24%
Option C (Green)	16,560	25%
Option D (Orange)	13,811	23%
Option E (Orange + Link 1 +Green)	12,549	22%
Option F (Orange + Link 2 +Green)	13,529	20%

A Traffic Modelling Report (see Volume 6, Part A of this Option Selection Report) has been completed in accordance with the TII Guidelines for this scheme. The data presented in Table 3.2 above has been taken from that Report and shows the maximum AADT and percentage HGV. Figures 5.3 to 5.9 of Volume 6, Part A also demonstrate how the AADT and the percentage of HGV varies along the draft indicative alignment. This is due to junctions and changes in the local road network and so traffic will change in the study area as a result of the proposed scheme. Even in the Do Minimum (the existing N2 – Figure 5.3) traffic levels do not stay the same along its length due to variance in journey origin and destinations.

At this stage of the project (Phase 2), the TII Noise Guidelines require an assessment of the Likely Need for Noise Mitigation Measures, which has been completed. At Phase 3 (EIA), there will be a detailed assessment of the need for noise mitigation measures for the emerging preferred route. This will evaluate in detail the specific traffic noise impacts at affected noise sensitive locations and include detailed modelling of the required noise mitigation (e.g. acoustic barrier structures, location, height, and length). The Phase 3 assessment will take into account the impact of junctions and changes in the local road network that cannot be done in this Phase 2 assessment as they have not been designed and will require consultation with statutory bodies and affected landowners.

Table 3.2 shows the maximum AADT and percentage HGV for each of the route corridor options. It was determined that this method would allow a reasonable worst-case assessment of the Likely Need for Noise Mitigation Measures based on the preliminary information available at this stage of the process. Further assessment will be required at Phase 3 as this assessment at Phase 2 is indicative. Undertaking a reasonable worst-case assessment will ensure that the noise effects of the Route Corridor Options are not underestimated and helps to ensure that the impacts to noise sensitive locations are fully addressed in-line with Phase 2 requirements. As noted above, during the Phase 3 assessment, the emerging preferred route is modelled in detail taking into account the finalised alignment and traffic model outputs.

Please note that the Do Minimum figures are for the existing N2, which has many accesses and junctions through connections of local roads. An indicative alignment within Option A (Yellow) will have less junctions and accesses to make it safer, as a result traffic will be altered as a result of road and junction changes. In Table 3.2 above the maximum AADT values are marginally lower Option A (Yellow) than the existing N2 (Do Minimum). This will not be the case for the entire length of the scheme. It is the case for one location outside of Carrickmacross, which can be seen on Figure 5.3 and Figure 5.4 of Volume 6, Part A. The difference between the Do Minimum and Option A (Yellow) of 1,184 AADT is due to the potential closures of existing accesses and junctions onto the existing N2. Traffic flow along Option B (Yellow+Blue) will result in a similar outcome at this location. Changes in the road network will result in changes to vehicle movements and journeys. Safe access will be provided to the proposed scheme at appropriate locations, however it will not be possible to maintain every current access and junction. The impact of changes in traffic flows along the local road network will be assessed at Phase 3 (EIA). The Environmental Impact Assessment Report at Phase 3 will include an assessment of the effects from any disruption as a result of changes to journeys.

Assessing the noise impacts of a potential online option like Option A (Yellow) is complex. The assessment presented in this chapter has completed a reasonable worst-case assessment based on the maximum AADT and percentage HGV - as shown in Table 3.2, an increase in the percentage HGV has been included in the assessment. By using this method, the noise assessment is robust and does not underestimate the noise effects from the indicative alignments within the Route Corridor Options. Further assessment will be required at the next Phase of the project in order to understand the detailed noise effects. There will be changes to the noise assessment as the design of the alignment takes shape and traffic modelling output is available (These will be addressed in the Environmental Impact Assessment Report for the project at Phase 3).

Proprietary noise calculation software, Brüel & Kjær Type 7810 Predictor, was used to predict the noise levels. This software calculates traffic noise levels in accordance with Calculation of Road Traffic Noise (CRTN) and TII guidance. The CRTN method of predicting noise from a road scheme consists of the following five elements:

- Divide the road scheme into segments so that the variation of noise within this segment is small;
- Calculate the basic noise level at a reference distance of 10 metres from the nearside carriageway edge for each segment;
- Assess for each segment the noise level at the reception point considering distance attenuation and screening of the source line;
- Correct the noise level at the reception point to take account of site layout features, and the size of source segment; and
- Combine the contributions from all segments to give the predicted noise level at the receiver location for the whole road scheme.

3.2.1.3 Determining Overall Effects

The comparative evaluation of Route Corridor Options was assisted by scoring of impacts to sensitive receptors using the Stage 2 project appraisal matrix suggested in the Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis²⁶ (TII PAG). An assessment has been undertaken on each Route Corridor Option to include both quantitative and qualitative assessment. The overall effect of each Route Corridor Option is scored based on the seven-point scale as shown in Table 3.3 and a number assigned according to the level of significance of the effect.

Table 3.3: Key for Scoring Effects

Score	Significance of Effect
7	Major or Highly Positive
6	Moderately Positive
5	Minor or Slightly Positive
4	Not Significant or Neutral
3	Minor or Slightly Negative
2	Moderately Negative
1	Major or Highly Negative

3.3 Existing Environment

The baseline noise environment in the vicinity of existing noise sensitive receptors adjacent to the existing N2 road will be dominated by road traffic movements along the existing N2. The round 3 road traffic noise maps published by the EPA²⁷ as part of the Environmental Noise Regulations have been reviewed to determine the range of predicted traffic noise in the vicinity of the existing section of the N2 under consideration within this Study Area. These maps indicate that road traffic noise levels are typically greater than 60dB L_{den} within 50m from the edge of existing carriageway of the N2.

Noise sensitive receptors in the vicinity of the off-line sections of the six Route Corridor Options are influenced by distant traffic along the N2, local traffic movements, agricultural activity, and other anthropogenic noise sources typical of rural and semi-rural areas and in turn the Study Area under consideration.

A full and detailed baseline noise survey will be undertaken in accordance with TII Guidelines at EIAR stage (Phase 3) to characterise the existing noise environment associated with the emerging preferred Route Corridor.

3.4 Route Corridor Option Comparison

3.4.1 Assessment of Potential Impacts

3.4.1.1 Potential Impact Rating Based on Property Counts

An assessment of the potential noise impact based on the number of noise sensitive receptors within specified distance bands from each of the Route Corridor Options under consideration as per the methodology in Section 3.2.1.1 is set out below.

²⁶ TII. 2016. Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis. PE-PAG-02031.

²⁷ Environmental Protection Agency (EPA) - Noise Round 3 Road – L_{den} [Online Maps] Available from gis.epa.ie/EPAMaps/ [Accessed 24 April 2020]

The 2014 TII Guidelines list a number of examples of 'receptor types' which may be particularly sensitive to noise; noise sensitive receptors may include residential units, schools, hospitals, nursing homes; although in this Stage 2 assessment no distinction is made between these different types of properties. During the subsequent detailed impact assessment for the proposed scheme at EIA stage of the emerging Preferred Route Corridor, any variation in noise sensitive receptors type will be identified and considered as appropriate. However, any variation in type of noise sensitive receptors would not be expected to materially affect the noise impact assessment at this stage. Table 3.4 presents the potential impact rating for each of the six Route Corridor Options.

Table 3.4: Summary of the Property Impact Rating (PIR) for Route Corridor Options

Option		0-50m Band	50-100m Band	100-200m Band	PR 200-300m Band	Total
Option A (Yellow)	No of Receptors (x weighting factor)	69 (x 4)	146 (x 3)	202 (x 2)	267 (x 1)	684
	PIR	276	438	404	267	1385
Option B (Yellow+Blue)	No of Receptors (x weighting factor)	58 (x 4)	143 (x 3)	198 (x 2)	268 (x 1)	667
	PIR	232	429	396	268	1325
Option C (Green)	No of Receptors (x weighting factor)	21 (x 4)	50 (x 3)	122 (x 2)	98 (x 1)	291
	PIR	84	150	244	98	576
Option D (Orange)	No of Receptors (x weighting factor)	4 (x 4)	41 (x 3)	112 (x 2)	91 (x 1)	248
	PIR	16	123	224	91	454
Option E (Orange + Link 1 +Green)	No of Receptors (x weighting factor)	6(x 4)	37 (x 3)	118 (x 2)	99 (x 1)	260
	PIR	24	111	236	99	470
Option F (Orange + Link 2 +Green)	No of Receptors (x weighting factor)	5 (x 4)	41 (x 3)	108 (x 2)	87 (x 1)	241
	PIR	20	123	216	87	446

Option A (Yellow) has the highest PIR score with Option B (Yellow+Blue) at a similarly high value however, it is noted that a high proportion of the properties along these routes are along the existing N2 alignment. An online Route Corridor Option will typically result in the highest PIR value due to the high number of existing properties located in proximity to the road edge.

3.4.1.2 Likely Need for Noise Mitigation Measures

The potential noise impact from each Route Corridor on its surrounding environment had been assessed in line with the methodology set out in Section 3.2.1.2 to determine the number of properties for which noise mitigation is likely to be required through the assessment of noise footprints for each Route Corridor.

The following three conditions must be satisfied under the TII guidelines in order for noise mitigation to be provided:

- The combined expected maximum traffic noise level, i.e. the relevant noise level, from the proposed road development together with other traffic in the vicinity is greater than the design goal of 60dB L_{den} ;
- The relevant noise level is at least 1dB more than the expected traffic noise level without the proposed road development in place (i.e. comparison with the Do-Minimum); and
- The contribution to the increase in the relevant noise level from the proposed road development is at least 1dB.

Table 3.5 summarises the number of properties counted along each Route Corridor which are likely to require noise mitigation.

Table 3.5: Number of Properties Potentially Requiring Noise Mitigation

Route Corridor Option	No. of Properties potentially requiring Noise Mitigation
Option A (Yellow)	105
Option B (Yellow+Blue)	117
Option C (Green)	138
Option D (Orange)	110
Option E (Orange + Link 1 +Green)	84
Option F (Orange + Link 2 +Green)	97

The results of this assessment have indicated that the number of properties likely to require noise mitigation is highest along Option C (Green) (138) with the second highest being Option B (Yellow+Blue) (117) and lowest along Option E (Orange+Link1+Green) (84). For the other three Route Corridor Options the total numbers are broadly similar in terms of the numbers requiring mitigation.

This assessment has considered the traffic noise levels for the Do Minimum scenario for sections of proposed Route Corridor which are online i.e. when the noise level is also above 60dB L_{den} but it is not predicted to increase by more than 1dB as stated in the methodology.

3.4.2 Assessment of Route Corridor Options

Based on the quantitative and qualitative analysis undertaken, all Route Corridor Options have been assessed against the following scoring system based on the TII PAG outlined in Table 3.3 above.

All Route Corridor Options have the potential to generate a negative noise impact at noise sensitive properties impacted by the six Route Corridor Options varying from Moderate Negative to Major Negative.

It should be noted that the PAG Scores are determined taking into consideration both the PIR and the number of properties potentially requiring mitigation. Option A (Yellow) and Option B (Yellow+Blue) have the highest PIR Scores, however due to being along the existing N2, less properties require additional mitigation than other routes. There are strict criteria for the application of noise mitigation measures. This includes a criterion based on the increase between existing noise levels and noise levels with the proposed scheme in place. As stated in TII Noise Guidelines (section 2.3.1 pages 12 and 13) mitigation measures are only deemed necessary when the following three conditions are satisfied at designated sensitive receptors:

- a) the combined expected maximum traffic noise level, i.e. the relevant noise level, from the proposed road scheme together with other traffic in the vicinity is greater than the design goal;
- b) the relevant noise level is at least 1dB more than the expected traffic noise level without the proposed road scheme in place;
- c) the contribution to the increase in the relevant noise level from the proposed road scheme is at least 1dB.

There are a number of properties along the existing N2 that would not qualify for mitigation should Option A (Yellow) or Option B (Yellow+Blue) be selected as the Emerging Preferred Route Corridor Option as the increased noise levels would not satisfy TII's criteria for mitigation.

It should also be noted that a positive impact may be experienced at several existing properties along the existing N2 where the Route Corridor Options divert from this road, however this has not been factored into the scoring of Options C-F. This has allowed a reasonable worst case assessment of the noise impacts of the offline Route Corridor Options.

Taking account of the impact assessments included in the previous sections, the scores applied to the six Route Corridor Options are presented in Table 3.6.

Table 3.6: Summary of Assessment for each Route Corridor Option

Option	PIR Score	No. of Properties Requiring Mitigation	Significance of Effect	PAG Unit 7.0 Preference Score
Option A (Yellow)	1385	105	Moderately Negative	2
Option B (Yellow+Blue)	1325	117	Moderately Negative	2
Option C (Green)	576	138	Major or Highly Negative	1
Option D (Orange)	454	110	Moderately Negative	2
Option E (Orange + Link 1 +Green)	470	84	Moderately Negative	2
Option F (Orange + Link 2 +Green)	446	97	Moderately Negative	2

Option C (Green) has the greatest impact based on this review. This is determined on the basis of the highest number of properties likely to require noise mitigation and the greatest potential magnitude of change that will be experienced at newly affected properties overall within the Study Area of this option. Taking into account the above the effect for the Option C (Green) is determined to be major negative.

All other Route Corridor Options for the scheme are determined to have a Moderate negative effect. However, it can be determined that Option E (Orange+Link1+Green) has the lowest level of impact in terms of noise. This is determined on the basis of the lowest number of properties likely to require noise mitigation and the overall positive impacts associated with the changes in traffic flows along the existing N2 road due to diverted traffic.

3.5 Typical Mitigation Options

The assessment has determined the likely number of properties that will potentially require noise mitigation to achieve the relevant operational noise design goal for national road schemes in Ireland, i.e. 60dB L_{den}. In this instance, noise mitigation will primarily be focused on boundary areas of residential dwellings to reduce noise levels at a single or collection of properties. The exact number of properties requiring mitigation and the specification of noise mitigation measures will be identified at the subsequent EIA Stage (Phase 3) developed during the Phase 3 design process Preferred Route Corridor. Prior to this, the following general guidance and discussion of potential noise mitigation is provided for background information.

Mitigation measures will typically consist of one or a combination of the following measures:

- Wherever possible, the design process should aim to maximise the distance between the road and noise sensitive locations, as much as is feasible, to avoid the need for further noise mitigation measures;
- Using local topography to provide screening along the route alignment, where possible (e.g. the use of earthworks to provide acoustic and visual screening);
- Noise barriers which can take many forms, e.g. an earth bund, a stone wall, or a proprietary vertical noise barrier. Several types of barriers are available on the market. These range from timber barriers (typically the most frequently used barriers along roadsides in Ireland) to sheet metal, concrete/brick, plastic (PVC) and bio barriers. The extent and height of noise barriers will be defined as the final route is selected and detailed alignments of the proposed scheme are assessed. Earth mounds or bunds are often used to screen infrastructural developments from noise sensitive receptors. Earth mounds do, however, require much more space than a vertical barrier (e.g. timber noise barrier).
- The use of low noise pavements may also be considered where practicable.

3.6 Conclusions

The Stage 2 noise impact assessment has been conducted in accordance with the relevant TII guidance.

The PIR assessment demonstrates the range of values for each of the six Route Corridor Options under assessment. Based on a count of properties within 300m of each Route Corridor Option, the assessment has determined that Option F (Orange + Link 2 + Green) has the lowest PIR value but that is noted to be broadly similar to Option D (Orange) and Option E (Orange+Link1+Green.) Option A (Yellow) has the highest PIR score with Option B (Yellow+Blue) at a similarly high value. For both Route Corridor Options there are lower numbers of properties that would qualify for mitigation. This is because the noise levels from the proposed scheme would not be sufficiently higher than the existing noise levels in line with TII Noise Guidance.

Taking account of indicative noise levels associated with the future traffic flows along each option, the number of properties that have the potential to require new noise mitigation in accordance with the criteria set out in the TII guidelines for national road schemes has been calculated. Option E (Orange + Link 1 +Green) and Option F (Orange + Link 2 +Green) have the least number of properties requiring mitigation (84 no. and 97 no. respectively), followed by Option A (Yellow) (105 no.), Option D (Orange) (110 no.), and Option B (Yellow+Blue) (117 no.). Option C (Green) has the highest number of properties requiring mitigation (138 no.).

All options also have been determined to have a moderate impact except for Option C (Green) which has a major negative impact. Option C (Green) has the greatest impact due to the number of properties potentially requiring mitigation compared to the other. Route Corridor Options. The significance of each of the Route Corridor Options is summarised in Table 3.7.

Table 3.7: Summary of Significance of Effect and Performance Scores for Each Route Corridor Option – Noise

Option	PAG Unit 7.0 Significance of Effect	PAG Unit 7.0 Performance Score
Option A (Yellow)	Moderately Negative	2
Option B (Yellow+Blue)	Moderately Negative	2
Option C (Green)	Major or Highly Negative	1
Option D (Orange)	Moderately Negative	2
Option E (Orange + Link 1 + Green)	Moderately Negative	2
Option F (Orange + Link 2 + Green)	Moderately Negative	2

4. Landscape and Visual

4.1 Introduction

This section of the Option Selection Report identifies the existing landscape character of the Study Area, landscape elements and sensitive visual receptors and has been completed by Macro Works Limited. The likely sensitivity of each receptor has been determined based on its value along with the predicted likely magnitude of impact of each Route Corridor Option resulting in a qualitative assessment of the likely significance of the impact.

The landscape is the visible environment in its entirety, comprised of both natural and built elements including topography, water bodies, vegetation, wildlife habitats, open spaces, buildings, and structures. Landscape and visual sensitivities considered include statutory and non-statutory landscape designations, natural features, landscape character areas, notable deciduous trees of woodland, amenities, and historic landscapes.

Landscape and visual constraints are examined as two discrete topics:

- **Landscape** - Concerned with alteration to the physical landscape and features which contribute to the formation of its character; and
- **Visual** - Concerned with changes that may arise in the overall visual amenity enjoyed by people.

4.2 Methodology

The Phase 2, Stage 2 landscape and visual assessment is derived from the methods described in the Design Manual for Roads and Bridges (UK)²⁸, and Guidelines for Landscape and Visual Impact Assessment (UK) (GLVIA),²⁹ which has been referred to as appropriate for the level of assessment necessary at this Option Selection Stage. The project is being progressed in accordance with the phased approach to developing a major road scheme identified in the NRA National Roads Project Management Guidelines (2010) and follows the methodologies contained in the TII document Project Appraisal Guidelines for National Roads Unit 7.0 – Multi Criteria Analysis³⁰. This document was also referred to when establishing the landscape and visual receptor sensitivity categories. The Environmental Protection Agency (EPA) Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports³¹ were also referred to when undertaking this assessment.

The assessment of landscape and visual impacts is generally separated into three phases; construction, operation and decommissioning and also considers proposed mitigation measures and any potential cumulative impacts. However, for the purposes of this TII Phase 2 Option Selection Assessment, it is the operational stage impacts of each corridor that are the primary consideration as the other aspects tend not to be as differentiating. The other aspects will be examined in greater detail in relation to the emerging preferred corridor as part of the EIA stage at Phase 3.

²⁸ Design Manual for Roads and Bridges Volume 11, Section 3 for Stage Two Assessment (UK DMRB, 1994)

²⁹ Landscape Institute and the Institute of Environmental Management and Assessment (eds.) (2013) Guidelines for Landscape and Visual Impact Assessment. Routledge, Oxon.

³⁰ TII. 2016. Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis PE-PAG-02031.

³¹ Environmental Protection Agency (Draft 2017), Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. Available from: <https://www.epa.ie/pubs/advice/ea/EPA%20EIA%20Guidelines.pdf> [Accessed: 09 April 2020]

4.2.1 Desk Study

The methodology for Landscape and Visual assessment involved a desk study of the relevant County Development Plans (CDPs) to ascertain the most valuable and sensitive landscapes and, along with a variety of other information sources listed in the bullet points below to identify sensitive visual receptors that may be impacted by views of the proposed development. This desk study was based on a review of the following sources:

- Louth County Development Plan 2015-2021³²;
- Louth Landscape Character Assessment 2008³³;
- Ardee Local Area Plan 2010-2016³⁴;
- Monaghan County Development Plan 2019 - 2025³⁵;
- Monaghan Landscape Character Assessment 2008³⁶;
- National Parks and Wildlife Service³⁷;
- The Heritage Council – HeritageMaps.ie³⁸;
- Ordnance Survey maps;
- Discover Ireland³⁹;
- Visit Louth⁴⁰;
- More to Monaghan⁴¹;
- Sport Ireland Trails⁴²; and
- Google Maps⁴³.

4.2.2 Field Study

Site visits were undertaken in February 2020 to establish an understanding of the landscape and visual context of the proposed Route Corridor Options and to validate the County Landscape Character Assessments. Fieldwork was undertaken from publicly accessible roads/land. Photography was captured and notes recorded at intersection points and close parallel sections of the existing road network to all of the Route Corridor Options.

4.2.3 Landscape Assessment Criteria

When assessing the potential impacts on the landscape resulting, the following criteria are considered:

- Landscape character, value, and sensitivity;
- Magnitude of likely impacts; and
- Significance of landscape impacts.

³² Louth County Council (2015) Louth County Development Plan 2015-2021. Available from: <https://www.louthcoco.ie/en/publications/development-plans/louth-county-council-development-plans/louth-county-development-plan-2015-2021.html> [Accessed: 28 January 2020]

³³ Louth County Council (2008) Louth Landscape Character Assessment. Available from <https://www.louthcoco.ie/en/services/heritage/publications/louthlandscapecharacterassessment.pdf> [Accessed 27 January 2020]

³⁴ Louth County council (2010) Ardee Local Area Plan 2010-2016. Available from: https://www.louthcoco.ie/en/publications/development-plans/louth_local_area_plans/ardee_local_area_plan_2010_-_2016.html [Accessed: 29 January 2020]

³⁵ Monaghan County Council (2019) Monaghan County Development Plan 2019-2025. Available from: <https://monaghan.ie/planning/new-county-development-plan/> [Accessed: 16 March 2020]

³⁶ Monaghan County Council (2008) Landscape Character Assessment. Available from: <https://monaghan.ie/planning/landscape-character-assessment/> [Accessed: 16 March 2020]

³⁷ National Parks and Wildlife Service (2020) Map viewer. Available from: <http://webgis.npws.ie/npwsviewer/> [Accessed: 16 March 2020]

³⁸ The Heritage Council (2020) Map Viewer. Available from <http://www.heritagemaps.ie/> [Accessed: 16 March 2020]

³⁹ Fáilte Ireland (2020). Available from: <https://www.discoverireland.ie/> [Accessed: 16 March 2020]

⁴⁰ Visit Louth (2020). Available from: <https://www.visitlouth.ie/> [Accessed: 16 March 2020]

⁴¹ More to Monaghan (2020). Available from: <https://monaghantourism.com/> [Accessed: 16 March 2020]

⁴² Sport Ireland (2020) Sport Ireland Trails. Available from: www.irishtrails.ie [Accessed: 16 March 2020]

⁴³ Google Maps (2020) Map view and aerial view. Available from: www.google.ie/maps [Accessed: 16 March 2020]

4.2.3.1 Landscape Sensitivity

The sensitivity of the landscape to change is the degree to which a particular landscape receptor (Landscape Character Area or landscape element) can accommodate changes or new elements without unacceptable detrimental effects to its essential characteristics. At a high level, landscape Sensitivity is based on the criteria set out in Table 4.1 but it should also be noted that the final judgement of sensitivity is dependent on the form of development being assessed and is ultimately a professional judgement.

Table 4.1 Landscape Sensitivity

Landscape Sensitivity	Description
Very High	Areas where the landscape character exhibits a very low capacity for change in the form of development. Examples of which are high value landscapes, protected at an international or national level (World Heritage Site/National Park), where the principal management objectives are likely to be protection of the existing character.
High	Areas where the landscape character exhibits a low capacity for change in the form of development. Examples of which are high value landscapes, protected at a national or regional level, where the principal management objectives are likely to be considered for conservation of the existing character.
Medium	Areas where the landscape character exhibits some capacity and scope for development. Examples of which are landscapes, which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use.
Low	Areas where the landscape character exhibits a higher capacity for change from development. Typically, this would include lower value, non-designated landscapes that may also have some elements or features of recognisable quality, where landscape management objectives include enhancement, repair, and restoration.
Negligible	Areas of landscape character that include derelict, mining, industrial land or are part of the urban fringe where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of landscape improvements and/or restoration to realise a higher landscape value.

4.2.3.2 Magnitude of Landscape Impact

The magnitude of a predicted landscape impact is a product of the scale, extent or degree of change that is likely to be experienced as a result of the likely impacts. The magnitude takes into account whether there is a direct impact resulting from the loss of landscape components and/or a change that extends beyond the immediate extents of a development that may have an impact on the landscape character of the area. This is shown in Table 4.2.

Table 4.2 Magnitude of Landscape Impact

Magnitude of Landscape Impact	Description
Very High	Change that would be large in extent and scale with the loss of critically important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the landscape in terms of character, value, and quality.
High	Change that would be more limited in extent and scale with the loss of important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the landscape in terms of character, value, and quality.
Medium	Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to changes in landscape character, and quality.
Low	Changes affecting small areas of landscape character and quality, together with the loss of some less characteristic landscape elements or the addition of new features or elements.
Negligible	Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable.

4.2.4 Visual Assessment Criteria

As with landscape impacts, the visual impacts of a development are assessed as a function of sensitivity versus magnitude. In this instance the sensitivity of the visual receptor, weighed against the magnitude of the visual impact.

4.2.4.1 Visual Sensitivity

Unlike landscape sensitivity, the sensitivity of visual receptors has an anthropocentric basis in that it is considered from a viewer’s context. It considers factors such as the perceived quality and values associated with the view, the landscape context of the viewer, the likely activity they are engaged in and whether this heightens their awareness of the surrounding landscape. The GLVIA were referred to by the assessor when estimating the level of sensitivity for a particular visual receptor.

4.2.4.2 Magnitude of Visual Impacts

The magnitude of visual impact is determined on the basis of two factors: the visual presence (visual prominence within the scene) of a development and its effect on visual amenity (nature of change to the visual qualities of the scene). The magnitude of visual impact is classified in Table 4.3.

Table 4.3 Magnitude of Visual Impact

Magnitude of Visual Impact	Description
Very High	The proposal intrudes into a large proportion or critical part of the available vista and is without question the most noticeable element. A high degree of visual disorder or disharmony is also generated, strongly reducing the visual amenity of the scene.
High	The proposal intrudes into a significant proportion or important part of the available vista and is one of the most noticeable elements. A considerable degree of visual disorder or disharmony is also likely to be generated, appreciably reducing the visual amenity of the scene.
Medium	The proposal represents a moderate intrusion into the available vista, is a readily noticeable element and/or it may generate a degree of visual disorder or disharmony, thereby reducing the visual amenity of the scene. Alternatively, it may represent a balance of higher and lower order estimates in relation to visual presence and visual amenity.
Low	The proposal intrudes to a minor extent into the available vista and may not be noticed by a casual observer and/or the proposal would not have a marked effect on the visual amenity of the scene.
Negligible	The proposal would be barely discernible within the available vista and/or it would not detract from, and may even enhance, the visual amenity of the scene.

4.2.5 Significance of Impacts

The significance of an impact is based on a balance between the sensitivity of the receptor and the magnitude of the impact as illustrated in Table 4.4 below. This applies to both landscape receptors and visual receptors alike.

Table 4.4 Key for Determining Significance of Impacts

Magnitude of Impact	Sensitivity of Receptor				
	Very High	High	Medium	Low	Negligible
Very High	Profound	Profound-substantial	Substantial	Moderate	Slight
High	Profound-substantial	Substantial	Substantial - moderate	Moderate-slight	Slight-imperceptible
Medium	Substantial	Substantial - moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

*The significance matrix provides an indicative framework from which the significance of impact is derived. The significance judgement is ultimately determined by the assessor using professional judgement. Due to nuances within the constituent sensitivity and magnitude judgements, this may be up to one category higher or lower than indicated by the matrix.

The relative importance of the receptor is also considered in order to further differentiate the significance of impacts. The likely 'importance' of any potential significant impact is judged depending on a scale from, 'Local', 'Regional', 'National' or 'International' outlined as:

- **Local** - likely significant impact on receptors where there is evidence of appreciation and value locally and / or where ramifications are unlikely to extend beyond a localised context;
- **Regional** - likely significant impact where a county designation applies and / or where impacts could potentially extend beyond a localised context;
- **National** - likely significant impact where a national designation applies and / or where impacts could potentially extend beyond a regional context; and
- **International** - likely significant impact where an international designation applies and / or where impacts could potentially extend beyond a national context.

4.2.6 Determining Overall Effects

The comparative evaluation of Route Corridor Options was assisted by the scoring of impacts to sensitive receptors using the Stage 2 project appraisal matrix suggested in the Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis. An assessment was undertaken on each option to include both quantitative and qualitative assessment. The overall effect of each Route Corridor Option is scored based on the seven-point scale as shown in Table 4.5 and a number was assigned according to the level of significance of the effects.

Table 4.5 Key for Scoring of Effects

Score	Significance of Effect
7	Major or Highly Positive
6	Moderately Positive
5	Minor or Slightly Positive
4	Not Significant or Neutral
3	Minor or Slightly Negative
2	Moderately Negative
1	Major or Highly Negative

As part of this assessment it is assumed that general landscape mitigation measures such as screening and landscape planting will be implemented to all Route Corridor Options.

4.3 Existing Environment – Landscape Context

The constraints in the Study Area have been mapped and are presented in Volume 2 (Figures 4.1 – 4.3) of this Option Selection Report.

4.3.1 County Louth

4.3.1.1 Landscape Character

Two sources of landscape character are outlined below; the Louth Landscape Character Assessment (2008) and the Louth County Development Plan 2015 – 2021.

4.3.1.1.1 Louth Landscape Character Assessment

The Louth Landscape Character Assessment published in 2008 is incorporated into the Louth County Development Plan 2015-2021 (LCDP). Within the Louth Landscape Character Assessment, nine different Landscape Character Areas (LCAs) are identified. The Route Corridor Options pass through two of the LCAs identified in Louth Landscape Character Assessment. These are indicated on Figure 4.1 and are listed in Table 4.6 along with a summary of the key characteristics, sensitivity, and key values from the Louth Landscape Character Assessment.

4.3.1.1.2 Louth County Development Plan (LCDP)

In contrast to the Louth Landscape Character Assessment, the more recently adopted LCDP categorises both the Muirhevna Plain LCA and the Louth Drumlin & Lake Areas this LCA as being of 'Local' Importance rather than being categorised as 'Regional'.

Three policies are listed within the development plan relating to Heritage (Built and Natural) which relate to the landscape. The following is relevant to the proposed scheme:

- *HER 10 - To afford protection to the landscapes and natural environments of the County, by permitting only those forms of development that are considered sustainable and do not unduly damage or take from the character of the landscape or natural environment.*

4.3.1.2 Landscape Elements

Within the broader LCA structure there are finer grained additional discrete and distinct landscape features / areas. These will be referred to herein as 'landscape elements'. These landscape elements have their own unique localised sensitivities, but also contribute to landscape character on a broader scale. Because landscape elements contribute to landscape character they have been considered during the assessment of the sensitivity and the magnitude of impact on the landscape character. However, for the purposes of this option selection process, in order to draw out the differences between the Route Corridor Options, these landscape features / areas were also selected for assessment as discrete landscape receptors. When assessing landscape elements, it is mainly direct impacts that are of relevance.

A number of landscape elements occur have been identified in the LCDP which occur within the Study Area.

4.3.1.2.1 Areas of High Scenic Quality

The LCDP identifies six Areas of High Scenic Quality within the County. A portion of one, 'AHSQ 6: Ardee Bog', occurs within the Study Area, approximately 920m south-west of the nearest Route Corridor Option but has no potential to be affected by any of the Route Corridor Options, as illustrated in Figure 4.2. The LCDP contains one policy relating to Areas of High Scenic Quality:

- *HER 61 - To protect the unspoiled rural landscapes of the AHSQ for the benefit and enjoyment of current and future generations.*

Table 4.6 Summary of Landscape Character Areas (LCAs) relevant to the proposed scheme within County Louth

LCA	Key Characteristics (of entire LCA)	Sensitivity (relevant to proposed scheme)	Key Values (relevant to Study Area)
Muirhevna Plain	<p><i>'Serves as a major traffic corridor between North and South.</i></p> <p><i>Extensive plain located between the Carlingford/Slieve Gullion mountain complex and the uplands of Collon and Monasterboice.</i></p> <p><i>Rich soils are conducive to extensive agricultural practices both in crop and animal production.</i></p> <p><i>Robust hedgerows give a sense of enclosure.</i></p> <p><i>The nature of the topography has had the effect that a number of small meandering rivers drain the flat landscape.</i></p> <p><i>Contains a number of fine broadleaf wooded areas around country houses.</i></p> <p><i>Area is rich in archaeological features.</i></p> <p><i>Renowned for its mythological past leading to the definition of the Táin Trail.</i></p> <p><i>Isolated housing is very evident especially in the eastern half.'</i></p>	<p><i>'In this open flat landscape, the removal of traditional hedgerows would have a significant impact on the landscape.'</i></p> <p><i>'...north-west of Ardee where the hedgerows are robust and mature.'</i></p> <p><i>'Ardee bog (proposed NHA.) is currently under threat from land drainage.'</i></p>	<p>Five Key Values within this LCA, three of which relate the portion which occurs within the Study Area:</p> <p><i>'Extensive area of good quality agricultural land with fine traditional hedgerows.</i></p> <p><i>Small but very fine broadleaf woodlands throughout the area and within the town of Ardee.</i></p> <p><i>High density of archaeological features, particularly souterrains.'</i></p> <p>These Key Values are related to Objectives which include conservation and enhancement.</p> <p>Received an overall value classification of <i>'Regional.'</i></p>
Louth Drumlin & Lake Areas	<p><i>'Southeast tip of the large Drumlin areas extending into Connacht and Ulster.</i></p> <p><i>Typical landform of the Drumlin glacial drift.</i></p> <p><i>Areas of biodiversity and ecological interest.</i></p> <p><i>Sparsely populated in comparison to the rest of the county.</i></p> <p><i>Strong sense of landscape enclosure created by the landform.</i></p> <p><i>Areas of scrub and rush invasion.</i></p> <p><i>Dominance of power lines.'</i></p>	<p><i>'The existing hedgerows are generally robust and in themselves add a distinctive feature to the Drumlin landscape. Their removal whilst exposing the Drumlin landform would dramatically change the landscape.'</i></p>	<p>Four Key Values within this LCA, three of which relate the portion which occurs within the Study Area:</p> <p><i>'Unique shape of drumlins formed by the deposition of material from the glacial age.</i></p> <p><i>Landscape quality is very robust and gives a sense of enclosure and unusual rurality.</i></p> <p><i>The few lake areas are small but not readily accessible.'</i></p> <p>These Key Values are related to Objectives which include conservation and enhancement.</p> <p>Received an overall classification of <i>'Regional.'</i></p>

4.3.1.2.2 Designed Landscapes and Historic Gardens

All designed landscapes and historic demesnes are considered to be sensitive landscapes within the extents of their boundaries and simultaneously as features which contribute to the landscape character of a wider landscape. Designed Landscapes and Historic Gardens are indicated on Figure 4.2. The LCDP contains a list of 93 important historic houses / demesnes / gardens within the County. Those with the potential to be affected by the proposed scheme are:

- Red House (approximately 950m south-east of nearest Route Corridor);
- Harristown House (intersects with a Route Corridor);
- Rahanna House (intersects with a Route Corridor);
- Cardistown House (approximately 160m west of nearest Route Corridor);
- Arthurstown House (intersects with a Route Corridor);
- Louth Hall (intersects with a Route Corridor); and
- Knockabbey Castle (intersects with a Route Corridor).

Other demesnes

Three other demesnes were identified within the Study Area in County Louth during the desk study which were not highlighted in the LCDP, but are shown on Figure 4.2:

- Lisrinny Demesne (approximately 150m east of nearest Route Corridor);
- Cookstown House Gardens/Demesne (intersects with a Route Corridor); and
- Tullakeel House (approximately 1.7km west of nearest Route Corridor).

The LCDP contains three policies relating to Historic Gardens and Designed Landscapes:

- *HER 55 - To ensure that new development will not adversely affect the site, setting or views to and from historic gardens and designed landscapes.*
- *HER 56 - To require that any proposals for new development in designed landscapes and demesnes include an appraisal of the landscape, designed views and vistas, and an assessment of significant trees or groups of trees, as appropriate.*
- *HER 57 - To require applicants for proposed large scale developments within the Designed Landscapes and Demesnes utilise 3D Digital Survey Modelling tools to demonstrate that the proposed development does not adversely affect the site or its setting.*

4.3.1.2.3 Designated Ecological Landscapes

Landscapes with ecologically related designations include Special Areas of Conservation, Natural Heritage Areas, proposed Natural Heritage Areas and Special Protection Areas (please see Chapter 5 Biodiversity for their ecological assessment). Two proposed Natural Heritage Areas occur within the Study Area and are considered to contribute to landscape character and have been considered during the assessment of same but neither will be directly impacted in terms of their status as landscape elements by the any of the Route Corridor Options. These pNHAs are indicated on Figure 5.1 and are recorded as:

- Louth Hall And Ardee Woods pNHA - Site Code: 001616⁴⁴ (approximately 550m south of nearest Route Corridor at Ardee Woods & approximately 100m east of nearest Route Corridor at Louth Hall); and
- Reaghstown Marsh pNHA -Site Code: 001828⁴⁵ (approximately 1.65km west of nearest Route Corridor).

⁴⁴ This pNHA is spilt into two parts – the southern part is over 460m from the southern end of the Route Corridors. The northern part is on the edge of the Study Area and is over 100m from the edge of Option D (Orange) and the orange section of Options E (Orange + Link 1 + Green) and F (Orange + Link 2 + Green).

⁴⁵ At its closest point, this pNHA is located over 1.5km to the west of Option A (Yellow).

4.3.1.2.4 Trees Woodlands and Hedgerows

All woodland, trees and vegetation contribute to the character of a landscape and can provide localised visual amenity. Hedgerow networks form field patterns that also contribute to the character of the landscape. The LCDP states:

'Louth's percentage coverage of native woodlands is one of the lowest in Ireland. In this context, conservation of existing woodlands becomes very important and the contribution of hedgerows to our landscape is heightened.'

The LCDP highlights several types of tree protections categories:

- Tree Preservation Orders,
- Champion Trees; and
- Trees and Woodlands of Special Amenity Value.

Tree Preservation Orders

There are five Tree Preservation Orders listed and mapped in the LCDP. Figure 4.2 shows that one occurs within the Study Area 'TPO3 – Red House, Ardee' but the Route Corridor Options terminates over 250m from the edge of the Red House area. (This Tree Preservation Order is in the same location and has similar extent as the Ardee Woods portion of the Louth Hall And Ardee Woods pNHA-001616 in the Townland of Ballybailie, near the settlement of Ardee.)

Champion Trees

There are 21 Champion Trees listed in the LCDP. Seven occur within the Study Area and are indicated on Figure 4.2. Two are situated within the extents of 'TPO3 – Red House, Ardee' but none of the Route Corridor Options pass near this location. Five others are situated within Knockabbey Castle and Gardens:

- *'Acer pseudoplatanus;*
- *Liriodendron tulipifera;*
- *Sequoiadendron giganteum;*
- *Taxus baccata; and*
- *Robinia pseudoacacia'.⁴⁶*

Trees and Woodlands of Special Amenity Value

The LCDP contains a lists and maps of 33 Trees and Woodland of Special Amenity Value within the County. Those that occur with the Study Area indicated on Figure 4.2 and are known as:

- TWSAV7 – Red House, Ardee; and
- TWSAV14 – Louth Hall.

The TWSAV14 – Louth Hall designation is understood to relate to the trees situated within the Louth Hall portion of the Louth Hall And Ardee Woods pNHA in the Townland of Louth Hall, near the settlement of Tallanstown. This northern part of the pNHA is on the edge of the Study Area and is over 100m from the edge of Option D (Orange) and the orange section of Options E (Orange + Link 1 + Green) and F (Orange + Link 2 + Green).

The LCDP contains two policies relating to Trees, Woodlands, and Hedgerows relevant to the proposed scheme:

- *HER 13 - To protect trees and woodlands of special amenity value*
- *HER 17 - To increase native tree coverage in the County by promoting the planting of suitable trees along public roads, residential streets, parks and other areas of open space.*

⁴⁶ Sycamore, tulip tree, redwood, yew, frisia/false acacia.

4.3.2 County Monaghan

4.3.2.1 Landscape Character

County Monaghan Landscape Character Assessment was published in 2008 and is incorporated into the Monaghan County Development Plan 2019-2025 (MCDP). Within the County Monaghan Landscape Character Assessment, 14 different Landscape Character Types (LCTs) and nine Landscape Character Areas (LCAs) are identified. The location and extent of these are indicated on Figure 4.1. The assessment defines LCTs and LCAs as;

- *'Landscape Character Types are distinct types of landscape that are relatively homogenous in character. They are generic in nature in that they may occur in different localities throughout any defined area. Nonetheless, where they do occur, they commonly share similar combinations of geology, topography, land cover and historical land use. For example, blanket bog uplands are distinct landscape character types and are recognisable as such whether they occur in Monaghan or other counties.'*
- *'Landscape Character Areas are the unique individual geographical areas in which landscape types occur. They share generic characteristics with other areas of the same type but also have their own particular identity.'*

4.3.2.1.1 Landscape Character Types

The LCTs relevant to the proposed scheme are identified in Table 4.7 along with a list of their key characteristics according to the County Monaghan Landscape Character Assessment.

Table 4.7 Summary of Landscape Character Types (LCTs) relevant to the proposed scheme within County Monaghan

LCT	Key Characteristics
8 - Undulating Farmland	<p><i>'A patchwork of predominantly medium sized fields defined typically by native species hedgerows and used for pasture.</i></p> <p><i>The town of Clones represents a significant urban settlement located in an elevated or hilly position.</i></p> <p><i>Numerous ring and fairy forts identified by wooded crests to prominent hills to the west of Inniskeen.</i></p> <p><i>Isolated farm and residential properties.'</i></p>
6 - Flat Riverine Farmland	<p><i>'A flat, and gently undulating landscape associated with the floodplains of the Fane River to the east and the Finn River to the west.</i></p> <p><i>Pastoral land uses combined with frequent areas of marshy ground.</i></p> <p><i>Minor roads and settlements few in number and very small.'</i></p>
2 - Drumlin Farmland	<p><i>'Low lying small to medium sized drumlins predominantly in a north to south orientation.</i></p> <p><i>A patchwork of predominantly medium sized fields defined typically by native hedgerows and used for pasture.</i></p> <p><i>Dispersed small to medium sized loughs.</i></p> <p><i>Extensive network of tertiary roads.</i></p> <p><i>Isolated and small clusters of farm and residential properties.</i></p> <p><i>Minor roads bounded occasionally by large estates, the boundary definition being cut limestone walling.'</i></p>
3 - Drumlin Foothills	<p><i>'Rising ground with small to medium sized drumlins predominantly in a north to south orientation.</i></p> <p><i>Mid to long ranging views.</i></p> <p><i>A patchwork of predominantly small sized well drained fields defined typically by native hedgerows and used for pasture.</i></p> <p><i>Patches of heath (Calluna spp) and gorse (Ulex spp).</i></p> <p><i>Isolated farm and residential properties.'</i></p>
5 - Farmed Lakelands (or Farmed Loughlands)	<p><i>'The Lakeland corridor between Lough Muckno and the County boundary at Cootehill is essentially a low-lying farmed landscape containing large Loughs punctuated by prominent drumlins. This low-lying landscape is enclosed physically and visually by upland drumlin farmlands located to the north and south of the area. The Lakeland area further south is associated with a more elevated open landscape setting.</i></p> <p><i>The Landcover is predominantly pasture, although there are tracts of forestry and woodland around the loughs to the south and to the west in the vicinity of Drumlona Lough and Inner Lough.</i></p> <p><i>Crannogs are common features in the lakes.</i></p> <p><i>Regional and minor roads are located in the Lakeland area, connecting Ballybay and Castleblayney, both principal County towns. The Lakeland further south also contains major and minor roads but no towns or villages are present.'</i></p>

4.3.2.1.2 Landscape Character Areas

The Route Corridor Options pass through three of the LCAs identified in County Monaghan Landscape Character Assessment. These are listed in Table 4.8 below along with a summary of the key characteristics and a description of the condition and sensitivity from the County Monaghan Landscape Character Assessment.

Table 4.8 Summary of Landscape Character Areas (LCAs) relevant to the proposed scheme within County Monaghan

LCA	Key Characteristics	Condition & Sensitivity
9 - Carrickmacross Drumlin & Lowland Farmland	<p><i>Topographically, this landscape comprises a mixture of undulating farmland and low-lying drumlins. The drumlins are more strongly aligned in a north west-south east orientation in the northern half of this character area.</i></p> <p><i>The River Fane flows in the same orientation as the strongly aligned drumlin groups and flows through the town of Inniskeen on the eastern side of the County.</i></p> <p><i>Frequent loughs are located in this landscape and range from small to medium in size. Some of these feature crannogs.</i></p> <p><i>Large areas of mature deciduous woodland are located to the south of Carrickmacross. Occasional clumps of mature deciduous woodland are located throughout.</i></p> <p><i>Coniferous forestry plantations are located in this character area including one particularly large plantation located to the south.</i></p> <p><i>Intact hedgerow pattern comprising a mix of managed and unmanaged hedgerows.</i></p> <p><i>Remnants of industrial heritage in the form of a dismantled railway line are present.</i></p> <p><i>Carrickmacross is the principal settlement.</i></p>	<p><i>Much of the farmed drumlin landscape is in good condition although there are isolated areas where the local landscape is in poor condition owing to the presence of run down or derelict farm facilities and the presence of broken or fragmented hedgerows with mature trees strangled with the native ivy climber. It is a Moderate scenic landscape and would not be considered to be highly sensitive to change.</i></p> <p><i>The loughs are plenty in number but are often not highly visible being fringed by riparian vegetation. These together with their vegetated edges would be highly sensitive to change.</i></p>
8 - Drumlin and Upland Farmland of South Monaghan	<p><i>An elevated landscape containing drumlin hills that are given over to pastoral uses. Strong field pattern evident as defined by hedgerow boundaries.</i></p> <p><i>Areas of rock outcrops are present at the highest elevations. These areas feature more impoverished pasture. Field boundary pattern is broken or lost in these locations.</i></p> <p><i>Plenty of clumps of gorse located in the higher more impoverished areas.</i></p> <p><i>Frequent medium to large sized loughs, the largest being Lough Egish.</i></p> <p><i>The Clarebane River which flows out of Lough Muckno is aligned with the County Boundary.</i></p> <p><i>Long range views can be gained from the more elevated parts of this landscape towards adjacent low-lying areas to the north.</i></p> <p><i>No major settlements. Extensive regional and minor road system.</i></p>	<p><i>The landscape at lower elevations is in good condition and would be regarded as only Moderate sensitive to development.</i></p> <p><i>The lakes and lake environs in particular have a high scenic quality and carry statutory designations and are judged to be highly sensitive to any development changes.</i></p> <p><i>In terms of the higher rocky remote landscapes, these would be highly sensitive to any changes involving large developments or tall structures. The relative exposure and scarcity of vegetation is such that sizable developments cannot be easily accommodated here without generating negative visual impacts albeit this area is in somewhat poor condition in terms of quality.</i></p>

A number of policies are listed within the development plan relating to Heritage, Conservation and Landscape. The following are relevant to the proposed scheme:

- **HLP 8** - *To ensure the preservation of the County's landscapes, by having regard to the character, value and sensitivity of the landscape as identified in the County Monaghan Landscape Character Assessment (2008) or any subsequent versions when considering planning applications.*
- **HLP 9** - *To protect the landscapes and natural environments of the County by ensuring that any new developments in designated sensitive rural landscapes do not detrimentally impact on the character, integrity, distinctiveness or scenic value of the area. Any development which could unduly impact upon such landscapes shall be resisted.*
- **HLP 10** - *To co-operate with adjoining local authorities north and south of the border, to ensure that the natural environment is maintained in a sustainable manner and to encourage a collaborative and consistent policy approach with adjoining areas on matters of environmental and landscape protection and to identify threats to the integrity of such sites through a transboundary approach.*
- **HLP 11** - *To contribute towards the protection of County and local level landscape designations from incompatible developments. Proposals for development that have the potential to significantly adversely impact upon these designations shall be accompanied by an assessment of the potential landscape and visual impacts of the proposed development. This shall demonstrate that landscape impacts have been anticipated and avoided to a level consistent with the sensitivity of the landscape and the nature of the designation.*
- **HLP 12** - *Support, as appropriate, any relevant recommendations contained in the National Landscape Strategy for Ireland.*

4.3.2.2 Landscape Elements

A number of landscape elements have been identified in the MCDP which occur within the Study Area.

4.3.2.2.1 Areas of Amenity Value

The MCDP identifies two types of amenity areas; Areas of Primary Amenity Value and; Areas of Secondary Amenity Value. Amenity areas comprise of both; linear features, such as river valleys and canal corridors; and spatial areas such as woodlands and lake environments. There are no Areas of Primary Amenity Value relevant to the proposed scheme, but there are a number of Areas of Secondary Amenity Value and these are indicated on Figure 4.2. The relevant the Areas of Secondary Amenity Value are:

- SA 15 - Lough Naglack (intersects with a Route Corridor); and
- SA 14 - Lisanisk Lake (water's edge is approximately 50m west of nearest Route Corridor).

The MCDP contains one policy relating to Areas of Secondary Amenity Value:

- *'SAP 1 - To limit development in Areas of Secondary Amenity Value and to only permit compatible amenity developments where they do not unduly impact on visual amenity.'*

4.3.2.2.2 Designed Landscapes

All designed landscapes and historic demesnes are considered to be sensitive landscapes within the extents of their boundaries and simultaneously as features which contribute to the landscape character of a wider landscape. Those within the Study Area are shown on Figure 4.2. There are many historic demesnes in County Monaghan. The MCDP contains a list of 10 important historic houses/demesnes within the County. One of these occurs with the Study Area:

- *Lough Fea Estate, Carrickmacross (approximately 1.9km west of nearest Route Corridor).*

Two other demesnes inside the Study Area were identified during the desk study within County Monaghan which were not highlighted in the LCDP:

- Monalty House (intersects with a Route Corridor); and
- Potential demesne at Rahans (intersects with a Route Corridor).

The MCDP contains two policies relating to Designed Landscapes:

- *DLP1 - To ensure that any new development will not adversely affect the site, setting or views to and from historic houses, gardens and designed landscapes.*
- *DLP2 - To require that any proposals for new development in the vicinity of historic houses or demesnes landscapes are accompanied by an evaluation of the impact of the development on the landscape, designed views and vistas to /from such a site.*

4.3.2.2.3 Designated Ecological Landscapes

Landscapes with ecologically related designations include Special Areas of Conservation, Natural Heritage Areas and Proposed Natural Heritage Areas, and Special Protection Areas (please see Chapter 5 Biodiversity for their ecological assessment). There are five Proposed Natural Heritage Areas (pNHA) within the Study Area. These pNHA are designated because of their ecological value and are not formal landscape designations however they do have landscape value in addition to their ecological value. The locations and extents of these are indicated on Figure 5.1 and are recorded by the National Parks and Wildlife Service as:

- Monalty Lough pNHA – site Code: 001608;
- Lough Naglack (pNHA) - Site Code: 000561;
- Lough Fea Demesne(pNHA) - Site Code: 000560;
- Creevy Lough(pNHA) - Site Code: 001599;
- Lough Egish (pNHA) - Site Code: 001605; and
- Spring and Corcin Loughs(pNHA) - Site Code: 001671.

Of these designated ecological landscapes only Lough Naglack pNHA has the potential to be directly impacted by a Route Corridor so, from a landscape perspective, is the only one relevant to the proposed scheme. This pNHA occupies the same area as the Lough Naglack Area of Secondary Amenity Value. For this reason, this pNHA was subsumed into the Area of Secondary Amenity Value for the purposes of this assessment so as not to be double counted as two separate landscape elements in this assessment.

4.3.2.2.4 Area Under Strong Urban Influence

The area surrounding Carrickmacross and Castleblayney is identified in the MCDP as an Area Under Strong Urban Influence. The core of the area will be most influenced (decreased sensitivity to development) while the urban influence will decrease towards the edge (increasing landscape sensitivity). Both of these Areas Under Strong Urban Influence are indicated on Figure 4.1.

4.3.2.2.5 Kavanagh Country Literary Landscape Character Assessment

The Kavanagh County Literary Landscape Character Assessment⁴⁷ states that extent of Kavanagh County “is not clearly defined in geographic or even abstract terms”. The Kavanagh County Literary Landscape Character Assessment does not define a character area that would be consistent with the Monaghan County Landscape Character Assessment. The Kavanagh County Literary Landscape Character Assessment states:

“The term Kavanagh Country appears to have been coined by the Patrick Kavanagh Centre and promoted as an area surrounding Inniskeen village incorporating the Patrick Kavanagh Trail. In terms of literary references this area is very much focussed on Inniskeen, largely focussing on a triangular area structured by Inniskeen Road, Barragroom Road and the Bog Road.”

This area appears to be the primary geographical area of interest as a cultural destination, although the abstract area extends to include Carrickmacross, Dundalk, Dublin and even London. The primary geographical area of interest is considered the most valuable and sensitive but is situated outside of the Study Area. The MCDP contains one policy in relation to Kavanagh Country:

- ‘HLP7 - To promote the development of Kavanagh Country as a cultural destination’

4.3.2.2.6 Amenity Lakes and Rivers

In the MCDP there are seven key amenity lake areas identified within the County. Those which occur within the Study Area are Indicated on Figure 4.2 but the only one which has a potential to be affected by the proposed scheme is:

- *Creevy Lake, Carrickmacross* (approximately 1km west of nearest route corridor in same location as Creevy Lough pNHA).

4.3.2.2.7 Trees, Woodland and Hedgerows

All woodland, trees and vegetation contribute to the character of a landscape and can provide localised visual amenity. Hedgerow networks form field patterns that also contribute to the character of the landscape. The MCDP contains a list of eight groups of Trees of Special Amenity Value within the County. Those that occur with the Study Area are indicated on Figure 4.2 and are identified as:

- *Laragh Village* (approximately 3.6km west of nearest Route Corridor), and
- *Connabury Hill* (approximately 1.1km north of nearest Route Corridor – in Castleblayney and outside of Study Area).

The MCDP contains two policies relating to Trees and Woodlands:

- *TWP1 - To minimise loss of tree(s) and hedgerow associated with any development proposal and encourage the retention of existing mature trees, hedgerows and woodlands in new developments. Where removal is unavoidable consideration should be given to transplanting trees and/or providing compensatory planting on the site.*
- *TWP2 - To preserve trees and/or groups of trees that have a significant amenity value, and to designate Tree Preservation Orders where appropriate.*

⁴⁷ Inniskeen Enterprise Development Group (2008). Kavanagh Country Literary Landscape Character Assessment And Management Plan

4.3.3 Sensitivity Assessment – Landscape

4.3.3.1 Landscape Character

The first step in the landscape assessment process was to determine the likely sensitivity of each Landscape Character Area (LCA) within the Study Area of the proposed scheme. The extent of the LCAs are shown in Figure 4.1.

Following a review of the County Monaghan Landscape Character Assessment, and the Louth Landscape Character Assessment and an on-site verification of these assessments it has been determined that the extents of the LCAs identified are appropriate to the scale of this project and should be adopted for use in this assessment. These are shown on Figure 4.1. Although there are some localised landscapes areas of varying sensitivity within each LCA, overall sensitivity judgements for each LCA have been made for this stage of assessment. In accordance with GLVIA, Landscape Sensitivity was rated on a five-point scale ranging from Negligible, Low, Medium, High or Very High. Ratings were made with reference to material from the County Development Plans but ultimately are independent decisions grounded in professional experience. The Landscape Sensitivity assessments for the LCAs are described in Table 4.9.

Table 4.9 Summary of Assessment of Landscape Character Area Sensitivity (Louth and Monaghan)

County	LCA Name	Assessment of LCA Sensitivity	Overall LCA Sensitivity
Louth	Muirhevna Plain	<p>The largest LCA occupying the core of the County. Due to the size of the LCA there are variations of landscape types and nuanced sensitivities across the LCA. The urban settlements that occur in this LCA are excluded, within the Study Area this relates to Ardee. This is a well utilised rural area of typical agricultural land use patterns of strong integrity. As described in the landscape character assessment it is an <i>“Extensive area of good quality agricultural land with fine traditional hedgerows”</i>. It also contains a <i>“High density of archaeological features, particularly souterrains”</i> However, the overall landscape character and associated landscape value in this LCA relates predominantly to agricultural productivity and the substance of rural livelihoods, rather than distinctive scenic value or a sense of the naturalistic.</p>	Medium
Louth	Louth Drumlin & Lake Areas	<p>The south-eastern extent of a vast area of drumlin hills that extends to the north and west into Ulster and Connacht. Whilst drumlin hills are distinct in form (relating to glaciation) and generate a sense of small-scale enclosure, they are not a particularly unique or remarkable landscape type in this part of the country. The enclosed setting of inter-drumlin lakes and associated wet margins and riparian vegetation can be highly valued for localised scenic amenity and tranquillity. Otherwise, the land cover is fairly uniform consisting of agricultural farmland contained within small to medium sized fields defined by hedgerows. As stated in the landscape Character Assessment these hedgerows <i>“are generally robust and in themselves add a distinctive feature to the Drumlin landscape”</i>. Overall, landscape character and associated landscape value in this LCA relates predominantly to agricultural productivity and the substance of rural livelihoods, rather than distinctive scenic value or a sense of the naturalistic.</p>	Medium
Monaghan	9 - Carrickmacross Drumlin & Lowland Farmland	<p>The south-western portion of the Study Area in LCA9 is predominantly Drumlin Farmland LCT while the north-east is composed of mostly Undulating Farmland LCT with a small area of Flat Riverine Farmland LCT in the north-west. In the northern part of this LCA (close to the interface with LCA 8) areas characterised as Drumlin Foothills LCT begin to appear.</p> <p>The Area Under Strong Urban Influence encompasses almost half of this LCA and contributes a sense of hinterland farmland with a higher density of local roads and rural / residential settlement. There is some scenic amenity associated with frequent loughs, but as stated in the Landscape Character Assessment, <i>“it is a Moderate scenic landscape and would not be considered to be highly sensitive to change”</i>. Overall, this is considered to be a productive rural landscape with associated values relating to the substance of rural livelihoods as well as hosting activities related to Carrickmacross in the hinterlands that surround the settlement, rather than distinctive scenic value or a sense of the naturalistic.</p>	Medium-Low

County	LCA Name	Assessment of LCA Sensitivity	Overall LCA Sensitivity
Monaghan	8 - Drumlin and Upland Farmland of South Monaghan	<p>The divide between LCA 9 and LCA8 is loosely aligned with, and likely informed by / based on, the transition between the gently rolling Drumlin Farmland LCT and the Flat Riverine Farmland in LCA9 with the more steeply rolling Drumlin Foothills LCT of LCA8.</p> <p>The vast majority of the Study Area in LCA8 is formed of the Drumlin Farmlands LCT while the north-western portion contains a small area of Farmed Lakelands LCT.</p> <p>Although this is a relatively varied area in terms of the landscape types it contains, these are all still drumlin-based landscape types with subtle transitions between them. Other than the variation provided by occasional loughs and rocky outcrops at higher elevations, the overall character remains dominated by agricultural farming. As stated in the Landscape Character Assessment, <i>“the landscape at lower elevations is in good condition and would be regarded as only Moderate sensitive to development”</i>. The drumlin formations in this LCA are more pronounced and generate the sense of localised pockets enclosure and increased sense of spatial separation as a result of intervening terrain. Overall, this is considered to be a productive rural landscape with associated values relating to the substance of rural livelihoods While there are some visual designations in this LCA, there is a relatively small proportion of demesne landscape suggesting a reduced tendency of historical aesthetic interactions or interventions with the landscape.</p>	Medium-Low

4.3.3.2 Landscape Elements

Only some of the landscape elements identified in Sections 4.3.1.2 and 4.3.2.1 have the potential to be impacted by a Route Corridor Option. These are assessed for in terms of sensitivity in Table 4.10. The sensitivity of linear landscape elements may vary in different locations across the length of the element. The likely sensitivity rating given are based on the overall likely sensitivity.

Table 4.10 Assessment of likely sensitivity of Landscape Elements (Louth and Monaghan)

County	Landscape Element Type	Landscape Element	Distance to nearest Route Corridor Boundary	Description of Sensitive Landscape Element	Likely Sensitivity
Louth	Designated Landscapes	Rahanna House demesne	Within corridor	Identified in the LCDP. The house and core curtilage contain mature tree lines and parkland trees. Beyond this it is surrounded by agricultural fields.	High-Medium
Louth	Designated Landscapes	Cookstown House demesne	Within corridor	Not identified in the LCDP. Mature trees still present. Reduced tranquillity due to existing N2 which severs / adjoins it.	Medium-Low
Louth	Designated Landscapes	Arthurstown House Demesne	Within corridor	Identified in the LCDP. Some mature trees remain adjoining the house.	Medium
Louth	Designated Landscapes	Louth Hall demesne	Within corridor	Identified in the LCDP. Many hedgerow and trees within the wider demesne have been lost apart from those within the pNHA which is of High sensitivity but the remaining area is Low sensitivity.	High
Louth	Designated Landscapes	Knockabbey Castle Demesne	Within corridor	Identified in the LCDP. Mature trees and house in the eastern side of the historic boundary. Some Champion trees identified in the LCDP in this area in addition to the Trees and Woodlands of Special Amenity Value designation.	High
Monaghan	Designated Landscapes	Monalty House demesne	Within corridor	Not identified in the LCDP. Contains Drumever Woods, a broadleaved woodland in the eastern side. N2 severs western tip of historic demesne. Mature trees remain in the immediate curtilage of the house.	Medium
Monaghan	Area of Amenity Value	SA15 - Lough Naglack	Within corridor	This Area of Secondary Amenity Value provides a resource to wildlife and the community within convenient location from the settlement of Carrickmacross. Designated as a pNHA.	High
Monaghan	Area of Amenity Value	SA14 - Lisanisk Lake	Approx. 50m from water's edge	This Area of Secondary Amenity Value provides a resource to wildlife and the community within convenient location from the settlement of Carrickmacross.	Medium
Monaghan	Designated Landscapes	Potential demesne at Rahans	Within corridor	Not identified in the LCDP. House and woodland gone.	Low

4.4 Existing Environment - Visual Context

The constraints in the Study Area have been mapped are presented in Volume 2 (Figures 4.1 – 4.3) of this Option Selection Report.

4.4.1 Residential Receptors

All residential settings are considered to be sensitive receptors, however the main focus at this Option Selection stage is substantial settlements based on population intensity. The visual impact of the Preferred Route Corridor Option on individual residential settings will be considered in future phases of the design process.

4.4.2 Designated Scenic Routes / Views

The scenic routes / views within the current Louth and Monaghan County Development Plans are discussed below.

4.4.2.1 Louth County Development Plan

Under the Louth County Development Plan, Scenic Routes and Views/Prospects of Special Amenity Value are discussed below.

4.4.2.1.1 Scenic Routes

Chapter 5 of the LCDP lists 22 Scenic Routes in Louth. Only the following occurs within the Study Area but has no potential to be significantly impacted by the proposed scheme due to its enclosed nature and low elevation as illustrated in Figure 4.3:

- SR17 - Townparks, Ardee (approximately 500m south of nearest Route Corridor).

4.4.2.1.2 Views and Prospects of Special Amenity Value

Chapter 5 of the LCDP lists Views and Prospects of Special Amenity Value in Louth. One occurs just outside the Study Area on SR17 but has no potential to be significantly impacted by the proposed scheme due to its enclosed nature and low elevation as illustrated in Figure 4.3:

- VP33 – Townparks north and southwards (approximately 1.9km west of nearest Route Corridor).

4.4.2.2 Monaghan County Development Plan

Appendix 3 of the MCDP lists 24 Scenic Routes in Monaghan. The following occur within the Study Area and are illustrated on Figure 4.3:

- *SV20 - View of Slieve Gullion at Taplagh, Broomfield (from N2) (intersects with a Route Corridor);*
- *SV19 - Distant views of Lough Muckno & Slieve Gullion (intersects with a Route Corridor);*
- *SV18 - Distant views of Lough Muckno & Slieve Gullion (approximately 1.1km west of nearest Route Corridor); and*
- *SV15, SV16 and SV17 - Scenic drive along Lake Muckno (approximately 1.1km west of nearest Route Corridor).'*

The MCDP contains three policies relating to Scenic Routes/Views:

- *SRP1 - To prohibit development that would disrupt or adversely affect a view from/along any scenic route as identified in Appendix 5.*
- *SRP2 - To protect the scenic quality of lakes by prohibiting development located between a public road and a lake where the development would interrupt a view of the lake or adversely affect its setting or its wildlife habitat. Development may be permitted between a public road and the lakeshore where the development is screened from the lake by existing topography or vegetation.*
- *SRP3 - An exception may be made for short term let tourist accommodation or recreational development where a specific need has been identified. Any such proposal should be sensitively sited and designed. Development on high exposed sites overlooking lakes or waterways shall be resisted.*

4.4.3 Tourist, Amenity and Heritage Views

Knockabbey Castle and demesne is a tourist attraction allowing the public to visit the historic house and gardens (intersects with a Route Corridor). This demesne is identified in the LCDP and is considered both a landscape element and as a sensitive visual receptor.

Nuremore Hotel & Country Golf Club (GC 4 on Figure 4.3) is situated adjacent to the N2 and Lough Naglack (Areas of Secondary Amenity Value - SA15) (intersects with a Route Corridor). Mannan Castle Golf Club is situated at Donaghmoynne (GC 1 on Figure 4.3) but is unlikely to be impacted by any Route Corridor Option.

4.4.3.1 Recreational Trails

People utilising recreational trails generally have a high sensitivity to visual change in their surrounding environment as views of the surrounding landscape are integral to their experience. Recreational trails have a greater potential to be impacted by Route Corridor Options that run parallel to them rather than simply when a Route Corridor briefly intersects at right angles. The following recreational trails occur within the Study Area:

- The Lakes Walking Trail (intersects with a Route Corridor Option);
- Town, Avenue & Lakeside Walk (intersects with a Route Corridor Option);
- Pilgrims' Way Tin Church Trail (approximately 150m west of nearest Route Corridor boundary); and
- National Way marked Trail: Monaghan Way (approximately 360m east of nearest Route Corridor boundary).

4.4.4 Kavanagh Trail Map

The Patrick Kavanagh Centre produced the Kavanagh County Map^[2] which shows the Kavanagh Trail and Kavanagh Sites. Kavanagh Site number '8: Rock Savage Fort and Triangular Field' in the townland of Shancoduff is indicated. It is located approximately 1km east of the nearest Route Corridor but is contained within private farmland and is not publicly accessible. Whilst the site is considered a sensitive landscape feature in its own right and in respect of views towards it from the Kavanagh Trail, its inaccessibility to the public means it is not a sensitive visual receptor i.e. place from which people enjoy visual amenity.

4.4.5 Sensitivity Assessment - Visual Receptors

The likely sensitivity for all of the visual receptors identified in Section 4.4 are presented in Table 4.10. Residents at home are considered to be highly susceptible to visual change, but the nature and value of such views can vary widely depending on viewing context, particularly within and around settlements. The sensitivity of receptors on linear features such as scenic routes and recreational trails can also vary according to the quality and value of the landscape through which they are passing at the time when views of the proposed scheme are likely to be afforded.

^[2] Patrick Kavanagh Centre (2020) Kavanagh Trail Map. Available from: <https://patrickkavanaghcountry.com/index.php/kavanagh-trail-map/>
[Accessed: 26 February 2020]

Designated Scenic Route / Views represent a consensus (through the Development Plan process) on visual amenity within a county. The context and scenic values of such views can vary widely (confined and naturalistic or vast and anthropogenic) and can also change over time and these factors are taken into account in the sensitivity judgements in Table 4.1 1. Key receptors are shown on Figure 4.2 and 4.3.

Table 4.1 1 Assessment of Visual Receptor Sensitivity (Louth and Monaghan)

Receptor Location	Receptor Type	Name	Distance to nearest Route Corridor Boundary	Description of Visual Receptor Sensitivity	Likely Sensitivity
-	Settlements in the Study Area	-	-	Represents a higher concentration of residential visual receptors.	Medium
Louth	Recreational trail	The Lakes Walking Trail	Within corridor	Looped on road trail through drumlins with short views of lakes. Mostly on quiet roads with reasonable tranquillity at sections away from N2. Considerable proportion of trail runs parallel the N2.	Medium
Louth	Tourism and recreation	Knockabbey Castle Demesne	Within corridor	Historic house and gardens open to the public. Enjoys considerable tranquillity and rural amenity. Mature trees in this demesne are identified in the LCDP as Trees and Woodlands of Special Amenity Value and some are also designated as Champion Trees.	High
Monaghan	Tourism and recreation	Nuremore Hotel & Country Golf Club	Within corridor	Hotel guests and golfers will be sensitive to visual changes to the visual amenity afforded by the surrounding landscape – this is part of the attraction for visitors.	High
Monaghan	Recreational trail	Monaghan Way	Approx. 360m	National Way marked linear walking route through drumlins between Inniskeen and Clontibret.	High-Medium
Monaghan	Recreational trail	Town, Avenue & Lakeside Walk	Within corridor	Looped trail links centre of Carrickmacross with the Lough Naglack and Lisanisk Lake Areas of Secondary amenity Value. Receptors on this trail at the naturalistic environs of the Loughs will be highly sensitive to visual change in the form of built structures.	High
Monaghan	Recreational trail	Pilgrims' Way Tin Church Trail Short	Approx. 160m	Trail follows local roads through rural Monaghan. Enjoys tranquillity along most of the route through drumlins and by lakes.	High-Medium
Monaghan	Designated Scenic Route / View	SV20 - View of Slieve Gullion at Taplagh, Broomfield	Within corridor	The view from existing N2 towards Slieve Gullion at Taplagh is largely screened by roadside trees and vegetation.	Medium
Monaghan	Designated Scenic Route / View	SV19 - Distant views of Lough Muckno & Slieve Gullion	Within corridor	Elevated broad views over farmed rolling drumlin hills towards Lough Muckno in the background and with a backcloth of Slieve Gullion.	High

Receptor Location	Receptor Type	Name	Distance to nearest Route Corridor Boundary	Description of Visual Receptor Sensitivity	Likely Sensitivity
Monaghan	Designated Scenic Route / View	SV18 - Distant views of Lough Muckno & Slieve Gullion	Approx. 1.17km	Elevated broad views over farmed rolling drumlin hills towards Lough Muckno in the background and with a backcloth of Slieve Gullion.	High

4.5 Route Corridor Option Comparison

4.5.1 Assessment of Potential Impacts

An assessment of landscape receptor sensitivity at the higher order scale of MCDP and the LCDP Landscape Character Areas, as well as the finer grained scale of 'Landscape Elements' has been provided in Table 4.7 and Table 4.8 of this report respectively. An assessment of visual receptor sensitivity is provided in Table 4.9. The assessment of likely landscape impacts and visual impacts are provided in tabular format in Appendix 4.1. The results of this assessment are summarised in Table 4.12 (Landscape) and 4.13 (Visual), whilst the final summary Table 4.14 combines the results in terms of overall route preference.

In the Landscape Visual Impact Assessment, the likely significance of impact is based on a balance between the sensitivity of the landscape or visual receptor and the magnitude of landscape or visual impact. For the purposes of this Option Selection Report, the importance of the effects on a receptor is also considered in order to differentiate and add weighting to particular impacts. The 'importance' is classified as 'International', 'National', 'Regional' or 'Local'.

4.5.2 Comparison of Options

4.5.2.1 Landscape Comparisons

Table 4.12 Summary of Landscape Assessment Results

	Option A (Yellow)	Option B (Yellow + Blue)	Option C (Green)	Option D (Orange)	Option E (Orange + Link 1 + Green)	Option F (Orange + Link 2 + Green)
Likely significant impact on a <u>landscape character area</u>	No	No	Regional	Regional	Regional	Regional
Likely number of significant impacts on <u>landscape element</u> of national importance	0	0	0	1	1	1
Likely number of significant impacts on <u>landscape element</u> of regional importance	0	0	1	0	0	0
Likely number of significant impacts on <u>landscape element</u> of local importance	2	2	1	0	0	0
<u>Isolated</u> Landscape Significance of Effect	Minor /Slightly Negative	Minor /Slightly Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative
PAG Unit 7.0 Performance Score	3	3	2	2	2	2

As can be seen from Table 4.12, none of the potentially significant landscape impacts identified in Appendix 4.1 relate to receptors of 'International importance', this is the primary reason why none of the Route Corridor Options are deemed to result in an 'Major Negative' effect score. Due to the anticipated effects on the physical landscape (landform and land cover patterns) most Route Corridor Options generate a 'Moderate Negative' effect (performance score of 2) for landscape, while the substantially online Option A (Yellow) and mostly online Option B (Yellow+Blue) generates a 'Minor Negative' impact (performance score of 3). This differential between Route Corridor Options is initially realised at the broader scale of Landscape Character Areas. Substantially offline Route Corridor Options through farmed drumlins with a relatively low intensity of built development and transport infrastructure will generate a noticeable change to prevailing landscape character within the vicinity of the corridor. Whereas, for the substantially online Option A (Yellow) and the mostly online Option B (Yellow+Blue), landscape character is already heavily influenced by the existing N2 road corridor and these are duly allocated higher performance scores in terms of landscape assessment. Although neither Option A (Yellow) or Option B (Yellow+Blue) registered a significant impact on landscape character, Option A (Yellow) is preferred over Option B (Yellow+Blue) as it traces the route of the existing N2 to the east of the settlement of Broomfield, while Option B (Yellow+Blue) passes to the west through less developed drumlin farmland.

This differential pattern between the various options is also replicated in terms of the Landscape Elements. The substantially online Option A (Yellow) and mostly online Option B (Yellow+Blue) both could result in potential significant impacts on a local level at the historic demesnes of Cookstown House and Moynalty House. Whereas, Option D (Orange), E (Orange + Link 1 + Green) and F (Orange + Link 2 + Green) (all with Orange sections) could potentially result in significant impacts at Knockabbey Castle demesne, which contains protections in the LCDP for both Trees and Woodlands of Special Amenity Value and Champion Trees within the extents of the demesne. This is the determining factor that results in them receiving Moderate Negative effect.

Option C (Green), could potentially have significant impacts at two other demesnes at Cookstown House and Arthurstown House, with the latter being highlighted in the LCDP and hence the effect is considered to be regionally important, while the former was identified as part of the desk study for the proposed scheme so is considered to be of local importance. Even though Option C (Green) is deemed likely to significantly impact on two landscape elements, one of regional importance and one of local importance, it remains Minor Negative overall effect because of the lesser value of these receptors when compared to Option D (Orange), E (Orange + Link 1 + Green) and F (Orange + Link 2 + Green).

4.5.2.2 Visual Comparisons

Table 4.13 Summary of Visual Assessment Results

	Option A (Yellow)	Option B (Yellow + Blue)	Option C (Green)	Option D (Orange)	Option E (Orange + Link 1 + Green)	Option F (Orange + Link 2 + Green)
Likely Significant Impact on visual receptors of national importance	0	0	0	1	0	0
Likely Significant Impact on visual receptors of regional importance	1	1	1	1	2	2
Likely Significant Impact on visual receptors of local importance	2	2	0	0	0	0
<u>Isolated</u> Visual Significance of Effect	Minor /Slightly Negative	Minor /Slightly Negative	Minor /Slightly Negative	Moderately Negative	Moderately Negative	Moderately Negative
PAG Unit 7.0 Performance Score	3	3	3	2	2	2

As can be seen from Table 4.13, Option D (Orange) registers a National level potential significant impact as a result of likely views afforded from a section of the Monaghan Way – National Waymarked walking trail. Specific mitigation for this receptor at this location may help reduce the residual effect. The significant regional level impact of Option D (Orange) relates to tourist and recreational receptors at Knockabbey Castle demesne and is shared with equally across Options E (Orange + Link 1 + Green) and F (Orange + Link 2 + Green).

Option E (Orange + Link 1 + Green) and F differ from Option D (Orange) in that they may experience significant impacts at a regional level from the designated Scenic Route *SV19 - Distant views of Lough Muckno & Slieve Gullion*. This receptor also accounts for the only registered impact for Option C (Green).

For Option A (Yellow) and B, regional level significant impacts may occur for Nuremore Hotel & Country Golf Club even though the sensitivity of this receptor to major road infrastructure development is slightly reduced on account of the presence of the adjacent existing N2. Regardless of this it is likely that routing within the 400m corridor and specific mitigation measures will be able to reduce the residual visual impacts on this receptor, whereas it is anticipated that this would not be the case for visual impacts on the designated Scenic Route SV19. Consequently, both Option A (Yellow) and B are categorised as Minor Negative effect, as is Option C (Green). Option B (Yellow+Blue) passes the settlement of Broomfield offline to the west through an open drumlin landscape so there is the potential for cumulative visual impacts related to road infrastructure in the area as some receptors in this area may be able to see both the existing N2 and Option A (Yellow) simultaneously.

4.6 Conclusions

The overall scoring of Route Corridor Options, determined by combining the results of both the landscape impact and visual impact tables, is provided in Table 4.14. There were clear similarities between the scoring for both landscape and visual. The predominantly online Option A (Yellow) and Option B (Yellow+Blue) scored Minor negative for both landscape and visual, largely because landscape character and visual amenity is already strongly influenced by the existing N2 corridor in this case. The remaining options have an increased landscape and visual effects (Moderate Negative) primarily due to their offline nature and are located further away from the existing N2. Options D-F have been assessed to be Moderate Negative impact for both landscape and visual elements largely because of impacts that Options D - F have on the Monaghan Way walking trail and to the tourist and recreational receptors at Knockabbey Castle demesne. Option C (Green) received Moderate adverse effect for Landscape and Minor adverse effect for Visual considerations, however has been determined to have Moderate Negative effect overall.

Table 4.13: Summary of Significance of Effect and Performance Scores for Each Route Corridor Option– Landscape and Visual

Option	PAG Unit 7.0 Significance of Effect	PAG Unit 7.0 Preference Score
Option A (Yellow)	Minor or Slightly Negative	3
Option B (Yellow+Blue)	Minor or Slightly Negative	3
Option C (Green)	Moderately Negative	2
Option D (Orange)	Moderately Negative	2
Option E (Orange + Link 1 + Green)	Moderately Negative	2
Option F (Orange + Link 2 + Green)	Moderately Negative	2

5. Biodiversity - Flora & Fauna

5.1 Introduction

The assessment for this Stage 2 assessment (completed by Scott Cawley Limited) of the proposed scheme, with respect to biodiversity and the ecological environment, was based on the six Route Corridor Options for the N2 Ardee to Castleblayney Road Scheme (N2 A2C). The extent of the overall Study Area for the proposed scheme is presented in Figures 1.1 and 1.2 in Volume 2 of this Option Selection Report.

The principal objectives of this assessment were to:

- Complete a desk study and field surveys to obtain relevant ecological data within the study area for each corridor to inform the assessment;
- Identify, describe and value all relevant ecological receptors which include designated sites for nature conservation and sites of known or potential ecological interest (hereafter referred to as “ecological sites”);
- To evaluate each corridor based on ecological criteria, as per the National Road Authority (NRA) *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (NRA, 2009)⁴⁸ and Chartered Institute for Ecology and Environmental Management (CIEEM) *Guidelines for Ecological Impact Assessment in the UK and Ireland; Terrestrial, Freshwater, Coastal and Marine* (2019)⁴⁹; and
- Assess the significance of the likely impacts of the proposed scheme on each of the biodiversity receptors potentially impacted by each corridor. As per the Transport Infrastructure Ireland (TII) guidance, this step discounted biodiversity receptors or ecological sites where the risk of significant impacts is unlikely considering where the application of standard mitigation and best practice during construction is unambiguous and success is highly likely; and
- To assess each corridor in accordance with Transport Infrastructure Ireland's *Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis* (TII, 2016)⁵⁰.

In fulfilling these objectives, an assessment of the likely or potential impacts of each corridor on ecological receptors was carried out so that an informed comparison of the corridors could be made with the knowledge of the potential ecological consequences.

5.2 Methodology

5.2.1 Desk Study

A detailed desk study was undertaken to identify potential features of ecological importance within the Study Area of the proposed scheme. Relevant ecological data was considered to be ecological receptors which were either confirmed or likely to occur within the Study Area and were deemed to be potentially at risk of impact from individual Route Corridor Options.

Material and resources used as part of the desk study included:

- Online data available on European sites (Special Conservation Areas (SACs) and Special Protection Areas (SPAs)) and nationally designated sites (Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs)) as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie;
- Online data available on European sites and Areas of Special Scientific Interest (ASSIs) from the Northern Ireland Environment Agency (NIEA) www.daera-ni.gov.uk;
- Online data available on protected habitats and species as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie;
- Online data available on protected species as held by the National Biodiversity Data Centre (NBDC) from www.biodiversityireland.ie;

⁴⁸ National Roads Authority (2009) *Guidelines for Assessment of Ecological Impacts of National Roads Schemes*: Revision 2.

⁴⁹ Chartered Institute of Ecology and Environmental Management (2019) *Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine*.

⁵⁰ TII (2016) *Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis*. PE-PAG-02031.

- Online data available on wetland sites as provided by Wetland Surveys Ireland⁵¹ and Foss Environmental Consulting⁵²;
- Online data available on geology, soils and hydrogeology as provided by Geological Survey of Ireland (GSI) www.gsi.ie;
- Online data available on water bodies, water quality and salmonid rivers (Salmonid Regulations S.I. 293) as provided by Environmental Protection Agency (EPA) www.epa.ie;
- Ordnance Survey of Ireland mapping and aerial photography available from www.osi.ie and www.geohive.ie;
- Records of rare and protected flora listed on the Flora Protection Order collected and provided by Botanical Society of Britain and Ireland (BSBI) vice-county recorders;
- Online data available on wintering birds from Irish Wetland Bird Survey (I-WeBS);⁵³
- N2 Clontibret to Northern Ireland Border Road Scheme. Constraints Study Report. March 2010; and
- Information collected as part of the Wetland Survey County Monaghan 2012 and Monaghan Wetland Map 2010 projects provided by Monaghan County Council.

Ecological sites, in this case, were identified based on collation of available existing information, from sources listed above, and focussed on the potential ecological value for the habitats present; the boundaries of which were initially defined based on interpretation of orthophotography and collation of available existing habitat information.

5.2.2 Consultation

The following organisations/individuals with relevance to collating information on ecological sites were consulted:

- National Parks & Wildlife Service (NPWS); and
- Heritage Officers, Monaghan County Council and Louth County Council;

5.2.3 Field Surveys

The aim of the field surveys was a ground truthing exercise to verify the orthophotography interpretation and selection of ecological sites, refine site boundaries and to capture additional ecological sites not identified during the desk study. Surveys from publicly accessible roads and land in the Study Area were undertaken in February 2020. Weather conditions were suitable for the surveys and visibility was generally good allowing views greater than 1km. Access and coverage of the Study Area was facilitated via local public road network and publicly accessible land. Direct observations of ecological sites were made from the roadside using binoculars, if necessary. In some cases, ecological sites were viewed from a significant distance or could not be viewed at a distance due to the local topography or limited public road network access. However, assumptions have been made on the value of those ecological sites based on local information gathered during the field surveys and desk study, and from the Public Consultation process.

Where possible habitat types were classified using *A Guide to Habitats in Ireland* (Fossitt, 2000)⁵⁴ and the likelihood/potential for Annex I habitat types was inferred where possible based on the professional judgement of the surveyor, with reference to the *Interpretation manual of European Union Habitats EUR 28* (CEC, 2013)⁵⁵. A precautionary approach was adopted with regards to the identification of the potential presence of Annex I habitats within an ecological site.

⁵¹ Available at <https://wetland.maps.arcgis.com/apps/View/index.html?appid=e13b75c3bcab4932b992aa0169aa4a32&extent=-11.9317,51.0620,-3.9117,55.6465> [Last accessed 24 March 2020]

⁵² Available at <http://www.fossenvironmentalconsulting.com/wildlife-photography/map-of-irish-wetlands---20/index.html> [Last accessed 24 March 2020]

⁵³ Available at <https://bwi.maps.arcgis.com/apps/View/index.html?appid=1043ba01fcb74c78bc75e306eda48d3a> [Last accessed 24 March 2020]

⁵⁴ Fossitt, J.A. (2000) *A Guide to Habitats in Ireland*. Heritage Council, Kilkenny.

⁵⁵ CEC. (Commission of the European Communities) (2013) *Interpretation manual of European Union Habitats EUR28*. European Commission, DG Environment.

The precautionary approach applied to the evaluation of the ecological sites and the assessment of potential impacts associated with the Route Corridor Options has addressed any limitations imposed due to the field surveys being undertaken outside the optimal season for habitat surveys and the restricted access to many of the ecological sites.

5.2.4 Ecological Valuation

Ecological sites have been valued with regard to ecological valuation set out in *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (NRA, 2009) and *Guidelines for Ecological Impact Assessment in the UK and Ireland; Terrestrial, Freshwater, Coastal and Marine* (CIEEM, 2019).

All Annex I habitats that lie outside of European sites, are valued as being of national importance, given that these habitats are of high conservation concern. However, priority Annex I habitat types are valued as being of international importance given that they are of the highest conservation concern at a European level (*i.e.* natural habitat types in danger of disappearance⁵⁶).

The overall ecological valuation for each of the ecological sites was based upon the highest value receptor known to be present or potentially present within the ecological site at the time of this assessment. Although a given Route Corridor Option may impact upon a given ecological site, the direct impact(s) on the ecological site may not necessarily directly impact on the highest value habitat receptor(s).

The comparative evaluation of Route Corridor Options was assisted by scoring of impacts to sensitive receptors using the Stage 2 project appraisal matrix based on that shown in the *Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis*⁵⁷. An assessment has been undertaken on each Route Corridor Option to include both quantitative and qualitative assessment. The overall effect of each Route Corridor Option has been scored based on the seven-point scale as shown in Table 5.1 and a number has been assigned according to the level of significance of the effect. To interpret the key for scoring effects and to assess the ecological effect for each corridor, the ecological criteria set out in Table 5.1 are applied, with the use of professional judgement as to the likelihood of significant effects occurring.

Table 5.1: Key for Scoring Effects

Score	Significance of Effect	Ecological Criteria
7	Major or Highly Positive	If a corridor increases the biodiversity value, condition or extent of one or more ecological sites valued as international or national importance
6	Moderately Positive	If a corridor increases the biodiversity value, condition or extent of one or more ecological sites valued as county importance, or numerous ecological sites valued as local high importance
5	Minor or Slightly Positive	If a corridor increases the biodiversity value, condition or extent of a small number of ecological sites valued as local high importance
4	Not Significant or Neutral	If a corridor avoids any direct or indirect impacts to ecological sites valued as international, national, county or local high importance
3	Minor or Slightly Negative	If a corridor impacts directly on a small number of ecological sites valued as local high importance
2	Moderately Negative	If a corridor impacts directly on one or more ecological sites valued as county importance, or numerous ecological sites valued as local high importance
1	Major or Highly Negative	If a corridor impacts directly on one or more ecological sites valued as international or national importance

⁵⁶ From the definition of "priority natural habitat types" in Article 1(d) of the Habitats Directive.

⁵⁷ TII. (2016). Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis. PE-PAG-02031.

Each Route Corridor Option was assessed based on the potential impacts likely to occur on the identified ecological sites. Potential impacts on ecological sites have been discounted where the risk of significant impacts occurring is considered unlikely due to the implementation of standard mitigation and best practice during construction.

5.3 Existing Environment

This section describes the ecological receptors identified within the Study Area.

5.3.1 Designated Sites

There are 51 designated areas for nature conservation located within the vicinity (*i.e.* within 15km of the study area), nine of which are located downstream of the Study Area:

- Three Special Areas of Conservation (SACs);
- Two Special Protection Areas (SPAs);
- 33 proposed Natural Heritage Areas (pNHAs); and
- 13 Areas of Special Scientific Interest (ASSIs).

There are no Natural Heritage Areas (NHAs) within 15km of the Study Area. There are no European sites located within the study area. However, there are:

- Nine pNHAs located within or partially within the Study Area;
- Three European sites downstream of the study area, *i.e.*: Dundalk Bay SAC, Dundalk Bay SPA and Stabannan-Braganstown SPA (the former via the River Fane river catchment and the latter two via the Glyde River catchment); and
- Six pNHAs located downstream of the Study Area, *i.e.* Dundalk Bay pNHA, Muckno Lake pNHA, Lough Smiley pNHA and Lough Ross (via the River Fane river catchment) and Stabannan-Braganstown pNHA and Ballyboe Lough pNHA (via the Glyde River catchment).

The designated areas for nature conservation are listed below in Tables 5.2 and 5.3 along with their location within the Study Area and a summary of the reasons for site designation. Their locations are also shown on Figures 5.1 and 5.2 .2of Volume 2 of this Option Selection Report.

Table 5.2 European sites (SACs and SPAs) located within 15km of the study area and those located downstream of the study area.

Site Name	Distance	Reasons for Designation – Qualifying Interests (QIs) or Special Conservation Interests (SCIs) (*Priority Annex I Habitats)
Special Areas of Conservation (SACs)		
Dundalk Bay SAC [000455] NPWS (2011) <i>Conservation Objectives: Dundalk Bay SAC 000455 and Dundalk Bay SPA 004026</i> . Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	c. 10.1km east of the study area.	[1130] Estuaries [1140] Mudflats and sandflats not covered by seawater at low tide [1220] Perennial vegetation of stony banks [1310] <i>Salicornia</i> and other annuals colonising mud and sand [1330] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1410] Mediterranean salt meadows (<i>Juncetalia maritimi</i>)
River Boyne And River Blackwater SAC [002299] NPWS (2018) <i>Conservation objectives for River Boyne and River Blackwater SAC [002299]</i> . Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht.	c. 14.7km south of the study area.	[7230] Alkaline fens [*91E0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) [1099] River lamprey <i>Lampetra fluviatilis</i> [1106] Atlantic salmon <i>Salmo salar</i> [1355] Otter <i>Lutra lutra</i>
Slieve Gullion SAC [UK0030277] NIEA (2017) <i>Slieve Gullion SAC Conservation Objectives</i> . V2.1. Department of Agriculture, Environment and Rural Affairs.	c. 14.7km north-east of the study area.	[4030] European dry heaths
Special Protection Areas (SPAs)		
Stabannan-Braganstown SPA [004091] NPWS (2018) <i>Conservation objectives for Stabannan-Braganstown SPA [004091]</i> . Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht	c. 3km east of the study area.	Greylag Goose (<i>Anser anser</i>) [A043] - wintering

Site Name	Distance	Reasons for Designation – Qualifying Interests (QIs) or Special Conservation Interests (SCIs) (*Priority Annex I Habitats)
Dundalk Bay SPA [004026] NPWS (2011) <i>Conservation Objectives: Dundalk Bay SAC 000455 and Dundalk Bay SPA 004026.</i> Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	c. 10.1km east of the study area.	Great Crested Grebe (<i>Podiceps cristatus</i>) [A005] – wintering Greylag Goose (<i>Anser anser</i>) [A043] – wintering Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] – wintering Shelduck (<i>Tadorna tadorna</i>) [A048] – wintering Teal (<i>Anas crecca</i>) [A052] – wintering Mallard (<i>Anas platyrhynchos</i>) [A053] – wintering Pintail (<i>Anas acuta</i>) [A054] – wintering Common Scoter (<i>Melanitta nigra</i>) [A065] – wintering Red-breasted Merganser (<i>Mergus serrator</i>) [A069] – wintering Oystercatcher (<i>Haematopus ostralegus</i>) [A130] – wintering Ringed Plover (<i>Charadrius hiaticula</i>) [A137] – wintering Golden Plover (<i>Pluvialis apricaria</i>) [A140] – wintering Grey Plover (<i>Pluvialis squatarola</i>) [A141] – wintering Lapwing (<i>Vanellus vanellus</i>) [A142] – wintering Knot (<i>Calidris canutus</i>) [A143] – wintering Dunlin (<i>Calidris alpina</i>) [A149] – wintering Black-tailed Godwit (<i>Limosa limosa</i>) [A156] – wintering Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] – wintering Curlew (<i>Numenius arquata</i>) [A160] – wintering Redshank (<i>Tringa totanus</i>) [A162] – wintering Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] Common Gull (<i>Larus canus</i>) [A182] – wintering Herring Gull (<i>Larus argentatus</i>) [A184] – wintering Wetland and Waterbirds [A999]

Table 5.3 Proposed Natural Heritage Areas and Areas of Special Scientific Interest located within 15km of the study area.

Site Name	Distance	Features of Interest ⁵⁸
Proposed Natural Heritage Areas (pNHAs)		
Creevy Lough pNHA [001599]	Within study area, north of Carrickmacross, c. 1km east of the nearest corridors Option A and Option B.	Lake and lakeshore habitats
Lough Egish pNHA [001605]	Partially within study area, north-west of Carnroe, c. 3.7km east of the nearest corridors Option E and Option F.	Lake. Wetland site supporting winter bird populations. Raised bog also present. Plant species of note present: greater spearwort <i>Ranunculus lingua</i> and shoreweed <i>Littorella uniflora</i> .
Lough Fea Demesne pNHA [000560]	Partially within study area, directly south-west of Carrickmacross, c. 1.4km east of nearest corridors Option A and Option B	Lake, mixed woodland, calcareous grassland and marsh
Lough Naglack pNHA [000561]	Partially within study area near Carrickmacross and partially within corridors Option A and Option B	Calcareous lake, calcareous grassland, marsh and mixed woodland
Louth Hall and Ardee Woods [001616]	Partially within study area, north of Ardee and south-west of Tallanstown, c. 110m north-east of nearest corridors Option D and Option E	Mixed, planted and semi-natural deciduous dry/wet woodland and lake
Moynalty Lough pNHA [001608]	Within study area, south-east of Carrickmacross, c. 138m north-east of nearest corridors: Option A and Option B	Lake and wet woodland. Wetland site supporting bird populations.
Muckno Lake pNHA [000563]	Partially within study area, north/north-east of Castleblayney, c. 365m north-east of nearest corridor: Option D	Lake and wet woodland. Wetland site supporting bird populations. Important for invertebrates.
Reaghstown Marsh pNHA [001828]	Within study area, west of Ballybonia, c. 1.7km south-west of nearest corridors: Option A and Option B	Marsh, lake and willow scrub
Spring and Corcrin Loughs pNHA [001671]	Within study area, east of Carrickmacross, c. 480m of corridors: Option A and Option B	Calcareous lakes, acidic grassland, wet grassland, marsh and scrub
Ardee Cutaway Bog pNHA [001454]	c. 43m south-west of the study area	Cutaway raised bog
Nafarty Fen pNHA [002077]	c. 458m from study area, near Carrickmacross	Wetland site
Lough Ross pNHA [001495]	c. 613m east of the study area	Lake and marsh
Ballyhoe Lough pNHA [001594]	c. 737m west of the study area	Acidic/peaty lake; wetland site supporting bird populations

⁵⁸ Information taken from the site synopses, where available, from <https://www.npws.ie/protected-sites>.

Site Name	Distance	Features of Interest ⁵⁸
Corstown Loughs pNHA [000552]	c. 800m south-west of the study area	Lakes, wet woodland, cutaway bog and wet grassland. Rare plant species present: lesser bulrush <i>Typha angustifolia</i> , tufted-sedge <i>Carex elata</i> and marsh fern <i>Thelypteris palustris</i>
Lough Smiley pNHA [001607]	c. 1.1km north of the study area	Marsh, fen, raised bog, cutover bog mosaic and wet woodland
Kildemock Marsh pNHA [001806]	c. 2.5km south of the study area	Wetland site
Drumakill Lough pNHA [001600]	c. 2.7km north-east of the study area	Lake, marsh and wet grassland
Stabannan-Braganstown pNHA [000456]	c. 2.9km east of the study area	See above under Stabannan-Braganstown SPA
Drumcah, Toprass And Cortial Loughs pNHA [001462]	c. 3.6km east of the study area	Lakes and marsh
Mentrim Lough pNHA [001587]	c. 4km south of the study area	Lake. Rare plant species present: marsh fern <i>Thelypteris palustris</i> .
Darver Castle Woods pNHA [001461]	c. 5.8km east of the study area	Wet deciduous woodland
Tassan Lough pNHA [001666]	c. 6.3km north of the study area	Lake and wet grassland
Mellifont Abbey Woods pNHA [001464]	c. 6.8km south-east of the study area	Mixed woodland, wet woodland, grassland and lake. Rare plant species present: wintergreen <i>Pyrola</i> spp. Red-list invertebrate species present: Pyrenean snail <i>Semilimax pyrenaicus</i> .
Stephenstown Pond pNHA [001803]	c. 7.3km east of the study area	Artificial pond supporting a variety of invertebrate species
Loughbawn House Loughs pNHA [001595]	c. 7.5km west of the study area	Lakes, mixed woodland and wet grassland. Wetland site supporting winter bird populations.
Cordoo Lough pNHA [001268]	c. 7.9km north-west of the study area	Lake and wetland site
Black and Derrygoony Loughs pNHA [001596]	c. 9.9km west of the study area	Lakes. Wetland site supporting winter bird populations.
Dundalk Bay pNHA [000455]	c. 10.1km east of the study area	See above under Dundalk Bay SAC and Dundalk Bay SPA
Barmeath Woods pNHA [001801]	c. 10.5km south-east of the study area	Deciduous woodland
Dromore Lakes pNHA [000001]	c. 10.6km west of the study area	Lakes; wetland site supporting winter bird populations
Breakey Loughs pNHA [001558]	c. 11.5km south-west of the study area	Lakes, marsh, wet woodland, cutover bog and wet grassland. Wetland site supporting bird populations.
Gibson's Lough pNHA [001604]	c. 12km west of the study area	Lake and marsh
King William's Glen pNHA [001804]	c. 14.7km south-east of the study area	No site synopsis available; however, according to the <i>National Survey of Native Woodlands 2003-2008</i> (Perrin <i>et al.</i> , 2008), site comprises mixed broadleaved woodland, wet willow-alder-ash woodland and riparian woodland.
Areas of Special Scientific Interest (ASSIs)		
Tullyvard ASSI [ASSI216]	c. 2.4km east of the study area	Lowland hay meadow.
Drumlougher Lough ASSI [ASSI205]	c. 4.2km east of the study area	Invertebrate assemblage and fen habitat.
Lurgan Lough ASSI [ASSI204]	c. 6.9km east of the study area	Invertebrate assemblage, fen habitat and eutrophic standing waters.

Site Name	Distance	Features of Interest ⁵⁸
Loughaveely ASSI [ASSI206]	c. 6.9km east of the study area	Invertebrate assemblage and fen habitat.
Drumcarn ASSI [ASSI182]	c. 8.7km north of the study area	Invertebrate assemblage and fen habitat.
Crossbane Lough ASSI [ASSI183]	c. 9.9km north of the study area	Fen habitat.
Cashel Loughs ASSI [ASSI189]	c. 10.3km east of the study area	Invertebrate assemblage and fen habitat.
Straghans Lough ASSI [ASSI179]	c. 10.8km north of the study area	Invertebrate assemblage and fen habitat.
Mullaghbane ASSI [ASSI291]	c. 11km east of the study area	Geology.
Glendesha ASSI [ASSI292]	c. 12km east of the study area	Geology.
Carrickastickan ASSI [ASSI215]	c. 13.6km east of the study area	Lowland hay meadow.
Slieve Guillion ASSI [ASSI215]	c. 14.7km east of the study area	Dry heath and fen habitats.
Cloghinny ASSI [ASSI293]	c. 15km east of the study area	Geology.

5.3.2 Records of Protected, Rare and Other Notable Species

5.3.2.1 Flora

Desktop records of protected, rare and other notable plant species are listed below in Table 5.4. Where a grid reference is available for the record, the location is mapped on Figure 5.22, Volume 2 of this Option Selection Report.

Table 5.4 Records of protected, red-listed⁵⁹ or notable flora within the study area.

Common name/scientific name ⁶⁰	Legal status ⁶¹	Red List Status ^{62,63}	Source
<i>Aulacomnium androgynum</i> (A type of moss)	n/a	Vulnerable	NBDC online database record
Basil thyme <i>Clinopodium acinos</i>	FPO	Near threatened	BSBI vice-county recorder record
Green-winged Orchid <i>Anacamptis morio</i>	n/a	Vulnerable	BSBI vice-county recorder record
Blunt-fruited Pottia <i>Tortula modica</i>	n/a	Vulnerable	NBDC online database record ⁶⁴

5.3.2.2 Fauna

There are a number of European and nationally protected mammal, bird, fish, amphibian and reptile species, and/or species of a high conservation concern, which have been recorded within the Study Area. These include:

- Bat species⁶⁵ - brown long-eared bat *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus*, Daubenton's bat *Myotis daubentonii*, Leisler's bat *Nyctalus leisleri*, Natterer's bat *M. nattereri* and soprano pipistrelle *Pipistrellus pygmaeus*;
- Other mammal species – otter *Lutra lutra*, badger *Meles meles*, hedgehog *Erinaceus europaeus*, Irish hare *Lepus timidus hibernicus*, pine marten *Martes martes*, red squirrel *Sciurus vulgaris*, pygmy shrew *Sorex minutus* and stoat *Mustela erminea*;
- Amphibian species - common frog *Rana temporaria*;
- Reptile species - common lizard *Lacerta vivipara*;
- Fish species – including, Atlantic salmon *Salmo salmar* and European eel *Anguilla anguilla*;
- Invertebrates – e.g. marsh fritillary butterfly *Euphydryas aurinia*; and
- Birds – a range of breeding and wintering birds, including species listed on Annex I of the Birds Directive (e.g. kingfisher *Alcedo atthis* and merlin *Falco columbarius*), Special Conservation Interest bird species and species on the Birds of Conservation Concern in Ireland (BoCCI) Red and Amber Lists⁶⁶.

⁵⁹ Records of Red-list species only include those that are in following International Union for Conservation of Nature (IUCN) categories: Vulnerable, Endangered, Critically Endangered, Extinct in the Wild and Extinct. Red List species in the IUCN categories Near Threatened and Least Concern have not been included as they are of less conservation concern.

⁶⁰ Nomenclature follows that of *New Flora of the British Isles Fourth Edition* (Stace, 2019) and *Mosses and Liverworts of Britain and Ireland: A Field Guide* (British Bryological Society, 2010).

⁶¹ HDII/IV/V = Habitats Directive Annexes II/IV/V; FPO = Flora (Protection) Order, 1999; WA = Wildlife Acts

⁶² *Ireland Red List No. 10: Vascular Plants* (Wyse Jackson et al., 2016)

⁶³ *Ireland Red List No. 8: Bryophytes* (Lockhart et al., 2012)

⁶⁴ National Biodiversity Data Centre (NBDC) records (<https://maps.biodiversityireland.ie/Map>) accessed in March 2020.

⁶⁵ Bat roost records collated by Bat Conservation Ireland (BCI) are available only at a resolution of approximately 1km². These records have not been included or referred to in this assessment due to their low resolution which precludes any comparative assessment of potential impacts on bat roosts from the Route Corridor Options.

⁶⁶ According to *Birds of Conservation Concern in Ireland 2014-2019* (Colhoun & Cummins, 2013).

In addition to the above records, the Erne-Annalee freshwater pearl mussel *Margaritifera margaritifera* sensitive area is partially located within the north-eastern section of the study area. None of the Route Corridor Options lie within or upstream of the Erne-Annalee freshwater pearl mussel *Margaritifera margaritifera* sensitive area and there is therefore no risk of indirect impacts to this species from any Route Corridor Option.

The full results of the desktop study are provided in Appendix 5.1.

5.3.3 Ecological Sites (Habitats)

All available information relating to habitats within the Study Area was reviewed and, where possible, existing habitat classifications were verified during field surveys. The most extensive habitat information available for the Study Area was information collected as part of the Wetland Survey County Monaghan 2012 and Monaghan Wetland Map 2010 projects provided by Monaghan County Council. Wetland information was also obtained for County Louth. This information, along with data collected in the field, was used to define the boundaries of the ecological sites. Wetland sites in County Louth were mapped using information provided by Wetland Surveys Ireland⁶⁷ and Foss Environmental Consulting and surveys from publicly accessible land.

A total of 289 ecological sites were identified within the study area (see Appendix 5.2 for a full list of these sites); 63 of which are located within or partially within one or more Route Corridor Options(s) (See Table 5.5 below for a description of the habitats present, or likely to be present, within each ecological site, including the potential presence of Annex I habitat types. Also, see Figure 5.2 for a location map of ecological sites within each of the corridors in the Study Area).

A range of habitat types are present across the study area. The more ecologically valuable habitats present comprise lakes with fringing lake shore habitats of reed swamp and fen, in parts grading into species-rich grassland, freshwater marsh and/or wet woodland/wet willow carr. There are also patches of wet woodland in isolation or along the banks of rivers and/or streams. In addition, there are areas of bog woodland in association with scrub and, in parts, heathland. Other habitats present include: areas of dry semi-natural broadleaved woodland; planted deciduous or mixed woodland, often found in large private gardens/estates; and, large areas of dense scrub. There are hedgerows and treelines located across the entire Study Area, which often form boundaries to fields of improved agricultural and improved wet grassland fields.

Table 5.5 Ecological sites located within or partially within the corridors.

Ecological Site No.	Description	Ecological Value	Option
1	Semi-improved wet grassland and dense scrub.	Local High	A, B, D
2	Dense scrub.	Local High	D
3	Wet woodland (potentially Alluvial woodland [*91E0] ⁶⁸), dense scrub, exposed rock and improved wet grassland.	International	D
4	Planted broadleaved woodland.	Local High	A, B
5	Sparse semi-natural broadleaved woodland and semi-natural/improved grassland	Local High	D

⁶⁷ Available at <https://wetland.maps.arcgis.com/apps/View/index.html?appid=e13b75c3bcab4932b992aa0169aa4a32&extent=-11.9317,51.0620,-3.9117,55.6465> [Last accessed 24 March 2020]

⁶⁸ * Indicates a priority Annex I habitat under the Habitats Directive

Ecological Site No.	Description	Ecological Value	Option
6	Potentially species-rich wet grassland, large dense patches of scrub and semi-natural broadleaved woodland.	County	A, B
7	Semi-natural broadleaved woodland.	Local High	D
8	Semi-improved wet grassland and dense scrub.	Local High	A, B
9	Planted mixed woodland along at top of the banks of Annahale stream.	Local High	C, E, F
10	Planted broadleaved woodland.	Local High	C, E, F
11	Planted broadleaved woodland.	Local High	A
12	Dense scrub.	Local High	B
13	Large area of semi-natural broadleaved woodland.	County	B
14	Species-rich wet grassland (potentially <i>Molinia</i> meadows [6410]) and wet woodland/willow carr (Alluvial woodland [*91E0]).	International	C, E, F
15	Edengirley fen, comprising fen (potentially <i>Cladium</i> fen [*7210] and alkaline fen [7230]) and freshwater marsh habitats.	International	A, B
16	Semi-natural wet grassland and area of semi-natural broadleaved woodland	County	F
17	Drumharrif Lough with surrounding habitats of reed swamp, fen (potentially <i>Cladium</i> fen [*7210] and alkaline fen [7230]) and semi-natural wet grassland	International	A, B
18	Semi-natural broadleaved woodland.	Local High	A, B
19	Dystrophic lake Coolair Lough and Tullymackilmartin watercourse with adjacent habitats of reed swamp, fen, wet grassland, freshwater marsh, wet woodland and transition mires and quaking bog (potentially <i>Cladium</i> fen [*7210], alluvial woodland [*91E0], <i>Molinia</i> meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]).	International	D, F
20	Planted broadleaved woodland.	Local High	A, B
21	Semi-natural broadleaved woodland.	Local High	A, B
22	Acid oligotrophic Altiduff Lough and unnamed lake with surrounding habitats of reed swamp, fen, species-rich wet grassland, freshwater marsh and bog/wet woodland (potentially <i>Cladium</i> fen [*7210], bog woodland [*91D0] and alluvial woodland [*91E0], <i>Molinia</i> meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]).	International	D, F

Ecological Site No.	Description	Ecological Value	Option
23	Planted broadleaved woodland.	Local High	A, B
24	Semi-natural broadleaved woodland and dense scrub.	Local High	D, F
25	Donaghmoynne fen and transition mire and quaking bog habitats (potentially <i>Cladium</i> fen [*7210], transition mires [7140] and alkaline fen [7230]).	International	A, B
26	Planted mixed woodland.	Local High	A, B
27	Semi-natural broadleaved woodland.	Local High	A, B
28	Linear broadleaved woodland along the banks of River Rossdreenagh, possibly wet woodland (potentially Alluvial woodland [*91E0]). In close proximity to Tober Lasair Spring and Aghavilla Spring.	International	A, B
29	Acid oligotrophic lake Blittoge Lough with surrounding habitats of reed swamp, fen and wet woodland (potentially <i>Cladium</i> fen [*7210], alluvial woodland [*91E0], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]).	International	D, F
30	Freshwater marsh, transition mire and quaking bog, semi-natural broadleaved woodland, possibly wet woodland, and dense scrub (potentially Alluvial woodland [*91E0] and transition mires [7140]). Nafarty River flowing along western boundary of ecological site.	International	A, B
31	Semi-natural broadleaved woodland.	Local High	C, E
32	Wet woodland (potentially Alluvial woodland [*91E0]) along the banks of the River Rossdreenagh.	International	C, E
33	Heath, bog woodland and dense scrub (potentially dry heath [4030] and bog woodland [*91D0]).	International	D, F
34	Ross Lough with surrounding habitats of reed swamp, fen, species-rich grassland and wet woodland (potentially <i>Cladium</i> fen [*7210], alluvial woodland [*91E0], <i>Molinia</i> meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]).	International	D, F
35	Lough Naglack pNHA. Calcareous lake with surrounding habitats of reed swamp, fen, wet grassland, freshwater marsh and mixed woodland, possibly wet woodland (potentially <i>Cladium</i> fen [*7210], alluvial woodland [*91E0], <i>Molinia</i> meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]).	International	A, B

Ecological Site No.	Description	Ecological Value	Option
36	Acid oligotrophic lake and Drumever wet woodland (potentially <i>Cladium</i> fen [*7210], alluvial woodland [*91E0], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]).	International	A, B
37	Semi-natural broadleaved woodland, including bog woodland (potentially Bog woodland [*91D0]). River Radrumskean to the north.	International	C, E
38	Semi-improved wet grassland.	Local High	C, E
39	Semi-natural broadleaved woodland.	Local High	A, B
40	Lake with surrounding habitats of reed swamp, fen, species-rich wet grassland and wet woodland (potentially <i>Cladium</i> fen [*7210], alluvial woodland [*91E0], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]).	International	D, F
41	Acid oligotrophic lake Lisnashannagh Lough with surrounding habitats of reed swamp, fen, species-rich wet grassland and wet woodland/willow carr (potentially <i>Cladium</i> fen [*7210], alluvial woodland [*91E0], <i>Molinia</i> meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]). River Aclint flows through the ecological site.	International	A, B
42	Wet woodland (potentially Alluvial woodland [*91E0]).	International	C, E
43	Planted broadleaved woodland.	Local High	A, B
44	Planted broadleaved woodland.	Local High	A, B
45	Acid oligotrophic lake Clonturk (Duffs) Lough with surrounding habitats of reed swamp, fen and wet woodland (potentially <i>Cladium</i> fen [*7210], alluvial woodland [*91E0], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]).	International	A, B
46	Planted broadleaved woodland.	Local High	A, B
47	Semi-natural broadleaved woodland including bog woodland and oak-ash-hazel woodland and possibly wet woodland and poor fen (bog woodland [*91D0] and possibly dry heath [4030]). Some areas cut. Drumboory River present along western section.	International	A, B
48	Planted broadleaved woodland.	Local High	A, B
49	Wet woodland (potentially Alluvial woodland [*91E0]) along the River Glyde.	International	C
50	Wet woodland (potentially Alluvial woodland [*91E0]) along the River Glyde.	International	C

Ecological Site No.	Description	Ecological Value	Option
51	Planted mixed woodland.	Local High	D, E, F
52	Acid oligotrophic lake Annahean Lough, with surrounding habitats of reed swamp, fen and wet grassland, transitioning into semi-natural broadleaved woodland (potentially <i>Cladium</i> fen [*7210], alluvial woodland [*91E0], <i>Molinia</i> meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]). It flows into Drumgeeny River.	International	A, B
53	Species-rich wet grassland (potentially <i>Molinia</i> meadows [6410]) and freshwater marsh.	National	C
54	Heathland, bog woodland and dense scrub (potentially bog woodland [*91D0] and dry heath [4030]).	International	A, B
55	Reed swamp, fen, species-rich grassland and wet woodland (potentially <i>Cladium</i> fen [*7210], alluvial woodland [*91E0], <i>Molinia</i> meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]).	International	D, E, F
56	Species-rich wet grassland (potentially <i>Molinia</i> meadows [6410]).	National	C
57	Artificial pond with surrounding wet habitats.	Local High	C
58	Lake with surrounding habitats of reed swamp, fen, species-rich wet grassland and wet woodland/willow carr (potentially <i>Cladium</i> fen [*7210], alluvial woodland [*91E0], <i>Molinia</i> meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]).	International	C
59	Wet woodland (potentially Alluvial woodland [*91E0]) with Rathory River flowing along its western section.	International	A, B
60	Planted mixed woodland.	Local High	A, B, C
61	Planted mixed woodland.	Local High	A, B, C
62	Freshwater marsh and wet woodland (potentially alluvial woodland [*91E0]).	International	A, B, C
63	Species-rich wet grassland (potentially <i>Molinia</i> meadows [6410]).	National	A, B

5.3.4 Summary

The most significant ecological receptors within the Study Area with respect to the option assessment are those ecological sites which contain habitats that may correspond to priority Annex I habitat types, followed by those which contain habitats that may correspond to non-priority Annex I habitats, and proposed Natural Heritage Areas.

Although other ecological receptors (*i.e.* mammals, birds, fish, invertebrates, amphibians and reptiles) were considered during the selection of ecological sites, however this information did not drive the option assessment process as these receptors are likely to be relatively ubiquitous across the Study Area and likely to be similarly affected by all Route Corridor Options. Additionally, the ecological sites identified, in particular those comprising wetland complexes with a suite of habitat types, are likely to support populations of a range of these ecological receptors.

5.4 Route Corridor Option Comparison

5.4.1 Introduction

This section details the results of the Stage 2 assessment of the six Route Corridor Options of the proposed scheme with respect to the ecological receptors identified in Section 5.3 of this report. Each corridor, which is 400m wide, is presented in Figure 1.2, Volume 2 of this Option Selection Report.

5.4.2 Assessment of Potential Impacts

The total number of ecological sites valued as being of international, national, county or local high importance present within the corridor of each option is provided in Table 5.6 below.

Table 5.6 Total number of ecological sites valued as being of international, national, county and local high importance within the Route Corridor Options

	Number of Ecological Sites per Option					
	Option A (Yellow)	Option B (Yellow + Blue)	Option C (Green)	Option D (Orange)	Option E (Orange + Link 1+ Green)	Option F (Orange + Link 2+ Green)
Number of ecological sites of international importance	14	14	8	8	5	8
Number of ecological sites of national importance	1	1	2	0	0	0
Number of ecological sites of county importance	1	2	0	0	0	1
Number of ecological sites of local higher importance	17	17	7	6	5	4
Total number of ecological sites	33	34	17	14	10	13

Each Route Corridor Option crosses ecological sites valued as being of international importance; therefore, based on the assessment of the entire 400m wide corridor, it has been determined that all Route Corridor Options could result in a 'Major Negative' effect on biodiversity as a result of direct impacts on these ecological sites, primarily due to direct habitat loss (see Table 5.1 for a description of ecological criteria). However, it should be noted that the 400m corridor has been defined for this Phase 2 design stage only and the actual road alignment will be narrower for the Preferred Route Corridor Option, which will be progressed during the Phase 3 design process when the initial draft alignment is refined and the land take required to deliver the project is defined.

Notwithstanding the above, with best practice methodologies applied during construction, it is considered at this initial stage of assessment that none of the Route Corridor Options are likely to result in any significant indirect impacts to any designated areas, or adversely affect the integrity of any European sites located downstream of the Study Area as a result of potential water quality effects in either the Fane catchment, Glyde catchment, Castletown Estuary and/or Dundalk Bay. Likewise, it is considered at this initial stage of assessment has been assumed that the proposed scheme will not result in any direct or indirect impacts on lake habitats present within any of the corridors. Therefore, the presence of European sites and nationally designated sites (NHAs and pNHAs), or any other ecological receptors downstream of the Route Corridor Options, or lake habitat within any of the corridors, did not influence the option assessment.

The assessment of potential impacts associated with each respective Route Corridor Option is described in detail below and commentary is provided with regards to the *potential* to reduce the level of impact as a result of the development and refinement of the indicative working road alignment in the subsequent stages of the proposed scheme development (i.e. Phase 3 – Design and Environmental Evaluation). Locations of the various ecological sites referred to below, relative to the Route Corridor Options, are shown in Figures 5.1 and 5.2, Volume 2 of this Option Selection Report.

At the next Phase of the project, in-line with TII and CIEEM guidance, further assessment will be undertaken on the Preferred Route Corridor to help to minimise the effects as far as possible. Surveys will be undertaken of the affected ecological site to clarify their ecological value and routing and mitigation can be used to minimise the effects as far as possible. Further measures such as habitat compensation will also be considered.

5.4.2.1 Option A (Yellow)

Based on the assessment of the 400m wide corridor, Option A (Yellow) may impact directly on up to a total of 14 ecological sites valued as being of international importance with an indicative total area⁶⁹ of up to c. .1ha 25.2ha and, therefore, could potentially result in a major negative effect on biodiversity. There is one nationally designated site of nature conservation, Lough Naglack pNHA (ecological site 35⁷⁰), is located partially within the corridor of Option A (Yellow). This pNHA is adjacent to the existing N2 near to Carrickmacross. The priority Annex I habitats that may be affected by Option A (Yellow) include *Cladium* fen [*7210]⁷¹, bog woodland [*91D0] and alluvial woodland [*91E0]; the non-priority Annex I habitats that may be affected include dry heath [4030], *Molinia* meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230].

Direct impacts on all of these 14 ecological sites valued as being of international importance may be avoided through the routing of the proposed scheme within the 400m corridor, which would will be done at the next phase of the project if Option A (Yellow) is selected as the Preferred Route Corridor. For instance, Lough Naglack pNHA (ecological site 35) is located within the Option A (Yellow) 400m corridor as it is adjacent to the existing N2.

⁶⁹ This is an indicative total area of habitat loss within the ecological site valued as being of international importance. Although the ecological site may be valued as internationally important, the area within the overlap between the corridor and the ecological site may not, in all cases, comprise a habitat type of international importance (e.g. a priority Annex I habitat type). The description and valuation of the ecological sites is based upon the level of access and site survey described above in Section 5.2.3.

⁷⁰ The ecological site code refers to those presented in Table 5.5 of this report.

⁷¹ Abbreviated Annex I habitat names are after NPWS (2019a & 2019b), full Annex I habitat titles are available in *Interpretation manual of European Union Habitats EUR28* (CEC, 2013)

Option A (Yellow) follows the path of the existing N2 at this location, however, there may be scope to design the proposed scheme so that it avoids the pNHA within the corridor. Another example is an ecological site located west of Corleygorm (ecological site 63); the centreline of Option A (Yellow) currently avoids this site, which is valued as being of national importance and, as such, direct impacts may be avoided through routing. In consideration of this, it is considered likely that the significance of effect of Option A (Yellow) may be reduced from major negative to moderate negative, when assessing the actual proposed scheme rather than the 400m wide corridor. The Notwithstanding the above, and as stated in Section 5.4.2 above, the assessment at this stage is based on 400m wide corridor, and it has been assessed that Option A (Yellow) has a 'Major Negative Effect, as the corridor crosses ecological sites valued as being of international importance.

5.4.2.2 Option B (Yellow + Blue)

Based on the assessment of the 400m wide corridor, Option B (Yellow+Blue) may impact directly on up to 1414 ecological sites valued as being of international importance with an indicative total area of up to 22. 21.8ha and, therefore, could potentially result in a major negative effect on biodiversity. The nationally designated site for nature conservation, Lough Naglack pNHA (ecological site 35), which is located partially within the corridor of Option B (Yellow+Blue), will also be directly impacted. This pNHA is adjacent to the existing N2 near to Carrickmacross. The priority Annex I habitats that may be affected as a direct impact of the Option B (Yellow+Blue) include *Cladium* fen [*7210], bog woodland [*91D0] and alluvial woodland [*91E0]; the non-priority Annex I habitats that may be affected: dry heath [4030], *Molinia* meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230].

Direct impacts on all of these 14 ecological sites valued as being of international importance may be avoided through routing of the proposed scheme, as described in the Option A (Yellow) text above. Option B (Yellow+Blue) affects the same ecological sites valued as being of international importance as Option A (Yellow) does and similar avoidance/mitigation through routing could be undertaken at the next phase of the project if Option B (Yellow+Blue) is selected as the Preferred Route Corridor. In consideration of this, it is considered likely that the significance of effect of Option B (Yellow+Blue) may be reduced from major negative to moderate negative, when assessing the actual proposed scheme rather than the 400m wide corridor. It appears that t Notwithstanding this, and as stated in Section 5.4.2 above, the assessment at this stage is based on 400m wide corridor, and it has been assessed that Option B (Yellow+Blue) will result in a 'Major Negative' Effect, as the corridor crosses ecological sites valued as being of international importance.

5.4.2.3 Option C (Green)

Based on the assessment of the 400m wide corridor, Option C (Green) could impact directly on up to 17 ecological sites, eight of which are valued as being of international importance with an indicative total area of up to c. 12.1ha. This could potentially result in a major negative effect on biodiversity. The priority Annex I habitats that may be affected as a direct impact of the Option C (Green) include *Cladium* fen [*7210], bog woodland [*91D0] and alluvial woodland [*91E0]; the non-priority Annex I habitats that may be affected include: *Molinia* meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230].

Direct impacts on seven of the eight ecological sites valued as being of international importance may be avoided through routing of the proposed scheme; however, in the case of an ecological site located west of Knockabbey (ecological site 50), it appears that direct impacts may be unavoidable as this ecological site is located directly adjacent to another ecological site valued as being of international importance (ecological site 49), both of which combined span the entirety of the Route Corridor Option.

In conclusion, it has been assessed that Option C (Green) will result in a 'Major Negative' Effect, as the corridor crosses ecological sites valued as being of international importance.

5.4.2.4 Option D (Orange)

Based on the assessment of the 400m wide corridor, Option D (Orange) may impact directly up to eight ecological sites valued as being of international importance with an indicative total area of up to c. 24.6ha and, therefore, could potentially result in a major negative effect on biodiversity. The priority Annex I habitats that may be affected as a direct impact of the Option D (Orange) include *Cladium* fen [*7210], bog woodland [*91D0] and alluvial woodland [*91E0]; the non-priority Annex I habitats that may be affected include: dry heath [4030], *Molinia* meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230].

Direct impacts on seven of the eight ecological sites valued as being of international importance may be avoided through routing of the proposed scheme; however, direct impacts on an ecological site located south-west of Monagirr at Altiduff Lough (ecological site 22) are likely to be unavoidable as this site spans the majority of the 400m wide corridor.

In conclusion, it has been assessed that Option D (Orange) will result in a 'Major Negative' Effect, as the corridor crosses ecological sites valued as being of international importance.

5.4.2.5 Option E (Orange + Link1+ Green)

Based on the assessment of the 400m wide corridor, Option E (Orange + Link1 + Green) corridor may impact directly on up to five ecological sites valued as being of international importance with an indicative total area of up to c. 4ha and, therefore, could potentially result in a major negative effect on biodiversity. The priority Annex I habitats that may be affected as a direct impact of the Option E (Orange + Link1 + Green) include *Cladium* fen [*7210], bog woodland [*91D0] and alluvial woodland [*91E0]; the non-priority Annex I habitats that may be affected include: *Molinia* meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230].

Direct impacts on all of these five ecological sites valued as being of international importance may be avoided through routing of the proposed scheme. In consideration of this, it is likely that the significance of effect of Option E (Orange + Link1 + Green) may be reduced from major negative to minor negative, when assessing the actual proposed scheme rather than the 400m wide corridor. Notwithstanding this, and as stated in Section 5.4.2 above, the assessment at this stage is based on 400m wide corridor, and it has been assessed that Option E (Orange + Link1 + Green) will result in a 'Major Negative' Effect, as the corridor crosses ecological sites valued as being of international importance.

5.4.2.6 Option F (Orange + Link2+ Green)

Based on the assessment of the 400m wide corridor, Option F (Orange + Link2 + Green) corridor may impact directly on up to eight ecological sites valued as being of international importance with an indicative total area of up to c. 23.6ha and, therefore, could potentially result in a major negative effect on biodiversity. The priority Annex I habitats that may be affected as a direct impact of the Option F (Orange + Link2 + Green) include *Cladium* fen [*7210], bog woodland [*91D0] and alluvial woodland [*91E0]; the non-priority Annex I habitats that may be affected include: dry heath [4030], *Molinia* meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230].

Direct impacts on seven of the eight ecological sites valued as being of international importance may be avoided through routing of the proposed scheme; however it appears that direct impacts on an ecological site located south-west of Monagirr at Altiduff Lough (ecological site 22) are likely to be unavoidable as this site spans the majority of the 400m wide corridor.

In conclusion, it has been assessed that Option F (Orange+Link2+Green) will result in a 'Major Negative' Effect, as the corridor crosses ecological sites valued as being of international importance.

5.4.2.7 Summary of Assessment of Potential Impacts on Biodiversity

A summary of the assessment of potential effect on biodiversity for each of the Route Corridor Option is presented in Table 5.7 below.

Table 5.7 Summary of significance of effect on each Route Corridor Option (as per TII, 2016)

Route Corridor Option	Significance of Effect (based on corridor)	<i>Potential</i> Significance of Effect with Avoidance through Routing – Initial Assessment*
Option A (Yellow)	Major or Highly Negative	Moderately Negative
Option B (Yellow + Blue)	Major or Highly Negative	Moderately Negative
Option C (Green)	Major or Highly Negative	Major or Highly Negative
Option D (Orange)	Major or Highly Negative	Major or Highly Negative
Option E (Orange + Link 1+ Green)	Major or Highly Negative	Minor or Slightly Negative
Option F (Orange + Link 2+ Green)	Major or Highly Negative	Major or Highly Negative

*This potential significance of effect is addressed in Section 5.4.2.1 to 5.4.2.6 In-line with TII guidelines, the Stage 2 (Biodiversity -Flora & Fauna) assessment is based on a 400m wide corridor. However, the actual width of the proposed alignment within that corridor will be much narrower. Therefore, there may be the potential that the effects of the proposed scheme could be reduced at the next phase of the project through avoidance by routing. Further surveys and assessment of the Preferred Route Corridor will be undertaken to inform the Phase 3 design process.

In the case of Options A (Yellow) and Option B (Yellow+Blue), the significance of effect may be reduced from major negative to moderate negative if the proposed alignment within the corridor is refined in such a way as to avoid direct impacts on ecological sites valued at either international or national importance. Similarly, refinements to the proposed scheme centreline of Option E (Orange + Link 1 + Green) may avoid potential impacts on ecological sites valued at either international or national importance and result in a reduction in the significance of effect from major negative to minor negative.

5.4.3 Comparison of Options

With reference to the sections above, all of the 400m wide Route Corridor Options may result in a 'Major Negative' Effect on biodiversity as a result of direct impacts on ecological sites valued at international importance. Some of the Route Corridor Options could have reduced levels of significance with careful routing at the next Phase of the design process, as the proposed alignment width will ultimately be much narrower than the assessed 400m wide corridor.

In the case of all Route Corridor Options the following priority and non-priority Annex I habitats may be encountered: *Cladium* fen [*7210], bog woodland [*91D0], alluvial woodland [*91E0], *Molinia* meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]. In the case of Options A (Yellow), B (Yellow + Blue), D (Orange) and F (Orange + Link 1 +Green) the non-priority Annex I habitat dry heath [4030] may also be present.

Option E (Orange + Link 1 + Green) is likely to result in the least significant negative effect on biodiversity compared to all other options as it directly impacts the smallest number of ecological sites (*i.e.* ten in total), the smallest number of ecological sites valued as being of international importance (*i.e.* five in total) and the smallest total area of ecological sites valued as being of international importance (*i.e.* c. 4ha), as illustrated in Table 5.6. Options A (Yellow) and B (Yellow + Blue) are very similar in terms of the total number of ecological sites that may be directly impacted (*i.e.* 33 and 34 respectively), the total number of ecological sites valued as being of international importance that may be directly impacted (*i.e.* 14 for each), and the total area of these ecological sites potentially being impacted (*i.e.* up to 26.1ha and 22.7ha, respectively). The 400m wide corridors of both these Route Corridor Options may directly impact on Lough Naglack pNHA (ecological site 35) as the site is adjacent to the existing N2, which the Route Corridor Options generally follow. Routing at the next Phase of the project could potentially avoid and/or mitigate any direct impacts to this nationally designated site. In addition, careful routing could also avoid all direct impacts on ecological sites valued as being of international importance, potentially reducing the significance of effect from major negative to moderate negative.

Options F (Orange + Link 2 + Green) and D (Orange) are very similar in terms of the total number of ecological sites that may be directly impacted (*i.e.* 13 and 14 respectively), the total number of ecological sites valued as being of international importance that may be directly impacted (*i.e.* eight for each), and the total indicative area of these ecological sites potentially being lost (*i.e.* up to c.23.6ha and c. 24.6ha, respectively). Options F (Orange + Link 2 + Green) and D (Orange) are likely to result in a less significant negative impact on biodiversity compared to Options A (Yellow) and B (Yellow + Blue) as they contain a smaller total number of ecological sites and a smaller number of ecological sites valued as being of international importance.

Whilst Option C (Green) will directly impact on a greater total number of ecological sites compared to Options F (Orange + Link 2 + Green) and D (Orange) and the same number of ecological sites valued as being of international importance (*i.e.* eight), the total indicative area of ecological sites valued as being of international importance for Option C (Green) is significantly less compared to Option F (Orange + Link 2 + Green) and D (Orange) (*i.e.* at c. 12.1ha). In consideration of this, Option C (Green) is likely to result in a less significant negative effect on biodiversity compared to Options A (Yellow), B (Yellow + Blue), F (Orange + Link 1 + Green) and D (Orange). Notwithstanding the above, and as stated at the introduction of this section, the assessment at this stage is based on 400m wide corridor, and it has been assessed that all Route Corridor Options will result in a 'Major Negative' Effect, as all of the corridors cross ecological sites valued as being of international importance.

5.5 Conclusions

Ecological sites were identified based on collation of available existing information, aerial photography and surveys from publicly accessible land. Values were assigned based on national guidance and focussed on the potential ecological value for the habitats present.

All Annex I habitats that lie outside of European sites, are valued as being of national importance, given that these habitats are of high conservation concern. However, priority Annex I habitat types are valued as being of international importance given that they are of the highest conservation concern at a European level (*i.e.* natural habitat types in danger of disappearance). The basis of this assessment has been that, if the 400m wide corridor of the Route Corridor Option impacts directly on one or more ecological sites valued as international or national importance, the Route Corridor Option is assessed as having 'Major Negative' effect. All of the assessed 400m wide corridors will result in a 'Major Negative' effect on biodiversity as a result of direct impacts on ecological sites valued at international importance. Some of the Route Corridor Options could potentially have reduced levels of significance with careful routing of actual proposed scheme/road alignment, but formal consideration and assessment forms part of the next phase of the scheme development (*i.e.* Phase 3 – Design and Environmental Evaluation).

In conclusion, a summary of the Stage 2 Biodiversity (Flora & Fauna) Assessment is provided in Table 5.8 below, where the level of significant effect and associated performance score, in accordance with TII's PAG Unit 7.0, is provided for each Option.

Table 5.8: Summary of Significance of Effect and Performance Scores for Each Route Corridor Option – Biodiversity

Option	PAG Unit 7.0 Significance of Effect	PAG Unit 7.0 Performance Score
Option A (Yellow)	Major or Highly Negative	1
Option B (Yellow+Blue)	Major or Highly Negative	1
Option C (Green)	Major or Highly Negative	1
Option D (Orange)	Major or Highly Negative	1
Option E (Orange + Link 1 + Green)	Major or Highly Negative	1
Option F (Orange + Link 2 + Green)	Major or Highly Negative	1

6. Waste

6.1 Introduction

This chapter identifies and assesses the potential for on the generation of waste material and the subsequent effects for each of the six Route Corridor Options and has been completed by Jacobs. A range of materials will be used in the construction of a new road and most have the potential to create waste arisings; however the largest volume of material which may become waste relates to the earthworks required to construct the road. Specifically, how much soil (including topsoil and sub-soil), stone and gravel needs to be removed or 'cut' to facilitate the road and how much similar material or 'fill' is required to construct the road. The relationship between these two quantities, the 'cut and fill', and any subsequent waste as a result of unacceptable (for reuse in construction) excavated materials, forms the basis of the majority of the assessment in this chapter.

6.2 Methodology

6.2.1 Legislation, Policy & Guidance Overview

The methodology used to identify and assess the impacts associated with the generation of waste had appropriate regard to relevant guidance including, but not limited to:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (Environmental Protection Agency (EPA) August 2017 Draft);
- Guidelines for the Management of Waste from National Road Construction Projects Revision 1 (Transport Infrastructure Ireland (TII) 2014);
- Guidelines on Soil and Stone By-products in the context of Article 27 of the European Communities (Waste Directive) Regulations 2011 (EPA 2019);
- Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Waste Projects (Department of Environment Heritage and Local Government 1 July 2006);
- Construction Industry Research and Information Service (CIRIA) document 133 Waste Minimisation in Construction (CIRIA 1997);
- Design Manual for Roads and Bridges (DMRB) LA110 Material assets and waste Revision 0 (Highways England August 2019);
- Project Appraisal Guidelines for National Roads Unit 7.0 – Multi Criteria Analysis October 2016;
- Specification for Road Works Series 900 – Road Pavements – Bituminous Materials;
- Construction and Demolition Waste Statistics for Ireland (EPA October 2019); and
- Design Out Waste factsheet (EPA 2013).

As part of the compilation of this chapter the following EU, national, regional and local policy documents were reviewed with respect to waste management policies:

- EU Construction & Demolition Waste Management Protocol (EC 2016);
- A Resource Opportunity – Waste Management Policy in Ireland (DoCELG 2012);
- Construction & Demolition Waste: Soil and Stone Recovery / Disposal Capacity (RPS on behalf of DCC 2016);
- Connacht-Ulster Region Waste Management Plan 2015-2021;
- Eastern-Midlands Region Waste Management Plan 2015-2021;
- Monaghan County Development Plan 2019-2025; and
- Louth County Development Plan 2015-2021.

In addition to the above, the following documents and legislation have been reviewed:

- The EU Waste Framework Directive (2008/98/EC);
- The Waste Management Act 1996 (as amended);
- The European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011); and
- Waste Classification – List of Waste and Determining if Waste is Hazardous or Non-Hazardous (EPA 2015).

6.2.1.1 Legislative Exemptions

The European Union (Waste Directive) regulations 2011 set out the exclusions from the scope of the Directive which includes the following under Article 3(1)(c):

“uncontaminated soil and other naturally occurring material excavated in the course of construction activities where it is certain that the material will be used for the purposes of construction in its natural state on the site from which it was excavated.”

Article 27 of the European Communities (Waste Directive) Regulations 2011 allows an economic operator to decide, under certain circumstances, that material is a by-product and not a waste. The following conditions must be met in this case:

- Further use of the substance or object is certain;
- The substance or object can be used directly without any further processing other than normal industrial practice;
- The substance or object is produced as an integral part of a production; and
- Further use is lawful in that the substance or object fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts.

Classification of material as a by-product means that the material is of a type that is not regulated by waste management legislation, and therefore is not required to be managed as per that legislation. For such construction projects, excavated soil and stone can be categorised under this exemption provided the material adheres to the conditions stipulated under Article 27. The economic operator and destination for the material must adhere to all applicable requirements for this exemption to be permitted.

Article 31(2)(b) of the regulations set out a target of 70% reuse of non-hazardous C&D waste by 2020.

Excavated materials from each Route Corridor Option which fall within these provisions are therefore not subject to the requirements of EU and National Waste Legislation.

6.2.1.2 European Union 7th Environment Action Programme to 2020

Turning waste into a resource is one key to a circular economy. The objectives and targets set in European legislation have been key drivers to improve waste management, stimulate innovation in recycling, limit the use of landfilling, and create incentives to change consumer behaviour. If countries engage in re-manufacturing, reusing and recycling, and if one industry's waste becomes another's raw material, it is possible to move to a more circular economy where waste is eliminated, and resources are used in an efficient and sustainable way.

The EU's 7th Environment Action Programme sets out environmental policy for the EU to 2020 and a vision to 2050. It identifies three key objectives:

- *“To protect, conserve and enhance the Union's natural capital;*
- *To turn the Union into a resource-efficient, green, and competitive low-carbon economy; and*
- *To safeguard the Union's citizens from environment-related pressures and risks to health and wellbeing.”*

In line with this programme and its policy objectives, waste policy for the EU identifies the following priority objectives:

- *“To reduce the amount of waste generated;*
- *To maximise recycling and re-use;*
- *To limit incineration to non-recyclable materials;*
- *To phase out landfilling to non-recyclable and non-recoverable waste; and*
- *To ensure full implementation of the waste policy targets in all Member States.”*

Consideration of how excavated material could be reused on each of the Route Corridor Options has been included in this assessment.

6.2.1.3 Regional and County Waste Policies

Any waste arisings are governed by the requirements as set out in the Connacht - Ulster Region Waste Management Plan 2015-2021 and the Eastern - Midlands Region Waste Management Plan 2015-2021. There is potential for waste arisings within both County Monaghan (which falls under the Connacht - Ulster Region) and County Louth (which falls under the Eastern - Midlands Region).

One of the policies described in the Monaghan County Development Plan 2019-2025 Section 8.32 is:

“To require that all construction projects are carried out in accordance with Best Practice Guidelines on the preparation of Waste Management Plans for Construction and Demolition Projects.”

The Louth County Development Plan 2015-2021 Section 9.9.12 states:

“During the construction process measures should be implemented to minimise soil removal (as part of the scheme design process), properly manage construction waste and encourage off-site prefabrication where feasible.”

6.2.2 Data Collection Methods

Online data sources used in the collation of data were:

- Connacht - Ulster Waste region and Eastern - Midlands Waste Region Annual statistics;
- www.cso.ie population statistics for small areas; and;
- www.ec.europa.eu/Eurostat.com European Union statistics on resource productivity.

6.2.3 Assessment Criteria

6.2.3.1 Significance of Impact Method

The comparative evaluation of Route Corridor Options was assisted by the scoring of the overall effect of each of the Route Corridor Options using the Stage 2 project appraisal matrix to that shown in the Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis⁷². An assessment has been undertaken on each Route Corridor Option to include both quantitative and qualitative assessment. The overall effect of each Route Corridor Option was scored based on the seven point scale as shown in Table 6.1 and a number have been assigned according significance of the effect.

Table 6.1: Key for Scoring Significance of Effect

Score	Significance of Effect
7	Major or Highly Positive
6	Moderately Positive
5	Minor or Slightly Positive
4	Not Significant or Neutral
3	Minor or Slightly Negative
2	Moderately Negative
1	Major or Highly Negative

⁷² TII. 2016. Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis. PE-PAG-02031.

The assessment of the potential effect of each Route Corridor Option has been undertaken having regard to the guidelines as set out in the draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2017) (the draft Guidelines). The characteristics of an effect in terms of waste relates to the quality, significance and duration of the effect. The definition of these effect characteristics as per the draft Guidelines is provided in Table 6.2.

Table 6.2: EPA impact Assessment Criteria

Quality of Effects	
It is important to inform the non-specialist reader whether the effect is positive, negative or neutral.	<p>Positive Effects</p> <p>A change which improves the quality of the environment (for example, by increasing species diversity or improving the reproductive capacity of an ecosystem; or removing nuisances; or improving amenities)</p>
	<p>Neutral Effects</p> <p>A change which does not affect the quality of the environment</p>
	<p>Negative / Adverse Effects</p> <p>A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing a nuisance)</p>
Significance of Effects	
'Significance' is a concept that can have different meanings for different topics – in the absence of specific definitions for the different topics the following definitions may be useful.	<p>Imperceptible</p> <p>An effect capable of measurement but without noticeable consequences</p>
	<p>Not significant</p> <p>An effect which causes noticeable changes in the character of the environment but without noticeable consequences</p>
	<p>Slight Effects</p> <p>An effect which causes noticeable changes in the character of the environment without affecting its sensitivities</p>
	<p>Moderate Effects</p> <p>An effect that alters the character of the environment in a manner that is consistent with existing and emerging trends</p>
	<p>Significant Effects</p> <p>An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment</p>
	<p>Very Significant Effects</p> <p>An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment</p>
	<p>Profound Effects</p> <p>An effect which obliterates sensitive characteristics</p>
'Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful.	<p>Momentary Effects</p> <p>Effects lasting from seconds to minutes</p>
	<p>Brief Effects</p> <p>Effects lasting less than a day</p>
	<p>Temporary Effects</p> <p>Effects lasting less than a year</p>
	<p>Short-term Effects</p>

Quality of Effects	
	Effects lasting one to seven years
	Medium-term Effects Effects lasting seven to fifteen years
	Long-term Effects Effects lasting fifteen to sixty years
	Permanent Effects Effects lasting over sixty years
	Reversible Effects Effects that can be undone, for example through remediation or restoration
	Frequency of Effects Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)

To determine the significance of effect in order to identify a score for each Route Corridor Option for use in the Options Appraisal, and in the absence of TII or other Irish Guidelines for this matter, the UK Guidance, DMRB LA110 Material Assets and Waste Guidelines were used. Specifically, the significance criteria in LA110 formed the basis of the criteria shown in Table 6.3. The DMRB categories are based around the EU Waste Framework Directive which mandates that at least 70% (by weight) of non-hazardous non-soil-and-stone C&D waste is recovered or recycled. This is expressed as a target also in the Waste Regulations (2011).

The DMRB categories were adapted by converting them to TII categories and awarding a score in accordance with the TII scoring system. To facilitate options assessment, the criteria within each category are identified as primary or secondary. The rate of materials recovery is identified as the primary criteria as this is the criteria used as a national target for construction and demolition waste in the Waste Regulations.

Table 6.3: Significance Criteria (adapted from DMRB LA110 Material Assets and Waste)

Significance Criteria	Description
Large = MAJOR Score 1	Primary Criteria: project achieves <50% overall material recovery / recycling (by weight) of non-hazardous Construction and Demolition Waste (CDW) to substitute use of primary materials; and Secondary Criteria: >50% of project waste for disposal outside of the region.
Moderate = MODERATE Score 2	Material assets: Primary Criteria: project achieves less than 50-75% overall material recovery / recycling (by weight) of non-hazardous CDW to substitute use of primary materials; and Secondary Criteria: 1-50% of project waste for disposal outside of the region.
Slight = MINOR Score 3	Material assets: Primary Criteria: project achieves 70-100% overall material recovery / recycling (by weight) of non-hazardous CDW to substitute use of primary materials; and Secondary Criteria: waste infrastructure has sufficient capacity to accommodate waste from a project, without compromising integrity of the receiving infrastructure (design life or capacity) within the region.

6.3 Existing Environment

6.3.1 Ireland Waste Statistics

Under the EU Waste Framework, member states must achieve 70% of material recovery of non-hazardous, non-soil-and-stone construction and demolition waste. The target date for Ireland to achieve this by is December 2020. Material recovery is therefore monitored biannually and provided as part of the EPA annual reporting process for waste. The first year of monitoring was 2014, during which 68% of C&D Waste was recovered; in 2016 71% was recovered. Data for later years is not yet available. Typically it is published in the second year after the reference year; as such, 2018 data is anticipated to be published this year

Each year, information on Construction and Demolition (C&D) waste collected by authorised collectors is provided to the EPA. Table 6.4 shows the statistics for Ireland from 2004 to 2017.

Table 6.4: Ireland Waste Statistics (C&D) 2017

Year	Thousands of tonnes			Annual change in Waste Arisings (%)
	Soil and stones	Other construction and demolition waste	Total	
2004	8,492	2,676	11,168	:
2005	12,646	2,286	14,931	34%
2006	13,883	2,937	16,820	13%
2007	13,560	4,232	17,792	6%
2008	10,537	2,986	13,523	-24%
2009	3,771	1,323	5,094	-62%
2010	2,553	1,089	3,642	-29%
2011	2,061	1,086	3,147	-14%
2012	2,254	889	3,143	0%
2013	2,029	906	2,935	-7%
2014	2,869	955	3,824	30%
2015	3,642	377	4,019	5%
2016	4,264	383	4,647	16%
2017	3,827	923	4,750	2%

6.3.2 Regional Waste Statistics

There are three Waste regions in Ireland; Southern Waste Region, Connacht Ulster Waste Region and Eastern and Midlands Waste Region. The proposed scheme is within both the Connacht Ulster Waste Region and the Eastern and Midlands Waste region.

The Connacht Ulster Waste Region includes the local authority areas of Cavan County Council, Donegal County Council, Galway City Council, Galway County Council, Leitrim County Council, Mayo County Council, Monaghan County Council, Roscommon County Council and Sligo County Council. The region covers 37% of the land mass of the country with a combined population of 837,350.

As lead authority for the Connacht Ulster, Mayo County Council's responsibilities include the preparation of the Connacht Ulster Regional Waste Management Plan, which was published in May 2015 and covers the period from 2015 to 2021.

The Eastern and Midlands Region includes the local authority areas of Dublin City Council, Dun Laoghaire-Rathdown County Council, Fingal County Council, South Dublin County Council, Kildare County Council, Louth County Council, Laois County Council, Longford County Council, Meath County Council, Offaly County Council, Westmeath County Council and Wicklow County Council.

The Regional Waste Management Plans (RWMPs) and the associated Annual Statistical Indicator Reports do not provide C&D Waste data to the same granularity as is available at a national level. Landfill capacities are included in the RWMPs and are included in the significance criteria; as a result these are presented for the regional baseline and used in the assessment.

Table 6.5 shows the waste statistics for the three waste regions in Ireland.

Table 6.5: Regional Waste Statistics

Region	Permitted/ Construction Landfill Capacity (tonnes)	Landfill Capacity Commentary in RWMP (Soils and Stones)
Southern	Total: 1,020,363 (Recorded 2015) Soil & Stone: 779,852	Non-hazardous-non-inert C&D waste has very few processing options in Ireland and is mainly restricted to being directed to lined landfills with the added pressure of using void space that otherwise might be available for Municipal Solid Waste (MSW) disposal. Export options were found for this waste in 2017 and whilst some national projects were delayed these export options came on stream during 2017. Exporting the non-hazardous C&D waste is described in the RWMP as set to continue as a necessary option in 2018, no update to this is available for 2019 / 2020.
Connacht-Ulster	Total: 319,095 (Recorded 2012)	Monaghan: Scotch Corner Landfill – constructed to receive a further 60,000 tonnes; consented to receive a further 175,000 tonnes (MSW and other wastes) (2013) Mayo: constructed to receive a further 40,000 tonnes (2013)
Eastern Midlands	Total: 1,910,887 (Recorded 2012) Soil & stone: 1,328,875	Limited detail available but management plan identifies of sharp decrease' in landfills – from 11 to 3 over the period to 2012.

6.4 Route Corridor Option Comparison

6.4.1 Assumptions and Limitation

In the case of soil/earthworks, approximate earthworks quantities were calculated, for which there are estimates based on the indicative working alignments of each Route Corridor Option. These are presented as 'cut and fill' in Table 6.7.

It is highlighted that the primary purpose of the earthworks calculations for Stage 2 was to inform and support the Option Comparison Estimate (OCE), and the subsequent Cost Benefit Analysis (CBA). As per OCE, the estimation of the earthworks quantities was used for the sole purpose of comparative assessment of the options. The quantities are reflective of the level of design undertaken at the time of the estimation (which is at initial development during Phase 2) and are subject to further refinement, change and further accuracy throughout TII's project delivery phases (i.e. Phases 3 to 7).

Two scenarios were assessed for the cut and fill volumes identified; a 'worst case' (Scenario 1) whereby no greater than 65% of material is deemed acceptable for reuse and a more likely scenario (Scenario 2) whereby up to 95% of excavated material would be reused, where fill requirements allowed for this.

For the determination of significance, the criteria in Table 6.3 were used; however, in order to enable a comparison of options, for Scenario 1 all Route Corridor Options are assumed to have 65% reuse and this does not provide a difference. As such, the secondary criteria of export of waste outside of the region was used to determine significance.

For Scenario 2, a more realistic figure of reuse was calculated and this did provide a differentiator between Route Corridor Options and so the primary significance criteria could be applied.

The following assumptions and limitations were applied in calculating the impacts which are presented in Table 6.7 below:

- Potential for 95% of reuse of cut where fill requires it;
- No account taken of potential reuse of cut elsewhere where fill does not require all;
- Imported material comprises reuse/recycled content in line with regional percentage targets;
- 1.7t per m³ for soil; stones not included in weight calculated; and
- Landfill capacity is based on constructed capacity. Assume 50% capacity for Eastern Midlands and zero for North Connacht and Southern (See Table 6.5).

6.4.2 Assessment of Potential Impacts

6.4.2.1 Construction

Table 6.6 shows a qualitative review of the types of construction and demolition waste likely to be generated during construction of any of the Route Corridor Options. It is not possible to quantify these at this stage, except in the case of soil. In the case of soil/earthworks, approximate earthworks quantities were calculated, for which there are estimates based on the indicative working alignments of each Route Corridor Option, which are presented 'cut and fill'. These are provided in Table 6.7. It is highlighted that the primary purpose of the earthworks calculations for Stage 2 was to inform and support the Option Comparison Estimate (OCE), and the subsequent Cost Benefit Analysis (CBA). As per OCE, the estimation of the earthworks quantities was used for the sole purpose of comparative assessment of the options. The quantities are reflective of the level of design undertaken at the time of the estimation (which is at initial development during Phase 2) and are subject to further refinement, change and further accuracy throughout TII's project delivery phases (i.e. Phases 3 to 7).

Table 6.6: Resources used and Waste Generated During Construction

Waste Type	All Routes
Drilling muds and other drilling wastes	Use unlikely, small quantities, waste very small
Hydraulic oils	Use likely: small quantities; waste very small
Waste engine, gear and lubricating oils	Use likely: small quantities; waste very small
Liquid fuels	Use likely: medium quantities; waste unlikely
Packaging	Yes – no quantities available
Concrete, bricks, tiles and ceramics	Yes - possibly for kerbing– quantities not yet known
Wood, glass and plastic	Yes – wood for fencing during construction- quantities not yet known
Bituminous mixtures, coal tar and tarred products	Yes – tarmac of road surfaces – quantities not yet known; may be some waste

Waste Type	All Routes
Metals (including their alloys)	Yes - demolition/removal of existing bridge parapets and road restraint systems—quantities not yet known
Soil (including excavated soil from contaminated sites), stones and dredging spoil	See Table 6.7.
Gypsum-based construction material	None
Other construction and demolition wastes	Possible
Soil and Stones	Significant quantities likely.

Table 6.7 Estimate Cut and Fill and Reuse for each Route Corridor Option

Estimated Cut and Fill and Reuse Calculations	Calculation Code	Calculation	Option A (Yellow)	Option B (Yellow + Blue)	Option C (Green)	Option D (Orange)	Option E (Orange + Link 1 + Green)	Option F (Orange + Link 2 + Green)
Bulk Cut (m ³)	(A)		2,182,346	3,105,516	4,106,500	2,468,393	4,201,433	4,149,262
Fill Required (m ³)	(B)		1,233,022	1,394,841	1,792,588	2,100,213	1,863,411	1,841,205
Scenario 1 (65% reuse)								
Bulk Cut Acceptable (65%) (m ³)	(C)	= (A) X 65%	1,418,525	2,018,586	2,669,225	1,604,456	2,730,932	2,697,020
Disposal of Unacceptable Cut (35%) (m ³)	(D)	= (A) x 35%	763,821	1,086,931	1,437,275	863,938	1,470,502	1,452,242
Disposal of Acceptable Cut surplus to requirements (m ³)	(E)	= (C) - (B) If < 0 = 0	185,503	623,745	876,637	0	867,521	855,815
Total Cut Disposed	(F)	= (D) + (E)	949,324	1,710,676	2,313,912	863,938	2,338,023	2,308,057
Weight of Cut disposed (tonnes) (1.7t/m ³)	(G)	= (F) X 1.7	1,613,850.80	2,908,149.20	3,933,650.40	1,468,694.60	3,974,639.10	3,923,696.90
Landfill capacity for C&D waste (t)	(H)		664,437.50	664,437.50	664,437.50	664,437.50	664,437.50	664,437.50
Weight of waste to be exported (Weight of Cut – Landfill Capacity)	(J)	= (G) – (H)	949,413.30	2,243,711.70	3,269,212.90	804,257.10	3,310,201.60	3,259,259.40
Percentage weight of project waste to be exported	(K)	(J)/(G) x 100	58.83	77.15	83.11	54.76	83.28	83.07
Import required (m ³)	(L)	= (B) – (C) If < 0 = 0	0	0	0	495,757.34	0	0
Scenario 2 (95% reuse)								
Reused Cut (95%) (m ³)	(M)	= (A) x 95%	1,233,022.00	1,394,841.00	1,792,588.00	2,100,213.00	1,863,411.00	1,841,205.00
Disposal of Unused Cut (5%) (m ³)	(N)	=[(A) x 5%] + [(M) - (B)]	949,324.00	1,710,675.00	2,313,912.00	3,681,80.00	2,338,022.00	2,308,057.00
% Reuse possible	(O)		56.50	44.91	43.65	85.08	44.35	44.37
Weight of Cut disposed (tonnes) (1.7t/m ³)	(P)	= (N) x 1.7	1,613,850.80	2,908,147.50	3,933,650.40	625,906.00	3,974,637.40	3,923,696.90
Landfill capacity for C&D waste	(Q)		664,437.50	664,437.50	664,437.50	664,437.50	664,437.50	664,437.50
Weight of waste to be exported	(R)	= (P) - (Q)	949,413.30	2,243,710.00	3,269,212.90	0	3,310,199.90	3,259,259.40
Percentage weight of project waste to be exported	(S)	= (R)/(P) *100	58.83	77.15	83.11	-6.16	83.28	83.07
Import required (m ³)	(T)	=(B) – (M) If < 0 = 0	0.00	0.00	0.00	0.00	0.00	0.00

6.4.2.2 Operation

Table 6.8 below shows the types of waste likely to be generated during operation of any one of the Route Corridor Options; it would be similar type of waste generated for each. These cannot be quantified at this stage and for the purposes of this comparative assessment of Route Corridor Options there is no differentiator between the routes.

Table 6.8 Resources used and Waste Generated During Operation

Waste Type	
Concrete, bricks, tiles and ceramics	Yes – possibly for kerbing– quantities not yet known
Wood, glass and plastic	Yes – wood for fencing during construction- quantities not yet known
Bituminous mixtures, coal tar and tarred products	Yes – tarmac for repairs of road surfaces; may be some waste
Magnitude of Operational Effects	Negligible
Significance of Effects	Imperceptible

6.4.3 Comparison of Options

Following the appraisal criteria and identification of primary and secondary criteria, as set out in Section 6.2.3, the options could be compared under the two different scenarios. This is summarised in Table 6.9.

As is set out in Assumptions and Limitations in Section 6.4.1, under Scenario 1 all options are assumed to have the same material recovery (reuse) rate of 65%. As such, secondary criteria were employed for the comparison of options; the percentage of waste to be exported from the region as a result of lack of landfill capacity for soil and stone. Whilst there were differences between the options in terms of percentage export of waste, all of the options required the export of more than 50% of waste and were therefore assessed to have major negative effects.

Under Scenario 2, it is assumed that the fill required will consist of up to 95% reusable cut. The level of reuse in this case is determined by the level of fill required; the lower the level of fill the lower the reuse required. As a result, Scenario 2 is a 'realistic best-case scenario'. This approach allowed for differentiation between the routes based on the primary criteria of reuse rates: Option D would have a 85% recovery rate under this scenario and have a minor negative effect; Option A would have a 58% materials recovery rate and have a moderate negative effect; and all other options would have less than 50% reuse and therefore have a major or highly negative effect.

Table 6.9 Significance of Effects for Route Corridor Options

Appraisal Criteria Cut and Fill and Reuse Calculations	Option A (Yellow)	Option B (Yellow + Blue)	Option C (Green)	Option D (Orange)	Option E (Orange + Link 1 + Green)	Option F (Orange + Link 2 + Green)
Scenario 1						
Primary Criteria: Material Recovery (Reuse) %	65	65	65	65	65	65
Secondary Criteria: Percentage weight of project waste to be exported	58.83	77.15	83.11	54.76	83.28	83.07
Effect Description (per appraisal criteria)	50-75% reuse; >50% project waste to be exported	50-75% reuse; >50% project waste to be exported	50-75% reuse; >50% project waste to be exported	50-75% reuse; >50% project waste to be exported	50-75% reuse; >50% project waste to be exported	50-75% reuse; >50% project waste to be exported
<i>Commentary</i>	<i>Reuse criterion is a primary criterion but cannot be used as no differentiation between options so excluded from significance criteria in this case.</i>					
Significance of Effect	Major or Highly Negative	Major or Highly Negative	Major or Highly Negative	Major or Highly Negative	Major or Highly Negative	Major or Highly Negative
PAG Performance Score	1	1	1	1	1	1
Scenario 2 (Allow up to 95% reuse where possible)						
Primary Criteria: Material Recovery (Reuse) %	56.50	44.91	43.65	85.08	44.35	44.37
Secondary Criteria: Percentage weight of project waste to be exported	58.83	77.15	83.11	0	83.28	83.07
Effect Description (per appraisal criteria)	50-75% reuse >50% project waste to be exported	<50% reuse; >50% project waste to be exported	<50% reuse; >50% project waste to be exported	70-100% reuse; >50% project waste to be exported	<50% reuse; >50% project waste to be exported	<50% reuse; >50% project waste to be exported
<i>Commentary</i>	<i>Reuse criterion is a primary criterion; as there are differences between the options this is used for significance over export of waste in this scenario</i>					
Significance of Effect Scores	Moderately Negative	Major or Highly Negative	Major or Highly Negative	Minor or Slightly Negative	Major or Highly Negative	Major or Highly Negative
PAG Performance Scores	2	1	1	3	1	1

6.5 Conclusions

A range of materials will be used in the construction of a new road and most have the potential to create waste arisings; however, the largest volume of material which may become waste relates to the earthworks required to construct the road. Specifically, how much soil (including topsoil and sub-soil), stone and gravel needs to be removed or 'cut' to facilitate the road and how much similar material or 'fill' is required to construct the road. The relationship between these two quantities, the 'cut and fill', and any subsequent waste as a result of unacceptable (for reuse in construction) excavated materials, forms the basis of the majority of the assessment in this chapter.

The Route Corridor Options are within both the Connacht Ulster Waste Region and the Eastern and Midlands Waste region. There is limited data on the capacity of landfills within Eastern and Midland region to take C&D waste, however it is clear from the Regional Waste Management Plan (RWMP) that capacity is an ever-decreasing resource. The RWMPs for the other two regions indicate no capacity for C&D waste. As a member of the EU and signatory to the 7th Environment Programme for Europe as well as being mindful of the limited landfill capacities for C&D waste, Ireland has included a target for 70% reuse of C&D by 2020.

As a result of this, materials recovery was made the primary criteria for the options selection process and export of waste outside of the region the secondary criteria.

Two scenarios were considered; Scenario 1 was based on a 'worst case scenario' of a maximum 65% recovery of excavated material; scenario 2 was a realistic best case which allowed for up to 95% recovery.

Under scenario 1, as all options had the same recovery rate of 65%, the secondary criteria of export of waste was used. Whilst this offered differentiation in terms of percentage export, all were still within the criteria of major negative.

Under scenario 2, Option D allowed for 85% of excavated material to be reused and was a minor negative effect; Option A allowed for 58% and was a moderate negative effect; all other Route Corridor Options were less than 50% reuse and therefore had a major negative effect.

As such, Scenario 2 was used to differentiate between the options. This is considered to be the more realistic scenario as well as one which could allow for comparisons. A summary of the Significance of effect and PAG scores for each Route Corridor Option under Scenario 2 is provided in Table 6.10.

Table 6.10 Summary of Significance of Effect and Performance Scores for Each Route Corridor Option – Waste

Option	PAG Unit 7.0 Significance of Effect	PMG Unit 7.0 Performance Score
Option A (Yellow)	Moderately Negative	2
Option B (Yellow+Blue)	Major or Highly Negative	1
Option C (Green)	Major or Highly Negative	1
Option D (Orange)	Minor or Slightly Negative	3
Option E (Orange + Link 1 + Green)	Major or Highly Negative	1
Option F (Orange + Link 2 + Green)	Major or Highly Negative	1

7. Soils, Geology and Hydrogeology

7.1 Introduction

This chapter contains two discrete and separate assessments of the impact of the six proposed Route Corridor Options in relation to:

- 1) Soils and Geology; and
- 2) Hydrogeology

The assessment has been completed by Jacobs in accordance with the Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes⁷³ produced by the National Roads Authority (now Transport Infrastructure Ireland (TII)).

This assessment examines the soils and geological conditions and the hydrogeological conditions along each Route Corridor Options with respect to their sensitivity and importance and the possible impacts resulting from the construction of a road.

7.2 Methodology

7.2.1 Assessment Criteria

The comparative evaluation of Route Corridor Options was based on scoring of potential impacts to sensitive receptors using a Stage 2 project appraisal matrix suggested by TII in the Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis⁷⁴. An assessment was undertaken on each option, including both quantitative and qualitative assessment. The overall significance of the effect of each Route Corridor Option was evaluated based on the seven-point scale as shown in Table 7.1 and an overall numerical score assigned according to the significance of the potential effects.

Each of the proposed Route Corridor Options was assessed in relation to:

Soils and Geology

- Bedrock geology;
- Soils and Quaternary geology;
- Geological Heritage and Karst Features;
- Mines, quarries and mineral resources; and
- Landfills and other potential contaminated land features.

Hydrogeology:

- The underlying aquifer (classification and vulnerability rating);
- Proximity to public groundwater supplies; and
- Risk to groundwater dependant water bodies and terrestrial environments.

⁷³ NRA. Undated. Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes. Unreferenced. Obtained from: www.tii.ie/technical-services/environment/planning/ (accessed March 2020).

⁷⁴ TII. 2016. Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis. PE-PAG-02031.

Table 7.1: Key for Scoring Effects

Score	Significance of Effect
7	Major or Highly Positive
6	Moderately Positive
5	Minor or Slightly Positive
4	Not Significant or Neutral
3	Minor or Slightly Negative
2	Moderately Negative
1	Major or Highly Negative

In some cases, there may be very little difference in potential impacts between Route Corridor Options. Where possible experienced judgement has been used to compare options, taking into account the quantitative and qualitative assessments between Route Corridor Options.

7.2.2 Information Sources

The Stage 2 options assessment was based on desk study, using available published information and other information obtained for the proposed scheme. No ground investigations or other on-site surveys for relevant information had been conducted at the time of this assessment.

Information on soils, geology and hydrogeology was obtained from the following sources:

- Geological Survey of Ireland (GSI) geological and hydrogeological data (including well database, aquifer classification data and groundwater vulnerability maps)⁷⁵;
- Environmental Protection Agency (EPA) online maps⁷⁶;
- Ordnance Survey Ireland⁷⁷;
- Louth County Council and Monaghan County Council;
- Department of Communications Energy and Natural Resources (DCENR) minerals licencing information⁷⁸;
- Irish Soil Information System (Teagasc) online maps⁷⁹; and
- Aerial imagery.

Relevant information received from other stakeholders, including public consultation, has also been taken into account.

7.3 Existing Environment

The constraints in the Study Area have been mapped are presented in Volume 2 (Figures 7.1 – 7.4) of this Option Selection Report.

⁷⁵ www.gsi.ie (accessed January 2020)

⁷⁶ <http://gis.epa.ie> (accessed January 2020)

⁷⁷ <http://map.geohive.ie/mapviewer.html> (accessed February 2020)

⁷⁸ <http://spatial.dcenr.gov.ie/ExplorationAndMining/SpatialViewer/index.html> (accessed March 2020)

⁷⁹ <http://gis.teagasc.ie/soils/map.php> (accessed January 2020)

7.3.1 Geology

7.3.1.1 Bedrock Geology

The northern section of the Study Area is predominantly underlain by complex geology, comprising the Shercock Formation (turbidite) and Taghart Mountain Formation (turbidite, sandstone & siltstone), along with smaller areas of Oghill Formation (sandstone & microconglomerate), Drumagelvin Greywacke Formation and Kehernaghkilly Formation (black shale & minor rhyolitic tuff).

The central section of the Study Area is predominantly underlain by the Milverton Group (micrite, crinoidal grainstone/packstone) and Castlerahan Formation (quartz greywacke, conglomerate).

The southern section of the Study Area is predominantly underlain by the Clontail Formation (calcareous greywacke) and Milverton Group (micrite, crinoidal grainstone/packstone).

Bedrock Geology is illustrated in Figure 7.1.

7.3.1.2 Soils and Quaternary Geology

The Study Area is underlain predominantly by Till, mapped as being derived primarily from sandstone and shale parent material. There are numerous scattered areas of cutover Peat mapped throughout the Study Area, with some larger areas mapped in the central to southern areas. There are also some small areas of gravelly Alluvium, sandstone and shale derived Sands and Gravels and bedrock outcrop scattered across the Study Area.

There are small areas of Made Ground in the central section of the Study Area. These are associated primarily with areas of built environment.

Figure 7.2 illustrates sub-soils within the Study Area.

7.3.1.3 Geological Heritage and Karst Features

There are 11 geological heritage sites within the Study Area, related to glacial features (drumlin), cliffs, caves, fossils, karst features, turloghs and mining (lead and silver).

There are numerous karst landforms (134 features, comprising caves, enclosed depressions, springs, swallow holes and turloughs) mapped in the central part of the Study Area as illustrated on Figure 7.2

7.3.1.4 Mines, Quarries and Mineral Resources

There is one active mine site (clay) mapped by GSI in the west of the central section of the Study Area. This is located on the R179 in the townland of Losset, south-west of Carrickmacross, and does not lie within any of the Route Corridor Options. There are 22 disused mine sites throughout the Study Area. Mining is recorded as associated with metals (silver, lead, baryte, pyrite, sphalerite), coal, limestone, slate, marl and clay.

There are no quarries mapped by GSI within the Study Area. There are three quarries registered by Monaghan County Council, two in the west of the central section and one in the north of the Study Area. One of the quarries in the central section is recorded as operational (limestone). This is located in the townlands of Killygally and Mokeeran, 4km south of Carrickmacross. The other is coincident with the GSI mine site in the townland of Losset, south-west of Carrickmacross, and is recorded as not operational (material extracted is not stated but the planning permission for the site includes manufacture of concrete blocks). Both of these are outside the Route Corridor Options. The quarry in the north is recorded as not authorised and not operational at present (material extracted is not stated). It is located close to the northern end of the route in the townland of Carrickagarvan. The quarry site is mapped just outside the western edge of all Route Corridor Options, but its access runs through the Route Corridor Options to the existing N2. Louth County Council Registers were obtained and confirmed that there are no quarries registered by Louth County Council.

Information from DCENR shows the majority of the central and southern sections of the Study Area have current prospecting licences issued, these are held for barytes, gypsum, base metals, gold and silver. Some areas in the east of the central section and the northern section of the Study Area are currently unlicensed, many with exploration incentives, however none of these sites are within any of the proposed route corridor options.

Figure 7.2 illustrates mines, quarries and mineral resources within the Study Area.

7.3.1.5 Contaminated Land

There are no recorded active landfill sites identified from Monaghan County Council, Louth County Council or EPA Registers within the Study Area. There are two recorded historical landfill sites in the central section of the Study Area. No further details on former use or current status were available at this stage of assessment. One site is located in the townland of Annahaia, 4km north of Carrickmacross, and is just outside the Option A (Yellow) Route Corridor to the west of the current N2. The other site is located in the townland of Tiragarvan, west of Carrickmacross, and is outside the Route Corridor Options. Both are illustrated on Figure 7.2.

No other known potentially contaminated sites within the Study Area were identified at this stage of assessment. This will be investigated further during subsequent stages of assessment.

7.3.2 Hydrogeology

7.3.2.1 Water Framework Directive

The northern section of the Study Area lies predominantly within the Louth WFD Groundwater Body (IEGBNI_NB_G_019), with a small area to the west side within the Cavan Groundwater Body (IE_NW_G_061). The central section lies predominantly within the Carrickmacross WFD Groundwater Body (IE_NB_G_016), with the eastern side also within the Louth Groundwater Body. The southern section of the Study Area lies predominantly within the Louth Groundwater Body. Small areas of the Kingscourt (E_NB_G_017) and Ardee (IE_NB_G_018) Groundwater Bodies are also within the Study Area, to the west side of the central and southern sections respectively. All of these groundwater bodies are currently classified as having 'Good' chemical status.

7.3.2.2 Aquifers

The majority of the northern and southern sections and the east side of the central section of the Study Area are underlain by Poor Aquifer (Bedrock which is Generally Unproductive except for Local Zones). The west side of the central section and small areas in the north and south are underlain by a Regionally Important Aquifer (Karstified). There are also small areas of Locally Important Aquifer (Bedrock which is Generally Moderate Productive) in the west of the central section.

The underlying aquifer vulnerability rating is varied in the northern section of the Study Area, ranging from Low to Moderate and High. There are also large areas of Extreme vulnerability and Rock at or near Surface or Karst in this section. In the central section of the Study Area the aquifer vulnerability rating is predominantly Moderate, but with large areas of High and Extreme vulnerability and some areas of Rock at or near Surface or Karst. The aquifer vulnerability rating in the southern section of the Study Area is predominantly High, but with areas of Moderate and Extreme vulnerability and some areas of Rock at or near Surface or Karst.

Aquifers are illustrated on Figure 7.3.

7.3.2.3 Groundwater Resources

As shown in Geological Survey of Ireland (GSI) geological and hydrogeological data (including well database, aquifer classification data and groundwater vulnerability maps), there are a large number (>350) of groundwater abstraction features mapped throughout the Study Area, including wells (dug wells and boreholes) and springs. Recorded uses comprise: Public supply; Domestic; Industrial; and Agricultural. Recorded yield class ranges from Poor to Excellent. Seven of these sources are recorded as being used for Public Supply, five in the central section of the Study Area, one in the north and one in the south. These locations coincide with the mapped area of Regionally Important Aquifer (Karstified).

There are no Public Supply Source Protection Areas mapped by Geological Survey Ireland within the Study Area. The National Federation of Group Water Schemes maintains a separate dataset of protection areas. The Killanny & Reaghstown NFGWS protection area is approximately 75km² in area, largely focused around Carrickmacross with the existing N2 passing through the protection area. All six of the corridors pass through this area and as such it is not a differentiator in the assessment.

This assessment was focused on the potential impact of the scheme on high-yielding springs and wells used for public water supply and their surrounding protection zones. In accordance with TII guidance⁸⁰, the total number of wells and springs along each Route Corridor and/or their distance from the route centre line has not been used in assessing relative impacts between Route Corridor Options. (Based on the observation that *“Low yielding wells, used mainly for domestic and farm water supply, are very common in Ireland...”* and that *“It is almost inevitable that any large national road scheme will result in at least a small number of low-yielding water supply wells having to be abandoned”* (and mitigation will be provided)). The location of private wells will be examined in more detail during surveys as part of the EIA stage (Phase 3).

7.3.2.4 Groundwater Dependant Water Bodies and Terrestrial Ecosystems

At this stage of assessment, no groundwater dependant water bodies or groundwater dependent terrestrial ecosystems (GWDTEs) have been identified and so these features do not contribute to the Stage 2 options assessment presented in this Chapter. However, the potential exists for such features to be present within the Study Area and it cannot be conclusively determined at this stage whether they may be a constraint for the proposed scheme. This will be investigated further during subsequent stages of the design process.

Details of surface water features within the Study Area are provided in Chapter 8 (Hydrology) and details of ecology in Chapter 5 (Biodiversity – Flora & Fauna).

7.4 Route Corridor Option Comparison

7.4.1 Assessment of Potential Impacts

The assessment of the Route Corridor Options has been made based on the environmental setting of each option and the significance of potential impacts on sensitive receptors. Each environmental topic has been assigned a score and an overall significance of effect for each corridor option as set out in Table 7.1, (one for Soils and Geology and one for Hydrogeology). These scores are presented in Tables 7.2 (Geology and Soils) and 7.3 (Hydrogeology). In order to provide an indication of which Route Corridor Options are more or less preferable in terms of soils and geology and hydrogeology, the lowest score (i.e. greatest negative impact) for each Route Corridor Option has been used to rank the options. Where possible, this ranking has been further refined based on expert judgement and qualitative evaluation of key environmental features. The final ranking is presented in Table 7.4.

The options assessment for soils, geology and hydrogeology was based on:

⁸⁰ NRA. Undated. Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes. Unreferenced. Obtained from: www.tii.ie/technical-services/environment/planning/ (accessed March 2020).

Soils and Geology:

- Bedrock geology;
- Soils and Quaternary geology;
- Geological Heritage sites and recognised Karst features;
- Economic Resources: Mines, Quarries and mineral resources (sand & gravel, granular aggregate and crushed rock);
- Potential Contaminated Land sites (recorded landfill sites);

Hydrogeology:

- Aquifer Classification and Vulnerability (the importance of the underlying groundwater resource and the ease with which a contaminant incident, e.g. accidental spill, can affect the aquifer); and
- Public Water Supplies.

The following features were not considered in the options comparison, either because insufficient information was available at this stage of assessment or because the value and widespread distribution of the feature was not considered to provide a differentiating factor. These features will be further considered as part of the EIA stage (Phase 3).

Soils and Geology:

- Potential Contaminated Land (other than recorded landfill sites).

Hydrogeology:

- Lower yielding groundwater abstractions;
- Groundwater Dependent Terrestrial Ecosystems; and
- Extent of cuttings (potential to alter the groundwater flow regime).

The scoring of the potential effect for each corridor option, based on 400m corridors, as described in Section 7.2 is presented in Table 7.2. This shows that overall there is no significant difference between any of the proposed Route Corridor Options based on the lowest score / greatest negative impact for either Geology and Soils or Hydrogeology factors. A further description of the basis of the assessment and comparison of the options is provided in Section 7.4.2 below and summarised in Tables 7.2 and 7.3.

7.4.2 Comparison of Options

7.4.2.1 Option A (Yellow)

7.4.2.1.1 Geology and Soils

The greatest potential impact on soils and geology relates to interaction with mapped karst landforms, and potential loss of valuable geological features. Quantitatively, there are 10 Karst Landforms mapped within the Route Corridor. Additionally, 52% of the Route Corridor lies over economic potential Crushed Rock reserves; 16% of the Route Corridor lies over economic Sand and Gravel deposits; and 9% of the Route Corridor crosses mapped peat deposits.

The karst landforms predominantly occur in the corridor section from north of Carrickmacross (at 18km) to the intersection with the Green corridor (at 24km). This corridor option could affect a significant proportion of such landforms in this area, but it is not known at this stage whether any features that are unique or considered to be of very high value would be affected (there is only a very slight potential interaction with Geological Heritage sites).

There is also a potential loss of economic deposits (Crushed Rock, and Sand and Gravel). These potential impacts are distributed throughout the Route Corridor, with no one area particularly impacted. However overall, the availability of these resources in the region will not be significantly affected.

There are five disused mines recorded within the Route Corridor and are therefore in the vicinity of the existing N2. At the next phase of the scheme when a Preferred Route Corridor has been identified, ground investigations will be undertaken which will help to clarify any impacts. Given their vicinity to the existing N2 no significant impacts to or from the mines are expected as this stage.

For all other soils and geology aspects, only Neutral impacts are predicted.

7.4.2.1.2 Hydrogeology

The greatest potential impacts on hydrogeology relate to potential interaction with areas of vulnerable aquifer and associated risk of pollution and disruption of the groundwater resource. Quantitatively, 71% of the Route Corridor crosses areas of Extreme or High groundwater vulnerability or where there is rock near surface and 35% of the Route Corridor crosses areas of Vulnerable and Regionally Important Aquifer. The southern half of the Route Corridor runs almost entirely over areas mapped as of High or Extreme groundwater vulnerability. The northern half of the Route Corridor has more scattered interaction with areas of High or Extreme vulnerability, including where bedrock is near surface.

The greatest potential impact occurs in the middle part of the Route Corridor, between approximately Ballymackney (at 13km) and the intersection with the Option C (Green) Route Corridor (at 24km), where a large area of Regionally Important (karstified) bedrock aquifer is crossed.

For all other hydrogeology aspects, only Neutral impacts are predicted.

7.4.2.2 Option B (Yellow + Blue)

7.4.2.2.1 Geology and Soils

The greatest potential impact on soils and geology relates to interaction with mapped karst landforms, and potential loss of valuable geological features. Quantitatively, there are 10 Karst Landforms mapped within the Route Corridor. Additionally, 54% of the Route Corridor lies over economic potential Crushed Rock reserves; 16% of the Route Corridor lies over economic Sand and Gravel deposits; and 9% of the Route Corridor crosses mapped peat deposits.

The karst landforms predominantly occur in the corridor section from north of Carrickmacross (at 18km) to the intersection with the Option C (Green) Route Corridor (at 24km). This corridor option could affect a significant proportion of such landforms in this area, but it is not known at this stage whether any features that are unique or considered to be of very high value would be affected (there is only a very slight potential interaction with Geological Heritage sites).

There is also a potential loss of economic deposits (Crushed Rock, and Sand and Gravel). These potential impacts are distributed throughout the Route Corridor, with no one area particularly impacted. However overall, the availability of these resources in the region will not be significantly affected.

There are five disused mines recorded within the Route Corridor and are therefore in the vicinity of the existing N2. At the next phase of the scheme when a Preferred Route Corridor has been identified, ground investigations will be undertaken which will help to clarify any impacts. Given their vicinity to the existing N2 no significant impacts to or from the mines are expected as this stage.

For all other soils and geology aspects, only Neutral impacts are predicted.

7.4.2.2 Hydrogeology

The greatest potential impacts on hydrogeology relate to potential interaction with areas of vulnerable aquifer and associated risk of pollution and disruption of the groundwater resource. Quantitatively, 73% of the Route Corridor crosses areas of Extreme or High groundwater vulnerability or where there is rock near surface and 35% of the Route Corridor crosses areas of Vulnerable and Regionally Important Aquifer. The southern half of the Route Corridor runs almost entirely over areas mapped as of High or Extreme groundwater vulnerability. The northern half of the Route Corridor has more scattered interaction with areas of High or Extreme vulnerability, including where bedrock is near surface.

The greatest potential impact occurs in the middle part of the Route Corridor, between approximately Ballymackney (at 13km) and the intersection with the Option C (Green) Route Corridor (at 24km), where a large area of Regionally Important (karstified) bedrock aquifer is crossed.

For all other hydrogeology aspects, only Neutral impacts are predicted.

7.4.2.3 Option C (Green)

7.4.2.3.1 Geology and Soils

The greatest potential impacts on soils and geology relate to the potential loss of economic deposits (Crushed Rock, and Sand and Gravel). Quantitatively, 46% of the Route Corridor lies over economic potential Crushed Rock reserves; 10% of the Route Corridor lies over economic Sand and Gravel deposits; and 10% of the Route Corridor crosses mapped peat deposits. These potential impacts are distributed throughout the Route Corridor, with no one area particularly impacted. A moderate area of mapped cut Peat is crossed by the Route Corridor between north of Nicholastown (at 8.5km) and Lannat (at 11.5km). However overall, the availability of these resources in the region will not be significantly affected.

There are 3 mines recorded within the Route Corridor. These could be affected, but it is unclear at this stage whether these are currently operational or how significant any impacts would be.

For all other soils and geology aspects, only Neutral impacts are predicted.

7.4.2.3.2 Hydrogeology

The greatest potential impacts on hydrogeology relate to potential interaction with areas of vulnerable aquifer and associated risk of pollution and disruption of the groundwater resource. Quantitatively, 75% of the Route Corridor crosses areas of Extreme or High groundwater vulnerability or where there is rock near surface. The southern half of the corridor runs almost entirely over areas mapped as of High or Extreme groundwater vulnerability. The northern half of the corridor has more scattered interaction with areas of High or Extreme vulnerability, including where bedrock is near surface. This interaction with areas of higher groundwater vulnerability leads to a potential impact classification of Major negative.

However, the majority of the Route Corridor crosses aquifer classified as Poor Aquifer (bedrock which is generally unproductive except for local zones). There is only a slight interaction with the edge of an area of Regionally Important (karstified) aquifer between Lurganboys (at 20km) and Lisnafinelly (at 24km).

For all other hydrogeology aspects, only Neutral impacts are predicted.

7.4.2.4 Option D (Orange)

7.4.2.4.1 Geology and Soils

The greatest potential impacts on soils and geology relate to the potential loss of economic deposits (Crushed Rock). Quantitatively, 58% of the Route Corridor lies over economic potential Crushed Rock reserves; 7% of the Route Corridor lies over economic Sand and Gravel deposits; and 8% of the Route Corridor crosses mapped peat deposits. These potential impacts are distributed throughout the Route Corridor, with no one area particularly impacted. However overall, the availability of these resources in the region will not be significantly affected.

There are three mines recorded within the Route Corridor. At the next phase of the scheme when a Preferred Route Corridor has been identified, ground investigations will be undertaken which will help to clarify any impacts.

For all other soils and geology aspects, only Neutral impacts are predicted.

7.4.2.4.2 Hydrogeology

The greatest potential impacts on hydrogeology relate to potential interaction with areas of vulnerable aquifer and associated risk of pollution and disruption of the groundwater resource. Quantitatively, 85% of the Route Corridor crosses areas of Extreme or High groundwater vulnerability or where there is rock near surface. The southern three quarters of the Route Corridor runs almost entirely over areas mapped as of High or Extreme groundwater vulnerability, including where bedrock is near surface. The northern half of the Route Corridor has more scattered interaction with these areas. This interaction with areas of higher groundwater vulnerability leads to a potential impact classification of Major negative.

However, the Route Corridor crosses aquifer classified as Poor Aquifer (bedrock which is generally unproductive except for local zones). No Regionally Important aquifers are affected.

For all other hydrogeology aspects, only Neutral impacts are predicted.

7.4.2.5 Option E (Orange + Link 1 + Green)

7.4.2.5.1 Geology and Soils

The greatest potential impacts on soils and geology relate to the potential loss of economic deposits (Crushed Rock, and Sand and Gravel). Quantitatively, 38% of the Route Corridor lies over economic potential Crushed Rock reserves; 10% of the Route Corridor lies over economic Sand and Gravel deposits; and 9% of the Route Corridor crosses mapped peat deposits. These potential impacts are distributed throughout the Route Corridor, with no one area particularly impacted. An area of mapped cut Peat is crossed by the Route Corridor between north of Nicholastown (at 9.2km) and Lannat (at 11.5km) and a significant proportion of this area would be lost. However overall, the availability of these resources in the region will not be significantly affected.

There are three mines recorded within the Route Corridor. At the next phase of the scheme when a Preferred Route Corridor has been identified, ground investigations will be undertaken which will help to clarify any impacts.

For all other soils and geology aspects, only Neutral impacts are predicted.

7.4.2.5.2 Hydrogeology

The greatest potential impacts on hydrogeology relate to potential interaction with areas of vulnerable aquifer and associated risk of pollution and disruption of the groundwater resource. Quantitatively, 73% of the Route Corridor crosses areas of Extreme or High groundwater vulnerability or where there is rock near surface. The southern half of the Route Corridor runs almost entirely over areas mapped as of High groundwater vulnerability. The northern half of the Route Corridor has more scattered interaction with areas of High or Extreme vulnerability, including where bedrock is near surface.

However, the majority of the Route Corridor crosses aquifer classified as Poor Aquifer (bedrock which is generally unproductive except for local zones). There is only a slight interaction with the edge of an area of Regionally Important (karstified) aquifer between Lurganboys (at 20km) and Lisnafinelly (at 24km).

For all other hydrogeology aspects, only Neutral impacts are predicted.

7.4.2.6 Option F (Orange + Link 2 + Green)

7.4.2.6.1 Geology and Soils

The greatest potential impacts on soils and geology relate to the potential loss of economic deposits (Crushed Rock). Quantitatively, 48% of the Route Corridor lies over economic potential Crushed Rock reserves; 7% of the Route Corridor lies over economic Sand and Gravel deposits; and 7% of the Route Corridor crosses mapped peat deposits. These potential impacts are distributed throughout the Route Corridor, with no one area particularly impacted. However overall, the availability of these resources in the region will not be significantly affected.

There are three mines recorded within the Route Corridor. At the next phase of the scheme when a Preferred Route Corridor has been identified, ground investigations will be undertaken which will help to clarify any impacts.

For all other soils and geology aspects, only Neutral impacts are predicted.

7.4.2.6.2 Hydrogeology

The greatest potential impacts on hydrogeology relate to potential interaction with areas of vulnerable aquifer and associated risk of pollution and disruption of the groundwater resource. Quantitatively, 75% of the Route Corridor crosses areas of Extreme or High groundwater vulnerability or where there is rock near surface. The southern three quarters of the Route Corridor runs almost entirely over areas mapped as of High or Extreme groundwater vulnerability, including where bedrock is near surface. The northern half of the Route Corridor has more scattered interaction with these areas.

However, the Route Corridor predominantly crosses aquifer classified as Poor Aquifer (bedrock which is generally unproductive except for local zones). There is only a very slight interaction with the edge of an area of Regionally Important (karstified) aquifer near Lisnafinelly (at 24km).

For all other hydrogeology aspects, only Neutral impacts are predicted.

Table 7.2: Corridor option Impact Scoring – Geology and Soils

Corridor option Geology & Soils	Option A (Yellow)	Option B (Yellow + Blue)	Option C (Green)	Option D (Orange)	Option E (Orange + Link 1 + Green)	Option F (Orange + Link 2 + Green)
% of 400m corridor within Peat Deposits	3	3	3	3	3	3
No. Mines within the 400m corridor	3	3	3	3	3	3
No. Quarries within the 400m corridor	4	4	4	4	4	4
% of 400m corridor through Sand & Gravel deposits	3	3	3	4	3	4
% of 400m corridor through Potential Granular Aggregate deposits (High or Very High potential)	4	4	4	4	4	4
% of 400m corridor through Potential Crushed Rock deposits (High or Very High potential)	2	2	2	2	2	2
No. Landfill sites within 400m corridor	4	4	4	4	4	4
No. Karst Landforms within 400m corridor	2	2	4	4	4	4
% of 400m corridor through Geological Heritage Sites	4	4	4	4	4	4
PMG Unit 7.0 Performance Score	2	2	2	2	2	2
PAG Unit 7.0 Significance of Effect	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative

Please see Appendix 7.1 for further details.

Table 7.3: Corridor option Impact Scoring - Hydrogeology

Corridor option Hydrogeology	Option A (Yellow)	Option B (Yellow+Blue)	Option C (Green)	Option D (Orange)	Option E (Orange + Link 1 + Green)	Option F (Orange + Link 2 + Green)
% of 400m corridor within Vulnerable and Regionally Important Aquifer (Karstified bedrock, Fissured bedrock or Extensive sand & gravel)	2	2	4	4	4	4
% of 400m corridor within Sand & Gravel Aquifer	4	4	4	4	4	4
% of 400m corridor within high Groundwater Vulnerability (Extreme, High, Rock near surface or Karst)	2	2	1	1	2	2
% of 400m corridor within Public & Group Supply Source Protection Area (Inner & Outer) - No GSI sites, one NFGWS site.	3	3	3	3	3	3
PMG Unit 7.0 Performance Score	2	2	1	1	2	2
PAG Unit 7.0 Significance of Effect	Moderately Negative	Moderately Negative	Major or Highly Negative	Major or Highly Negative	Moderately Negative	Moderately Negative

Please see Appendix 7.2 for further details.

7.5 Conclusions

The soils, geology and hydrogeology effects of the six proposed Route Corridor Options have been assessed in accordance with the Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes produced by TII.

Option C (Green) and Option D (Orange) generate potential major negative effects due to significant interaction with areas of higher groundwater vulnerability. However, they do not cross aquifers of the highest potential for water supply.

The options scoring does not otherwise differentiate between options at a significant level for the proposed Ardee to Castleblayney scheme – all are assessed to be moderate negative effect. However, Option A (Yellow) and Option B (Yellow + Blue) have three Public Supply abstraction sources within their 400m corridors. These features relate to groundwater abstractions for public water supply and are considered to be of high sensitivity.

Option A (Yellow) and Option B (Yellow+Blue) also interact with many sites of geological interest, in the form of karst landform features. For these reasons these options are considered to be have a greater overall effect than the Route Corridor Options in terms of soils and geology.

It should be noted that the differences between options are relatively small and may not be considered significant compared to other factors.

Table 7.4: Summary of Significance of Effect and Performance Score for Each Route Corridor Option – Soils and Geology

Option	PAG Unit 7.0 Significance of Effect	PAG Unit 7.0 Performance Score
Option A (Yellow)	Moderately Negative	2
Option B (Yellow+Blue)	Moderately Negative	2
Option C (Green)	Moderately Negative	2
Option D (Orange)	Moderately Negative	2
Option E (Orange + Link 1 + Green)	Moderately Negative	2
Option F (Orange + Link 2 + Green)	Moderately Negative	2

Table 7.5: Summary of Significance of Effect and Performance Score for Each Route Corridor Option – Hydrogeology

Option	PAG Unit 7.0 Significance of Effect	PAG Unit 7.0 Performance Score
Option A (Yellow)	Moderately Negative	2
Option B (Yellow+Blue)	Moderately Negative	2
Option C (Green)	Major or Highly Negative	1
Option D (Orange)	Major or Highly Negative	1
Option E (Orange + Link 1 + Green)	Moderately Negative	2
Option F (Orange + Link 2 + Green)	Moderately Negative	2

8. Hydrology

8.1 Introduction

This section discusses the potential effect of each of the proposed Route Corridor Options on the hydrology in the project Study Area and has been completed by Jacobs. Road schemes have the potential to significantly effect surface water bodies such as rivers, lakes/ponds, estuaries and reservoirs. This hydrology assessment considers the impacts on the following:

- Surface Water Quality; and
- Flood Risk.

Please note that groundwater is assessed as hydrogeology in Chapter 7 above.

Surface Water Quality

Increased sediment run-off during construction as a result of direct works within channel such as culverting, diversions or bridge construction as well as cement run-off or hydrocarbon / oil spillages can negatively impact water quality. Operational impacts to surface water bodies include run-off such as suspended solids, heavy metals and hydrocarbons as well as any changes to hydrological flow and geomorphological features as a result of works to the channel to construct crossing structures.

Flood Risk

The associated floodplain of each watercourse was also considered in the assessment as:

- There is the potential for flood risk to be increased if an existing watercourse and/or floodplain flows are impeded by the new road construction;
- Flooding of the new road from watercourses overtopping their banks could create hazardous conditions and prevent use of the road infrastructure; and
- Increased flooding can in turn cause a greater impact in terms of water quality in the event of an unexpected hydrocarbon or oil spillage.

8.2 Methodology

The hydrology assessment considers the 'TII Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' as recommended in the TII Project Appraisal Guidelines for National Roads Unit 7.0 – Multi Criteria Analysis.

The Guidelines refer to a list of requirements (where available) to be assessed for each Route Corridor Option in the Phase 2 assessments and details a list of information which may be included in the assessment where available and applicable. The information available and relevant to the proposed scheme and therefore included in the assessment is detailed in Table 8.1 below.

Table 8.1: TII Assessment and Data Requirements

TII Requirement	Included Yes/No	Reasons for Including / Not Including	Data included
Watercourses crossed and impact on water quality arising from re-alignment and discharge of surface water run-off	Yes	Information available to support this assessment.	<ul style="list-style-type: none"> • Aerial photography and mapping of Study Area (GSI, OSI and online sources); • Environmental Protection Agency, (website www.epa.ie) – WFD waterbody status (2013-2018).
Aquatic ecological sites close to and downstream of water crossings	Yes	Consultation has been undertaken between the hydrologist and the ecologist for the project as there is overlap between the two areas. The ecology chapter addresses such ecological sites. This chapter addresses water dependent habitats (identified by the ecologist) with direct hydrological connection to the Route Corridor Options.	Water-dependent habitats identified within the ecology chapter.
Surface water abstractions close to and downstream of water crossings	No	<p>Information not publicly available, therefore at this stage of the assessment none have been identified and so these features do not contribute to the Stage 2 options assessment presented in this Chapter.</p> <p>However, the potential exists for such features to be present within the Study Area and this may be investigated further during subsequent stages of assessment.</p>	None

TII Requirement	Included Yes/No	Reasons for Including / Not Including	Data included
Established amenity value of surface waters traversed by each Route Corridor Option	No	Although information is available from various online sources to assist in determining the amenity value of watercourses for fishing, water sports and walking and cycling trails, it is not considered that there will be enough information the amenity value of all surface waters impacted by Route Corridor Options. Therefore, to ensure consistency across the assessment amenity value has been excluded at this stage.	None
Potential increase (or reduction) in flood risk to existing properties	Yes	Information available to support this assessment.	<ul style="list-style-type: none"> • Aerial photography and mapping of Study Area (GSI, OSI and online sources); • EPA National rivers dataset; • OPW North Western CFRAM study, fluvial flood extents; • OPW Preliminary Flood Risk Assessment (PFRA), fluvial flood extents⁸¹.

8.2.1 Assessment Criteria

The comparative evaluation of Route Corridor Options was assisted by scoring of impacts to receptors using the Stage 2 project appraisal matrix suggested in the Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis⁸² against Surface Water Quality and Flood Risk.

In order to determine the overall significance of effect, it was noted that mitigation measures will be built into the design of the proposed scheme, although there will still be a residual risk/impact for both aspects. However, the design of the proposed scheme will include future proofing for flood risk in terms of climate change which should reduce the residual risk to very low. Whereas with water quality, while the road drainage can be designed to deal with road run-off and common pollutants, some issues cannot be mitigated for in design, for example spillage of miscible substances such as milk or slurry. As a result, the residual risk to water quality from the proposed scheme is higher than that for flood risk.

⁸¹ The CFRAM study data is a more detailed flood risk assessment than the PFRA however it covers a smaller area. Where available the CFRAM data is not available, PFRA data is used, however where available CFRAM data is the preference to the PFRA data.

⁸² TII. 2016. Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis. PE-PAG-02031.

8.2.1.1 Surface Water Quality

A desktop study was undertaken of all surface water bodies crossed by a proposed Route Corridor. This was completed by quantitative assessment (no. receptors impacted); and qualitative assessment (sensitivity of the receptor to changes in water quality and magnitude of the predicted impact).

The sensitivity of each receptor was determined based on a combination of things such as the Water Framework Directive (WFD) water quality status and the presence of water dependent habitats. Water bodies which are hydrologically linked to water dependent habitats are more sensitive to change. The criteria to determine the sensitivity of a waterbody to changes in water quality is detailed in Table 8.2.

Table 8.2: Criteria to determine the Sensitivity of a water body to changes in Surface Water Quality

Sensitivity	Criteria
Very High	A water body which has: <ul style="list-style-type: none"> • Good or High WFD Status; and • Annex I Water Dependand Habitats present in Designated Site(s) present.
High	A water body which has: <ul style="list-style-type: none"> • Good or High WFD Status; and/or • Annex I Water Dependand Habitats present non-Designated present. Or <ul style="list-style-type: none"> • Unassigned WFD Status; and • Annex I Water Dependand Habitats present (in Designated or non-Designated Site (s)).
Medium	A water body which has: <ul style="list-style-type: none"> • Unassigned WFD Status; and • No Annex I Water Dependand Habitats present. Or <ul style="list-style-type: none"> • Moderate / Poor / Bad WFD Status; and • Annex I Water Dependand Habitats present (in Designated or non-Designated site(s)).
Low	A water body which has: <ul style="list-style-type: none"> • Moderate / Poor / Bad WFD Status; and • No Annex I Water Dependand Habitats present.

For the purposes of this assessment watercourses with Unassigned status have been considered to be of higher sensitivity than Moderate, Poor or Bad watercourses but less sensitive than Good or High status waterbodies. The presence of Annex I Water Dependand Habitats has also influenced the determination of sensitivity; watercourses which have a direct hydrological link to a water dependent habitat are more sensitive to change. The magnitude of the surface water quality impact on each receptor was considered to determine the overall impact. The criteria for determining magnitude is detailed below in Table 8.3.

Table 8.3: Criteria for determining magnitude of impacts

Magnitude of Impact	Criteria
High Adverse	Results in loss of receptor and/or significant decrease in water quality of receptor
Medium Adverse	Results in a moderate impact on water quality of receptor or loss of part of receptor
Low Adverse	Results in minor impact on quality of receptor or loss of small part of receptor
Negligible	Results in an impact on receptor but of insufficient magnitude to affect the quality
Low Beneficial	Results in minor improvement of receptor quality
Medium Beneficial	Results in moderate improvement of receptor quality
High Beneficial	Results in major improvement of receptor quality

The significance of the overall effect of each Route Corridor Option was then determined based on professional judgement of the impacts on each receptor in combination along that route. The effect of each Route Corridor Option on surface water quality is scored based on the seven point scale as shown in Table 8.4 and a number will be assigned according to the level of significance of the effects.

Table 8.4: Surface Water Quality Key for Scoring Effects

Score	Significance of Effect	Description of Effect
7	Major or Highly Positive	Measures that might result in an overall improvement in surface water quality status of a WFD waterbody, also positively enhancing a water dependent habitat. Given the current stage of the design and for the purposes of this comparative assessment, it has been assumed there are no positive impacts arising from any of the Route Corridor Options.
6	Moderately Positive	
5	Minor or Slightly Positive	
4	Not Significant or Neutral	No change to surface water quality, therefore no risk to water dependent habitats.
3	Minor or Slightly Negative	Potential for minor changes to surface water quality and therefore some potential to impact water dependant habitats.
2	Moderately Negative	Potential for moderate risk to surface water quality and therefore some risk to water dependent habitats and increased risk from flooding.
1	Major or Highly Negative	Major risk to surface water quality therefore high risk to water dependent habitats and potentially high impacts from any increased flooding.

8.2.1.2 Flood Risk

A desktop study has been undertaken of all surface water bodies crossed by a proposed Route Corridor. This was completed through a quantitative assessment (no. receptors impacted); and a qualitative assessment (potential severity and magnitude of the predicted flood risk impact). The potential impact on each receptor was determined based on an assessment of existing flood risk information. The criteria to determine the potential flood risk impacts is detailed in Table 8.5.

Table 8.5: Criteria for determining magnitude of impacts on Flood Risk

Magnitude of Impact	Criteria
Significant Adverse	Increased risk of flooding affecting highly vulnerable development and/or Flood Zone A / B lands (based on OPW Catchment Flood Risk Assessment and Mapping (CFRAM) programme mapping ⁸³)
Moderate negative	Increased risk of flooding affecting low vulnerability development and/or potential Flood Zone A / B lands (based on OPW Preliminary Flood Risk Assessment (PFRA) mapping)
Low Adverse	Minor increase (<25mm) in channel water levels but no impact on floodplain flood depths or extents
Neutral	No impact on flooding or existing channel flow processes
Low Beneficial	Results in minor decrease in flood risk to surrounding lands
Medium Beneficial	Results in moderate decrease in flood risk to surrounding lands
High Beneficial	Results in significant decrease in flood risk to surrounding lands

⁸³ Impacts identified from CFRAM mapping are anticipated to be of higher magnitude than impacts identified from PFRA mapping. This is as a result of increased certainty around the likelihood of the occurrence due to the greater accuracy of the data as previously described in Footnote 75.

The significance of the overall effect of each Route Corridor was then determined based on professional judgement of the impacts on each receptor in combination along that route. The significance of effect is determined by considering sensitivity of the receptor and magnitude of impacts. Therefore, the higher the sensitivity of a watercourse the more significant the impact could be depending on the magnitude.

Each impact is scored based on the seven point scale as shown in Table 8.6 and a number assigned according to the level of significance of the impacts.

Table 8.6: Flood Risk Key for Scoring Effects

Score	Significance of Effect	Scoring Criteria
7	Major or Highly Positive	Measures that might result in a positive impact on flood risk include upsizing of existing culverts to reduce flood risk. Given the current stage of the design, and for the purposes of this comparative assessment, it has been assumed there are no positive impacts arising from any of the Route Corridor Options.
6	Moderately Positive	
5	Minor or Slightly Positive	
4	Not Significant or Neutral	No change to the existing flooding regime
3	Minor or Slightly Negative	Potential for minor change in in-channel water levels but no impact on floodplain depths or extents.
2	Moderately Negative	Increased risk of flooding to potential Flood Zone A or B lands as identified by the PFRA mapping
1	Major or Highly Negative	Increased risk of flooding to Flood Zone A or B lands as identified by the CFRAM mapping

8.2.2 Determining Overall Significance of Effects on Hydrology

Where the score for water quality and flood risk are the same, the overall significance of effect will be the same, however should they differ, the overall score will take a precautionary approach to the Water Quality assessment as a result of the greater residual risk after design embedded mitigation, as discussed in 8.2.1.

8.3 Existing Environment

The constraints in the Study Area have been mapped are presented in Volume 2 (Figures 8.1 – 8.2) of this Option Selection Report.

The proposed Route Corridor Options are along existing road infrastructure in the case of Option A and Option B, through undeveloped greenfield land. for the offline Route Corridor Options C, D, E and F. All of the proposed routes cross numerous watercourses of varying size and form, from small ditches to larger rivers. The overarching topography means that watercourses typically flow in an east to south easterly direction to cross many of the proposed Route Corridor Options.

Surface Water Quality

All six Route Corridor Options pass through a number of sub-catchments Glyde_SC_030, Glyde_SC_020, Fane_SC_020 and Fane_SC_010. Option A (Yellow) route also passes through the Dee_SC_020 and Glyde_SC_010.

The WFD waterbody status of waterbodies crossed has been identified in Table 8.7. The sensitivity of each receptor (WFD Waterbody) has been defined based on the WFD status and presence of Water Dependent Habitats as per the method detailed in Table 8.2. Figure 8.1 illustrates the surface water quality information of watercourses crossed and which routes intersect each watercourse.

Table 8.7: Surface Water Quality of Watercourses crossed by a Route Corridor Option

Catchment	Waterbody Name	WFD Status	At Risk Status	Protected Areas	No. Water Dependent Habitats	Receptor Sensitivity
Glyde_SC_030	Bawn_010	Unassigned	Review	Drinking Water Protected Area	N/A	Medium
	Mapastown_010	Unassigned	Review	Drinking Water Protected Area	N/A	Medium
Dee_SC_020	Dee_060	Moderate	At Risk	Drinking Water Protected Area	N/A	Low
Glyde_SC_020	Glyde_060	Good	Review	Drinking Water Protected Area	N/A	High
	Glyde_050	Moderate	At Risk	Drinking Water Protected Area; Nutrient Sensitive Area	5	Medium
	Proules_030	Moderate	At Risk	Drinking Water Protected Area; Nutrient Sensitive Area	3	Medium
	Rossdreenagh Stream_010	Moderate	At Risk	Drinking Water Protected Area	4	Medium
	Rossdreenagh Stream_020	Moderate	At Risk	Drinking Water Protected Area	6	Medium
Glyde_SC_010	Glyde_030	Good	Not at Risk	Drinking Water Protected Area	1	High
	Glyde_040	Good	Not at Risk	Drinking Water Protected Area	3	High
Fane_SC_020	Fane_050	Good	Not at Risk	Drinking Water Protected Area	N/A	High
	Fane_040	Moderate	Review	Drinking Water Protected Area	N/A	Low
Fane_SC_010	Annahale Stream_010	Poor	At Risk	Drinking Water Protected Area	N/A	Low
	Fane_020	Unassigned	Review	Drinking Water Protected Area	N/A	Medium

The most sensitive water bodies within the Study Area include; Glyde_030, Glyde_040, Glyde_060, and Fane_040, all of which have Good status.

Flooding Risk

The River Glyde is the largest watercourse to be crossed by the proposed routes. The Glyde has a known history of flooding characterised by reaches with large and extensive floodplains. Where it is crossed by the proposed routes, the Glyde channel is typically 10m wide with its floodplains being up to 290m wide.

The Proules River is also crossed by the proposed Route Corridor Options and is a tributary of the Glyde. Where it is crossed by the proposed routes, the Proules River channel is typically 10m wide with its floodplains being up to 100m wide.

The other named watercourse that are crossed by the proposed Route Corridor Options include Rossdreenagh Stream and the Fane River. These have channel widths in range of 5m to 10m.

8.4 Route Corridor Option Comparison

8.4.1 Assessment Assumptions and Limitations

There are a number of regulations which ensure that impacts in relation to water quality and flood risk are mitigated through design, therefore design embedded mitigation has been assumed and considered in the assessment of impacts throughout this chapter.

In relation to water quality it is assumed that the preferred route will be designed in compliance with the following guidelines:

- TII Publications (Standards), 2015. Drainage Systems for National Roads, DN-DNG-03022;
- TII Publications (Standards), 2015. Road Drainage and the Water Environment (including Amendment No. 1 dated June 2015), DN-DNG-03065;
- TII Publications (Standards), 2015. Vegetated Drainage System for Road Runoff, DN-DNG-03063;
- TII Publications (Standards), 2015. Design of Soakaways, DN-DNG-03072;
- TII Publications (Standards), 2015. Grassed Surface Water Channels for Road Runoff, DN-DNG-03073;
- CIRIA C648 Control of Water Pollution from Linear Construction Projects: Technical Guide (Murnane et al. 2006);
- CIRIA C649 Control of Water Pollution from Linear Construction Projects: Site Guide (Murnane et al. 2006);
- 'Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors' (CIRIA, 2001); and
- Inland Fisheries Board document 'Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters'.

In relation to flood risk, it is assumed the preferred route will be designed to comply with the following:

- Section 50: Arterial Drainage Act (1945) and EU Assessment and Management Flood Risk Regulations (2010) for the construction of any new or modification to existing culverts;
- Section 9: Arterial Drainage Amendment Act (1995) for the modification to or alteration of any watercourse to ensure no increase in flood risk or negative impact on the drainage of land; and
- Planning System and Flood Risk Management Guidelines (2009) and specifically the Justification Test.

There are also limitations to this assessment which must be noted in the outset:

- For the purposes of this Stage 2 comparative assessment, ecological sites have only been identified by the ecologists from surveys of publicly accessible roads and land, therefore it must be assumed that there may be other water dependent habitats in the Study Area that may not have been identified at this point. A precautionary approach has been taken in some instances, and the presence of Annex I habitats may be assumed for the purposes of this Stage 2 assessment. At later phases of the design process, when more detailed surveys will be conducted, it may become clear that Annex I habitats are not present within any particular site;

- The accuracy of the available Flood Risk Mapping information has not been assessed at the is stage. Whilst it is judged to be sufficiently accurate to allow a relative comparison of the flood risk impacts between various Route Corridor Options, a detailed Flood Risk Assessment will be required at later Phases of the project to confirm the flood risk impacts of the proposed scheme in the subsequent Phase 3 (Design and Environmental Evaluation); and
- Where no flood mapping is available for a watercourse, it is assumed to have no limited natural floodplain with flows constrained to the watercourse channel.

8.4.2 Assessment of Potential Impacts

Table 8.8 and Table 8.9 summarise the quantitative assessment conducted detailing the number of crossings within each proposed Route Corridor Option and the sensitivity of waterbodies in terms of water quality and flood risk. The number of crossings has been used to guide the assessment primarily, and a qualitative assessment has also been conducted. As part of this, rivers running parallel in close proximity to a proposed Route Corridor Option are also considered.

8.4.2.1 Surface Water Quality

The number of watercourse crossings for each of the Route Corridor Options ranges from 11 to 17. The crossings are listed in Table 8.8 below.

In terms of magnitude of impacts, as is set out in the Section 8.2 Methodology, the options assessment considered;

- the number of different watercourse crossings on any particular Route Corridor Option;
- the increased risk of a pollution incident to any watercourses to be crossed more than once; the more crossings there are present on any Route Corridor, the increased risk of a pollution incident; and the more crossings on a single water body, the greater the risk of cumulative impacts leading to a significant impact on the status of the water body; and
- Design Embedded Mitigation.

8.4.2.2 Flood Risk

All these crossings have the potential to have a negative impact on flood risk to varying degrees without suitable mitigation from impeding channel and floodplain flowpaths. There is also the potential for the works to be located in areas at a high risk of flooding resulting in unsafe conditions when rivers overtop their banks. The introduction of new impermeable surfaces could also increase flood risk due to increased run-off rates.

The options assessment considered the number and nature of floodplain and the potential impact on flood risk. There is a range in the number and nature of crossings of flood risk areas made by each Route Corridor, however the typical flow direction of watercourses is in an easterly to south-easterly direction meaning many of Route Corridor Options cross the same flood risk zones and watercourses.

However, for the purposes of this analysis it is however assumed that flood risk impacts will be mitigated in the design to ensure compliance with Section 50 of Arterial Drainage Act, Section 9: Arterial Drainage Amendment Act and Planning System and Flood Risk Management Guidelines (FRM Guidelines) to maintain run-off rates from new works to existing greenfield rates, which will mitigate the potential increase in run-off rates. It is therefore assumed that the overall impact of the Route Corridor Options, with mitigation, all Route Corridor Options are determined to have Minor Negative impact on Flood Risk.

Table 8.8: Surface Water Quality Assessment of Watercourses Crossings

Watercourse Crossings	Route Corridor Options					
	Option A (Yellow)	Option B (Yellow + Blue)	Option C (Green)	Option D (Orange)	Option E (Orange + Link 1 + Green)	Option F (Orange + Link 2 + Green)
High Sensitivity	3	3	1	3	1	3
Waterbody Names	Glyde_030 (1); Glyde_040 (1); Glyde_060 (1)	Glyde_030 (1); Glyde_040 (1); Glyde_060 (1)	Glyde_060 (1)	Glyde_060 (1); Fane_050 (2)	Glyde_060 (1);	Glyde_060 (1); Fane_050 (2)
Medium Sensitivity	6	5	7	9	12	8
Waterbody Names	Fane_020 (1); Proules_030 (2); Glyde_050 (1); Rossdreenagh Stream_010 (2)	Proules_030 (2); Glyde_050 (1); Rossdreenagh Stream_010 (2)	Mapastown_010 (1); Proules_030 (2); Glyde_050 (3); Rossdreenagh Stream_020 (1)	Bawn_010 (1); Mapastown_010 (2); Fane_020 (1); Glyde_050 (4); Rossdreenagh Stream_020 (1)	Bawn_010 (1); Mapastown_010 (2); Proules_030 (2); Glyde_050 (6); Rossdreenagh Stream_020 (1)	Bawn_010 (1); Mapastown_010 (2); Glyde_050 (4); Rossdreenagh Stream_020 (1)
Low Sensitivity	4	3	7	7	6	6
Waterbody Names	Dee_060 (1); Fane_040 (2); Annahale Stream_010 (1)	Dee_060 (1); Fane_040 (1); Annahale Stream_010 (1)	Dee_060 (1); Fane_040 (3); Annahale Stream_010 (3)	Fane_040 (6); Annahale Stream_010 (1)	Fane_040 (3); Annahale Stream_010 (3)	Fane_040 (3); Annahale Stream_010 (3)
Total Number of Crossings	13	11	15	19	19	17
Significance of Effect	Minor or Slightly Negative	Minor or Slightly Negative	Minor or Slightly Negative	Minor or Slightly Negative	Minor or Slightly Negative	Minor or Slightly Negative

Table 8.9: Flood Risk Assessment of Watercourses Crossings

Flood Risk Zones Crossed	Number of Crossings of Flood Risk Locations					
	Option A (Yellow)	Option B (Yellow + Blue)	Option C (Green)	Option D (Orange)	Option E (Orange + Link 1 + Green)	Option F (Orange + Link 2 + Green)
1 – Potential increased flooding in Flood Zone A and B identified by CFRAM mapping (Major negative Significance)	2	2	6	5	6	3
2 – Potential increased flooding in <i>Potential</i> Flood Zone A and B identified by PFRA mapping (Moderate negative Significance)	8	8	6	10	8	8
3 – Potential change in in-channel water levels but no impact on floodplain depths or extents (Minor negative Significance)	10	12	16	22	22	26
Total No. of Major or Moderate Flood Risk Interfaces	10	10	12	15	14	11
Significance of Effect	Minor or Slightly Negative	Minor or Slightly Negative	Minor or Slightly Negative	Minor or Slightly Negative	Minor or Slightly Negative	Minor or Slightly Negative

8.4.3 Comparison of Options

8.4.3.1 Surface Water Quality

Option A (Yellow), Option B (Yellow + Blue), Option D (Orange) and Option F (Orange + Link 2 + Green) cross the most highly sensitive waterbodies. However, with best practice construction, design and mitigation it is not determined that these routes will have significantly greater magnitude of impacts than the others. Therefore, the overall significance of impact remains minor. Routes have been assessed based on the cumulative impact of all crossings along the entire Route Corridor Option.

Option D (Orange), Option E (Orange + Link 1 + Green) and Option F (Orange + Link 2 + Green) cross the highest number of water bodies due to more crossings of Moderate and Low sensitivity water bodies, although the impacts are still determined to be minor considering the best practice construction practices, controls and mitigation measures in place and being adhered to as detailed in Section 8.4.1. Very little separates Option D (Orange), Option E (Orange + Link 1 + Green) and Option F (Orange + Link 2 + Green), particularly Option D (Orange) and Option F (Orange + Link 2 + Green) which have 3 high sensitivity crossings and a similar number of medium sensitivity crossings. Option E (Orange + Link 1 + Green) has only 1 high sensitivity crossing, but 12 medium sensitivity crossings.

Option A (Yellow), Option B (Yellow + Blue) and Option C (Green) cross a much smaller number of water bodies than the remainder of other Route Corridors. Despite crossing the lowest number of High sensitivity waterbodies, Option C (Green) crosses a higher number of total waterbodies than Option A (Yellow) and Option B (Yellow + Blue); it crosses slightly more Medium and Low sensitivity waterbodies. Option B (Yellow + Blue) has the fewest number of crossings of Medium and Low sensitivity water bodies and has the smallest number of overall crossings.

In addition to this, both Option A (Yellow) and Option B (Yellow + Blue) are predominantly online routes and although it cannot be determined at this stage that the crossing will be in the same location, it can be assumed that the change in the baseline to the watercourses along these two routes may be slightly less significant to other offline routes, including Option C (Green), although the will still result in Minor impact.

8.4.3.2 Flood Risk

Despite all routes receiving Minor Negative impact scores, the analysis does permit some distinction between the Route Corridor Options; specifically, the crossing of broad areas of floodplain that would be identified as Flood Zone A or B has the potential for a more significant impact on flood risk compared to minor drains. Option C (Green), Option D (Orange) and Option E (Orange + Link 1 + Green) have the highest number of crossings of areas identified as being in Flood Zone A or B. In accordance with the FRM Guidelines, the Route Corridor Options should seek to avoid lands at the highest risk of flooding if there are reasonable alternatives irrespective of any mitigation measures that might be implemented.

Option A (Yellow) and Option B (Yellow + Blue) routes have the smallest number of crossings of areas identified as being in in Flood Zone A or B. There is little to differentiate between the two options with the only difference being Option B (Yellow + Blue) route making two additional crossings of minor watercourses. As noted above, both Option A (Yellow) and Option B (Yellow + Blue) routes are majority online.

8.5 Conclusions

Given that all routes have been assessed to be minor negative for Surface Water Quality and minor negative for Flood Risk, the overall significance of effect for each Route Corridor Option on Hydrology is 'Minor Negative'.

Although there is a range in the number of water body crossings on each route and there could be very slight increased cumulative impacts associated with some Route Corridor Options compared to others, it is not considered that this range is wide enough to determine that one Route Corridor Option would result in a **higher magnitude of impact** than another due to construction best practices, controls and mitigation measures in place and being adhered to as detailed in Section 8.4.1. As a result, all Route Corridor Options have been determined to have minor negative effect on surface water quality as detailed in Table 8.8.

Additionally, due to the uncertainty around 'Potential Flood Zone A or B' areas, there is not sufficient information at this stage to determine that one route would result in a more significant effect than another until detailed Flood Risk Assessment has been conducted at Phase 3. This supported by the assumption that design mitigation measures will be in place and adhered to as detailed in Section 8.4.1.

Table 8.10: Summary of Significance of Effect and Performance Score for Each Route Corridor Option–Hydrology

Option	PAG Unit 7.0 Significance of Effect	PAG Unit 7.0 Performance Score
Option A (Yellow)	Minor or Slightly Negative	3
Option B (Yellow+Blue)	Minor or Slightly Negative	3
Option C (Green)	Minor or Slightly Negative	3
Option D (Orange)	Minor or Slightly Negative	3
Option E (Orange + Link 1 + Green)	Minor or Slightly Negative	3
Option F (Orange + Link 2 + Green)	Minor or Slightly Negative	3

9. Cultural Heritage

9.1 Introduction

This chapter outlines the Cultural Heritage Assessment carried out as part of the Option Selection Report for the proposed Scheme. The assessment was carried out by Archaeological Management Solutions Ltd (AMS).

Under EIA Directive 2014/52/EU, 'cultural heritage' comprises archaeology, architectural heritage, folklore and history. Archaeology is the study of past societies through surviving structures, artefacts and environmental data, and is concerned with known archaeological sites and monuments, areas of archaeological potential and underwater archaeology. Architectural heritage comprises structures, buildings, traditional and designed, and groups of buildings including streetscapes and urban vistas, which are of historical, archaeological, artistic, engineering, scientific, social or technical interest, together with their setting, attendant grounds, fixtures, fittings and contents. Architectural heritage and archaeology together form 'built heritage' or 'tangible heritage'. Folklore and history are aspects of 'intangible heritage', which also includes language, musical traditions, traditional crafts and skills, townland names, poetry and so on. These forms of cultural heritage are "non-moveable, non-material and largely non environmental although by their associations with certain sites and places, add to the character of an area" (EPA 2015).

In this assessment, tangible cultural heritage assets are captured under the relevant sections on archaeology and architectural heritage, while non-tangible (e.g. historical or folklore) associations with these sites and the wider Study Area are referred to where known. Additional information on non-tangible associations will be collected during the EIA stage (Phase 3 – Design and Environmental Evaluation) through further documentary research and where reported through public consultation.

9.2 Methodology

9.2.1 Overview and Guidance

The Cultural Heritage Route Corridor Options Assessment built upon the Archaeology, Architectural and Cultural Heritage Constraints Study (hereafter referred to as the 'Constraints Study') completed for the proposed scheme. The aim of the Constraints Study was to identify, using readily available sources, the known archaeological, architectural heritage and other cultural heritage assets within the defined Study Area in order to assist with the identification of Feasible Route Corridor Options. For the purposes of the study, assets were categorised broadly as follows:

- **Archaeological (AY)** — World Heritage Sites; National Monuments; archaeological sites and monuments listed on the Sites and Monuments Record (SMR) and/ or Record of Monuments and Places (RMP);
- **Architectural (AH)** — designated Protected Structures and Architectural Conservation Areas; structures and other items listed on the National Inventory of Architectural Heritage (NIAH); and undesignated structures of potential architectural heritage interest;
- **Cultural Heritage (CH)** — any other sites, areas or features of potential cultural heritage value including areas where undesignated archaeological sites, material and deposits potentially occur.

The objective of the Cultural Heritage Route Corridor Options Assessment was to produce a common assessment and detailed technical comparative evaluation of each Route Corridor Option with reference to its potential archaeological and architectural heritage impacts. The methodology for the appraisal of the Route Corridor Options with regards to archaeological and architectural heritage was based on the National Roads Authority's (NRA) *Guidelines for the Assessment of Archaeological Heritage Impacts on National Road Schemes* (NRA 2005a) and *Guidelines for the Assessment of Architectural Heritage Impacts of National Road Schemes* (NRA 2005b) (the NRA Guidelines),⁸⁴ and the Environmental Protection Authority's (EPA's) *Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports* (EPA 2017). Other guidance of relevance to the assessment includes:

- Department of Arts, Heritage, Gaeltacht and the Island's *Framework and Principles for the Protection of the Archaeological Heritage* (DAHGI, 1999);
- Department of Arts, Heritage and the Gaeltacht's *Architectural Heritage Protection Guidelines for Planning Authorities* (DAHG 2011a);
- Department of Arts, Heritage and the Gaeltacht's *NIAH Handbook* (DAHG 2011b);
- EPA's *Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)* (EPA 2003);
- EPA's *Guidelines on the information to be contained in Environmental Impact Statements* (EPA 2002); and
- NRA's *Environmental Impact Assessment of National Road Schemes – A Practical Guide* (NRA 2008); and
- TII's *Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis* (PE-PAG-02031 2016).

The Cultural Heritage Option Selection Study was divided into four main components:

1. Further appraisal of known and potential archaeological sites and monuments and architectural heritage as identified in the initial Constraints Study within a 400m-wide corridor for each of the Route Corridor Options, including collation and analysis of previous archaeological investigations and preliminary collation of local folklore using the Irish Folklore Commission's Schools Collection;
2. Surveys from accessible land and targeted field surveys of archaeological and architectural heritage assets to supplement the desktop research;
3. Quantitative and qualitative assessment of Route Corridor Options (based on a 400m wide corridor); and
4. Report writing.

9.2.2 Establishing the Baseline

9.2.2.1 Archaeology

At present, archaeological sites and monuments in the Republic of Ireland are protected under the National Monuments Act 1930 (as amended) in one of four ways:

1. Being recorded in the Record of Monuments and Places (RMP);
2. Being registered in the Register of Historic Monuments (RHM);
3. Being a National Monument in the ownership or guardianship of the Minister for Culture, Heritage and the Gaeltacht or a Local Authority; or
4. Being a National Monument subject to a Preservation Order or Temporary Preservation Order.

The principal sources for the identification of archaeological heritage assets are outlined below. Reference numbers (e.g. N2/ AC/ CS-AY001, abbreviated to AY001 etc.) have been assigned to each identified archaeological heritage asset in line with the referencing convention outlined in the NRA guidelines, which can be seen on Figure 9.1.

⁸⁴ The functions of the former NRA have now been assumed by Transport Infrastructure Ireland (TII).

9.2.2.1.1 World Heritage Sites and Tentative World Heritage List

There are no UNESCO World Heritage Sites or sites included on the Tentative List within the Study Area. The closest World Heritage Site, Brú na Bóinne, includes a core area (comprising over 750 hectares) and surrounding buffer zone (comprising some 2,500 hectares). The northern limit of the buffer zone, which follows the line of the River Mattock, lies over 12 km to the south of the Study Area.

9.2.2.1.2 National Monuments Lists

A National Monument, as defined in Section 2 of the National Monuments Act 1930, means a monument “the preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic or archaeological interest attaching thereto....” The current Lists of National Monuments in State Care (Ownership and Guardianship) for Counties Louth and Monaghan were published in 2009. Any updates since 2009 have been taken into account. However, there are no National Monuments in State Care listed within the Route Corridor Options for the proposed Scheme but there is one within the Study Area - Mannan Castle in Donaghmoynne (see Section 9.3.1).

9.2.2.1.3 Record of Monuments and Places (RMP)

The Record of Monuments and Places (RMP) is the statutory list of protected places and monuments established under Section 12(1) of the National Monuments (Amendment) Act 1994. The RMP for Counties Louth and Monaghan was published in 1996 in paper form with accompanying constraints maps. Any updates since 1996 have been taken into account. During the subject assessment, the printed lists and maps were used to check whether a monument or place is subject to legal protection under the National Monuments Acts through its inclusion on the RMP.

9.2.2.1.4 Sites and Monuments Record (SMR)

The Archive Unit of the National Monuments Service (NMS) maintains a publicly-accessible database known as the Sites and Monuments Record (SMR) which contains current information on known archaeological sites and monuments, including whether or not they are scheduled for inclusion in the next issue of the statutory Record of Monuments and Places (RMP). The SMR sites dataset includes a ‘Zone of Notification’ for sites and monuments. These do not define the exact extent of the monuments, but rather are intended to identify areas in which archaeological remains are believed to occur for the purposes of notification under Section 12 (3) of the National Monuments (Amendment) Act 1994. Updated searches of the SMR were carried out during the Option Selection assessment and are illustrated in Figure 9.1.

9.2.2.1.5 List of Monuments Subject to Preservation Orders

Section 8 (1) of the National Monuments Act 1930 provides for the Minister placing a preservation order on a monument which the Minister considers to be a National Monument under threat. The list of Preservation Orders detailing all monuments that have had a Preservation Order or a Temporary Preservation Order placed on them was published by the NMS in June 2019. There are no Preservation Orders relating to monuments within the Study Areas for the proposed road scheme in either County Louth or County Monaghan.

9.2.2.1.6 Database of Irish Excavation Reports

The Database of Irish Excavation Reports, also commonly known as the ‘Excavations Bulletin’ (summary accounts of archaeological excavations in Ireland), is maintained by Wordwell publishers with the support of the Department of Culture, Heritage and the Gaeltacht (DCHG) and is accessible online. Transport Infrastructure Ireland (TII) also makes available reports commissioned as a result of their road projects.

9.2.2.1.7 Historical Maps and Satellite Imagery

Cartographic sources including the first-edition six-inch Ordnance Survey map (published for County Monaghan in 1836 and for County Louth in 1836) and the first-edition 25-inch Ordnance Survey maps (published 1907-9) were reviewed online through the Historic Environment Viewer and Ordnance Survey of Ireland websites. In addition, the Down Survey maps (1657)⁸⁵ and Map of the County of Monaghan (McCrea Map of Monaghan) 1793⁸⁶ were also examined. Satellite imagery was also reviewed throughout the assessment.

9.2.2.2 Architectural Heritage

The principal sources for the identification of architectural heritage are outlined below. Reference numbers (e.g. N2/ AC/ CS-AH001, abbreviated to AH001 etc.) have been assigned to each identified archaeological heritage asset in line with the referencing convention outlined in the NRA guidelines. Those within the Study Area are illustrated on Figure 9.2.

9.2.2.2.1 Record of Protected Structures

Under the Planning and Development Act 2000, Local Authorities are required to maintain a Record of Protected Structures (RPS) as part of their Development Plan. These are structures recognised by the Local Authority as having special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. The legal protections afforded to Protected Structures are set out in Part IV of the Planning and Development Act 2000.

The RPS provides positive recognition of a structure's importance and protection from adverse impacts. A Protected Structure, unless otherwise stated in the RPS, includes the interior of the structure, the land lying within its curtilage, any other structures and their interiors lying within that curtilage, plus all of the fixtures and features that form part of the interior or exterior of any of these structures. The National Monuments Act 1930 (as amended) can also protect elements of the architectural heritage or offer dual/ parallel protection. The Development Plan also contains a list of Architectural Conservation Areas (ACAs).

Protected Structures within the Study Area are illustrated on Figure 9.2.

9.2.2.2.2 National Inventory of Architectural Heritage

The National Inventory of Architectural Heritage (NIAH) is a nationwide survey of architectural heritage including buildings, structures and historic landscapes and gardens, carried out under the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. The NIAH comprises a Building Survey and a Survey of Historic Gardens and Designed Landscapes. These surveys are used to advise Local Authorities in relation to structures of interest within their areas. The purpose of the surveys is to highlight a representative sample of the architectural heritage of each county and to raise awareness of the wealth of architectural heritage in Ireland. Not all buildings and structures listed on the NIAH are legally protected through inclusion on the RPS.

NIAHs within the Study Area are illustrated on Figure 9.2.

9.2.2.3 Folklore and History

A review of published and unpublished source material was undertaken to establish whether the Study Area or particular sites within it has any specific folk or historical significance that would be significantly impacted by the proposed project. This included a search of the Irish Folklore Commission's School Collection, which is a rich source of local information that is gradually being made accessible online as part of UCD's National Folklore Collection Digitization Project (see Appendix 9.6 of this Volume 5).

⁸⁵ Available from <http://downsurvey.tcd.ie/down-survey-maps.php>

⁸⁶ Available from https://digitalcollections.tcd.ie/home/#folder_id=22&pidtopage=PapyrusCase5_20&entry_point=20

9.2.3 Appraisal Methodology

9.2.3.1 Stage 1 — Preliminary Assessment of Route Corridor Options

9.2.3.1.1 Desk Study

The information gathered during the Constraints Study, which informed the selection of the Route Corridor Options, provided the baseline for the desk study at the Option Selection phase. The sources outlined above were consulted again to cross-check and update this baseline. The constraints study initially identified constraints across the Study Area. During the Stage 1 and this Stage 2 assessment of the Route Corridor Options, the assessment encompassed the overall width of 400m for each option (i.e. 200m from the centreline of each route). These assessment corridors were also used for the architectural heritage assessment, which exceeds the recommended corridor width for architectural heritage (NRA 2005b, 17).

9.2.3.1.2 Compilation of Base Maps

The archaeological and architectural heritage assets identified during the Constraints Study were updated and digitally mapped using open-source GIS software QGIS (versions 2.18.17 and 3.4.4) and cross-checked with current RMP, SMR, NIAH and RPS datasets. The historical mapping and satellite imagery referred to above were imported as basemap layers and further examined to identify other structures and features of potential heritage interest for checking in the field. Vector data for each Route Corridor Option were also imported and examined in relation to the identified heritage assets during the assessment.

9.2.3.1.3 Field Survey

A targeted survey of accessible lands (sometimes referred to as a 'windshield' survey) was carried out to supplement the desktop research completed for the Constraints Study. The survey assisted in:

- confirming the nature, location, condition and extent of archaeological sites and monuments and architectural heritage features potentially impacted by the Route Corridor Options;
- noting additional unidentified archaeological sites and monuments and architectural heritage assets as defined under the National Monuments Acts 1930–2004 and Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999;
- evaluating potential magnitude and significance of potential impact by the Route Corridor Options; and
- providing a preliminary photographic record of individual features of potential archaeological and architectural heritage interest.

9.2.3.1.4 Compiling the Archaeological and Architectural Heritage Inventories

Preliminary inventories of archaeological and architectural heritage assets were compiled, drawing on data and information recorded during the Constraints Study, supplemented by the additional research and fieldwork. These inventories (Appendices 9.1 & 9.2) include a brief description and appraisal of each feature or area of archaeological and architectural heritage interest, the legal status and suggested importance of the feature as well as an approximate date.

The relative importance of each archaeological or architectural asset was rated in terms of Negligible, Low, Medium or High for archaeological sites and Local, Regional, National and International for architectural heritage sites, in accordance with the published NRA and EPA guidelines. Under the Assessment of Route Corridor Options, a list of potential affected assets is given for each Route Corridor Option, along with approximate distance from each proposed Route Corridor Option and the type, quality, magnitude and significance of predicted impact (sections 9.4.1.2 and 9.4.2.2 below).

In addition, an Archaeological and Historical Background was prepared to place the Study Area into its wider spatial and temporal context, and where previous archaeological investigations or research works have been conducted summary detail of the relevant work is provided (Section 9.3.2 below and Appendix 9.5 Summary of Previous Archaeological Investigations). Summaries of pertinent extracts from the Irish Folklore Commission's School Collections are provided in Appendix 9.6.

9.2.3.1.5 Options Assessment

A comparative quantitative and qualitative evaluation of the impacts on Cultural Heritage assets identified within each Route Corridor Option was carried out to arrive at the identification of a preferred Route Corridor Option from the standpoint of Cultural Heritage. It is recognised that the preferred route from a Cultural Heritage perspective may not be the overall optimum route when other impacts and considerations are evaluated.

The future proposed road alignment within the selected Preferred Route Corridor Option will of course be narrower than 400m, and so sites within the Route Corridor Option could potentially be avoided through careful routing. As identified in Section 9.2.4.1.1 below, this assessment has included a 50m band within the 400m-wide Route Corridor Option. This band is 25m either side of the centreline (i.e. 50m-wide in total). This allows the assessment to more accurately identify potential direct and indirect effects to cultural heritage sites. Sites within the 50m band have been assessed for potential direct effects and sites beyond the 50m band have been assessed for potential indirect effects. At the next phase of the project (i.e. Phase 3), there will be further surveys and assessments to inform the proposed alignment within the selected preferred Route Corridor Option.

9.2.3.2 Stage 2 — Appraisal of Route Corridor Options

Given the identification of the various constraints from initial Constraints Study, the Route Corridor Options did not change significantly. The Route Corridor Options were assessed and compared using the same methods as Stage 1, adding additional sites not originally noted on GIS databases and taking account of the likely impacts and relative merits of affected features and sites.

The quantitative attributes assessed when comparing Route Corridor Options involved analysing the relative number of known and potential archaeological sites and monuments, and structures or features of architectural heritage merit, likely to be adversely impacted by each Route Corridor Option. The qualitative attributes assessed included the type of site and relative importance, condition and rarity of structures or features present within the study corridors. Relative importance derives from a number of factors including current designation or listing (i.e. RMP, SMR, RPS, NIAH or none) and archaeological, architectural, historical, artistic, cultural, scientific, social or technical interest. This part of the assessment involves the application of professional judgement.

The Route Corridor Options Appraisal outlined above detailed the impacts associated with each Route Corridor Option with respect to archaeology and architectural heritage. It is important to note that the NRA guidelines recognise that the preferred route may not necessarily be the route with the lowest number of impacts on archaeological or architectural heritage sites (NRA 2005a: 27): for example, a route that has relatively minor indirect impacts on eight (8) sites may be preferable to a Route Corridor Option that has just one direct impact resulting in the demolition of a building of regional or national architectural heritage merit (NRA 2005b:23).

More detailed research, including consultation and further fieldwork, will need to be carried out on the Preferred Route Corridor that is ultimately selected, in accordance with the NRA Guidelines (NRA 2005:28). This would be done as part of an Environmental Impact Assessment (EIA) in the subsequent phase of the development of the proposed scheme.

9.2.4 Assessment Criteria

Evaluation of impacts was carried out using metrics specific to archaeological and architectural heritage, and with reference to the published NRA guidelines for archaeological heritage (NRA 2005a) and architectural heritage (2005b) as outlined below. The assessment was undertaken on each option and included both quantitative and qualitative assessment.

The comparative evaluation of Route Corridor Options was assisted by scoring of impacts to sensitive receptors using the Stage 2 project appraisal matrix suggested in the Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis⁸⁷. The overall significance of effect of each Route Corridor Option is scored based on the seven-point scale as shown in Table 9.1 and a number will be assigned according to the level of significance of the effects.

Table 9.1: Key for Scoring Effects

Score	Significance of Effect
7	Major or Highly Positive
6	Moderately Positive
5	Minor or Slightly Positive
4	Not Significant or Neutral
3	Minor or Slightly Negative
2	Moderately Negative
1	Major or Highly Negative

9.2.4.1 Types of Impact

Likely impacts associated with each Route Corridor Option were categorised as one of three types:

- **Direct Impact** — where a feature or site of archaeological or architectural heritage interest is physically located within 25m either side of the centreline (a 50m-wide band) which potentially entails the removal of part, or all of the monument or feature;
- **Indirect Impact** — where a feature or site of archaeological or architectural heritage interest or its setting is located more than 25m either side of the centreline (outside of the 50m-wide band) but is in proximity; or
- **No predicted impact** — where the Route Corridor Option does not adversely or positively affect a feature or site of archaeological or architectural heritage interest.

9.2.4.2 Quality and Magnitude of Impact

The quality of predicted impact was classified as **Negative, Positive or Neutral**. Negative impacts include total or partial loss of a site, monument, structure or its attendant grounds, visual intrusion, severance and degradation of setting and/ or amenity. Positive impacts include increased physical separation resulting in traffic relief, reduced visual and noise intrusion, and enhancement of setting or amenity. Where no impact is predicted, the quality of impact is rated as Neutral. The predicted magnitude of impact was rated as **Low, Medium, High or Very High** (NRA 2005a: 28; NRA 2005b: 31).

9.2.4.3 Significance of Impact on each receptor

The predicted significance of impact on each receptor was evaluated by comparing the predicted magnitude of impact with the suggested importance of the asset using the schedule of significance provided in the NRA guidelines (NRA 2005a: 27; NRA 2005b: 32–33). Significance of impact for both archaeological and architectural heritage are classified and summarised below:

- **Imperceptible** — an impact on archaeological or architectural heritage of local importance that is capable of measurement but without noticeable consequences;
- **Slight** — an impact that causes some minor change in the character of archaeological or architectural heritage of local or regional importance without affecting its integrity or sensitivities. Although noticeable, the effects do not directly impact on the archaeological or architectural structure or feature. Impacts are reversible and of relatively short duration. Appropriate mitigation will reduce the impact;

⁸⁷ TII. 2016. Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis. PE-PAG-02031.

- **Moderate** — an impact that results in a change to the archaeological or architectural heritage which, although noticeable, is not such that it alters the integrity of the heritage. The change is likely to be consistent with existing and emerging trends. Impacts are probably reversible and may be of relatively short duration. Appropriate mitigation is very likely to reduce the impact;
- **Significant** — an impact that by its magnitude, duration or intensity alters the character and/ or setting of the archaeological or architectural heritage. These effects arise where an aspect or aspects of the architectural heritage is/ are permanently impacted upon leading to a loss of character and integrity in the archaeological or architectural structure or feature. Appropriate mitigation is likely to reduce the impact.
- **Profound** — an impact that obliterates the archaeological or architectural heritage of a structure or feature of national or international importance. These effects arise where an archaeological or architectural structure or feature is completely and irreversibly destroyed by the proposed development. Mitigation is unlikely to remove adverse effects.

9.3 Existing Environment

9.3.1 General Description

The constraints in the Study Area have been mapped are presented in Volume 2 (Figures 9.1 – 9.3) of this Option Selection Report.

The existing section of the N2 under consideration in this project is approx. 32km long and extends from Muldrumman townland in County Monaghan on the north to Broadlough and Stickillen townlands at Ardee, County Louth on the south (please see Figures 9.1 – 9.3, Volume 2 of this Option Selection Report).

The underlying geology of the Study Area is diverse and is comprised of turbidite to the north, micrite in the area near Carrickmacross, and greywacke and sandstone to the south (www.gsi.ie).

The Study Area comprises much pastoral land defined by hedgerows and trees, with many of the fields enclosed by a combination of earthen banks and stone walls with associated hedgerows and ditches. The predominant land use is pastoral (dairy, beef and sheep grazing), with some areas of coniferous and deciduous forestry. There are numerous local roads crisscrossing this landscape with very frequent residential properties dispersed throughout the area. The modern landscape within the Study Area is a reflection and culmination of thousands of years of human intercession, with medieval and post-medieval settlement concentrated along the major routes of communication including the existing N2. Indeed, the majority of the architectural heritage assets identified during this study are located along the existing N2 or adjacent side roads. The archaeological heritage is more dispersed across the landscape, and almost every period of human interaction and settlement with the landscape in Ireland is represented throughout the Study Area.

The overall Study Area contains 517 known archaeological heritage assets illustrated in Figure 9.1, all of which are listed on the RMP and/ or SMR. There is one (1) National Monument within the Study Area – Mannan Castle in Donaghmoyne (MO028-188 / Nat. Mon. No. 382). The Study Area contains a very high concentration of ringfort (rath) sites, numbering over 280 and accounting for more than half of the total assets. The landscape within the Study Area also contains megalithic tombs, Neolithic houses, Bronze Age burial sites, an Iron Age enclosure and promontory fort, ecclesiastical sites, Anglo-Norman castle ruins and fortified houses, reflecting extensive and continual occupation of the location over thousands of years. The archaeological heritage assets identified within the Study Area are summarised in more detail below and, where they fall within the Route Corridor Options, are described individually in the Preliminary Archaeological Inventory (Appendix 9.1).

A total of 192 summary reports on test excavations or archaeological monitoring are recorded on www.excavations.ie as having taken place in Counties Monaghan and Louth. Of these, 32 were conducted in and around the Study Area. These excavations occurred between 1999 and 2014 and were reviewed on the Database of Irish Excavation Reports (DIER, accessed online at www.excavations.ie on 15/03/2020). In ten of the 32 cases summarised in the DIER, nothing of archaeological significance was encountered during these works. Investigations that did record archaeological or potential archaeological features or deposits are incorporated into the overview presented below.

There are 145 identified architectural assets within the Study Area, identified on Figure 9.2, comprising buildings/structures on the National Inventory of Architectural Heritage (NIAH) and structures listed on the Record of Protected Structures (RPS) for Counties Monaghan and Louth. These structures date from the seventeenth to mid-twentieth century; and vary from vernacular houses to religious buildings and graveyards, to country houses and gate lodges, and include historical places of industry and commerce such as mills and forges, as well as education such as schools and seminaries. While most of the dwellings are modern, some may date to the nineteenth century (such as AH009, AH062, AH064, AH086, AH087, AH159, AH162) and possibly the eighteenth century (such as AH023, AH069, AH073, AH079) and even the seventeenth century (such as AY043, AY116, AY123). The types of buildings of architectural heritage interest identified within the Study Area are summarised in more detail below and, where they fall within the Route Corridor Options, are described individually in the Preliminary Architectural Heritage Inventory (Appendix 9.2).

9.3.2 Archaeological Background

9.3.2.1 Prehistoric Period (c. 7000BC–AD400)

Evidence for Mesolithic activity (7000–4000BC) in Ireland tends to be concentrated around or in close proximity to water. The archaeological record of this period presents as the remains of temporary settlements, fishing technology, or the debitage of the flint implements. Mesolithic society is believed to have been the preserve of small family-based groups of nomadic hunter-gathers and fishermen.

The earliest recorded evidence for human activity in the northern part of the Study Area comes from the discovery of an early Mesolithic core axe from Ardee, Co. Louth (Woodman 2015, p.208). A Late Mesolithic (5500–4000 BC) “Bann” flake was discovered in 1965 on the shore of Lough Fea in the townland of Doohatty, located to the southwest of Carrickmacross town. The flint flake (NMI reg: 1965:137), heavily trimmed at the butt and slightly tanged, is listed in the NMI: Finds Database on the heritagemaps.ie website. The flake was found in association with a lozenge-shaped flint arrowhead (NMI reg: 1965:120). Evidence for early prehistoric occupation in the southern area of the Study Area consists primarily of stray finds such as an Early Mesolithic (c. 7000–4000 BC) microlith found in Ardee townland, County Louth (Bradley 1984, 267). A study of Mesolithic activity would indicate that our earliest ancestors initially utilised coastal resources and followed river paths to settle the forested interior (McDermott, 2017, p.51). The lithic scatters within County Monaghan indicate the potential for more sites of Mesolithic date to be identified at similar lake and river locations in the Study Area.

The Neolithic period (4000–2500BC) is typically associated with Ireland’s first farmers; the century between c.3800–3700BC saw a period of rapid expansion across the country, with the archaeological imprint of rectangular houses being a common settlement feature of this period.

Three Neolithic houses (SMR records MO031-124 to MO031-126) were discovered and excavated under archaeological licence (03E0888) in advance of road construction on the N2 in Monanny townland near Carrickmacross in 2003. These three large rectangular structures were found with a large assemblage of early Neolithic pottery (978 sherds from probably more than 143 vessels), flint and a polished stone axe. C14 dated material returned dates of c.3700 – 3500 BC for these houses (Excavations.ie, 2003:1503).

The Neolithic period also saw the construction of a variety of imposing megalithic tombs (court, passage, portal and wedge) which imply the presence of complex and ordered farming communities in existence at that time. While a chronology in terms of tomb types has been suggested (with court tombs being the earliest and wedge tombs the latest), it would appear that an overlap in their construction and use-history exists (Aalen et al. 1997, p.33). County Louth is home to a significant number of megalithic structures; Cooney notes a particular concentration (a minimum of 40 structures) in the Cooley and Mourne Mountains (Cooney 2000, 139-42) - although the Historic Environment Viewer (HEV) files include just 23 references to megalithic constructions, of which 1 (LH008-106) is not for inclusion in the next revision of the RMP. Little research has been undertaken on the 51 monuments noted as "megalithic" in County Monaghan (McDermott, 2017, p.51). Within the Study Area, three megalithic tombs and four unclassified tombs are recorded (AY006, AY020, AY021, AY022, AY026, AY196, and AY220). All of these recorded sites lie outside the 400m route corridors of the six Route Corridor Options (A–F). The majority of these sites lie between 1–2km beyond the centreline of any of the six options, the closest recorded megalithic tomb to the proposed development is AY196, which lies just outside the 400m boundary of Option B (Yellow+Blue). The sites reveal an archaeological presence in the area of c. 6000 years and the names of the some of these sites show how they have been fused with myth, such as the cairn with kerbstones on a hilltop at Fincairn (AY022), once the traditional burial place of Finn Mac Cool, or the court tomb with gallery at Aghnafarcán (AY026) associated with the burial place of Manowar, a Scandinavian giant who travelled to Ireland to kill Finn Mac Cool (SMR file), or the destroyed cromlech at Cloughvally Lower (AY220) recorded as Finn McCool's Table in the 6-inch Ordnance Survey (OS) map (1835). All these sites occupy upland areas. None of the sites have undergone archaeological excavation and therefore remain undated.

A stone axehead (NMI reg: 1935:62) which would appear to date to the Neolithic was discovered within the Study Area in 1935 in the townland of Knocklore, County Louth. Route Corridor Options A (Yellow) and B (Yellow+Blue) pass through Knocklore townland as the routes follow the existing N2. To the south of the Study Area a stone axe (NMI 1942:534), likely Neolithic in date (c. 4000–2300 BC), was found in the vicinity of Ardee town. A collection of stone axeheads, probably originally from Farney Barony was acquired by the National Museum of Ireland from Major. J.E. Shirley of Lough Fea Castle in the mid-1960s (NMI reg numbers 1965:0097; 1965:0099; 1965:0100-0107; and 1965:0110).

The Bronze Age (2500–500BC) is typically associated with the introduction and development of metal technology and the use of metal tools, and the emergence of a distinct warrior elite class defined by high-status weaponry towards the end of the period. Historic finds of artefacts greatly add to our archaeological understanding of this period. Within the Study Area, a bronze axehead (NMI reg: IA/ L/ 1977:5) was discovered in the townland of Aclint in 1977. Route Corridor Options A (Yellow) and B (Yellow+Blue) pass through Aclint townland as the routes follow the existing N2.

Funerary monuments of the Bronze Age in the Study Area are represented by cist, barrow and ring-ditch sites. There are six such recorded sites in total in the Study Area (AY394, AY395, AY443, AY477, AY479, and AY493). In the townland of Oaktate, County Louth, is a barrow (LH011-001001 [AY394]) with an associated cist burial (LH011-001002 [AY395]); both sites were excavated in 1926 and revealed numerous fragments of bone in the barrow constructed of mixed soils and stone, whilst the cist was rectangular, stone-lined and contained four urns. These sites are located over 750m from the nearest routes (Options C and E) and will not be affected by any Route Corridor Option. However, an unclassified barrow site (LH014-062 [AY493]) is located in the townland of Pepperstown, County Louth, and will be potentially impacted upon by Route Corridor Options D, E and F as the site is located 55m from the centreline of these routes. The LH014-062 SMR file notes that there is a soil-mark during ploughing in a field known locally as "Mount field" and local tradition relates that bones were unearthed here. Clearly some extent of human remains are buried at this location.

Another possible barrow site AP-11 is located 700m to the east of an enclosure site (LH014-031 [AY477]) in the same townland. Two ring-ditch sites (LH014-033 [AY479] and LH014-086 [AY507]) are also located in the Study Area. AY507 is in close proximity to the barrow site [AY493] also located in Pepperstown, whilst AY479 in Mullacloe is a cropmark ring, located at a distance of c. 280m from any Route Corridor Option centreline; neither of these ring-ditch sites will be affected by any Route Corridor Option.

Fulachtaí fia are amongst the most common site types in Ireland and are characterised by a mound or mounds of heat-shattered stone discarded from the process of heating water in a subsoil-cut trough. Generally found in low-lying ground where the water table is close to the surface, the often wood-lined troughs filled naturally with water. The use-functions of *fulachtaí fia* were many and varied, from cooking to bathing places to brewing sites and sweat houses. Within the Study Area, there are sixteen recorded *fulachtaí fia* or burnt spreads/mounds. In 1998, works involving widening and other improvements of a 5.5km long line of the N2 resulted in the uncovering of nine *fulachtaí fia* and burnt spread features, all of which were excavated. These sites were located in the townlands of Tattyboys, Knocklore, and Cookstown where Route Corridor Options A and B are proposed. Whilst most of the sites appeared consistent with the cooking waste finds of *fulachtaí fia*, cremated human bone was found in one of the burnt spreads. No radiocarbon dating samples were taken from the sites. It is likely, especially in the more low-lying portions of the scheme, that additional burnt spreads and features of this nature will be encountered.

There is a notable absence of Iron Age (500 BC–AD 400) activity in the Study Area, although there is a possibility that some of the funerary monuments ascribed to the Bronze Age (above) may more accurately belong to this period. It is worth noting that the OPW Archaeological Inventory of Counties Louth and Monaghan 1986 were among the first to be published. Thus, while a pioneering survey, a number of flaws can be noted and there is a risk that monuments classified as 'enclosures' (a category generally associated with medieval settlement) are in fact of a scale that is likely to have them classified as Iron Age enclosures in subsequent inventories (McDermott, 2017, p.50). There is a total of 43 enclosure sites in the Study Area, and at least three enclosure sites (LH014-085 [AY506], LH014-086 [AY477] and LH014-083 [AY504]), all in Pepperstown townland, in close proximity to the Route Corridor Option. In relation to AY477, the SMR entry for the site includes detail as follows: "*Shown as enclosure on Taylor and Skinner's Map of 1777. The OS Letters refer to 'fort' called 'Lios Baile Hubaraigh' in this townland*": Lios Baile Hubaraigh could be any (or none) of these monuments. A beehive quern (NMI ref: IA/81/1991) from the townland of Beagh (Farney By, Donaghmoyne Par.), northwest of Carrickmacross, is indicative of late Iron Age activity. Activity outside of the Study Area can be seen in the linear earthworks in northern Monaghan with the presence of the Black Pig's Dyke. Ó Drisceoil and Walsh (2018, p.69) have shown that elements of this monument were probably constructed in the Middle Bronze Age but that most of the monument was probably constructed in the Iron Age in 220-160 cal BC).

9.3.2.2 Early Medieval Period (AD400–1100)

The beginning of the early medieval period saw the arrival of Christianity, the gradual conversion of the population, and the flourishing of Irish monasteries. The period spans 700 years and encompasses huge changes. Four ecclesiastical enclosures are located with the Study Area. The closest to any proposed Route Corridor Option is MO032-004003 (AY336) located in the townland of Drumgristin Upper. The site is c.100m west of the centreline of Route Corridor Options D and F and is a typical oval shape (140m N-S x 100m E-W) defined by field banks to its west and a townland boundary to its east. There is a tradition that St Derrig had a monastery there. The Zone of Notification of the site is c.28m from the centreline of the proposed route. A 'Caldragh' or 'Ancient burial ground' (MO032-004001 [AY334]) is noted on the 6-inch OS map (1834) as being within the enclosure and a bullaun stone (MO032-004002 [AY335]) is present on the site.

Of the 517 recorded archaeological sites and monuments in the Study Area, a total of 287, the overwhelming majority of any site type in the Study Area are ringforts - raths. Ringforts are defended homesteads of relatively wealthy farmers generally dated to the early medieval period (AD400–1100), though some remained in use until much later. Stout (2015, 73) suggests that of the c.60,000 ringforts in Ireland, most of these were occupied between the early seventh and ninth centuries AD. Often located on higher ground and with the space to shelter cattle, many ringforts appear to form a network of associated sites, often around a key site. This can be seen with a crannog site often being overlooked by ringforts.

Ringforts are also representative of a predominantly cattle economy. Many of the ringforts in the Study Area are prominent in the landscape, though outlying subsurface archaeological remains (e.g., trackways, field systems and souterrains) also have the potential to occur, as do ringfort sites with no surface expression. Due to the concentration of ringfort-raths in the Study Area, they are the most directly impacted upon site type by each Route Corridor Option. Whilst Option A (Yellow) has no direct impacted on recorded sites, Option B (Yellow+Blue) potentially directly impacts 1 ringfort-rath, Options C and D directly impact 4 ringfort-raths, Option E (Orange + Link 1 + Green) directly impacts 5 ringfort-raths, while Option F (Orange + Link 2 + Green) directly impacts 7 ringfort-raths.

Souterrains are sub-surface stone features built for storage and/ or defence, dating primarily to the Early Medieval period. They are commonly, although not always, associated with ringforts. Within this Study Area, one potential souterrain (LH014-004 [AY459]) is directly impacted by 3 proposed Route Corridor Options (Route Corridor Options D, E and F at Louth Hall Demesne). The SMR notes that there is a "local tradition of a souterrain here, now inaccessible".

A number of excavated archaeological sites in the Study area have revealed evidence dating to the Early Medieval Period. An excavation (13E0289) was undertaken in 2013 in the townland of Mullanstown, Co. Louth. The excavation site was c.60-160m east northeast of an early medieval cemetery, recorded as a burial ground (LH014-043001 [AY487]), and an associated enclosure (LH014-043002 [AY488]), The location of the excavation is within the 400m Route Corridor of the southern starting point of all Route Corridor Options for the proposed road. The excavated features were radiocarbon dated and comprised a linear ditch (AD 442–543), a field boundary ditch (AD 601–662), a curvilinear ditch/ gully (AD 425–550), a cereal-drying kiln, small pits, and an inhumation burial dating to AD 437–639. The isolated burial was aligned roughly west–east and is likely a peripheral burial contemporary with the burials in the early medieval cemetery nearby (excavations.ie 2013:193).

An excavation (03E1255) in Cloughvalley Upper, Co. Monaghan, undertaken in advance of the construction of N2 Carrickmacross - Aclint road realignment, revealed a pit with evidence of burning along with early medieval pottery. The site also contained a number of inhumation burials, comprising 7 men, 5 women, and 3 children (excavations.ie 2003:1485). The site is believed to be related to the nearby Monanny Ringfort and dates to the 7th-8th century. The excavated pit with evidence of burning corresponds with isolated large cooking pits found in Early Medieval graveyards around which celebrations could occur (possibly at the time of death of the deceased or Samhain).

9.3.2.3 Medieval Period (AD1100–1600)

Archaeological evidence for the medieval period in the Study Area is partly characterised by castles or castle sites. The beginning of this period in Ireland is marked by the arrival and settlement by the Anglo-Normans and subsequent interaction with the native Gaelic population.

The impact of the arrival of the Anglo-Normans has certainly been left on the landscape of the Study Area. Located to the north of centre of the Study area on the grounds of Donaghmoynne Demesne is a site that is believed to be the ancient capital of the Airghialla, a kingdom formed in the 4th century AD. The site is the location of a Mannan Castle, a motte and two baileys (MO028-118001 [AY171]), which is 12.5m high, with a ruined Anglo-Norman Castle site (MO028-118002 [AY172]) on top of the motte. The site is an exceptional example of a medieval earthwork and is a National Monument. The closest centreline is over 700m to the west (Option B (Yellow+Blue)). The motte and its two baileys are recorded as being built in 1193 by the Anglo-Norman Pipard family, initially constructing a wooden castle. The lands were entrusted to Ralph fitz Nicolas, who constructed a stone castle here (MO028-118002 [AY172]) in 1244 following the razing of the wooden structure by the Irish. The construction of such an imposing feature at that specific Gaelic traditional location was a clear statement of conquest. By the early 1300s the site was abandoned to the native Irish inhabitants and would appear to have been in disrepair and ultimately abandoned by the 17th century (SMR file). Excavation works were carried out in 1910 and again in 1999 (under Licence number 99E0044) where large amounts of iron slag, iron working tools and pottery were revealed.

Another motte and bailey site (LH010-004001 [AY374]) featuring an octagonal structure on top (MO010-004002 [AY375]) appears at Killanny townland, Co. Louth, c.700m to the west of the centreline of Route Corridor Options C and E, the closest option to the west is over 1900m. A further four castle (motte and bailey or castle-motte) sites appear in the Study Area: AY386, AY440, AY448, and AY489. Only one recorded site, castle-motte and bailey (LH010-013 [AY386]) in the townland of Aclint, Co. Louth, appears in the 400m Route Corridor. It is located 137m from the centreline of Option B (Yellow+Blue); however, the route follows the existing N2 at this point and the site would not be affected by the development.

A number of unclassified castle sites (AY411, AY420, AY425, AY466, AY486), a castle/fortified house site [AY037], and a tower house site [AY406] are located within the Study Area. None of these sites will be directly impacted by any Route Corridor Option; however, the modernised tower house site (LH011-080 [AY406]) and Pale fortress (Dolan 1923 p.179) in the townland of Thomastown (Ardee By) is the original house of the Knock Abbey Demesne (Dolan 1923 p.197), and Route Corridor Options D, E and F run through the demesne grounds. These castle sites should not be solely viewed as having a military or defensive function but rather as expressions of prestige in southeastern Monaghan and northwestern Louth in the medieval period.

9.3.2.4 Post Medieval / Modern

Cultural heritage assets dating from the post-medieval and modern periods are detailed in the Architectural Heritage (Section 9.3.3) below.

9.3.2.5 Houses of Indeterminate Date

Houses of indeterminate date within the Study Area include two examples in Dunaree townland (MO028-026003 [AY074] and MO028-026005 [AY076]). Both of these sites are rectangular house-sites (dims, 4.8m x 4m and c.7m x 6.5m respectively); the houses are defined by low earthen banks and are located within a ringfort-rath (MO028-026001 [AY072]). These sites are over 3km from the nearest Route Corridor Option. Another example of a house of indeterminate date (MO027-090001 [AY048]) is located in Peast townland. Again, a rectangular area defined by a small earthen bank within a ringfort, this site is over 4km from the nearest Route Corridor Option.

9.3.3 Identified Architectural Heritage Assets

9.3.3.1 Record of Protected Structures (RPS)

The Constraints Study has identified sixty-seven (67) key structures with the Study Area that are listed in the RPS of the Monaghan County Development Plan (2019-2025) and Louth County Development Plan (2015-2021) as varied. These are listed as AH001- AH067 in Table 9.9 of the Option Selection Report in Volume 5, and include a grave monument (AH001); graveyard (AH006); eleven (11) churches AH002, AH004, AH008, AH010, AH011, AH015, AH035, AH048, AH052, AH058, AH013; two (2) schools AH044, AH057; a mill AH016, a windmill AH028 and a water mill AH040; eleven (11) houses Donaghmoyne House (AH012), Losset School (AH021), Orange Lodge (AH022), Lough Fea House (AH026), Monalty House (AH027), Corcrin Cottage (AH031), Kilanney Glebe Rectory (AH039), Ballytrasna House (AH041), Pakenham Hall (AH049), Tullakeel House (AH051), Cardistown House (AH053); two (2) curate's houses AH055 and AH062; three (3) country houses Rocksavage House (AH034), Red House (AH059), Rahanna House (AH064); two (2) worker's houses AH005, AH063; worker's cottages AH007; a farm house AH066; a house / manse AH003; a public house AH029; a steward's house AH025; a Presbytery AH067; a house/ post-office AH014; five (5) thatched cottages AH042, AH043, AH045, AH046, AH056; two (2) farmyard complexes AH065 and AH054; outbuildings AH032; a limekiln AH036; two forges/smithies AH009 and AH030; seven (7) gate lodges AH017, AH018, AH019, AH020, AH023, AH033, AH050; two (2) demesne walls/gates/ railings AH024 and AH066; a castle/ fortified house AH037; a tower house AH044 and a fort AH038.

In relation to demesnes in the relevant County Development Plans, throughout the assessment the demesne as a whole, and other undesignated features within it both extant and demolished, have been considered as a number of the Route Corridor Options pass through the historic demesnes, as illustrated on Figure 9.3.

In relation to Protected Structures, where outbuildings are not specifically covered under the RPS designation but are considered to be an intrinsic or integral component of the Protected Structure, they have been included in the assessment where the Route Corridor Options pass through or may affect them. This is particularly pertinent in the case of AH061 and AH062 where outbuildings associated with Cookstown House and Charlestown Rectory are described as such in the NIAH.

The Protected Structures are described in more detail in the Preliminary Architectural Heritage Inventory (Appendix 9.2). The Council's policies and objectives for the protection of these Protected Structures and other heritage assets, including demesnes, are outlined in the County Development Plans.

9.3.3.2 Architectural Conservation Areas

There are no Architectural Conservation Areas (ACAs) within the Study Area.

9.3.3.3 National Inventory of Architectural Heritage (Building Survey)

The Constraints Study found that the Study Area contains one hundred and forty-four (144) structures listed in the NIAH, illustrated on Figure 9.2. With the exception of AH006 (graveyard), this includes all of the RPS sites listed above and the following in addition: house and gardens AH094, AH097, AH099; a potential house and garden site AH104; a chimney AH107; a store/ warehouse AH109; workers' houses AH111, AH112, AH128; a kiln AH115 and limekiln AH133; waterpumps AH116, AH117, AH125; post-boxes AH 122, AH135; a mill manager's house AH136; a railway station AH123; buildings miscellaneous AH124; a gate lodge AH140; church/ chapels AH084, AH108, AH129; schools AH44, AH57, AH68, AH73, AH78, AH83, AH91, AH98, AH105, AH106; houses AH069, AH075, AH092, AH102, AH120, AH132, AH136, AH137, AH096, AH100; farm houses AH70, AH119; farmyard complex AH71, AH118, AH134; historic demesnes AH92, AH77, AH83, AH90, AH93, AH141, AH142, AH143, AH144, AH145; gates/railings AH76, AH101; bridges AH74, AH87, AH95, AH103, AH110, AH121, AH126, AH127, AH130, AH131; millrace/ millpond AH079; windmill AH113, watermill AH114; and outbuildings AH080. A number of these features are also listed on the NIAH Garden Survey (see below).

9.3.3.4 National Inventory of Architectural Heritage (Survey of Historic Gardens and Designed Landscapes)

A total of sixteen (16) sites within the Study Area are listed on the National Inventory of Architectural Heritage (Survey of Historic Gardens and Designed Landscapes) and include gardens, parkland and landscape features associated with them based on the 1st edition OS mapping as follows: AH027, AH032, AH072, AH077, AH081, AH090, AH092, AH094, AH097, AH099, AH104, AH141, AH142, AH143, AH144 and AH145. These are illustrated on Figure 9.2.

9.3.4 Historical Background and Folklore

The Study Area of the N2 Ardee to Castleblayney covers c.250km² and includes parts of both County Monaghan and County Louth. Approximately 75% of the Study Area is in County Monaghan, with 25% in County Louth. Monaghan or *Mhuineachain* means "place of the shrubs" whilst Louth is named after 'Lugh', the ancient warrior-god linked with the Lughnasa harvest festival. The Study Area is located within one of the few areas of the country where the pre-existing pattern of Gaelic landownership appears to have survived relatively intact into the Early Modern period, reflected in the predominance of Irish place names throughout the county and the complex pattern of small townland units.

The lands of medieval (and probably early medieval) Monaghan were divided into tates or townlands, joined into groups of sixteen and collectively known as a 'ballybetagh'. Each ballybetagh was usually named after one of the sixteen townlands but distinguished from it by the prefix baille (bally). The concept of the division of land into units apparently originated from the Gaelic agricultural systems of open fields and dispersed rural settlement (Halpin, 2007, p.4).

The Study Area is contained within the medieval territory of “Airghialla” which is anglicized as “Oriel”, the Gaelic translates as or “the hostage givers”. The territory of Airghialla was formed in the 4th century AD, by the Three Collas, and at its peak in the 12th century included lands in Counties Monaghan, Louth, Armagh, Tyrone, Fermanagh and Derry. Airghialla was ultimately a confederation of minor dynasties (Haywood, 2009, p.96). The confederation comprised nine dynasties and from the 6th century onwards its king was selected from amongst these different dynasties. The seat of the territory was located in the townland of Donaghmoyne, which is located in the Study Area, which later became the location of an Anglo-Norman Castle site (MO028-118002 [AY172]). With pressure for territory and control to the northwest from the Northern Ui Neill dynasty (occupying County Donegal, and parts of Derry, Tyrone and Fermanagh) and to the south from the Southern Ui Neill dynasty (occupying parts of County Meath, Westmeath, Cavan and Louth), the lands of the Airghialla were gradually reduced to territories solely within County Monaghan. From 1243–1590 the territory was under the control of the McMahon dynasty.

The Study Area does not encompass but is located near three substantial towns; Ardee to the south, Carrickmacross to west, and Castleblayney to the north. Carrickmacross and Castleblayney were established in the 17th century following the development of fortifications built by the Crown forces around which market towns developed. Ardee, however, was increasingly noted in the annals as a fording point and a place of engagement between rival Irish armies from the tenth to the twelfth centuries. It derives its name from the Irish *Ath Fhirdia*, meaning ‘the fording place of the river Ferdia’ (Gwynn 1946, 77; Bradley 1984, 269). The name reflected the mythic tradition that Cuchulainn met Ferdia in epic combat at this ford (Gwynn 1946, 77). The town of Ardee was founded in the late twelfth century (RMP LH017-101) and was focused on the historic fording point at the River Dee. The major streets and properties were probably laid out at this time (Bradley 1984, 271). Ardee was part of the kingdom of Airgialla. The presence of an Augustinian Priory, a hospital of St John and a chantry chapel, in addition to the parish church, indicates the prosperous nature of Ardee during the Middle Ages. This prosperity was further emphasised by the building of a town wall enclosing an area of approximately 25 hectares.

The arrival of the Anglo-Normans in Ireland in 1169 saw immediate and drastic changes in Irish society. Following King Henry II of England’s invitation by Diarmuid MacMurrough to intervene in an inter-dynastic row, this was the initial step in the colonisation of Irish society by the Anglo-Normans through the English Crown. The combination of armoured knights and archers of the Anglo-Normans gave a military superiority over their Irish counterparts, who in little technological deviation from the Iron Age fought with spears and were mostly unarmoured. As the Anglo-Norman conquest progressed, earth and timber motte and bailey castle structures were erected and were gradually upgraded with a small number of imposing stone castles and fortress towns (Haywood, 2009, p.114). The National Monument of Mannon Castle is the finest example of the six motte and bailey structures within the Study Area. However, that it was abandoned by the 1300s illustrates that resistance by the native Gaelic dynasties, through guerrilla tactics and the use of Scottish galloglasses, was effective to some extent in this area. The landscape throughout the country changed during this period following the extensive increase of land clearance for cultivation purposes.

The late Middle Ages saw English lordship and control in the Study Area and throughout the country wane and by the 1500s only the area within the Pale (a linked network of linear earthworks) and parts of southern Ireland loyal to the English crown, were securely controlled by the English and Anglo-Irish. The Pale ran through the four ‘loyal’ counties of Dublin, Kildare, Meath and Louth, and Ardee was located at its northern edge. This meant that the area occupied by the Study Area was a borderland between the areas of English governance and the Gaelic heartland of Ulster; the territory was under the control of the Gaelic McMahons. During the sixteenth century internecine feuding took place between the three distinct branches of the McMahon family; the Dartry MacMahons (ruling from a fort at Lisnagore, near Clones), the Luacht-Tighe MacMahons (ruling the northern part of Monaghan) and the Farney MacMahons (ruling from Lisanisk, near Carrickmacross). These branches of McMahons varied in allegiance to the O’Neills of Tyrone, their traditional overlords, and the English Crown. In 1539, the Luacht-Tighe MacMahons, fighting alongside the O’Neill and a number of Ulster chieftains, were completely defeated by the English in the battle of Ballahoe (Moore, 1955, p.25). After the battle, the victorious English forces penetrated to Monaghan town and burnt the monastery; the MacMahon chieftains subsequently submitted to the crown.

In 1585 the county of Monaghan came into existence as it is today, when the McMahon rulers of Airghialla agreed to join the Kingdom of Ireland following discussions with the Lord Deputy of Ireland, Sir John Perrot, who was involved in establishing the plantations of Munster and Connaught. The Kingdom of Ireland was ultimately a client state of England, a relationship existing from 1542 until its ending with the Acts of Union in 1801. The county was shired by the Crown and divided into five baronies for administrative purposes: Farney, Cremore, Dartrey, Monaghan, and Truagh; these territories reflect the pre-existing Gaelic divisions. The last McMahon overlord recognised by the Elizabethan administration, Aodh Rua McMahon, was executed on the orders of the Lord Deputy in 1590, and the 'McMahonship' (the traditional overlordship of the McMahons) was abolished the following year; his holdings were then parcelled out into smaller units more pliable to the Elizabethan administration (Moore 1955, 22–32).

The Nine Years War (1594–1603) between the Ulster forces of O'Neill and his Gaelic allies, and the Crown forces based in Dublin, was fought in the hinterland between Ulster and the Pale; Monaghan was one of the most disputed areas. This war was the strongest threat to English control in Ireland since Silken Thomas's rebellion (1534–35). Following the loss of a company of English Crown forces to Hugh O'Neill and his allies of Ulster chieftains at the Battle of Clontibret in May 1595, the Elizabethan forces were determined to secure the area and maintained a garrison in Monaghan town and Newry, as one of their bridgeheads into Ulster. For a time, the county passed out of English control and under the ultimate control of O'Neill. In 1601–02 the territory was reduced by the Elizabethan forces using a scorched-earth policy (Moore, 1956, 90–99).

Following the defeat of Hugh O'Neill and the Ulster Chieftains in 1603, the Study Area was subject to plantation; however, unlike other counties, Monaghan was left in the hands of the loyal native chieftains, i.e. the McMahons and McKennas. Development of English controlled towns in the wider environs of the Study Area can be dated to the early 17th century. Following persistent attack from the local Gaelic tribes, travel between the Crown forces' outposts became hazardous. Edward Blayney, a Welsh soldier appointed seneschal or governor of the county and who sat in the Irish House of Commons as MP for Monaghan, was granted two ballybetaghs of land at a strategic location between the garrisons at Newry and Monaghan on condition that he construct a secure halting place for troops and goods in transit. Blayney was appointed the task having previously erected a small fort in Monaghan town where he garrisoned a company of foot soldiers (Lewis, 1837). Construction of Castle Blayney began and by 1611 it consisted of a bawn with an 5m high stone wall, a gatehouse and a house. In 1613 the town received permission to hold a market and in 1617 permission was granted to construct taverns (Sutton, 2007, p.4). Monaghan town also saw expansion around this time, with a street pattern radiating from its original marketplace.

The McMahons were centrally involved in the rebellion of 1641, which was organised by a small group of Gaelic Irish landowners. Twin surprise seizures of control were planned, with a number of northern towns and Dublin Castle the targets. Once under way, countrywide support was envisioned. Hugh Oge MacMahon and Conor Maguire were tasked with seizing Dublin Castle; however, they were arrested on a tip off from an agent, Owen O'Connelly (in fact MacMahon's own foster brother). Up north, a number of towns were seized and a Proclamation declared; however, indiscriminate retaliations followed, prompting support amongst the Catholic population into joining the revolt. Even the original instigators of the rebellion were powerless to prevent one of "the bloodiest episodes in the relationship between the islands of Ireland and Britain" (Robinson, 2017, p.225) as communal uprisings spread around the country as decades of brutal resentment from cultural and land displacement erupted. Atrocities followed, and the 1641 Depositions (kept in Trinity College Dublin) contain the testimonies of 8,000 Protestant victims and survivors. Records detail massacres of large numbers of imprisoned Glaslough Protestants, Scottish settlers at Clones and mass drownings of men, women and children (Robinson, 2017, p.236–40.). The rebellion lasted seven months and ended with the formation of the Catholic Confederation in 1642, and it has been seen as the catalyst for the Confederate Wars of the subsequent decade and Oliver Cromwell's ultimate recapturing of the country and restoration of English rule in the name of the new republican government. Vast numbers died during the rebellion and following decade from disease and starvation rather than massacres committed by both sides, with countrywide estimates of approximately one-third of Ireland's population at the time (Haywood, 2009, p.120).

Following the Cromwellian conquest of Ireland, subsequent land confiscation and settlement meant that in 1657 lands in the Study Area that had been left to the native Irish were taken from the “Irish Papists” and given to the Cromwellian undertakers and soldiers for arrears of pay. Rushe notes that:

“the Cromwellian undertakers and soldiers do not appear to have taken root in the soil, and many of them sold estates, but both those who held on and the new purchaser preferred receiving rents from old tenants than bothering themselves with tilling the land. In a few localities the landlords brought in planters from other parts of Ulster, who were principally the sons and grandsons of the anglicised Scotch of James I period.... As a general rule the method of planting the land with alien tenants was not followed in County Monaghan, as it had been in other parts of Ulster. The manner was much more subtle and gave less cause for irritation by evicting an occasional tenant and gradually filling the vacant holdings with the descendants of planters, which was continued with occasional periods of cessation until the rise of the Land League in 1878-79” (Rushe, 1921, p.3).

The imposition of penal laws meant that Catholics were prohibited from holding land, possessing arms, keeping schools, or teaching their religion. Catholics were prohibited from living in the towns of settlers, which have been compared to “small islands of settlers in a largely Gaelic rural landscape... in Monaghan and Carrickmacross Catholics were compelled to leave town after the curfew bell” (Duffy, 2017, p.288). These discriminatory laws resulted in the development of large settler leaseholds with middlemen tenants managing numerous smaller tenants in fragmented large estates, owned by often absentee landlords. A gradual relaxation of these laws saw merchants and traders join the commerce in these towns.

The estates established by absentee landlords in the 17th century became the location of the mansion homes and demesnes of the ascendancy class in the 18th century. The Study Area contains what would become the two largest estates in the county. The barony of Farney was effectively split between two families descended from the earl of Essex – the Shirley family and the third Viscount Weymouth “the Marquis of Bath”. The Shirley Estate consisted of the western half of the barony, whilst the Bath Estate consisted of the western side of the barony; the dividing line was down Main Street in Carrickmacross and even included the houses on either side (Ó Mearain, 1967, p.333). In 1878, the Landowners of Ireland evaluated the Shirley Estate at 26,386 acres, with the Bath Estate at 22,762 acres. The Shirleys were absentee landlords based in Warwickshire. In 1750, they built a house near Carrickmacross and in 1826 work began on a Tudor-revival style manor house in Lough Fea [AH026] to the south west of Carrickmacross, the Tudor revival style being utilised as very much a “tool for the creation of an image of British nationhood” (Campbell, 2017, p.544). The Study Area included smaller estates c.2,000 acres in size; however, the 17th century plantation and post-plantation era in the area may be reflected by these large estates. The sheer scale of the Shirley and Bath estates resulted in them becoming the principal agency through which economic and social change was mediated through the landscape (Duffy, 2017, p.291). The landscape in the area is still reflected by its tenancy history, primarily that of farm holdings in origin and layout (Duffy, 2017, p.312).

The Cross Border Archives Project for County Louth lists prominent landed and estate families including the Plunkett Family of Tallanstown whose landholdings and tenure are most recognised in the estate of Louth Hall. Their estate house was constructed at the site of their medieval tower house (LH014-052). The family's ancestry stemmed from the Anglo-Norman Sir Hugh de Punkett who arrived in Ireland in the twelfth century; the title Baron Louth was conferred on Oliver Plunkett by King Henry VIII in the 1540s. The family were Catholic protagonists throughout the sixteenth and seventeenth centuries whilst remaining loyal to the English crown; they lost their landholdings in the Cromwellian era but were regranted them by King Charles II in the 1660s. The Louth Hall estate in the nineteenth century extended through counties Louth and Monaghan and covered some three thousand English statute acres. The last Baron Louth died in 1950, after which time Louth Hall was sold and is now in a ruinous condition.⁸⁸

Other notable estates within the Study Area include Knock Abbey; the eighteenth-century house of Knock Abbey incorporated the late fourteenth- or early fifteenth-century Thomastown castle (LH011-080; [AH044]), and the townland name Knock Abbey was originally Thomastown (Dolan, p.179). The Tennison and O'Brien families were associated with the estate for over two centuries. The house was burned down by insurgents in 1923 but has subsequently been re-built.

⁸⁸ <http://www.louthnewryarchives.ie/online-exhibitions/landowners-county-louth/louth.shtml>

The region was among the hardest hit by the Great Famine with estimates that the population of County Monaghan was reducing by one-third between 1841 and 1851 due to starvation and emigration. Newspaper archives record hardship and large-scale evictions near Castleblayney and reprisal murders of rent collecting agents. Records of offers of free passage to Australia in 1848–50 from female workhouse orphans in Castleblayney and Carrickmacross reflect the poverty, overcrowding and deprivation at these times. The Atlas of the Great Irish Famine (Crowley et al. 2012) indicates the excess deaths directly relating to the famine in Co. Louth being between 10 and 19.9 per 1,000 people during the famine years (p.171). What is also clear is that the mortality rates (recorded as a percentage of starvation deaths recorded for each county) were highest in Louth during the first three years (1845-8) of the famine, but overall the urban and coastal baronies fared better than those inland (ibid p.117).

Post-Famine agricultural change in the latter half of the 19th century had a major impact on farming within the Study Area. In 1855, almost half of all agricultural land was devoted to tillage, with a focus on oats, potato, and flax (feeding into the lucrative linen industry). Between 1880 and 1914 the focus shifted from tillage to pig and poultry production and again later in the early 20th century with the introduction of the creamery system and the rearing and milking of dairy cows. These changes are reflective of the adaptable agricultural landscape of the Study Area.

Many customs relating to marriages which owe their origins to at least the nineteenth century survive as intangible cultural heritage traditions and folklore in the Louth and Monaghan areas. These include customs regarding strawmen/strawboys who – with their wicker-woven elaborate head-dresses – often presided over post-ceremony aspects of wedding celebrations, their behaviour being directly related to how well they were treated by the newly married wedding couple. Although not directly relating to the Study Area, the Irish Folklore Commission's Schools Collection recounts three such examples each for Counties Louth and Monaghan (see Appendix 9.6) including one reference as follows: *"Another very old one [custom] was the coming of the strawboys to the house on the night of the wedding. There were boys dressed up in straw and blackened. They danced and sang if well treated but if not made things very uncomfortable for the wedding".* A second account recalls the mischievous nature of the strawboys: *"Strawboys or "granías" as they were sometimes called, were those that were not invited to the wedding, and thought they had a night [sic] right to be invited. They stuffed the chimney, nailed the windows, and tied the doors".*

The renowned Irish poet Patrick Kavanagh was born and lived for much of his life in Inniskeen, Co. Monaghan and a portion of County Monaghan is today known (abstractly) as 'Kavanagh Country', but this is an area that is not defined geographically. A 'Kavanagh Country' Landscape Character Analysis commissioned in 2012 aimed to define what 'Kavanagh Country' would comprise, and an outcome of that work was the development of a specific Kavanagh Trail which is supported by Monaghan County Council. The trail focuses on the sites of specific significance in the early part of the poet's life and which provided the inspiration for some of his best-loved works. Kavanagh Country and elements of the trail fall within the Study Area for this scheme, with the Option A (Yellow) and F corridors fall within the southwest corner of Coolnagrattan townland in which the Rocksavage Estate (RPS 41403201) is located. The views around this estate, particularly those looking towards Inniskeen and Shancoduff, are significant in terms of the Kavanagh Trail, but are not considered significant in relation to the routes proposed as part of this scheme. Similarly, the church at Drumcatton (MO028-134001-; NIAH 41402821) falls within the Study Area, but there are no predicted impacts on this structure. The 'triangular field' at Shancoduff Fort (MO029-026001) and souterrain (MO029-026002) fall within the Study Area, with the views from this monument and field being significant, particularly from the surrounding roads. The views take in Coolnagrattan and the Rocksavage Estate, but there is no predicted impact on these features with any of the routes proposed. Further fieldwork may refine this assessment.

9.4 Route Corridor Option Comparison

9.4.1 Archaeological Assessment

9.4.1.1 Known and Potential Archaeological Sites and Monuments

An inventory of all previously recorded archaeological sites and monuments within the 400m-wide Route Corridor Options (as established in Section 9.2.3) is included as Appendix 9.1 to this report and are listed in Table 9.2 below (see also Figure 9.1 of Volume 2 of this Option Selection Report).

Ref. No.	Route Corridor(s)	Site Type	SMR Ref.	Townland	ITM_E	ITM_N	Importance	Source
AY009	CEF	Ringfort - rath	MO025-008----	Mullaghane	683901	816025	High	RMP/SMR
AY010	ABCEF	Ringfort - rath	MO025-009----	Mullaghane	684118	815953	High	RMP/SMR
AY015	CEF	Ringfort - rath	MO025-016----	Drumharriff North	683615	815095	High	RMP/SMR
AY018	D	Redundant record	MO025-019	Gorteens	685936	815167	Negligible	RMP/SMR
AY019	D	Ringfort - rath	MO025-020----	Coolskeagh	685640	815764	High	RMP/SMR
AY023	CEF	Ringfort - rath	MO025-024----	Cornahawla	683921	814104	High	RMP/SMR
AY027	BCEF	Ringfort - rath	MO025-028----	Lisaquill	684434	813531	High	RMP/SMR
AY034	AB	Ringfort - rath	MO025-035----	Brackagh (Farney By)	685110	813092	High	RMP/SMR
AY037	D	Ringfort - rath	MO025-038----	Knockreagh Lower	686660	813393	High	RMP/SMR
AY039	D	Redundant record	MO025-040	Knockreagh Upper	686870	813115	Negligible	RMP/SMR
AY059	CEF	Ringfort - rath	MO028-009----	Clonavogy (Farney By)	684146	812448	High	RMP/SMR
AY060	CEF	Ringfort - rath	MO028-010----	Lisnafinelly	684355	811850	High	RMP/SMR
AY061	AB	Ringfort - rath	MO028-011----	Taplagh	685187	812498	High	RMP/SMR
AY062	AB	Ringfort - rath	MO028-012----	Garranroe or Cornamucklagh	685094	812010	High	RMP/SMR

Table 9.2: Previously recorded archaeological sites and monuments within the 400m Route Corridor Options (Options A-F)

Ref. No.	Route Corridor(s)	Site Type	SMR Ref.	Townland	ITM_E	ITM_N	Importance	Source
AY090	CE	Ringfort - rath	MO028-039----	Drumharrif	685581	810588	High	RMP/SMR
AY091	F	Ringfort - rath	MO028-040----	Drumillard (Farney By)	685967	811184	High	RMP/SMR
AY095	D	Ringfort - rath	MO028-044----	Kilnacranfy	687113	810880	High	RMP/SMR
AY096	D	Ringfort - rath	MO028-045----	Kilnacranfy	687162	810469	High	RMP/SMR
AY097	F	Ringfort - rath	MO028-046----	Coolcair	686804	810081	High	RMP/SMR
AY098	DF	Enclosure	MO028-047----	Lisnamoyle Etra	687134	810036	High	RMP/SMR
AY099	DF	Ringfort - rath	MO028-048----	Lisnamoyle Etra	687193	809684	High	RMP/SMR
AY111	AB	Ringfort - rath	MO028-060----	Tonyellida	684623	808530	High	RMP/SMR
AY121	AB	Ringfort - rath	MO028-070----	Tonyellida	684533	808450	High	RMP/SMR
AY122	AB	Ringfort - rath	MO028-071----	Tullyvaragh Lower	684833	809192	High	RMP/SMR
AY123	AB	Ringfort - rath	MO028-072----	Tullyvaragh Upper	684798	808664	High	RMP/SMR
AY126	AB	Ringfort - rath	MO028-075----	Tullyvaragh Lower	684845	809849	Negligible	RMP/SMR
AY129	CE	Ringfort - rath	MO028-078----	Aghateskin	685915	809909	High	RMP/SMR
AY131	CE	Ringfort - rath	MO028-080----	Monanagirr	685942	809578	High	RMP/SMR
AY137	CE	Ringfort - rath	MO028-086----	Lurganboys	686423	808735	High	RMP/SMR
AY139	DF	Crannog	MO028-088----	Lurganboys/Cl oghoge and Tievadinna	687346	808700	High	RMP/SMR
AY140	DF	Ringfort - rath	MO028-089----	Mullanavannog (Farney By)	687346	809091	High	RMP/SMR

Table 9.2: Previously recorded archaeological sites and monuments within the 400m Route Corridor Options (Options A-F)

Ref. No.	Route Corridor(s)	Site Type	SMR Ref.	Townland	ITM_E	ITM_N	Importance	Source
AY165	AB	Ringfort - rath	MO028-113----	Lisgall (Farney By)	684008	806609	High	RMP/SMR
AY180	CE	Ringfort - rath	MO028-126----	Drumlusty	687665	806488	High	RMP/SMR
AY181	CE	Ringfort - rath	MO028-127----	Drumlusty	687518	806764	High	RMP/SMR
AY186	DF	Ringfort - rath	MO028-132----	Blittoge	688513	806876	High	RMP/SMR
AY201	DF	Ringfort - rath	MO028-146----	Momony	689224	806365	High	SMR
AY223	AB	Ringfort - rath	MO031-013----	Monanny	684255	805385	High	RMP/SMR
AY231	CE	Ringfort - rath	MO031-021----	Drumhillagh (Farney By)	687622	806106	High	RMP/SMR
AY258	CE	Ringfort - rath	MO031-057----	Drumhillagh (Farney By)	688034	805395	High	RMP/SMR
AY259	CE	Souterrain	MO031-058	Ballingarry	688620	804474	High	RMP/SMR
AY299	AB	Ringfort - rath	MO031-097----	Shanmullagh (Farney By)	686608	801659	High	RMP/SMR
AY307	CE	Earthwork Site	MO031-106	Ballingarry	688765	804305	High	RMP/SMR
AY311	CE	Ford	MO031-112----	Garlegobban	689202	803735	High	RMP/SMR
AY313	CE	Ringfort - rath	MO031-119001-	Stradeen	689243	802916	High	SMR
AY314	CE	Souterrain	MO031-119002-	Stradeen	689237	802917	High	SMR
AY315	CE	Ringfort - rath	MO031-120----	Rahans (Farney By, Donaghmoynes Par.)	687590	805803	High	SMR
AY316	AB	House - Neolithic	MO031-124----	Monanny	684208	805228	Negligible	SMR
AY317	AB	House - Neolithic	MO031-125----	Monanny	684209	805257	Negligible	SMR

Table 9.2: Previously recorded archaeological sites and monuments within the 400m Route Corridor Options (Options A-F)

Ref. No.	Route Corridor(s)	Site Type	SMR Ref.	Townland	ITM_E	ITM_N	Importance	Source
AY318	AB	House - Neolithic	MO031-126----	Monanny	684193	805257	Negligible	SMR
AY319	AB	<i>Fulacht fia</i>	MO031-127----	Monanny	684177	805227	Negligible	SMR
AY320	AB	Burial	MO031-128----	Monanny	684195	805239	Negligible	SMR
AY321	AB	Kiln - corn-drying	MO031-129----	Monanny	684157	805254	Negligible	SMR
AY322	AB	Ringfort - rath	MO031-130----	Lisanisk	685096	803693	Negligible	SMR
AY323	AB	Excavation - miscellaneous	MO031-131----	Lisanisk	685214	803567	Negligible	SMR
AY324	AB	Excavation - miscellaneous	MO031-132----	Monaltyduff	686016	802359	Negligible	SMR
AY325	AB	Excavation - miscellaneous	MO031-133----	Monaltybane	686428	802018	Negligible	SMR
AY326	AB	<i>Fulacht fia</i>	MO031-134----	Monanny	684107	805199	Negligible	SMR
AY327	AB	Burial ground	MO031-135----	Cloghvally Lower	684218	805105	High	SMR
AY328	AB	Burnt mound	MO031-136----	Cloghvally Lower	684149	805227	Negligible	SMR
AY334	DF	Burial ground	MO032-004001-	Drumgristin Upper	690516	804947	High	RMP/SMR
AY335	DF	Bullaun stone	MO032-004002-	Drumgristin Upper	690556	804942	High	RMP/SMR
AY336	DF	Ecclesiastical enclosure	MO032-004003-	Coolderry (Farney By, Donaghmoynes Par.)/Drumgristin in Upper	690512	804968	High	RMP/SMR
AY363	AB	<i>Fulacht fia</i>	MO034-023001-	Drumgeeny (Farney By)	688987	798216	Negligible	RMP/SMR

Table 9.2: Previously recorded archaeological sites and monuments within the 400m Route Corridor Options (Options A-F)

Ref. No.	Route Corridor(s)	Site Type	SMR Ref.	Townland	ITM_E	ITM_N	Importance	Source
AY364	AB	<i>Fulacht fia</i>	MO034-023002-	Drumgeeny (Farney By)	688987	798216	Negligible	RMP/SMR
AY365	AB	<i>Fulacht fia</i>	MO034-023003-	Drumgeeny (Farney By)	688987	798216	Negligible	RMP/SMR
AY371	DF	Ringfort - rath	LH010-001----	Rootate	691192	802272	High	RMP/SMR
AY379	CE	Enclosure	LH010-007----	Tully	690992	799902	High	RMP/SMR
AY385	AB	Souterrain	LH010-012----	Aclint	689332	797963	High	RMP/SMR
AY386	AB	Castle - motte and bailey	LH010-013----	Aclint	689334	797917	High	RMP/SMR
AY388	CE	Ford	LH010-015----	Essexford	689202	803732	High	RMP/SMR
AY391	DF	Burial ground	LH010-017----	Stonetown Lower	691402	803002	High	SMR
AY393	DF	Ringfort - rath	LH010-A001--	Rosslough	690832	804411	High	RMP/SMR
AY404	DEF	Earthwork	LH011-078----	Nicholastown (Ardee By)	692271	798982	High	RMP/SMR
AY405	C	Enclosure	LH011-079----	Thomastown (Ardee By)	692151	798243	High	RMP/SMR
AY408	DEF	Enclosure	LH011-082----	Rathbody	693021	797983	High	RMP/SMR
AY409	DEF	Enclosure	LH011-083001-	Cavanrobert	693441	797783	High	RMP/SMR
AY410	DEF	Souterrain	LH011-083002-	Cavanrobert	693441	797783	High	RMP/SMR
AY413	DEF	Enclosure	LH011-120----	Cavanrobert	693384	797617	High	SMR
AY419	AB	Ringfort - rath	LH013-003----	Reaghstown	690702	796853	High	RMP/SMR
AY456	C	Ringfort - rath	LH014-001----	Rathbody	692654	797425	High	RMP/SMR

Table 9.2: Previously recorded archaeological sites and monuments within the 400m Route Corridor Options (Options A-F)

Ref. No.	Route Corridor(s)	Site Type	SMR Ref.	Townland	ITM_E	ITM_N	Importance	Source
AY457	DEF	Standing stone	LH014-002----	Rathbody	693552	797223	High	RMP/SMR
AY459	DEF	Southern	LH014-004----	Louth Hall	694121	796815	High	RMP/SMR
AY460	AB	Enclosure	LH014-014001-	Knocklore	692691	795213	High	RMP/SMR
AY461	AB	Burial mound	LH014-014002-	Knocklore	692695	795211	High	RMP/SMR
AY466	ABC	Castle - unclassified	LH014-016001-	Cookstown	693223	794432	High	RMP/SMR
AY467	ABC	Southern	LH014-016002-	Cookstown	693221	794413	High	RMP/SMR
AY478	ABC	Enclosure	LH014-032----	Mullanstown	694691	792664	High	RMP/SMR
AY486	ABC	Castle - unclassified	LH014-042----	Mullanstown	695003	792338	High	RMP/SMR
AY492	ABC	Font	LH014-058----	Cookstown	693791	794013	High	RMP/SMR
AY493	DEF	Barrow - unclassified	LH014-062----	Pepperstown	695031	794224	High	SMR
AY494	AB	<i>Fulacht fia</i>	LH014-064----	Tattyboys	692279	795517	Negligible	SMR
AY495	AB	Burnt spread	LH014-065----	Tattyboys	692481	795363	Negligible	SMR
AY496	AB	Burnt spread	LH014-066----	Knocklore	692581	795283	Negligible	SMR
AY497	AB	<i>Fulacht fia</i>	LH014-067----	Knocklore	692788	795206	High	SMR
AY498	AB	<i>Fulacht fia</i>	LH014-068----	Cookstown	692865	795041	Negligible	SMR
AY499	AB	<i>Fulacht fia</i>	LH014-069----	Cookstown	693038	794933	Negligible	SMR
AY500	AB	Cremated remains	LH014-070----	Knocklore	692581	795183	Negligible	SMR

Table 9.2: Previously recorded archaeological sites and monuments within the 400m Route Corridor Options (Options A-F)

Ref. No.	Route Corridor(s)	Site Type	SMR Ref.	Townland	ITM_E	ITM_N	Importance	Source
AY503	DEF	Enclosure	LH014-082----	Louth Hall	694241	796890	High	SMR
AY504	DEF	Enclosure	LH014-083----	Pepperstown	695181	794309	High	SMR
AY505	DEF	Enclosure	LH014-084----	Pepperstown	695021	794506	High	SMR
AY508	DEF	Enclosure	LH014-087----	Pepperstown	695024	794680	High	SMR
AY509	DEF	Enclosure	LH014-088----	Pepperstown	694971	794381	High	SMR
AY510	DEF	Enclosure	LH014-090----	Rathbody	693608	797081	High	SMR
AY515	AB	Ringfort - rath	LH010-023	Aclint	689561	797882	High	SMR
AY516	AB	Road – hollow-way	MO031-139	Monaltyduff	685636	802738	High	SMR
AY517	C	Ringfort - rath	LH010-020	Nicholastown (Ardee By)	691344	798665	High	SMR
AY518	DEF	Enclosure - large	LH011-150	Rathbody	692994	797864	High	SMR
AY519	DEF	Enclosure - large	LH014-004001-	Louth Hall	694039	796815	High	SMR

In addition, undesignated potential archaeological sites have been identified through analysis of aerial photography. These features were factored into the assessment where a direct impact is likely to occur from any of the Route Corridor Options and are included in the Route Assessment tables below, with areas of particular significance highlighted in red. However, the archaeological significance of many of these features is currently unknown with the result that the significance of impact cannot be accurately determined at this stage.

Table 9.3: Areas of Archaeological Potential Impacted by the Route Corridor Options

Ref.	RMP/ SMR/ Ref	Route Corridor Option	Townland	ITM	Type	Within 25m of Centre line?	Detail
AP-3	Adjacent to LH010-011 and LH010-010001	Option C	Nicholastown (Ardee By)	691252 798987	Possible circular enclosure(s)	No	Clear on both HEV (Historic Environment Viewer) Digital Globe and Google Maps aerial.
AP-4	Adjacent to LH010-007	Option C; Option E	Tully	691082 800012	Possible circular enclosure	No	Possible circular enclosure visible on Bing, Google Maps aerial and HEV Digital Globe.
AP-5	N/A	Option C; Option E	Garlegobban	688925 803871	Possible enclosure/s small circular features	Yes	Possible enclosure and possibly smaller features throughout the field. Visible on Bing, HEV Digital Globe and Google Maps aerial. In relatively flat pasture that slopes to the west.
AP-6	N/A	Option C; Option E	Lurganboys	686467 808890	Possible enclosure	No	Possible circular enclosure visible on HEV Digital Globe. Situated on a level plateau with gentle slope down to road.
AP-7	Adjacent to (AY131) MO028-080	Option C; Option E	Corryagan/Mo nanagirr	685942 809578	Possible field boundaries	No	Possible field boundaries visible on HEV Digital Globe, may be associated with the ringfort-rath.
AP-8	Adjacent to (AY131) MO028-080	Option C; Option F	Corryagan	686178 809551	Possible ring-ditch(es)	Yes	Cropmarks clearly visible on Google Maps aerial, faint traces on HEV Digital Globe. Seems to be several similar cropmarks in the fields to the west (outside road corridor). Possible barrow cemetery?
AP-9	(AY391) LH010-017	Option D; Option F	Stonetown Lower	691333 802868	Enclosure/c curvilinear ditch.	Possible	Irish Folklore Commission (IFC) - a recorded story of bones being unearthed in a field (AY391 - LH010-017-). Very distinctive curvilinear cropmark in the southern side of the field. High potential for this to be archaeological, and although not directly impacted by the route the D/F corridor passes through this part of the field. Visible on HEV Digital Globe and Google Maps aerial.
AP-10	(AY391)	Option D; Option F	Stonetown Lower	691415 802836	Possible ring-ditch	Yes	On eastern side of field boundary to the IFC entry above: possible ring-ditch/barrow – route centreline

Table 9.3: Areas of Archaeological Potential Impacted by the Route Corridor Options

Ref.	RMP/ SMR/ Ref	Route Corridor Option	Townland	ITM	Type	Within 25m of Centre line?	Detail
	LH010-017						direct impact. Very clear on Bing aerial, Google Maps aerial and faint traces on HEV Digital Globe.
AP-11	Adjacent to LH014-088- and LH014-084- Adjacent to LH014-062 (AY493)	Option D; Option E; Option F	Pepperstown	695208 794069 and 695057 794104	Possible barrows?	Yes	Two possible circular features (1) centred on ITM 695208 794069 and lying within 400m of centreline and (2) centred on ITM 695057 794104 lying within 25m of centreline. Located within 0.2 km and 0.1km respectively from AY493 SMR LH014-062---- (unclassified barrow). Google Maps aerial images indicates potential for several more features of this nature to exist within the field in which enclosures LH014-088---- and LH014-084--- and three additional enclosures are located, the former enclosures lie within 400m of centreline. These sites were identified through analysis of aerial photograph GB89.D.20.
AP-12	N/A	Option D	Tully	692351 800111	Possible enclosure(s)	Possible	Circular enclosure very clearly identified in aerial images (visible on Bing and HEV Digital Globe) within corridor. Potential for further cropmarks in NW corner of this field.
AP-13	N/A	Option D, Option F	Lurganboys/Cl oghoge and Tievadinna	687735 808582	Possible enclosure	No	Possible enclosure site located 0.4km to the E/SE of crannog MO028-088, noted on HEV Digital Globe and Google Maps aerial.
AP-14	N/A	Option D; Option F	Lurganboys/Cl oghoge and Tievadinna	687642 808652 and 687610 808629	Circular (ring-ditch?) features	Yes	Series of possible circular (ring-ditch?) features extend in a roughly E-W line across route corridor D and F. Very clear on Google Maps aerial, faint traces on HEV Digital Globe.
AP-15	(AY140) MO028-089	Option D; Option F	Mullanavanno g (Farney By)	687346 809091	Ringfort-rath	Yes	Marked on 1834 1st Ed. Not visible above ground according to SMR. Faint traces (of southern side especially) visible on Google Maps aerial.
AP-16	N/A	Option D; Option F	Rosslough	690984 803937	Circular enclosure and possible barrow cemetery?	Yes	There is a definite circular enclosure and smaller circular features (possible barrows/ring-ditches). These are visible on HEV Digital

Table 9.3: Areas of Archaeological Potential Impacted by the Route Corridor Options

Ref.	RMP/ SMR/ Ref	Route Corridor Option	Townland	ITM	Type	Within 25m of Centre line?	Detail
							Globe, Google Maps aerial and Bing Maps aerial.
AP-18	N/A	Option A	Reaghstown	690449	796759	No	Very faint traces of curvilinear ditch-like feature visible on Google Satellite, not clear on Bing, Google Earth, OSI 1995, 2000. LiDAR could confirm.

9.4.1.2 Archaeological Assessment of Route Corridor Options

As outlined above, a comparative quantitative and qualitative evaluation was carried out to assess the potential impact of each Route Corridor Option on the identified archaeological heritage assets within each 400m Route Corridor. The results of these assessments are outlined in the tables below. Where the likely significance of impact is rated as Slight or higher, or is currently unknown, the relevant rows are highlighted in bold text.

As the draft indicative road alignment footprints are not yet defined, for the purposes of the assessment all assets within 25m of the centrelines are considered as direct impacts, and the measurements included below (unless otherwise stated) represent the distance between the route centreline and the edge of the RMP or SMR Zone of Notification (where one has been defined by the Archaeological Survey of Ireland). Where no Zone of Notification is illustrated in either dataset this is acknowledged with the text ‘No Zone illustrated’. It is acknowledged that in mitigation avoidance of these sites could be achieved.

There is a minimum of eighteen (18) sites listed on the SMR which were excavated as part of previous archaeological works on previous N2 upgrades or on the N2 Carrickmacross Bypass Scheme. In these cases, each site has been included in the assessment tables, and unless otherwise stated (where, for example, portions of the site have been preserved in situ beyond previous Route Corridor Options, or where high potential for archaeology associated with these sites to occur is considered) there is no predicted impact on these sites.

Impacts on townland boundaries, roads, lanes, quarries, gravel pits and other previously un-recorded features shown on the 1st Edition OS Map were quantified as part of the process; impacts on a minimum of one hundred and forty-seven (147) townland boundaries, an additional three (3) townland boundaries which also serve as county boundaries, one hundred and two (102) lanes / paths, seventy six (76) roads, nine (9) quarries, seven (7) gravel pits were noted. While their condition (extant, site of etc) was noted as part of the baseline study they are not considered as part of the assessments below but will be included in later stages of analysis in the EIA process.

Table 9.4: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option A (Yellow)

AY Asset Ref.	SMR/RMP No.	Type	Statutory Protection	Approx. Distance to RMP/SMR Zone of Notification	Approx. Distance to RMP/SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AY010	MO025-009----	Ringfort - rath	Recorded Monument	105m	165m	None (Neutral)	N/A	N/A
AY034	MO025-035----	Ringfort - rath	Recorded Monument	151m	211m	None (Neutral)	N/A	N/A
AY061	MO028-011----	Ringfort - rath	Recorded Monument	120m	180m	None (Neutral)	N/A	N/A
AY062	MO028-012----	Ringfort - rath	Recorded Monument	131m	191m	None (Neutral)	N/A	N/A
AY111	MO028-060----	Ringfort - rath	Recorded Monument	0m	37m	Potential direct	Unknown	Potentially Significant
AY121	MO028-070----	Ringfort - rath	Recorded Monument	0m	36m	Potential direct	Unknown	Potentially Significant
AY122	MO028-071----	Ringfort - rath	Recorded Monument	65m	125m	None (Neutral)	N/A	N/A
AY123	MO028-072----	Ringfort - rath	Recorded Monument	125m	185m	None (Neutral)	N/A	N/A
AY126	MO028-075----	Ringfort - rath	Recorded Monument	19m	99m	None (Neutral)	N/A	N/A
AY165	MO028-113----	Ringfort - rath	Recorded Monument	162m	222m	None (Neutral)	N/A	N/A
AY223	MO031-013----	Ringfort - rath	Recorded Monument	92m	152m	None (Neutral)	N/A	N/A
AY299	MO031-097----	Ringfort - rath	Recorded Monument	97m	157m	None (Neutral)	N/A	N/A
AY316	MO031-124----	House - Neolithic	Listed on SMR	No Zone illustrated	55m	None (Neutral)	N/A	N/A
AY317	MO031-125----	House - Neolithic	Listed on SMR	No Zone illustrated	66m	None (Neutral)	N/A	N/A
AY318	MO031-126----	House - Neolithic	Listed on SMR	No Zone illustrated	53m	None (Neutral)	N/A	N/A
AY319	MO031-127----	Fulacht fia	Listed on SMR	No Zone illustrated	26m	None (Neutral)	N/A	N/A
AY320	MO031-128----	Burial	Listed on SMR	No Zone illustrated	47m	None (Neutral)	N/A	N/A
AY321	MO031-129----	Kiln - corn-drying	Listed on SMR	No Zone illustrated	18m	None (Neutral)	N/A	N/A
AY322	MO031-130----	Ringfort - rath	Listed on SMR	No Zone illustrated	12m	None (Neutral)	N/A	N/A
AY323	MO031-131----	Excavation - miscellaneous	Listed on SMR	No Zone illustrated	20m	None (Neutral)	N/A	N/A

Table 9.4: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option A (Yellow)

AY Asset Ref.	SMR/RMP No.	Type	Statutory Protection	Approx. Distance to RMP/SMR Zone of Notification	Approx. Distance to RMP/SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AY324	MO031-132----	Excavation - miscellaneous	Listed on SMR	No Zone illustrated	7m	None (Neutral)	N/A	N/A
AY325	MO031-133----	Excavation - miscellaneous	Listed on SMR	No Zone illustrated	2m	None (Neutral)	N/A	N/A
AY326	MO031-134----	Fulacht fia	Listed on SMR	No Zone illustrated	46m	None (Neutral)	N/A	N/A
AY327	MO031-135----	Burial ground	Listed on SMR	No Zone illustrated	2m	Unknown	Unknown	Unknown
AY328	MO031-136----	Burnt mound	Listed on SMR	No Zone illustrated	1m	None (Neutral)	N/A	N/A
AY363	MO034-023001-	Fulacht fia	Recorded Monument	No Zone illustrated	88m	None (Neutral)	N/A	N/A
AY364	MO034-023002-	Fulacht fia	Recorded Monument	43m	88m	None (Neutral)	N/A	N/A
AY365	MO034-023003-	Fulacht fia	Recorded Monument	43m	88m	None (Neutral)	N/A	N/A
AY385	LH010-012----	Souterrain	Recorded Monument	35m	95m	None (Neutral)	N/A	N/A
AY386	LH010-013----	Castle - motte and bailey	Recorded Monument	77m	137m	Potential Indirect Negative	Low	Slight
AY419	LH013-003----	Ringfort - rath	Recorded Monument	130m	190m	Indirect	Low	Slight
AY460	LH014-014001-	Enclosure	Recorded Monument	0m	17m	Unknown	Unknown	Unknown
AY461	LH014-014002-	Burial mound	Recorded Monument	0m	18m	Unknown	Unknown	Unknown
AY466	LH014-016001-	Castle- unclassified	Recorded Monument	146m	206m	None (Neutral)	N/A	N/A
AY467	LH014-016002-	Souterrain	Recorded Monument	146m	219m	None (Neutral)	N/A	N/A
AY478	LH014-032----	Enclosure	Recorded Monument	110m	150m	None (Neutral)	N/A	N/A
AY486	LH014-042----	Castle - unclassified	Recorded Monument	112m	172m	None (Neutral)	N/A	N/A
AY492	LH014-058----	Font	Recorded Monument	17m	37m	Potential Direct Negative	Unknown	Potentially Significant
AY494	LH014-064----	Fulacht fia	Listed on SMR	No Zone illustrated	18m	None (Neutral)	N/A	N/A

Table 9.4: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option A (Yellow)

AY Asset Ref.	SMR/RMP No.	Type	Statutory Protection	Approx. Distance to RMP/SMR Zone of Notification	Approx. Distance to RMP/SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AY495	LH014-065----	Burnt spread	Listed on SMR	No Zone illustrated	8m	None (Neutral)	N/A	N/A
AY496	LH014-066----	Burnt spread	Listed on SMR	No Zone illustrated	5m	None (Neutral)	N/A	N/A
AY497	LH014-067----	Fulacht fia	Listed on SMR	No Zone illustrated	71m	None (Neutral)	N/A	N/A
AY498	LH014-068----	Fulacht fia	Listed on SMR	No Zone illustrated	11m	None (Neutral)	N/A	N/A
AY499	LH014-069----	Fulacht fia	Listed on SMR	0m	9m	None (Neutral)	N/A	N/A
AY500	LH014-070----	Cremated remains	Listed on SMR	No Zone illustrated	63m	None (Neutral)	N/A	N/A
AY515	LH010-023	Ringfort - rath	Listed on SMR	0m	67m	Potential Indirect Negative	Low	Slight
AY516	MO031-139	Road – hollow-way	Listed on SMR	15m	75m	Potential Direct Negative	Low	Slight
Archaeological Potential Assets:								
AP-18	N/A	Possible curvilinear ditch feature	N/A	N/A	>25m	None	N/A	N/A

Table 9.5: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option B (Yellow+Blue)

AY Asset Ref.	SMR / RMP No.	Type	Statutory Protection	Approx. Distance to RMP/SMR Zone of Notification	Approx. Distance to RMP/SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AY010	MO025 -009--- -	Ringfort - rath	Recorded Monument	105m	165m	None (Neutral)	N/A	N/A
AY027	MO025 -028	Ringfort - rath	Recorded Monument	86m	146m	None (Neutral)	N/A	N/A
AY034	MO025 -035--- -	Ringfort - rath	Recorded Monument	181m	241m	None (Neutral)	N/A	N/A
AY061	MO028 -011--- -	Ringfort - rath	Recorded Monument	0m	11m	Direct Negative	Very High	Significant
AY062	MO028 -012--- -	Ringfort - rath	Recorded Monument	55m	115m	Indirect	Low	Slight
AY111	MO028 -060--- -	Ringfort - rath	Recorded Monument	0m	37m	Potential Direct Negative	Unknown	Potentially Significant
AY121	MO028 -070--- -	Ringfort - rath	Recorded Monument	0m	36m	Potential Direct Negative	Unknown	Potentially Significant
AY122	MO028 -071--- -	Ringfort - rath	Recorded Monument	65m	125m	None (Neutral)	N/A	N/A
AY123	MO028 -072--- -	Ringfort - rath	Recorded Monument	125m	185m	None (Neutral)	N/A	N/A
AY126	MO028 -075--- -	Ringfort - rath	Recorded Monument	19m	99m	None (Neutral)	N/A	N/A
AY165	MO028 -113--- -	Ringfort - rath	Recorded Monument	162m	222m	None (Neutral)	N/A	N/A
AY223	MO031 -013--- -	Ringfort - rath	Recorded Monument	92m	152m	None (Neutral)	N/A	N/A
AY299	MO031 -097--- -	Ringfort - rath	Recorded Monument	97m	157m	None (Neutral)	N/A	N/A
AY316	MO031 -124--- -	House - Neolithic	Listed on SMR	No Zone illustrated	55m	None (Neutral)	N/A	N/A

Table 9.5: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option B (Yellow+Blue)

AY Asset Ref.	SMR / RMP No.	Type	Statutory Protection	Approx. Distance to RMP/SMR Zone of Notification	Approx. Distance to RMP/SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AY317	MO031 -125--- -	House - Neolithic	Listed on SMR	No Zone illustrated	66m	None (Neutral)	N/A	N/A
AY318	MO031 -126--- -	House - Neolithic	Listed on SMR	No Zone illustrated	53m	None (Neutral)	N/A	N/A
AY319	MO031 -127--- -	Fulacht fia	Listed on SMR	No Zone illustrated	26m	None (Neutral)	N/A	N/A
AY320	MO031 -128--- -	Burial	Listed on SMR	No Zone illustrated	47m	None (Neutral)	N/A	N/A
AY321	MO031 -129--- -	Kiln - corn-drying	Listed on SMR	No Zone illustrated	18m	None (Neutral)	N/A	N/A
AY322	MO031 -130--- -	Ringfort - rath	Listed on SMR	No Zone illustrated	12m	None (Neutral)	N/A	N/A
AY323	MO031 -131--- -	Excavation - miscellaneous	Listed on SMR	No Zone illustrated	20m	None (Neutral)	N/A	N/A
AY324	MO031 -132--- -	Excavation - miscellaneous	Listed on SMR	No Zone illustrated	7m	None (Neutral)	N/A	N/A
AY325	MO031 -133--- -	Excavation - miscellaneous	Listed on SMR	No Zone illustrated	2m	None (Neutral)	N/A	N/A
AY326	MO031 -134--- -	Fulacht fia	Listed on SMR	No Zone illustrated	46m	None (Neutral)	N/A	N/A
AY327	MO031 -135--- -	Burial ground	Listed on SMR	No Zone illustrated	2m	Unknown	Unknown	Unknown
AY328	MO031 -136--- -	Burnt mound	Listed on SMR	No Zone illustrated	1m	None (Neutral)	N/A	N/A
AY363	MO034 - 02300 1-	Fulacht fia	Recorded Monument	No Zone illustrated	88m	None (Neutral)	N/A	N/A

Table 9.5: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option B (Yellow+Blue)

AY Asset Ref.	SMR / RMP No.	Type	Statutory Protection	Approx. Distance to RMP/SMR Zone of Notification	Approx. Distance to RMP/SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AY364	MO034 - 02300 2-	Fulacht fia	Recorded Monument	No Zone illustrated	88m	None (Neutral)	N/A	N/A
AY365	MO034 - 02300 3-	Fulacht fia	Recorded Monument	No Zone illustrated	88m	None (Neutral)	N/A	N/A
AY385	LH010-012----	Souterrain	Recorded Monument	35m	95m	None (Neutral)	N/A	N/A
AY386	LH010-013----	Castle - motte and bailey	Recorded Monument	77m	137m	Potential Indirect Negative	Low	Slight
AY419	LH013-003----	Ringfort - rath	Recorded Monument	130m	190m	Indirect	Low	Slight
AY460	LH014-01400 1-	Enclosure	Recorded Monument	0m	17m	Unknown	Unknown	Unknown
AY461	LH014-01400 2-	Burial mound	Recorded Monument	0m	18m	Unknown	Unknown	Unknown
AY466	LH014-01600 1-	Castle-unclassified	Recorded Monument	146m	206m	None (Neutral)	N/A	N/A
AY467	LH014-01600 2-	Souterrain	Recorded Monument	146m	219m	None (Neutral)	N/A	N/A
AY478	LH014-032----	Enclosure	Recorded Monument	110m	150m	None (Neutral)	N/A	N/A
AY486	LH014-042----	Castle - unclassified	Recorded Monument	112m	172m	None (Neutral)	N/A	N/A
AY492	LH014-058----	Font	Recorded Monument	17m	37m	Potential Direct Negative	Unknown	Potentially Significant
AY494	LH014-064----	Fulacht fia	Listed on SMR	No Zone illustrated	18m	None (Neutral)	N/A	N/A
AY495	LH014-065----	Burnt spread	Listed on SMR	No Zone illustrated	8m	None (Neutral)	N/A	N/A
AY496	LH014-066----	Burnt spread	Listed on SMR	No Zone illustrated	5m	None (Neutral)	N/A	N/A
AY497	LH014-067----	Fulacht fia	Listed on SMR	No Zone illustrated	71m	None (Neutral)	N/A	N/A

Table 9.5: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option B (Yellow+Blue)

AY Asset Ref.	SMR / RMP No.	Type	Statutory Protection	Approx. Distance to RMP/SMR Zone of Notification	Approx. Distance to RMP/SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AY498	LH014-068----	Fulacht fia	Listed on SMR	No Zone illustrated	11m	None (Neutral)	N/A	N/A
AY499	LH014-069----	Fulacht fia	Listed on SMR	0m	9m	None (Neutral)	N/A	N/A
AY500	LH014-070----	Cremated remains	Listed on SMR	No Zone illustrated	63m	None (Neutral)	N/A	N/A
AY515	LH010-023	Ringfort - rath	Listed on SMR	0m	67m	Potential Indirect Negative	Low	Slight
AY516	MO031-139	Road – hollow-way	Listed on SMR	15m	75m	Potential Indirect Negative	Unknown	Slight
Archaeological Potential Assets:								
AP-18	N/A	Possible curvilinear ditch feature	N/A	N/A	>25m	None	N/A	N/A

Table 9.6: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option C (Green)

AY Asset Ref.	SMR/RMP No.	Type	Statutory Protection	Approx. Distance to RMP/SMR Zone of Notification	Approx. Distance to RMP/SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AY009	MO025-008----	Ringfort - rath	Recorded Monument	0m	20m	Direct Negative	Very High	Significant
AY010	MO025-009----	Ringfort - rath	Recorded Monument	187m	247m	None (Neutral)	N/A	N/A
AY015	MO025-016	Ringfort - rath	Recorded Monument	82m	142m	Potential Indirect Negative	Low	Slight
AY023	MO025-024	Ringfort - rath	Recorded Monument	175m	235m	None (Neutral)	N/A	N/A
AY027	MO025-028----	Ringfort - rath	Recorded Monument	0m	10m	Direct Negative	Very High	Significant
AY059	MO028-009----	Ringfort - rath	Recorded Monument	38m	98m	Potential Indirect Negative	Low	Slight
AY060	MO028-010	Ringfort - rath	Recorded Monument	174m	234m	None (Neutral)	N/A	N/A
AY090	MO028-039----	Ringfort - rath	Recorded Monument	187m	247m	None (Neutral)	N/A	N/A
AY129	MO028-078----	Ringfort - rath	Recorded Monument	83m	143m	None (Neutral)	N/A	N/A
AY131	MO028-080----	Ringfort - rath	Recorded Monument	137m	197m	None (Neutral)	N/A	N/A
AY137	MO028-086----	Ringfort - rath	Recorded Monument	179m	239m	None (Neutral)	N/A	N/A
AY180	MO028-126----	Ringfort - rath	Recorded Monument	58m	118m	Indirect	Low	Slight
AY181	MO028-127----	Ringfort - rath	Recorded Monument	0m	8m	Direct Negative	Very High	Significant
AY231	MO031-021----	Ringfort - rath	Recorded Monument	0m	19m	Direct Negative	Very High	Significant
AY258	MO031-057----	Ringfort - rath	Recorded Monument	65m	125m	Indirect	Low	Slight
AY259	MO031-058	Souterrain	Recorded Monument	43m	121m	None (Neutral)	N/A	N/A
AY307	MO031-106	Earthwork Site	Recorded Monument	104m	179m	None (Neutral)	N/A	N/A
AY311	MO031-112----	Ford [see also AY388]	Recorded Monument	14m	94m	Potential Indirect Negative	Low	Slight
AY313	MO031-119001-	Ringfort - rath	Listed on SMR	71m	131m	None (Neutral)	N/A	N/A

Table 9.6: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option C (Green)

AY Asset Ref.	SMR/RMP No.	Type	Statutory Protection	Approx. Distance to RMP/SMR Zone of Notification	Approx. Distance to RMP/SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AY314	MO031-119002-	Souterrain	Listed on SMR	71m	137m	None (Neutral)	N/A	N/A
AY315	MO031-120-	Ringfort - rath	Listed on SMR	140m	200m	Indirect Negative	Low	Slight
AY379	LH010-007----	Enclosure	Recorded Monument	0m	28m	Direct Negative	Very High	Significant
AY388	LH010-015----	Ford [see also AY311]	Recorded Monument	49m	92m	Potential Indirect Negative	Low	Slight
AY405	LH011-079----	Enclosure	Recorded Monument	131m	191m	None (Neutral)	N/A	N/A
AY456	LH014-001----	Ringfort - rath	Recorded Monument	96m	156m	Potential Indirect Negative	Low	Slight
AY478	LH014-032----	Enclosure	Recorded Monument	110m	150m	None (Neutral)	N/A	N/A
AY486	LH014-042----	Castle - unclassified	Recorded Monument	112m	172m	None (Neutral)	N/A	N/A
AY492	LH014-058----	Font	Recorded Monument	17m	37m	Potential Indirect Negative	Unknown	Potentially Significant
AY517	LH010-020----	Ringfort - rath	Listed on SMR	188m	248m	None (Neutral)	N/A	N/A
Archaeological Potential Assets:								
AP-3	LH010-01001 (adjacent to)	Cropmarks: possible circular enclosure	N/A	N/A	>25m	Unknown	Unknown	Unknown
AP-4	LH010-007 (adjacent to)	Cropmark: possible circular enclosure	N/A	N/A	>25m	Unknown	Unknown	Unknown
AP-5	N/A	Cropmarks: possible enclosure and small circular features	N/A	N/A	<25m	Potential direct Negative	Potential high	Potential Significant
AP-7	MO028-080 (adjacent to)	Cropmarks: possible field boundaries	N/A	N/A	>25m	Unknown	Unknown	Unknown

Table 9.6: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option C (Green)

AY Asset Ref.	SMR/RMP No.	Type	Statutory Protection	Approx. Distance to RMP/SMR Zone of Notification	Approx. Distance to RMP/SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AP-8	MO028-080 (adjacent to)	Possible ring-ditches	N/A	N/A	<25m	Potential direct Negative	Potential high	Potential Significant

Table 9.7: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option D (Orange)

AY Asset Ref.	SMR/RMP No.	Type	Statutory Protection	Approx. Distance to RMP/ SMR Zone of Notification	Approx. Distance to RMP/ SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AY018	MO025-019	Redundant record	Recorded Monument	53m	134m	None (Neutral)	N/A	N/A
AY019	MO025-020----	Ringfort – rath	RMP	178m	238m	Potential Indirect Negative	Low	Slight
AY037	MO025-038----	Ringfort - rath	Recorded Monument	103m	163m	None (Neutral)	N/A	N/A
AY039	MO025-040	Redundant record	Recorded Monument	0m	51m	None (Neutral)	N/A	N/A
AY095	MO028-044----	Ringfort - rath	Recorded Monument	107m	167m	None (Neutral)	N/A	N/A
AY096	MO028-045----	Ringfort - rath	Recorded Monument	106m	166m	None (Neutral)	N/A	N/A
AY098	MO028-047----	Enclosure	Recorded Monument	62m	122m	None (Neutral)	N/A	N/A
AY099	MO028-048----	Ringfort - rath	Recorded Monument	0m	15m	Direct Negative	Very High	Significant
AY139	MO028-088----	Crannog	Recorded Monument	149m	209m	None (Neutral)	N/A	N/A
AY140	MO028-089----	Ringfort - rath	Recorded Monument	0m	33m	Direct Negative	Very High	Significant
AY186	MO028-132----	Ringfort - rath	Recorded Monument	10m	70m	Potential Indirect Negative	Low	Slight
AY201	MO028-146----	Ringfort - rath	Listed on SMR	107m	167m	None (Neutral)	N/A	N/A
AY334	MO032-004001-	Burial ground	Recorded Monument	27m	106m	Potential Indirect Negative	Low	Slight

Table 9.7: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option D (Orange)

AY Asset Ref.	SMR/ RMP No.	Type	Statutory Protection	Approx. Distance to RMP/ SMR Zone of Notification	Approx. Distance to RMP/ SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AY335	MO032-004002-	Bullaun stone	Recorded Monument	27m	71m	Potential Indirect Negative	Low	Slight
AY336	MO032-004003-	Ecclesiastical enclosure	Recorded Monument	27m	103m	Potential Indirect Negative	Low	Slight
AY371	LH010-001----	Ringfort - rath	Recorded Monument	48m	108m	Potential Indirect Negative	Low	Slight
AY391	LH010-017----	Burial ground	Listed on SMR	0m	51m	Direct Negative	Very High	Significant; see also AP 09 & AP10
AY393	LH010-001----	Ringfort - rath	Recorded Monument	0m	30m	Direct Negative	Very High	Significant
AY404	LH011-078----	Earthwork	Recorded Monument	122m	182m	None (Neutral)	N/A	N/A
AY408	LH011-082----	Enclosure	Recorded Monument	0m	52m	Potential Indirect Negative	Medium	Potentially Significant
AY409	LH011-083001-	Enclosure	Recorded Monument	65m	125m	None (Neutral)	N/A	N/A
AY410	LH011-083002-	Souterrain	Recorded Monument	65m	125m	None (Neutral)	N/A	N/A
AY413	LH011-120----	Enclosure	Listed on SMR	0m	28m	Potential Indirect Negative	Potential Medium	Potentially Significant
AY457	LH014-002----	Standing stone	Recorded Monument	149m	169m	Indirect Negative	Low	Slight
AY459	LH014-004----	Souterrain	Recorded Monument	0m	15m	Direct Negative	Very High	Significant
AY493	LH014-062----	Barrow - unclassified	Listed on SMR	14m	54m	Direct Negative	Low	Slight
AY503	LH014-082----	Enclosure	Listed on SMR	66m	126m	Potential Indirect Negative	Low	Slight
AY504	LH014-083----	Enclosure	Listed on SMR	164m	224m	None (Neutral)	N/A	N/A
AY505	LH014-084----	Enclosure	Listed on SMR	78m	138m	Indirect Negative	Low	Slight
AY508	LH014-087----	Enclosure	Listed on SMR	138m	198m	None (Neutral)	N/A	N/A

Table 9.7: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option D (Orange)

AY Asset Ref.	SMR/ RMP No.	Type	Statutory Protection	Approx. Distance to RMP/ SMR Zone of Notification	Approx. Distance to RMP/ SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AY509	LH014-088----	Enclosure	Listed on SMR	0m	49m	Potential Indirect Negative	Potential High	Potentially Significant
AY510	LH014-090----	Enclosure	Recorded Monument	164m	224m	None (Neutral)	N/A	N/A
AY518	LH011-150-	Enclosure - large	Listed on SMR			Potential Indirect Negative	Unknown	Unknown
AY519	LH014-004001-	Enclosure – large	Listed on SMR	24m	79m	Potential Indirect Negative	Unknown	Unknown
Archaeological Potential Assets								
AP-9	LH010-017 (adjacent to)	Cropmark: possible enclosure	N/A	N/A	25m	Unknown	Unknown	Unknown
AP-10	LH010-017 (adjacent to)	Cropmark: possible ring-ditch	N/A	N/A	0m	Potential direct Negative	Potential high	Potential Significant
AP-11	LH014-088 and LH014-084 (adjacent to)	Cropmarks: Two possible circular features (at least)	N/A	N/A	<25m	Potential direct Negative	Potential high	Potential Significant
AP-12	N/A	Cropmarks: possible enclosure	N/A	N/A	<25m	Potential direct Negative	Potential high	Potential Significant
AP-13	N/A	Cropmark: possible enclosure	N/A	N/A	25m	Unknown	Unknown	Unknown
AP-14	N/A	Cropmark: possible ring-ditch	N/A	N/A	<25m	Potential direct Negative	Potential high	Potential Significant
AP-15	MO028-089 (adjacent to)	Cropmark: southern portion of ringfort AY140	RMP/SMR	0m	33m	Direct Negative	High	Significant

Table 9.7: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option D (Orange)

AY Asset Ref.	SMR/ RMP No.	Type	Statutory Protection	Approx. Distance to RMP/ SMR Zone of Notification	Approx. Distance to RMP/ SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AP-16	N/A	Cropmark: enclosure and smaller circular features	N/A	N/A	<25m	Potential direct Negative	Potential high	Potential Significant

Table 9.8: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option E (Orange + Link1 + Green)

AY Asset Ref.	SMR/RMP No.	Type	Statutory Protection	Approx. Distance to RMP/SMR Zone of Notification	Approx. Distance to RMP/SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AY009	MO025-008----	Ringfort - rath	Recorded Monument	0m	21m	Direct impact	Very High	Significant
AY010	MO025-009----	Ringfort - rath	Listed on SMR	187m	247m	None (Neutral)	N/A	N/A
AY015	MO025-016----	Ringfort - rath	Recorded Monument	82m	142m	Potential Indirect Negative	Low	Slight
AY023	MO025-024----	Ringfort - rath	Recorded Monument	175m	235m	None (Neutral)	N/A	N/A
AY027	MO025-028----	Ringfort - rath	Recorded Monument	0m	10m	Direct Negative	Very High	Significant
AY059	MO028-009----	Ringfort - rath	Recorded Monument	38m	98m	Potential Indirect Negative	Low	Slight
AY060	MO028-018	Ringfort - rath	Recorded Monument	173m	233m	None (neutral)	N/A	N/A
AY090	MO028-039----	Ringfort - rath	Recorded Monument	187m	247m	None (Neutral)	N/A	N/A
AY129	MO028-078----	Ringfort - rath	Recorded Monument	83m	143m	None (Neutral)	N/A	N/A
AY131	MO028-080----	Ringfort - rath	Recorded Monument	137m	197m	None (Neutral)	N/A	N/A
AY137	MO028-086----	Ringfort - rath	Recorded Monument	177m	237m	None (Neutral)	N/A	N/A
AY180	MO028-126----	Ringfort - rath	Recorded Monument	58m	118m	Indirect	Low	Slight
AY181	MO028-127----	Ringfort - rath	Recorded Monument	0m	8m	Direct Negative	Very High	Significant

Table 9.8: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option E (Orange + Link1 + Green)

AY Asset Ref.	SMR/RMP No.	Type	Statutory Protection	Approx. Distance to RMP/SMR Zone of Notification	Approx. Distance to RMP/SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AY231	MO031-021----	Ringfort - rath	Recorded Monument	0m	19m	Direct Negative	High	Significant
AY258	MO031-057----	Ringfort - rath	Recorded Monument	65m	125m	Indirect	Low	Slight
AY259	MO031-058	Souterrain	Recorded Monument	43m	121m	None (Neutral)	N/A	N/A
AY307	MO031-106	Earthwork Site	Recorded Monument	103m	179m	None (Neutral)	N/A	N/A
AY311	MO031-112----	Ford [see also AY388]	Recorded Monument	14m	94m	Potential Indirect Negative	Low	Slight
AY313	MO031-119001-	Ringfort - rath	Listed on SMR	71m	131m	None (Neutral)	N/A	N/A
AY314	MO031-119002-	Souterrain	Listed on SMR	71m	137m	None (Neutral)	N/A	N/A
AY315	MO031-120----	MO031-120-	Ringfort - rath	140m	200m	Indirect Negative	Low	Slight
AY379	LH010-007----	Enclosure	Recorded Monument	71m	131m	Potential Indirect	Medium	Moderate
AY388	LH010-015----	Ford [see also AY311]	Recorded Monument	49m	92m	Potential Indirect Negative	Low	Slight
AY404	LH011-078----	Earthwork	Recorded Monument	82m	142m	None (Neutral)	N/A	N/A
AY408	LH011-082----	Enclosure	Recorded Monument	0m	52m	Potential Indirect Negative	Unknown	Potentially Significant
AY409	LH011-083001	Enclosure	Recorded Monument	65m	125m	None (Neutral)	N/A	N/A
AY410	LH011-083002	Souterrain	Recorded Monument	65m	125m	None (Neutral)	N/A	N/A
AY413	LH011-120----	Enclosure	Listed on SMR	0m	28m	Potential Indirect Negative	Medium	Potentially Significant
AY457	LH014-002----	Standing stone	Recorded Monument	149m	169m	Indirect Negative	Low	Slight
AY459	LH014-004----	Souterrain	Recorded Monument	0m	15m	Direct Negative	Very High	Significant
AY493	LH014-062----	Barrow - unclassified	Listed on SMR	14m	54m	Potential Direct Negative	Low	Slight

Table 9.8: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option E (Orange + Link1 + Green)

AY Asset Ref.	SMR/RMP No.	Type	Statutory Protection	Approx. Distance to RMP/SMR Zone of Notification	Approx. Distance to RMP/SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AY503	LH014-082----	Enclosure	Listed on SMR	66m	126m	Potential Indirect Negative	Low	Slight
AY504	LH014-083----	Enclosure	Listed on SMR	164m	224m	None (Neutral)	N/A	N/A
AY505	LH014-084----	Enclosure	Listed on SMR	78m	138m	Indirect Negative	Low	Slight
AY508	LH014-087----	Enclosure	Listed on SMR	138m	198m	None (Neutral)	N/A	N/A
AY509	LH014-088----	Enclosure	Listed on SMR	0m	49m	Potential Indirect Negative	Medium	Potentially Significant
AY510	LH014-090----	Enclosure	Recorded Monument	164m	224m	None (Neutral)	N/A	N/A
AY518	LH011-150-	Enclosure - large	Listed on SMR			Potential Indirect Negative	Unknown	Unknown
AY519	LH014-004001-	Enclosure - large	Listed on SMR	15m	80m	Potential Indirect Negative	Unknown	Unknown
Archaeological Potential Assets								
AP-4	LH010-007 (adjacent to)	Cropmark: possible circular enclosure	N/A	N/A	>25m	Unknown	Unknown	Unknown
AP5	N/A	Cropmarks: possible enclosure and small circular features	N/A	N/A	<25m	Potential direct Negative	Potential high	Potential Significant
AP-7	MO028-080 (adjacent to)	Cropmarks: possible field boundaries	N/A	N/A	>25m	Unknown	Unknown	Unknown
AP-8	MO028-080 (adjacent to)	Possible ring-ditches	N/A	N/A	<25m	Potential direct Negative	Potential high	Potential Significant

Table 9.8: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option E (Orange + Link1 + Green)

AY Asset Ref.	SMR/RMP No.	Type	Statutory Protection	Approx. Distance to RMP/SMR Zone of Notification	Approx. Distance to RMP/SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AP-11	LH014-088 and LH014-084 (adjacent to)	Cropmarks: Two possible circular features (at least)	N/A	N/A	<25m	Potential direct Negative	Potential high	Potential Significant

Table 9.9: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option F (Orange + Link2 + Green)

AY Asset Ref.	SMR/RMP No.	Type	Statutory Protection	Approx. Distance to RMP/SMR Zone of Notification	Approx. Distance to RMP/SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AY009	MO025-008----	Ringfort - rath	Recorded Monument	0m	21m	Direct Negative	Very High	Significant
AY010	MO025-009----	Ringfort - rath	Listed on SMR	187m	247m	None (Neutral)	N/A	N/A
AY015	MO025-016----	Ringfort - rath	Recorded Monument	82m	142m	Potential Indirect Negative	Medium	Slight
AY027	MO025-028----	Ringfort - rath	Recorded Monument	0m	10m	Direct Negative	Very High	Significant
AY059	MO028-009----	Ringfort - rath	Recorded Monument	38m	98m	Potential Indirect Negative	Low	Slight
AY060	MO028-018	Ringfort - rath	Recorded Monument	173m	233m	None (neutral)	N/A	N/A
AY091	MO028-040----	Ringfort - rath	Recorded Monument	187m	247m	None (Neutral)	N/A	N/A
AY097	MO028-046----	Ringfort - rath	Recorded Monument	179m	239m	None (Neutral)	N/A	N/A
AY098	MO028-047----	Enclosure	Recorded Monument	0m	39m	Direct Negative impact	Very High	Significant
AY099	MO028-048----	Ringfort - rath	Recorded Monument	0m	6m	Direct Negative impact	Very High	Significant
AY139	MO028-088----	Crannog	Recorded Monument	139m	209m	None (Neutral)	N/A	N/A

Table 9.9: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option F (Orange + Link2 + Green)

AY Asset Ref.	SMR/RMP No.	Type	Statutory Protection	Approx. Distance to RMP/SMR Zone of Notification	Approx. Distance to RMP/SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AY140	MO028-089----	Ringfort - rath	Recorded Monument	0m	33m	Direct Negative impact	Very High	Significant
AY186	MO028-132----	Ringfort - rath	Recorded Monument	10m	70m	Potential Indirect Negative	Low	Slight
AY201	MO028-146----	Ringfort - rath	Listed on SMR	107m	167m	None (Neutral)	N/A	N/A
AY334	MO032-004001-	Burial ground	Recorded Monument	27m	106m	Potential Indirect Negative	Low	Slight
AY335	MO032-004002-	Bullaun stone	Recorded Monument	27m	71m	Potential Indirect Negative	Low	Slight
AY336	MO032-004003-	Ecclesiastical enclosure	Recorded Monument	27m	103m	Potential Indirect Negative	Low	Slight
AY371	LH010-001----	Ringfort - rath	Recorded Monument	48m	108m	Potential Indirect Negative	Low	Slight
AY391	LH010-017----	Burial ground	Listed on SMR	0m	51m	Direct Negative	Very High	Significant
AY393	LH010-001----	Ringfort - rath	Recorded Monument	0m	30m	Direct Negative	Very High	Significant
AY404	LH011-078---	Earthwork	Recorded Monument	122m	182m	None (Neutral)	N/A	N/A
AY408	LH011-082----	Enclosure	Recorded Monument	0m	52m	Potential Indirect Negative	Unknown	Potentially Significant
AY409	LH011-083001-	Enclosure	Recorded Monument	65m	125m	None (Neutral)	N/A	N/A
AY410	LH011-083002-	Souterrain	Recorded Monument	65m	125m	None (Neutral)	N/A	N/A
AY413	LH011-120----	Enclosure	Listed on SMR	0m	28m	Potential Direct Negative	High	Potentially Significant
AY457	LH014-002----	Standing stone	Recorded Monument	149m	169m	Indirect Negative	Low	Slight
AY459	LH014-004----	Souterrain	Recorded Monument	0m	15m	Direct Negative impact	Very High	Significant

Table 9.9: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option F (Orange + Link2 + Green)

AY Asset Ref.	SMR/RMP No.	Type	Statutory Protection	Approx. Distance to RMP/SMR Zone of Notification	Approx. Distance to RMP/SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AY493	LH014-062----	Barrow - unclassified	Listed on SMR	14m	54m	Potential Indirect Negative	Low	Slight
AY503	LH014-082----	Enclosure	Listed on SMR	66m	126m	Potential Indirect Negative	Low	Slight
AY504	LH014-083----	Enclosure	Listed on SMR	164m	224m	None (Neutral)	N/A	N/A
AY505	LH014-084----	Enclosure	Listed on SMR	78m	138m	Indirect Negative	Low	Slight
AY508	LH014-087----	Enclosure	Listed on SMR	138m	198m	None (Neutral)	N/A	N/A
AY509	LH014-088----	Enclosure	Listed on SMR	0m	49m	Potential Indirect Negative	Unknown	Potentially Significant
AY510	LH014-090----	Enclosure	Recorded Monument	164m	224m	None (Neutral)	N/A	N/A
AY519	LH014-004001-	Enclosure - large	Listed on SMR	14m	79m	Potential Indirect Negative	Unknown	Unknown
Archaeological Potential Assets								
AP-9	LH010-017 (adjacent to)	Cropmark: possible enclosure	N/A	N/A	25m	Unknown	Unknown	Unknown
AP-10	LH010-017 (adjacent to)	Cropmark: possible ring-ditch	N/A	N/A	0m	Potential direct Negative	Potential high	Potential Significant
AP-11	LH014-088 and LH014-084 (adjacent to)	Cropmarks: Two possible circular features (at least)	N/A	N/A	<25m	Potential direct Negative	Potential high	Potential Significant
AP-13	N/A	Cropmark: possible enclosure	N/A	N/A	25m	Unknown	Unknown	Unknown
AP-14	N/A	Cropmark: possible ring-ditch	N/A	N/A	<25m	Unknown	Unknown	Unknown

Table 9.9: Archaeological Heritage Assets Potentially Impacted by Route Corridor Option F (Orange + Link2 + Green)

AY Asset Ref.	SMR/RMP No.	Type	Statutory Protection	Approx. Distance to RMP/SMR Zone of Notification	Approx. Distance to RMP/SMR Centre	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AP-15	MO028-089 (adjacent to)	Cropmark: southern portion of ringfort	RMP/SMR	0m	33m	Unknown	Unknown	Unknown
AP-16	N/A	Cropmark: enclosure and smaller circular features	N/A	N/A	<25m	Potential direct Negative	Potential high	Potential Significant

Table 9.10 Summary of Significance of Impacts on Recorded and Potential Archaeological Sites for Each Route Corridor Option

Route Corridor Option	N/A	Unknown Impact	Slight Impacts	Moderate Impacts	Number of Potentially Significant Impacts	Number of Significant Impacts
Option A (Yellow)	38	3	4	-	3	-
Option B (Yellow + Blue)	38	3	5	-	3	1
Option C (Green)	15	3	8	-	3	5
Option D (Orange)	14	4	10	-	8	6
Option E (Orange+Link1+Green)	17	4	11	1	6	5
Option F (Orange+Link2+Green)	5	12	11	-	6	8

9.4.2 Assessment of Potential Impacts on Architectural Heritage Assessment

9.4.2.1 Known and Potential Architectural Heritage Sites

An inventory of all previously recorded architectural heritage assets within the Route Corridor Options is included as Appendix 9.2 to this report. Previously recorded architectural heritage assets within the 400m corridors for the six Route Corridor Options (Options A – F) listed on the RPS and/or NIAH are included below in Table 9.11 and are shown in Figure 9.2. The suggested importance of the architectural heritage assets listed in Table 9.11 below follows their NIAH-assigned ratings, or where these are not available, importance has been attributed using the criteria outlined in the NIAH handbook. Inclusion on the relevant Records of Protected Structures (RPS) automatically ensures that statutory protection from adverse impacts is afforded. The importance of many of these buildings is outlined in the NIAH, which highlights a representative sample of the architectural heritage of each county. Not all buildings and structures listed on the NIAH are legally protected through inclusion on the RPS. In instances where the architectural heritage asset does not appear on either register these have been assessed below as being of local importance, but it is important to bear in mind that this rating is based on professional judgement and may be subject to change as the relevant RPS and NIAH are reviewed.

Table 9.11: Previously recorded architectural heritage sites within the 400m corridors of Route Corridor Options A - F

AH Asset Ref.	Route Corridor Option	Type	Townland	ITM_E	ITM_N	Importance Rating	Sources
AH001	A	Grave monument	Brackagh	685154	813581	Regional	NIAH / 25-inch OS map (1859–1909) / Aerial Photography
AH002	A	Church	Brackagh	685169	813610	Regional	RPS/NIAH / 25-inch OS map (1859–1909) / Aerial Photography
AH003	A	House/manse	Brackagh Broomfield	685308	813486	Local	RPS/NIAH 6-inch OS map (1835) / 25-inch OS map (1859–1909) / Aerial Photography
AH004	A and B	Church	Taplagh Broomfield	685142	812835	Regional	RPS/NIAH / / 25-inch OS map (1859–1909) / Aerial Photography
AH005	A and B	Worker's house	Taplagh Broomfield	685197	812871	Regional	RPS/NIAH / 25-inch OS map (1859–1909) / Aerial Photography
AH006	A and B	Graveyard	Taplagh Broomfield	685293	812690	RPS/Regional	RPS
AH027	A and B	House	Monaltybane	686699	801999	RPS/Local	RPS/NIAH Garden Survey / 6-inch OS Map (1835) / 25-inch OS map (1859–1909) / Aerial Photography
AH029	C and E	Public house	Garlegobban Inniskeen	689164	803744	RPS / Regional	RPS/NIAH / 6-inch OS Map (1835) / 25-inch OS map (1859–1909) / Aerial Photography / Site visit (13/03/20)
AH030	C and E	Forge / smithy	Garlegobban Inniskeen	689184	803722	RPS / Regional	RPS/NIAH / 6-inch OS Map (1835) / 25-inch OS map (1859–1909) / Aerial Photography / Site visit (13/03/20)
AH032	A and B	Outbuilding (domestic)	Monaltybane	686663	802033	RPS/Local	RPS/NIAH Garden Survey / . 6-inch OS Map (1835) / 25-inch OS map (1859–1909) / Aerial Photography

Table 9.11: Previously recorded architectural heritage sites within the 400m corridors of Route Corridor Options A - F

AH Asset Ref.	Route Corridor Option	Type	Townland	ITM_E	ITM_N	Importance Rating	Sources
AH039	C and E	House	Essexford	689248	803306	Regional	RPS/NIAH / 6-inch OS Map (1835) / 25-inch OS map (1859–1909) / Aerial Photography
AH043	D and F	Thatched cottage/far mhouse	Tully	692093	800769	Regional	RPS/NIAH
AH060	D, E and F	Farm house	Mullacloe	695567	793052	Regional	RPS/NIAH
AH061	A, B and C	House	Cookstown	693657	794040	Regional	RPS/NIAH 6-inch OS map (1838) / 25-inch OS map (1859–1909) / Aerial Photography
AH062	A, B and C	Curate's house	Cookstown	693779	794032	Regional	RPS/NIAH 6-inch OS map (1838) / 25-inch OS map (1859–1909) / Aerial Photography
AH067	C (Green)	Presbytery	Arthurstown	693005	796448	Regional	RPS/NIAH
AH070	All six	Farm house	Clonavogy	683921	816622	Regional	NIAH/ 6-inch OS Map (1835) / 25-inch OS map (1859–1909) / Aerial Photography
AH071	All six	Farmyard complex	Clonavogy	683956	816631	Regional	NIAH / 6-inch OS Map (1835) / 25-inch OS map (1859–1909) / Aerial Photography
AH072	C (Green)	Historic Demesne	Arthurstown	692631	796511	Local	NIAH Garden Survey/Historical Maps / 6-inch OS Map (1835) / 25-inch OS map (1859–1909) / Aerial Photography
AH083	A, B and C	Historic Demesne	Cookstown	693827	793987	Local	Historic mapping
AH091	C and E	School	DRUMLUSTY	687728	806681	Regional	NIAH / 25-inch OS map (1859–1909) / Aerial Photography / Site Visit (13/03/20)

Table 9.11: Previously recorded architectural heritage sites within the 400m corridors of Route Corridor Options A - F

AH Asset Ref.	Route Corridor Option	Type	Townland	ITM_E	ITM_N	Importance Rating	Sources
AH092	A, B and C	House	Harristown	694180	793081	RPS/Local	RPS/NIAH Garden Survey / 6-inch OS Map (1835) / 25-inch OS map (1859–1909) / Aerial Photography
AH094	D and F	House & Gardens	Kiltybegs	689550	806087	Local	NIAH Garden Survey/Historical Maps
AH104	C and E	Potential House / Gardens Site	Rahans	687711	805641	Local	NIAH Garden Survey/Historical Maps
AH108	A (Yellow)	Church/chapel	Brackagh	685229	813149	Regional	NIAH / 25-inch OS map (1859–1909) / Aerial Photography
AH109	C, E and F	Store/warehouse	Aghadreenan	683884	815004	Regional	NIAH / 6-inch OS map (1835) / 25-inch OS map (1859–1909) / Aerial Photography
AH121	C and E	Bridge	Garlegobban	689063	803807	Regional	NIAH / 25-inch OS map (1859–1909) / Aerial Photography / Site visit (13/03/20)
AH122	C and E	Post box	Garlegobban	689167	803779	Regional	NIAH / 25-inch OS map (1859–1909) / Site visit (13/03/20)
AH123	C and E	Railway station	Garlegobban	689204	803859	Regional	NIAH / 25-inch OS map (1859–1909) / Site visit (13/03/20)
AH124	C and E	Building misc	Garlegobban	689186	803782	Regional	NIAH / 25-inch OS map (1859–1909) / Site visit (13/03/20)
AH125	C and E	Water pump	Garlegobban	689186	803782	Regional	NIAH / Site visit (13/03/20)
AH126	C and E	Bridge	Garlegobban	689199	803721	Regional	NIAH / 6-inch OS map (1835) / 25-inch OS map (1859–1909) / Aerial Photography / Site visit (13/03/20)

Table 9.11: Previously recorded architectural heritage sites within the 400m corridors of Route Corridor Options A - F

AH Asset Ref.	Route Corridor Option	Type	Townland	ITM_E	ITM_N	Importance Rating	Sources
AH142	D, E and F	Historic Demesne	Louth Hall	694580	796477	Local	NIAH Garden Survey/Historical Maps
AH145	D, E and F	Historic demesne associated with Knock Abbey. Associated with a Protected Structure	Thomastown	692832	798815	Local	NIAH Garden Survey/Historical Maps

A number of additional structures and other features of potential architectural heritage interest identified from the Constraints Study and further research and fieldwork include bridges, culverts, vernacular buildings, former schools, former Police station, smithies, creameries, railway lines and associated features and roadside water pumps and pipes. While a complete list of cultural heritage assets has been compiled and have been assigned a unique reference (Cultural Heritage (CH)) number, it is only where these assets survive extant and are directly or indirectly impacted by the proposed routes that they are listed in Table 9.12 below. The most frequent asset noted was vernacular buildings; where multiple buildings are depicted on the map the number of buildings were recorded but were counted as a single site. The buildings were checked against available aerial mapping to assess their condition, and their relative status (site of, ruin, extant, in use as, and an indeterminate category where the status was unclear) was noted as part of the baseline study. A total of four hundred and seventy-nine (479) sites with vernacular buildings were identified within the 400m Route Corridor Options A – F, almost three-hundred (300) of those comprise the ‘site of’ buildings no longer visible in the landscape. Almost ninety (90) direct or indirect impacts on the ‘sites of’ vernacular buildings within twenty-five metres of the route centreline were recorded but are not included in the assessment below. The remaining sites will be assessed in later stages of the EIA process for the preferred route.

Preliminary importance ratings have been assigned to each asset following the ratings used by the NIAH. These ratings are for guidance purposes only to assist with the impact assessments and Option Selection and have no legal effect.

Table 9.12: Non-exhaustive list of undesignated architectural heritage sites within assessment corridors

AH Asset Ref.	Route Corridor Option	Type	Townland	ITM Easting	ITM Northing	Preliminary Importance Rating	Source
CH-01	A and B	Possible site of bridge - named <i>Mullaghanee bridge</i> on 1st Edition. Direct impact on Option A (Yellow) only, but N2 is also extant at this location.	Mullaghanee	684556	815516	Local	1st Edition OS Map;
CH-02	D and F	Bridge (extant) Named <i>Rossloughbridge</i> on 25-inch OS Map.	Coolderry	690765	804612	Local	1st Edition OS Map;
CH-03	A and B	Culvert (possible) (possibly extant on E side of N2). Direct impact on Option A (Yellow) only	Garranroe Or Cornamucklagh	685295	812009	Local	1st Edition OS Map;
CH-05	B	Vernacular building (extant - in use house). Well-marked on 25-inch OS Map.	Aghadreenan	684512	814585	Local	1st Edition OS Map:
CH-06	B	Vernacular building (extant - in use as house). Marked as 'Broomfield Post Office' on 2nd Edition	Cornahawla	684606	813811	Local	1st Edition OS Map; 25-inch OS Map
CH-34	B	Vernacular building (ruin)	Lisgall	684257	806952	Local	1st Edition OS Map
CH-36	A and B	Lane / avenue (Esmore Hall)	Drummond Otra	685534	802993	Local	1st Edition OS Map;
CH-46	A and B	Plantation (site of)	Cloghvally Upper	684269	804992	Local	1st Edition OS Map;
CH-47	A and B	Plantation (site of) N2 extant	Lisgall	684281	806683	Local	1st Edition OS Map;
CH-48	A	Police Station (extant possibly survives as a shed at rear of house).	Drumagnus Lower	685025	813766	Local	1st Edition OS Map;

Table 9.12: Non-exhaustive list of undesignated architectural heritage sites within assessment corridors

AH Asset Ref.	Route Corridor Option	Type	Townland	ITM Easting	ITM Northing	Preliminary Importance Rating	Source
CH-49	D and F	Railway line (GNR Carrickmacross branch line)	Essexford	690723	804670	Local	25-inch OS Map
CH-50	C and E	Railway line (GNR Ireland Carrickmacross branch line)	Essexford	689009	803792	Local	25-inch OS Map
CH-51	A and B	Railway line (site of) GNR IRELAND CARRICKMACROSS BRANCH LINE	Drummond Otra	685477	803116	Local	25-inch OS Map
CH-52	A and B	School House - marked as Mullaghane School Ho on 25-inch OS Map. Extant	Mullaghane	684374	815880	Local	1st Edition OS Map; 25-inch OS Map
CH-53	A and B	School house on 1st edition (site of?). Direct impact on Option A (Yellow) only.	Taplagh	685327	812604	Local	1st Edition OS Map;
CH-54	C	Thornbush (site of ?)	Thomastown	692166	797922	Local	1st Edition OS Map;
CH-55	D	Vernacular building (ruin)	Lisnamoyle Otra	687324	810230	Local	1st Edition OS Map;
CH-56	A and B	Vernacular building (extant - in use house and shed)	Garranroe Or Cornamucklagh	685300	811983	Local	1st Edition OS Map;
CH-57	A and B	Vernacular building (extant)	Annamarran	688414	799224	Local	1st Edition OS Map;
CH-58	D	Vernacular building (extant)	Knockreagh Lower	868861	813407	Local	1st Edition OS Map;
CH-60	A and B	Vernacular building (extant). Direct impact on Option A (Yellow) only.	Taplagh	685347	812243	Local	1st Edition OS Map;
CH-61	A and B	Vernacular building (extant) in use as house	Drumharriff	685022	811149	Local	1st Edition OS Map;

Table 9.12: Non-exhaustive list of undesignated architectural heritage sites within assessment corridors

AH Asset Ref.	Route Corridor Option	Type	Townland	ITM Easting	ITM Northing	Preliminary Importance Rating	Source
CH-62	A and B	Vernacular building (extant) in use as shed. Direct impact on Option A (Yellow) only.	Taplagh	685339	812326	Local	1st Edition OS Map;
CH-63	D and F	Vernacular building (extant) ruin - house and shed	Drumgowna	691581	801395	Local	1st Edition OS Map;
CH-64	A and B	Vernacular building (extant) well marked on 25-inch OS Map. Direct impact on Option A (Yellow) only.	Taplagh	685342	812484	Local	1st Edition OS Map; 25-inch OS Map
CH-65	A	Vernacular building (house) Much extended but some original surviving? Marked as Broomfield on 25-inch OS Map	Drumagnus Lower	684994	813899	Local	1st Edition OS Map; 25-inch OS Map
CH-66	All six	Vernacular building (extant) (in use)	Clonavogy	683622	816842	Local	1st Edition OS Map;
CH-67	A	Vernacular building – site of (marked as Smithy on 25-inch OS Map)	Brackagh	685088	813687	Local	1st Edition OS Map; 25-inch OS Map
CH-70	C and E	Vernacular buildings (2) (extant in part) 1 building surviving	Cornalough	683758	815351	Local	1st Edition OS Map;
CH-71	C and E	Vernacular buildings (2) (extant)	Drumillard	685388	811231	Local	1st Edition OS Map;
CH-72	A and B	Vernacular buildings (2) (extant) - in use as house and shed. Direct impact on Option A (Yellow) only.	Taplagh	685295	812009	Local	1st Edition OS Map;

Table 9.12: Non-exhaustive list of undesignated architectural heritage sites within assessment corridors

AH Asset Ref.	Route Corridor Option	Type	Townland	ITM Easting	ITM Northing	Preliminary Importance Rating	Source
CH-73	D and F	Vernacular buildings (2) (ruin)	Rosslough	691480	803626	Local	1st Edition OS Map;
CH-74	C and E	Vernacular buildings (3)	Clonavogy	684347	812206	Local	1st Edition OS Map;
CH-75	A and B	Vernacular buildings (4): 25-inch OS shows 2 possibly still extant. Direct impact on Option A (Yellow) only.	Mullaghane	684272	816073	Local	1st Edition OS Map; 25-inch OS Map
CH-76	A and B	Vernacular buildings (extant) in use as sheds). Direct impact on Option A (Yellow) only.	Mullaghane	684667	815413	Local	1st Edition OS Map;
CH-80	A and B	Vernacular building (extant) extended on 25-inch OS Map.	Drumgeeny	688819	798686	Local	1st Edition OS Map; 25-Inch OS Map
CH-83	A and B	Vernacular buildings (2) (extant possibly)	Monygorbet	684718	815193	Local	1st Edition OS Map;
CH-87	A and B	Vernacular buildings (4) (extant - 2) in use as sheds?	Leeg	688822	798506	Local	1st Edition OS Map;
CH-88	A and B	vernacular buildings (3) possibly 1 extant	Annamarran	687949	799798	Local	1st Edition OS Map;
CH-89	A and B	Vernacular building (house and farmyard) (Extant)	Drumgeeny	689218	798190	Local	1st Edition OS Map;
CH-137	D (Orange)	Vernacular building (extant)	Knockreagh Lower	686832	813342	Local	1st Edition OS Map
CH-142	D (Orange)	Vernacular building (ruin)	Lisnamoyle Otra	687324	810230	Local	1st Edition OS Map
CH-151	D and F	Railway line (GNR Carrickmacross branch line) (site of)	Essexford	690723	804670	Local	25-inch OS Map

Table 9.12: Non-exhaustive list of undesignated architectural heritage sites within assessment corridors

AH Asset Ref.	Route Corridor Option	Type	Townland	ITM Easting	ITM Northing	Preliminary Importance Rating	Source
CH-160	D and F	Lane (possibly associated with Ecclesiastic Enclosure MO032-004003-)	Coolderry (Farney By., Donaghmoyne Par.), Drumgristin Upper	690597	805015	Local	1 st Edition OS Map, 25-inch OS Map

9.4.2.2 Architectural Heritage Assessment of Route Corridor Options

As outlined above, a comparative quantitative and qualitative evaluation was carried out to assess the potential impact of each Route Corridor Option on the identified architectural heritage assets (NIAH, RPS and undesignated) within each 400m Route Corridor. The results of these assessments are outlined in the tables below.

The future proposed road alignment within the selected preferred Route Corridor Option will be narrower than 400m, and so sites within the Route Corridor Option could potentially be avoided through careful routing. This assessment has included a 50m band within the 400m-wide Route Corridor Option. This band is 25m either side of the centreline of the 400m-wide corridors (i.e. 50m-wide in total). This allows the assessment to more accurately identify potential direct and indirect effects to cultural heritage sites. Sites within the 50m band have been assessed for direct effects and sites beyond the 50m band have been assessed for potential indirect effects. It is considered that to assess all sites within the 400m-wide corridor as at risk of direct effects would not reflect the actual effects of the scheme. At the next Phase of the project (i.e. Phase 3), there will be further surveys and assessment to inform the proposed alignment within the selected preferred Route Corridor Option. This work will seek to find identify the best overall alignment in terms of all factors. Changes with the Phase 3 proposed alignment, and associated different effects, will be appropriately identified and assessed in the Environmental impact Assessment Report in the subsequent phase.

The architectural heritage assessment found that there are no profound impacts on any structures listed on the NIAH but that two of the Route Corridor Options could have a potentially Significant direct negative impact on one or two Protected Structures (AH061 and AH062). The assessment of some sites may be refined with subsequent development design modifications.

Table 9.13: Architectural Heritage assets Potentially Impacted by Route Corridor Option A (Yellow)

AH Asset Ref.	Type	Statutory Protection	Approx. Distance from Route Corridor centreline to Centre Point of site	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AH001	Grave monument: An Eaglais	Listed on NIAH	14m	Potential Direct Negative	Low	Slight
AH002	Church: Broomfield Presbyterian Church (An Eaglais)	Protected Structure	45m	Potential Indirect Negative	Low	Slight
AH003	House/ manse: Mount Carmel Glebe	Protected Structure	90m	None (Neutral)	N/A	N/A
AH004	St Patrick's Catholic Church	Protected Structure	199m	None (Neutral)	N/A	N/A
AH005	Cottage: Worker's house	Protected Structure	140m	None (Neutral)	N/A	N/A
AH006	Graveyard: Grave of Thomas Hughes V.C	Protected Structure	58m	Potential Direct Negative	Low	Slight
AH027	House: Monalty House	Protected Structure	166m	Potential Indirect Negative	Medium	Slight
AH032	Outbuildings: Monalty Outbuildings	Protected Structure	166m	Potential Indirect Negative	Medium	Slight
AH061	House: Cookstown House	Protected Structure	66m	Potential Direct Negative	Potentially High	Potentially Significant
AH062	Curate's house: Charlestown Rectory	Protected Structure	36m	Potential Direct Negative	Potentially High	Potentially Significant
AH070	Farmhouse: Annevale House	Listed on NIAH	59m	Potential Indirect Negative	Low	Slight
AH071	Farmyard complex: Annevale House	Listed on NIAH	92m	None (Neutral)	None	N/A
AH072	Historic Demesne Arthurstown House	Undesignated	25m	Direct Negative	Medium	Slight
AH083	Historic Demesne: Cookstown House (undesignated)	None	0m	Potential Direct Negative	Medium	Slight
AH092	House: Harristown house	Listed on NIAH Garden Survey	233m	None (Neutral)	N/A	N/A

Table 9.13: Architectural Heritage assets Potentially Impacted by Route Corridor Option A (Yellow)

AH Asset Ref.	Type	Statutory Protection	Approx. Distance from Route Corridor centreline to Centre Point of site	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AH108	Church/chapel: Holy Trinity church of Ireland, Brackagh NIAH 41402513	Listed on NIAH	88m	Potential Indirect Negative	Low	Slight
Cultural Heritage Sites						
CH-01	Bridge (Mullaghane Bridge) (possible site of)	N/A	27m	Indirect Negative	Low	Imperceptible
CH-03	Culvert (possible) (possibly extant on E side of N2).	N/A	25m	Direct Negative	Low	Imperceptible
CH-04	Culvert (site of)	N/A	25m	None (Neutral)	N/A	N/A
CH-36	Lane / avenue- Esmore Hall (25-inch OS MAP)	N/A	25m	Direct Negative	Medium	Slight
CH-46	Plantation (site of)	N/A	25m	None (Neutral)	N/A	N/A
CH-47	Plantation (site of) N2 extant	N/A	25m	None (Neutral)	N/A	N/A
CH-51	Railway line (site of) GNR Ireland Carrickmacross Branch Line.	N/A	25m	None (Neutral)	N/A	N/A
CH-52	School House – marked as Mullaghane School House on 25-inch OS Map. Extant	N/A	25m	Direct Negative	High	Moderate
CH-53	School house on 1st edition (site of?). Direct impact on Option A (Yellow) only.	N/A	25m	Indirect Negative	Low	Imperceptible
CH-56	Vernacular building (extant – in use house and shed)	N/A	16m	Direct Negative	High	Moderate
CH-57	Vernacular building (extant)	N/A	25m	Indirect Negative	Low	Imperceptible
CH-60	Vernacular building (extant). Direct impact on Option A (Yellow) only.	N/A	25m	Direct Negative	High	Moderate

Table 9.13: Architectural Heritage assets Potentially Impacted by Route Corridor Option A (Yellow)

AH Asset Ref.	Type	Statutory Protection	Approx. Distance from Route Corridor centreline to Centre Point of site	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
CH-61	Vernacular building (extant) in use as house	N/A	20m	Direct Negative	High	Moderate
CH-62	Vernacular building (extant) in use as shed. Direct impact on Option A (Yellow) only.	N/A	25m	Direct Negative	High	Moderate
CH-64	Vernacular building (extant) well marked on 25-inch OS Map. Direct impact on Option A (Yellow) only.	N/A	25m	Direct Negative	High	Moderate
CH-65	Vernacular building (house) Much extended but some original surviving? Marked as Broomfield on 25-inch OS Map	N/A	25m	Direct Negative	High	Moderate
CH-66	Vernacular building (in use)	N/A	21m	Direct Negative	High	Moderate
CH-67	Vernacular building (marked as Smithy on 25-inch OS Map)	N/A	25m	Indirect Negative	Low	Imperceptible
CH-72	Vernacular buildings (2) (extant) – in use as house and shed. Direct impact on Option A (Yellow) only.	N/A	25m	Direct Negative	High	Moderate
CH-75	Vernacular buildings (4): 25-inch OS shows 2 possibly still extant. Direct impact on Option A (Yellow) only.	N/A	25m	Direct Negative	High	Moderate
CH-76	Vernacular buildings (extant) in use as sheds). Direct impact on Option A (Yellow) only.	N/A	25m	Direct Negative	Medium	Slight

Table 9.14: Architectural Heritage Assets Potentially Impacted by Route Corridor Option B (Yellow+Blue)

AH Asset Ref.	Type	Statutory Protection	Approx. Distance	Type & Quality of Impact	Magnitude of impact	Significance of Impact
AH004	Church (St Patrick's Catholic Church)	Protected Structure	107m	Indirect Negative	High	Significant
AH005	Cottage: worker's house	Protected Structure	173m	None (Neutral)	N/A	N/A
AH006	Graveyard: Grave of Thomas Hughes V.C.	Protected Structure	174m	Indirect Negative	Low	Slight
AH027	House: Monalty House	Protected Structure	166m	Potential Indirect Negative	Medium	Slight
AH032	Outbuildings: Monalty	Protected Structure	166m	Potential Indirect Negative	Low	Slight
AH061	House: Cookstown House	Protected Structure	66m	Potential Direct Negative	Potentially High	Potential Significant
AH062	Curate's house: Charlestown Rectory	Protected Structure	36m	Potential Direct Negative	Potentially High	Potential Significant
AH070	Farm house: Annevale House	Listed on NIAH	59m	Potential Indirect Negative	Low	Slight
AH071	Farmyard complex: Annevale House	Listed on NIAH	92m	None (Neutral)	N/A	N/A
AH083	Historic Demesne: Cookstown House (undesigned)	None	0m	Potential Direct Negative.	Medium	Slight
AH092	House: Harristown house	Listed on NIAH Garden Survey	233m	None (Neutral)	N/A	N/A
Cultural Heritage Sites						
CH-05	Vernacular building (extant - in use as house)/ Well marked on 25-inch OS Map. Option B (Yellow+Blue) only.	N/A	25m	Indirect Negative	Medium	Slight
CH-06	Vernacular building (extant - in use as house). Marked as 'Broomfield Post Office' on 2nd Edition	N/A	50m	Indirect Negative	High	Moderate
CH-36	Lane / avenue- Esmore Hall (25-inch OS MAP)	N/A	25m	Direct Negative	Medium	Slight

Table 9.14: Architectural Heritage Assets Potentially Impacted by Route Corridor Option B (Yellow+Blue)

AH Asset Ref.	Type	Statutory Protection	Approx. Distance	Type & Quality of Impact	Magnitude of impact	Significance of Impact
CH-46	Plantation (site of)	N/A	25m	None (Neutral)	N/A	N/A
CH-47	Plantation (site of) N2 extant	N/A	25m	None (Neutral)	N/A	N/A
CH-51	Railway line (site of) GNR Ireland Carrickmacross Branch Line	N/A	25m	None (Neutral)	N/A	N/A
CH-52	School House - marked as Mullaghanees School Ho on 25-inch OS Map. Extant	N/A	25m	Direct Negative	High	Moderate
CH-56	Vernacular building (extant - in use house and shed)	N/A	16m	Direct Negative	High	Moderate
CH-57	Vernacular building (extant)	N/A	25m	Indirect Negative	Low	Imperceptible
CH-61	Vernacular building (extant) in use as house	N/A	20m	Direct Negative	High	Moderate
CH-65	Vernacular building (house) Much extended but some original surviving? Marked as Broomfield on 25-inch OS Map	N/A	20m	Direct Negative	High	Moderate
CH-66	Vernacular building (in use)	N/A	21m	Direct Negative	High	Moderate
CH-67	Vernacular building (marked as Smithy on 25-inch OS Map)	N/A	25m	Indirect Negative	Low	Imperceptible
CH-34	Vernacular building (ruin)	N/A	50m	Indirect Negative	Low	Imperceptible
CH-80	Vernacular building (extant) extended on 2nd Edition	N/A	50m	Indirect Negative	Low	Imperceptible
CH-83	Vernacular buildings (2) (extant possibly)	N/A	50m	Indirect Negative	Low	Imperceptible
CH-87	Vernacular buildings (4) (extant - 2) in use as sheds?	N/A	50m	Indirect Negative	Low	Imperceptible
CH-88	Vernacular buildings (3) possibly 1 extant	N/A	50m	Indirect Negative	Low	Imperceptible

Table 9.14: Architectural Heritage Assets Potentially Impacted by Route Corridor Option B (Yellow+Blue)

AH Asset Ref.	Type	Statutory Protection	Approx. Distance	Type & Quality of Impact	Magnitude of impact	Significance of Impact
CH-89	Vernacular building (house and farmyard) (Extant)	N/A	50m	Indirect Negative	Low	Imperceptible

Table 9.15: Architectural Heritage Assets Potentially Impacted by Route Corridor Option C (Green)

AH Asset Ref.	Type	Statutory Protection	Approx. Distance	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AH029	McArdles Public house	Protected Structure	71m	Potential Indirect Negative	Low	Slight
AH030	Forge/smithy	Protected Structure	71m	Potential Indirect Negative	Low	Slight
AH039	House: Killannev Glebe Rectory	Protected Structure	81m (from house)	Direct impact on curtilage	Low	Slight
AH061	House: Cookstown House	Protected Structure	66m	Potential Direct Negative	Potentially High	Potentially Significant
AH062	Curate's house: Charlestown Rectory	Protected Structure	36m	Potential Direct Negative	Potentially High	Potentially Significant
AH067	Presbytery: Former Parochial house	Protected Structure	95m	Indirect Negative	Low	Slight
AH070	Farm house: Annevale House	Listed on NIAH	110m	Indirect Negative	Low	Slight
AH071	Farmyard complex: Annevale House	Listed on NIAH	145m	None (Neutral)	N/A	N/A
AH072	Historic demesne: Arthurstown House	Listed on NIAH Garden Survey	0m	Direct impact on historic demesne	Medium	Slight
AH083	Historic Demesne: Cookstown House (undesignated)	None	0m	Potential Direct Negative	Medium	Slight
AH091	School: Drumlustly School	Listed on NIAH	189m	None (Neutral)	N/A	N/A

Table 9.15: Architectural Heritage Assets Potentially Impacted by Route Corridor Option C (Green)

AH Asset Ref.	Type	Statutory Protection	Approx. Distance	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AH092	House: Harristown house	Listed on NIAH Garden Survey	233m	None (Neutral)	N/A	N/A
AH104	Potential house/ gardens site: Rahans	Listed on NIAH Garden Survey	0m	Direct impact on historic demesne	Low	Imperceptible
AH109	Store/ warehouse	Listed on NIAH	97m	None (Neutral)	N/A	N/A
AH121	Bridge	Listed on NIAH	45m	None (Neutral)	N/A	N/A
AH122	Post box	Listed on NIAH	98m	None (Neutral)	N/A	N/A
AH123	Railway station	Listed on NIAH	180m	None (Neutral)	N/A	N/A
AH124	Building misc	Listed on NIAH	113m	None (Neutral)	N/A	N/A
AH125	Water pump	Listed on NIAH	87m	None (Neutral)	N/A	N/A
AH126	Bridge	Listed on NIAH	82m	None (Neutral)	N/A	N/A
Cultural Heritage Sites						
CH-50	Railway line (GNR Ireland Carrickmacross branch line) (site of)	N/A	25m	Indirect Negative	Low	Imperceptible
CH-66	Vernacular building (in use)	N/A	21m	Direct Negative	High	Moderate
CH-70	Vernacular buildings (2) (1 extant)	N/A	15m	Direct Negative	Medium	Slight
CH-71	Vernacular buildings (2) (extant)	N/A	15m	Direct Negative	Medium	Slight

Table 9.16: Architectural Heritage Assets Potentially Impacted by Route Corridor Option D (Orange)

AH Asset Ref.	Type	Statutory Protection	Approx. Distance	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AH043	Thatched cottage/ farmhouse: Tully thatched cottage	Protected Structure	81m	Potential Indirect Negative	Medium	Moderate
AH060	Farm house	Protected Structure: Mullacloe House	202m	Indirect Negative	Low	Slight
AH070	Farm house: Annevale House	Listed on NIAH	59m	Potential Indirect Negative	Low	Slight
AH071	Farmyard complex: Annevale House	Listed on NIAH	92m	None (Neutral)	N/A	N/A
AH094	House & Gardens: Kiltybegs	Listed on NIAH Garden Survey	13m	Direct Negative	High	Moderate
AH142	Louth Hall Demesne	Listed on NIAH Garden Survey	0m	Potential Direct Negative	Medium	Slight
AH145	Historic demesne associated with Knock Abbey	Associated with a Protected Structure	0m	Direct Negative	Medium	Slight
Cultural Heritage Assets						
CH-02	Bridge (marked Rosslough Bridge on 25- inch OS)	N/A	0m	Direct Negative	High	Moderate
CH-58	Vernacular building (extant)	N/A	12m	Direct Negative	Medium	Slight
CH-63	Vernacular building (extant) ruin - house and shed	N/A	19m	Direct Negative	Low	Imperceptible
CH-66	Vernacular building (in use)	N/A	21m	Direct Negative	High	Moderate

Table 9.16: Architectural Heritage Assets Potentially Impacted by Route Corridor Option D (Orange)

AH Asset Ref.	Type	Statutory Protection	Approx. Distance	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
CH-73	Vernacular buildings (2) (ruin)	N/A	8m	Direct Negative	Medium	Slight
CH-137	Vernacular building (extant)	N/A	14m	Direct Negative	Medium	Slight
CH-151	Railway line (GNR Carrickmacross branch line)	N/A	0m	Indirect Negative	Low	Imperceptible
CH-160	Lane (possibly associated with Ecclesiastic Enclosure MO032-004003-)	N/A	0m	Direct Negative	High	Moderate

Table 9.17: Architectural Heritage Assets Potentially Impacted by Route Corridor Option E (Orange + Link1 + Green)

AY Asset Ref.	Type / Name	Statutory Protection	Approx. Distance	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AH029	Public house: McArdles Public House	Protected Structure	71m	Potential Indirect Negative	Low	Slight
AH030	Forge/smithy: The Forge	Protected Structure	71m	Potential Indirect Negative	Low	Slight
AH039	House: Kilanney Glebe Rectory	Protected Structure	81m	Direct impact on curtilage	Medium	Moderate
AH060	Farm house: Mullacloe House	Protected Structure	202m	Indirect Negative	Low	Slight
AH070	Farm house: Annevale House	Listed on NIAH	109m	Indirect Negative	Low	Slight

Table 9.17: Architectural Heritage Assets Potentially Impacted by Route Corridor Option E (Orange + Link1 + Green)

AY Asset Ref.	Type / Name	Statutory Protection	Approx. Distance	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AH071	Farmyard complex: Annevale House	Listed on NIAH	148m	None (Neutral)	N/A	N/A
AH091	School: Drumlusty School	Listed on NIAH	189m	None (Neutral)	N/A	N/A
AH104	Potential House/Gardens Site: Rahans (Potential Site)	Listed on NIAH Garden Survey	153m (from potential house location)	Direct impact on historic demesne	Low	Imperceptible
AH109	Store/warehouse	Listed on NIAH	97m	None (Neutral)	N/A	N/A
AH121	Bridge	Listed on NIAH	45m	None (Neutral)	N/A	N/A
AH122	Post box	Listed on NIAH	98m	None (Neutral)	N/A	N/A
AH123	Railway station	Listed on NIAH	180m	None (Neutral)	N/A	N/A
AH124	Building misc	Listed on NIAH	113m	None (Neutral)	N/A	N/A
AH125	Water pump	Listed on NIAH	87m	None (Neutral)	N/A	N/A
AH126	Bridge	Listed on NIAH	82m	None (Neutral)	N/A	N/A
AH142	Louth hall demesne	Listed on NIAH Garden Survey	0m	Potential Direct Negative	Medium	Slight
AH145	Historic demesne associated with Knock Abbey	Associated with a Protected Structure	0m	Direct Negative	Medium	Slight

Table 9.17: Architectural Heritage Assets Potentially Impacted by Route Corridor Option E (Orange + Link1 + Green)

AY Asset Ref.	Type / Name	Statutory Protection	Approx. Distance	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
Cultural Heritage Assets						
CH-50	Railway line (GNR Ireland Carrickmacross branch line)	N/A	0m	Direct Negative	Low	Imperceptible
CH-66	Vernacular building (in use)	N/A	21m	Direct Negative	High	Moderate
CH-70	Vernacular buildings (2) (1 extant)	N/A	15m	Direct Negative	Medium	Slight
CH-71	Vernacular buildings (2) (extant)	N/A	14m	Direct Negative	Medium	Slight

Table 9.18: Architectural Heritage Assets Potentially Impacted by Route Corridor Option F (Orange + Link2 + Green)

AY Asset Ref.	Type	Statutory Protection	Approx. Distance	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AH043	Thatched cottage/ farmhouse: Tully thatched cottage	Protected Structure	81m	Potential Indirect Negative	Medium	Moderate
AH060	Farm house	Protected Structure	202m	Indirect Negative	Low	Slight
AH070	Farm house Annevale House	Listed on NIAH	109m	Potential Indirect Negative	Low	Slight
AH071	Farmyard complex: Annevale House	Listed on NIAH	148m	None (Neutral)	N/A	N/A
AH094	House & Gardens Kiltybegs	Listed on NIAH Garden Survey	13m	Direct Negative	High	Moderate

Table 9.18: Architectural Heritage Assets Potentially Impacted by Route Corridor Option F (Orange + Link2 + Green)

AY Asset Ref.	Type	Statutory Protection	Approx. Distance	Type & Quality of Impact	Magnitude of Impact	Significance of Impact
AH109	Store/warehouse	Listed on NIAH	97m	None (Neutral)	N/A	N/A
AH142	Louth Hall Demesne, Louth Hall	Listed on NIAH Garden Survey	0m	Potential Direct Negative	Medium	Slight
AH145	Historic demesne associated with Knock Abbey	Associated with a Protected Structure	0m	Direct Negative	Medium	Slight
Cultural Heritage Sites						
CH-02	Bridge (marked Rosslough Bridge on 25-inch OS)	N/A	0m	Direct Negative	High	Moderate
CH-49	Railway line (GNR Carrickmacross branch line)	N/A	0m	Direct Negative	Low	Imperceptible
CH-63	Vernacular building (extant) ruin - house and shed	N/A	19m	Direct Negative	Low	Imperceptible
CH-66	Vernacular building (in use)	N/A	21m	Direct Negative	High	Moderate
CH-73	Vernacular buildings (2) (ruin)	N/A	8m	Direct Negative	Medium	Slight
CH-151	Railway line (GNR Carrickmacross branch line)	N/A	25m	Indirect Negative	Low	Imperceptible
CH-160	Lane (possibly associated with Ecclesiastic Enclosure MO032-004003-)	N/A	25m	Indirect Negative	High	Moderate

Table 9.19: Summary of Significance of Impacts on Architectural and Cultural Heritage Sites for Each Route Corridor Option

Route Corridor Option	Number of Impacts					
	N/A	Unknown / Imperceptible	Slight	Moderate	Potentially Significant	Significant
Option A (Yellow)	9	5	11	10	2	-
Option B (Yellow + Blue)	6	8	7	6	2	1
Option C (Green)	10	2	9	1	2	-
Option D (Orange)	1	2	7	5	-	-
Option E (Orange+Link1+Green)	9	2	8	2	-	-
Option F (Orange+Link2+Green)	2	3	5	5	-	-

9.4.3 Comparison of Options

Option A (Yellow)

No direct impacts on any Recorded Monuments are predicted for Option A (Yellow). An indirect Potentially Significant negative impact on archaeology associated with two (2) Recorded Monuments is predicted at ringfort-raths AY111 and AY121. Depending on route design options, a third potentially Significant negative impact could occur at the site of a font AY492 though this could easily be mitigated for through avoidance. Burial ground AY327, enclosure AY460 and burial mound AY461 were previously excavated within the footprint of the extant N2 but their extents may go beyond its current limit and widening of the route could incur an impact which is as yet unknown; the archaeological potential of these sites is considered high.

An indirect Slight negative impact may be incurred on castle AY386 and on ringfort-rath AY515 overlooking the Lagan river at Aclint and ringfort AY419 in Reaghstown. Depending on route design, a potential indirect Slight impact could also occur on a road/hollow-way AY516 at Monaltyduff / Shanmullagh townlands. Within the 400m Option A (Yellow) corridor, analysis of available aerial imagery has highlighted the potential for previously unrecorded archaeological sites to exist. Hilltop ringfort-rath AY061 occupies a prominent position, but as the N2 is extant the impact on setting and views both to and from the monument is negated.

There is no predicted impact on a further 38 sites and monuments within the Option A (Yellow) corridor, a number of which were excavated within the footprint of the existing N2 as part of previous upgrading works. These excavated sites are not to be included in the next revision of the RMP, and this proposed route will have no impact because they have already been removed and/or they are at a distance from the route centreline. These sites include two (2) ringfort-raths - AY126 and AY322; three (3) Neolithic houses AY316, AY317 and AY318; five (5) fulachtaí fia AY319, AY326, AY494, AY498 and AY499; a corn drying kiln AY321; three (3) miscellaneous excavations – AY323, AY324 and AY325; a burnt mound AY328 and two (2) burnt spreads AY495 and AY496. An additional site AY500 which yielded cremated remains during archaeological works on the above mentioned scheme is likely shown in the incorrect position on GIS databases (outside the footprint of existing N2), there is likely to be no impact associated with this site also.

Option A (Yellow) could incur a Potentially Significant direct Negative impact (depending on development design solutions) on Protected Structures AH061 (Cookstown House) and/or AH062 (Charlestown Rectory) and a Slight Negative impact on AH083 – the historic demesne associated with Cookstown House (undesigned). Depending on development design, a potential Slight direct negative impact could occur at grave monument AH001 and indirect negative impact at AH002 Broomfield Presbyterian church (An Eaglais). There is no predicted impact from Option A (Yellow) as proposed on AH003 – Mount Carmel Glebe, the rectory associated with AH002 above. There is no predicted impact at AH004 – St Patrick's Catholic Church and AH005, worker's cottage in Taplagh; however, an indirect Slight Negative impact is predicted on the adjacent graveyard AH006 and on AH108 the church/chapel of the Holy Trinity, depending on route design. At Monalty House AH027 (Protected Structure) and its outbuildings AH032 an indirect Slight Negative impact on the setting and views could occur. Similarly, a potential indirect Slight Negative impact is predicted at AH070 – Annevale House, with no predicted impact on its farmyard complex AH071. There is no predicted impact on AH092 Harristown House, listed on the NIAH Garden Survey. A Slight Negative impact is predicted at the historic demesne associated with Arhurstown house AH072.

Regarding other undesigned cultural heritage assets, Option A (Yellow) could have a Moderate Negative direct impact on a former school-house (extant) CH-52 and three occupied vernacular buildings –CH-61, CH-65 and CH-72. It could also have a Moderate impact on further extant buildings marked on the 1st edition OS Map, including houses and sheds (in use) CH-56, CH-62, and vernacular buildings CH-60, CH-64, CH-66, CH-75. A Slight negative impact is predicted at CH-36, a lane associated with Esmore Hall. Option A (Yellow) could have an indirect Slight or Imperceptible Negative impact on the setting of extant buildings CH-57, CH-67, CH-76, a possible bridge CH-01, a possible culvert CH-03 and a school-house CH-53.

In conclusion, and with reference to Table 9-19 below, it has been assessed that the Significance of Effect (as per TII PAG Unit 7.0) of Option A (Yellow) on Cultural Heritage is 'Minor Negative'.

Option B (Yellow+Blue)

Option B (Yellow+Blue) could have a Significant Negative direct impact on one (1) Recorded Monument: ringfort-rath AY061. Option B (Yellow+Blue) could have a Potentially Significant direct impact on the site of ringfort-raths AY111 and AY121. Depending on development design options, Option B (Yellow+Blue) could also have a potential direct impact on a font AY492 in Charlestown though this could easily be mitigated through avoidance.

Depending on route design, a potential indirect Slight impact is predicted on a road/hollow-way AY516; this monument was previously tested and excavated at Monaltyduff/Shanmullagh (Farney By) and appears to be truncated where the proposed Option B (Yellow+Blue) crosses the site. An indirect impact of Slight significance could occur at ringfort AY062. A Slight Negative impact may occur at ringforts AY515 at Aclint, AY419 in Reaghstown and on the views and setting of the adjacent castle motte-and-bailey AY386. Burial ground AY327, enclosure AY460, and burial mound AY461 were previously excavated within the footprint of the extant N2 but their extents may go beyond its current limit and widening of the route could incur an impact which is as yet unknown; the archaeological potential of these sites is considered high. Aerial imagery has highlighted the potential for previously unrecorded archaeological sites to exist within the Route Corridor Option. There are an additional 38 archaeological sites that fall within the 400m Route Corridor Option which will not be impacted by Option B (Yellow+Blue).

A potential Significant Negative direct impact may occur (depending on development design solutions) on outbuildings associated with one or both Protected Structures AH061 Cookstown House and AH062 Charlestown Rectory, and a Significant impact is predicted at AH004 St Patrick's Catholic Church in Taplagh where the setting and views could be compromised. A Slight Negative indirect impact is predicted at the associated graveyard AH006. This will be assessed in more detail in the Landscape and Visual Chapter and during further fieldwork. There is no predicted impact at AH005, a worker's house / cottage. A Slight Negative direct impact could occur on AH083 (the undesigned historic demesne of Cookstown House), an indirect negative impact at Monalty House AH027 (Protected Structure) and its outbuildings AH032, and a potential indirect negative impact at AH070 – Annevale House. However, the farmyard complex AH071 at Annevale House would not be impacted. There is no predicted impact on Harristown House (AH092), listed on the NIAH Garden Survey and at Rahanna where the N2 already exists.

Regarding other undesignated cultural heritage assets impacted by Option B (Yellow+Blue), the following impacts are predicted: a Moderate Negative direct impact on a former school-house (extant) CH-52, and four vernacular buildings – CH-56, CH-61, CH-65 and CH-66. A Moderate negative impact is also predicted on a residence and former post-office CH-06 and a Slight negative impact on a lane/avenue associated with Esmore Hall CH-36 and an occupied vernacular dwelling CH-05. An Imperceptible impact is predicted at vernacular buildings CH-34, CH-57, CH-67 (marked as a smithy on 25-inch OS Map), CH-80, CH-83, CH-87, CH-88, CH-89.

In conclusion, and with reference to Table 9-19 below, it has been assessed that the Significance Effect (as per TII PAG Unit 7.0) of Option B (Yellow+Blue) on Cultural Heritage is 'Moderate Negative'.

Option C (Green)

Option C (Green) could have a Significant Negative impact on five (5) Recorded Monuments: ringforts AY009, AY027, AY181, AY231 and enclosure AY379. Aerial photography has highlighted potential new archaeological sites (for example AP-3, AP-4 and AP-7) which lie within the 400m Route Corridor Option where the predicted impact is unknown, and AP-5 and AP-8 which are considered to be Potentially Significant direct impacts. The realignment or redesign of Option C (Green) to facilitate avoidance of impact on AH061 (Protected Structure) could result in a potentially Significant Negative impact on a font AY492 within the grounds of Charlestown Rectory, but which could easily be mitigated through avoidance by moving to an alternative location. Option C (Green) could have a potential Slight indirect impact on ford AY311/AY388, and indirect Slight Negative impacts on ringforts AY180 AY258, AY315 and on the setting of hilltop ringforts AY015, AY059 and AY456. A total of sixteen (16) further archaeological sites lying within the 400m Route Corridor Option will not be impacted by Option C (Green).

Option C (Green) could incur a potentially Significant Negative direct impact (depending on development design solutions) on Protected Structures AH061 (Cookstown House) and AH062 (Charlestown Rectory). Option C (Green) could have a direct Slight Negative impact on the curtilage of AH039 Kilanney Glebe Rectory (a Protected Structure) and the historic demesne of AH083 at Cookstown. Indirect Slight Negative impacts on the setting of three (3) more Protected Structures (AH029, AH030 and AH067) may occur. An indirect Slight Negative impact is predicted where severance between AH067 and AH072 at Arthurstown House and where the route would cross the historic demesne associated with it. A Slight Negative impact may occur at AH070 Annevale House, but there is no predicted impact at its associated farmyard complex AH071. Option C (Green) crosses the demesne associated with AH104 - Rahans (Potential site) where the predicted impact is Imperceptible. Option C (Green) has no predicted impact on school AH091 and AH092 Harristown House.

Regarding other potential cultural heritage assets marked on the 1st Edition OS Map, the following impacts for Option C (Green) are predicted: a Moderate Negative impact on vernacular building in use CH-66, and a Slight Negative impact on extant vernacular buildings CH-70 and CH-71. An Imperceptible impact is predicted at the site of the former GNR Ireland Carrickmacross Branch line (CH-50).

Option C (Green) has the potential to impact on a possible 'site of' a thorn bush (CH-51) which is indicated on the 1st Edition OS map – some history or folklore may be associated with this feature but is as yet not identified. As this thorn bush may no longer be extant, it is unknown what the potential impact on this feature may be.

In conclusion, and with reference to Table 9-19 below, it has been assessed that the Significance Effect (as per TII PAG Unit 7.0) of Option C (Green) on Cultural Heritage is 'Major Negative'.

Option D (Orange)

Option D (Orange) mainly traverses open fields and farmland, and crosses the area designated 'Kavanagh Country' although no cultural heritage assets associated with the Kavanagh Trail would be impacted. The assessment found that Option D (Orange) could have a Significant Negative impact on five (5) Recorded Monuments: ringforts AY099, AY140, AY393, and souterrain AY459. At burial ground AY391, potential archaeological sites (AP-09 and AP-10) were identified and as the 25m Route Corridor crosses the Zone of Archaeological Potential (ZAP) the impact is considered Significant.

A Potential Significant indirect impact could occur at three (3) more Recorded Monuments: enclosures AY408, AY413, AY509 where the route passes through or immediately adjacent to the ZAP for these sites. Impacts on further potential sites (AP-10, AP-11, AP-12, AP-14, and AP-16) are considered to be Potentially Significant as they fall within 25m of the Route Corridor. The impact of the route is unknown on AP-9 – a possible ditch in an area where human remains were reputedly discovered, AP-13 identified adjacent to crannog AY139, and a possible enclosure AP-17 at Donaghmoynne.

While technically a Direct Negative impact could be incurred by Option D (Orange), a Slight negative impact has been assessed for barrow AY493 based on the archaeological potential and from analysis of aerial images which have indicated possible ring-ditches adjacent. There is a potential indirect Slight negative impact on AY503, an enclosure in Louth Hall where the ZAP for this site falls within the route corridor, and on enclosure AY505. A Slight negative indirect impact could occur at a low-lying ringforts AY186 and AY371, and on the setting and views on hilltop ringfort AY019 in Gorteens. Option D (Orange) has a possible Slight indirect negative impact on a standing stone AY457, the setting of a burial ground AY334, a bullaun stone AY335 and ecclesiastical enclosure AY336 and the route crosses a watercourse which forms the townland boundary between Drumgristin Upper and Rosslough. The potential for previously unrecorded archaeology to survive in its vicinity (such as CH-160 where a Moderate negative impact is predicted) and in the vicinity of the above sites is considered high. Option D (Orange) causes severance between two prominent ringforts on the 140m contour within the Study Area – AY038 in Knockreagh and at AY040 in Keeneraboy; further fieldwork would assist in final assessment. An indirect impact of unknown significance could occur on two large enclosures AY518 and AY519, both of which are newly added sites to the SMR in June 2020. A total of fourteen (14) further sites and monuments which lie within the 400m route corridor will not be impacted by Option D (Orange).

Option D (Orange) could have a potentially Moderate negative impact on one (1) Protected Structure (thatched farmhouse AH043). A Slight negative impact is predicted at AH060 Mullacloe House, and a potential indirect negative impact on AH070 Annevale House but no impact predicted at the farmyard complex at Annevale House (AH071). A Slight negative impact is also predicted at the historic demesne of Knock Abbey (AH145). A Moderate negative impact is predicted at Kiltybegs (AH094) and a Slight Negative Impact at AH142 (Louth Hall). Regarding other potential cultural heritage assets which are indicated on the 1st Edition OS Map, the following impacts are predicted: a Moderate Negative impact on a bridge CH-02 and vernacular building CH-66, a Slight impact on extant vernacular buildings CH-58, CH-137, CH-73. An Imperceptible Negative impact is predicted at the site of former GNR (Ireland) Carrickmacross Branch line CH-151 and on vernacular building CH-63.

In conclusion, and with reference to Table 9-19 below, it has been assessed that the Significance of Effect (as per TII PAG Unit 7.0) of Option D (Orange) on Cultural Heritage is 'Major Negative'.

Option E (Orange + Link1 + Green)

Option E (Orange + Link1 + Green) could have a Significant Negative impact on five (5) Recorded Monuments: four ringforts (AY009, AY027, AY181, AY231) and a souterrain (AY459) which would be removed within the 25m route corridor. There is high potential for previously unrecorded sub-surface archaeological features in the immediate vicinity of these sites. A Potential Significant Negative impact could occur at enclosures AY408, AY413, AY509. Aerial images have highlighted the potential for previously unrecorded sites at AP-4 (adjacent to AY379 within the 400m route corridor and where a moderate impact is predicted), AP-5, AP-7, AP-8 and AP-11 (in the immediate vicinity of barrow AY493), of which AP-5, AP-8 and AP-11 are possible direct impacts of potential significance. A Moderate Negative impact could occur at enclosure AY379. In the case of AY493, the potential significance of effect has been rated as Slight. There could be an indirect Slight negative impact on enclosure AY505, standing stone AY457, ford AY311/AY388 (where setting and views may also be impacted), ringforts AY015, AY059, AY180, AY258 and AY315 where the setting and views from a hill-side or hilltop ringforts would be affected by the construction of a road in their vicinity. There is a potential indirect Slight negative impact on AY503, an enclosure in Louth Hall where the ZAP for this site falls within the route corridor. An indirect impact of unknown significance could occur on two large enclosures AY518 and AY519, both of which are newly added to the SMR in June 2020. A total of sixteen (16) additional archaeological sites and monuments which fall within the 400m route corridor would not be impacted by Option E (Orange + Link1 + Green).

A Moderate negative impact could be incurred by Option E (Orange +Link1 + Green) on the curtilage of AH039 – Kilanney Glebe Rectory Route, and a Slight Negative impact on the setting of two (2) Protected Structures: McArdles Public House (AH029) and The Forge (AH030). While a Slight Negative impact could occur at AH070 – Annevale House, no impact is predicted at its farmyard complex AH071. An indirect Slight negative impact could occur at AH060, Mullacloe House. Option E (Orange +Link1 + Green) crosses the demesne AH104 Rahans (Potential site) but nothing survives extant of the original building and the predicted impact is Imperceptible. At Louth Hall (AH142) a Slight Negative impact is predicted where Option E (Orange +Link1 + Green) crosses the historic demesne and gardens listed on the NIAH Garden Survey, and on assets associated with the hall (such as avenue, pond, tree-ring and landscaped boundaries). A Slight negative impact could occur at the historic demesne of Knock Abbey (AH145).

Regarding undesignated cultural heritage assets which are depicted on the 1st Edition OS Map, the following impacts are predicted: a Moderate Negative impact at a vernacular building in use CH-66; a Slight Negative impact on extant vernacular buildings CH-70, CH-71, and an Imperceptible impact on the site of the former GNR Ireland Carrickmacross Branch Line CH-50.

In conclusion, and with reference to Table 9-19 below, it has been assessed that the Significance of Effect (as per TII PAG Unit 7.0) of Option E (Orange+Link1+Green) on Cultural Heritage is 'Major Negative'.

Option F (Orange + Link2 + Green)

Option F (Orange + Link 2 + Green) traverses a monument-rich landscape with views and setting being a significant factor in the assessment of each asset. As well as having Significant Negative impacts on nine (9) Recorded Monuments (six (6) ringfort-raths AY009, AY027, AY099, AY140, AY393, souterrain AY459, two (2) enclosures AY098 and AY413 and a burial ground AY391), Option F (Orange +Link2 + Green) could potentially encounter significant subsurface archaeological remains associated with these sites.

Potentially Significant impacts may be incurred at enclosures AY408 and AY509. The potential for archaeological features associated with an unclassified barrow AY493 to occur is considered high and a Slight negative impact is predicted. An indirect Slight negative impact is predicted on Ecclesiastical Enclosure AY336, burial ground AY334 and bullaun stone AY335 where setting and views are concerned, but where the potential to encounter previously unidentified archaeology in this vicinity is also considered high (for example at CH-160 – lane where a Moderate Negative impact is predicted). A possible indirect Slight negative impact may occur at enclosure AY505, standing stone AY457, enclosure AY503 and a Slight Negative impact could occur at ringforts AY015 AY059, AY186, AY371. An indirect impact of unknown significance could occur on two large enclosures AY518 and AY519, both of which are newly added to the SMR in June 2020.

Potential new archaeological sites identified within the 25m route corridor where direct impacts of Potential Significance could occur include at AP-10, AP-11, and AP-16. Possible new archaeological sites within the Option F (Orange +Link2 + Green) 400m corridor have also been identified at AP-9, AP-13, AP-14, and AP-17; the potential impact on AP-9, AP-13 and AP-17 is unknown. A cropmark AP-15 possibly represents the southern side of ringfort MO028-089, and where mitigation by avoidance may be possible with the road footprint being sited to the eastern side of the 50m corridor. Option F (Orange + Link2 + Green) will have no impact on eleven (11) further archaeological sites and monuments which lie within the 400m route corridor.

Option F (Orange + Link 2 + Green) could have a potentially Moderate negative impact on Kiltybegs House and Gardens (AH094), a Slight negative impact at the historic demesne of Knock Abbey (AH145), and a Slight Negative impact on the historic demesne at Louth Hall (AH142) the assessment of which would be refined with further fieldwork. Option F (Orange +Link2 + Green) could have a Moderate Negative impact on a thatched cottage (Tully Thatched Cottage) AH043, and on vernacular buildings CH-66 and on bridge CH-02. A Slight negative impact is predicted at Mullacloe House (AH060), a potential Indirect Negative impact on Annevale House (AH070) and on vernacular buildings CH-73. An Imperceptible impact is predicted on vernacular buildings CH-63 and on the former GNR (Ireland) Carrickmacross Branch line elements CH-49, CH-151. As proposed, the route would pass in the vicinity of one other cultural heritage asset (AH109), where there is no predicted impact. Option F (Orange +Link2 + Green) would cross through 'Kavanagh Country' but no cultural heritage assets associated with the Kavanagh Trail would be impacted.

In conclusion, and with reference to Table 9.20 below, it has been assessed that the Significance of Effect (as per TII PAG Unit 7.0) of Option F (Orange+Link2+Green) on Cultural Heritage is 'Major Negative'.

9.4.4 Do-Nothing Option

The Do-Nothing option would have no direct impacts on the identified heritage assets. However, indirect impacts such as those resulting from high traffic volumes (e.g. noise and visual intrusion of traffic into the setting) will continue for those assets located in close proximity to the existing N2.

9.4.5 Common Impacts

All Route Corridor Options would impact townland and county boundaries and require the removal of roadside features including enclosing elements of fields such as drystone walls and gates. Such impacts will be avoided where possible and mitigated where necessary.

Assessment of visual intrusion and obstruction on individual assets will be carried out in more detail during the next Phases of the design process following the selection of a Preferred Route Corridor. This will include assessing the potential impact on views to and from archaeological sites, architectural heritage assets and demesne features along the preferred route.

A comparison of the Route Corridor Options and their potential impacts on archaeology, architectural heritage and cultural heritage is provided in Table 9.20 below.

Table 9.20: Route Corridor Options Appraisal Table (Archaeological and Architectural Heritage)

Impact Significance Level	Option A (Yellow)	Option B (Yellow + Blue)	Option C (Green)	Option D (Orange)	Option E (Orange + Link 1 + Green)	Option F (Orange + Link 2 + Green)
Profound	None	None	None	None	None	None
Significant Negative	None	Ringfort AY061 St Patrick’s Church AH004	Ringforts AY009, AY027, AY181, AY231 Enclosure AY379	Ringforts AY099, AY140/AP-15, AY393, Burial ground AY391 Souterrain AY459	Ringforts AY009, AY027, AY181, AY231 Souterrain AY459	Ringforts AY009, AY027, AY099, AY140, AY393 Souterrain AY459 Enclosures AY098, AY413 Burial ground AY391
Potentially Significant Negative	Ringforts AY111, AY121 Font AY492 Cookstown House AH061 Charlestown Rectory AH062	Ringforts AY111, AY121 Font AY492 Cookstown House AH061 Charlestown Rectory AH062	Font AY492 Cookstown House AH061 Charlestown Rectory AH062 Possible Sites AP-5, AP-8	Enclosures AY408, AY413, AY509 Possible sites AP-10, AP-11, AP-12, AP-14, AP-16	Enclosures AY408, AY413, AY509 Possible sites AP-5, AP-8, AP-11	Enclosures AY408, AY509 Possible sites AP-10, AP-11, AP-16.

Impact Significance Level	Option A (Yellow)	Option B (Yellow + Blue)	Option C (Green)	Option D (Orange)	Option E (Orange + Link 1 + Green)	Option F (Orange + Link 2 + Green)
Moderate Negative	Former school-house (extant) CH-52 Vernacular buildings CH-56, CH-60, CH-61, CH-62, CH-64, CH-65, CH-66, CH-72, CH-75.	Vernacular building (former post-office) CH-06 Former school-house (extant) CH-52 Vernacular buildings CH-56, CH-61, CH-65, CH-66.	Vernacular buildings CH-66	Thatched Cottage AH043 Kiltybeg House / Gardens AH094 Bridge CH-02 Vernacular building CH-66 Lane CH-160 (possibly associated with ecclesiastic enclosure MO032-004003-)	Enclosure AY379 Kilannee Glebe AH039 Vernacular building CH-66	Thatched cottage AH043 Kiltybeg House / Gardens AH094 Bridge CH-02 Vernacular building CH-66 Lane CH-160 (possibly associated with ecclesiastic enclosure MO032-004003-)

Impact Significance Level	Option A (Yellow)	Option B (Yellow + Blue)	Option C (Green)	Option D (Orange)	Option E (Orange + Link 1 + Green)	Option F (Orange + Link 2 + Green)
Slight Negative	Castle – motte and bailey AY386 Ringforts AY515, AY419 Road - hollow-way AY516 Grave Monument AH001 Church AH002 Graveyard AH006 Monalty House AH027 Monalty House outbuildings AH032 Annevale House AH070 Historic Demesne Cookstown House (undesigned) AH083 AH108 the church/chapel of the Holy Trinity CH-36, a lane/avenue associated with Esmore Hall Vernacular buildings CH-76	Castle- motte and bailey AY386 Ringforts AY515, AY419, AY062 Road hollow-way AY516 Graveyard AH006 Monalty House AH027 and outbuildings AH032 Annevale House AH070 Historic Demesne Cookstown House (undesigned) AH083 Vernacular building CH-05 Lane/avenue associated with Esmore Hall CH-36	Ford AY311/AY388 Ringforts AY015, AY059, AY180, AY258, AY315 AY456Public House AH029 Forge / smithy AH030 Kilanney Glebe AH039 Former Presbytery AH067 Annevale House AH070 Farmyard complex historic demesne / Arthurstown House AH072 Historic Demesne / Gardens Cookstown House AH083 Vernacular buildings Ch-70, CH-71	Ringforts AY019, AY186, AY371, Ecclesiastical enclosure AY336, burial ground AY334 and bullaun AY335 Barrow AY493 Enclosures AY503, AY505 Standing stone AY457 Annevale House AH070 Mullacloe House AH060 Historic Demesne Knock Abbey (AH145) Vernacular buildings CH-58, CH-73, CH-137. Louth Hall AH142	Ringforts AY015, AY059, AY180, AY258, AY315 Enclosures AY503, AY505 Barrow AY493 Ford AY311/AY388 Standing stone AY457 Public House AH029 Forge / smithy AH030 Mullacloe House AH060 Annevale House AH070 Vernacular buildings CH-70, CH-71 Historic demesne, Louth Hall AH142 Historic Demesne Knock Abbey (AH145)	Ringforts AY015, AY059, AY186, AY371 Around ecclesiastical enclosure AY336, burial ground AY334 and bullaun AY335 Enclosures AY503, AY505 Barrow AY493 Standing stone AY457 Annevale house AH070 Mulacloe House AH060 Vernacular building CH-73 Historic demesne, Louth Hall AH142 Historic Demesne Knock Abbey (AH145)

Impact Significance Level	Option A (Yellow)	Option B (Yellow + Blue)	Option C (Green)	Option D (Orange)	Option E (Orange + Link 1 + Green)	Option F (Orange + Link 2 + Green)
Imperceptible	Avenue AH072 Bridge CH-01 Culvert CH-03 Vernacular buildings CH-57, CH-67 Former school-house CH-53	Vernacular buildings CH-34, CH-57, CH-67, CH-80, CH-83, CH-87, CH-88, CH-89.	Historic Demesne Rahans AH104 Former GNR (Ireland) Carrickmacross Branch line CH-50	GNR (Ireland) Carrickmacross Branch line CH-151. Vernacular building CH-63	Historic demesne Rahans AH104 Site of former GNR (Ireland) Carrickmacross Branch line CH-50.	Former GNR (Ireland) Carrickmacross Branch line elements CH-49, CH-151 Vernacular building CH-63
Unknown/Archaeological Potential	Burial ground AY327 Enclosure AY460 Burial mound AY461	Burial Ground AY327 Enclosure AY460, Burial mound AY461	Possible sites AP-3, AP-4, AP-7 Thorn bush CH-51	Large Enclosures AY518 and AY519 Possible sites AP-9, AP-13, AP-17	Large Enclosures AY518 and AY519 Possible sites AP-4, AP-7	Large Enclosures AY518 and AY519 Possible sites AP-9, AP-13, AP-14, AP-15, AP-17
Impact Significance Levels	Minor or Slightly Negative	Moderately Negative	Major or Highly Negative	Major or Highly Negative	Major or Highly Negative	Major or Highly Negative

9.5 Conclusions

During the identification of the Route Corridor Options, every effort was made to avoid known archaeological and architectural heritage sites wherever possible. However, all Route Corridor Options are likely to have an adverse effect on Cultural Heritage, including known and currently unidentified archaeological remains and architectural heritage assets. In addition, all options have the potential to encounter currently unrecorded archaeological sites and other cultural heritage features. The actual likely impact of the selected preferred option will be assessed in more detail during the subsequent EIA stage (Phase 3 – Design and Environmental Evaluation).

From the analysis of likely impacts on archaeology, architectural heritage and other cultural heritage, and an assessment of the likely significance of impact for these, Option A (Yellow) has the lowest level of effect (Minor) on Cultural Heritage followed by Option B (Yellow+Blue) (Moderate). Option C (Green), Option D (Orange), Option E (Orange+ Link1 + Green) and Option F (Orange + Link2 + Green) have the greatest level of effect with Major Effect.

Options A (Yellow) and B (Yellow+Blue), compared to the other four are mostly on-line on the existing N2, which reduces the overall risk of encountering previously unrecorded archaeology, although, as stated above, all options have the potential to encounter previously unrecorded archaeological sites. Previous archaeological excavations on the N2 have illustrated the potential for this to occur, with significant archaeological sites (particularly in the townlands of Monanny and Cloghally Upper) being identified and recorded. as part of the Carrickmacross Bypass project. Widening of the existing N2 could impact on un-excavated portions of sites preserved *in-situ* following these excavations and could impact one or two Protected Structures (Cookstown House AH061 and/or Charlestown Rectory AH062) towards their southern limits.

Option C (Green) has the potential to impact on a possible ‘site of’ a thornbush (CH-51) which is indicated on the 1st Edition OS map – some history or folklore may be associated (but is as yet not identified) in relation to this feature. There are no predicted impacts on any of the sites associated with the ‘Kavanagh Trail’ which lie within the Study Area; however, further fieldwork at the next Phase of the project may provide a more refined assessment of these.

Table 9.21: Summary of Significance of Effect and Performance Score of Each Route Corridor Option – Cultural Heritage

Option	PAG Unit 7.0 Significance of Effect	PAG Unit 7.0 Performance Score
Option A (Yellow)	Minor or Slightly Negative	3
Option B (Yellow+Blue)	Moderately Negative	2
Option C (Green)	Major or Highly Negative	1
Option D (Orange)	Major or Highly Negative	1
Option E (Orange + Link 1 + Green)	Major or Highly Negative	1
Option F (Orange + Link 2 + Green)	Major or Highly Negative	1

9.6 References

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10. Material Assets (Non-Agricultural Properties)

10.1 Introduction

TII Project Appraisal Guidelines for National Roads Unit 7.0 – Multi Criteria Analysis (2016) requires the assessment of Non-Agricultural Properties. This assessment has been completed by Jacobs. For consistency throughout Stage 1 and 2 of this process and onwards to Phase 3, Environmental Impact Assessment, this chapter is referred to as Material Assets (Non-Agricultural). Material Assets can be defined as resources that are valued and that are intrinsic to specific places. They may be of either human or natural origin and the value may arise for either economic or cultural reasons. (EPA, 2003)

The TII Guidelines noted above specifically define Non-Agricultural Properties as “affected properties and types of land classed as commercial, recreational, open space, minerals and public facilities (hospitals, schools, and religious institutions) which are not of an agricultural nature are considered under the heading of Non-Agricultural Properties. This definition is similar to the definition of Community Assets DMRB Sustainability and Environmental Appraisal guidelines for Population and Human Health which includes “village halls, healthcare facilities, education facilities, religious facilities, village greens, open green space, allotments, sports pitches etc”. Therefore, in the absence of specific TII guidance for the assessment of Non-Agricultural Properties or Material assets, this assessment will be conducted in line with these DMRB guidelines.

10.2 Methodology

The receptors types included in the assessment comprise the following:

- Community properties – hospitals, schools, religious institutions, public parks, open spaces or lands that are used for recreation amenity;
- Commercial properties; and
- Development land – lands or sites zoned for development within the County Development Plan. Lands zoned for development within the County Development Plan are shown on Figure 10.7.

10.2.1 Limitations of the Assessment

Commercial properties will be considered in terms of a “community asset” in line with the DMRB guidelines. This assessment does not consider the impact on a business in terms of impact on trading, although it is noted that positive or negative impacts on businesses could occur as a result of changes to passing trade, the information relating how this might affect different businesses is not available at this stage of the assessment. It therefore assesses the impact of commercial properties as an amenity to the wider community, focussing is on impacts which are directly measurable, including potential impacts in relation to loss of land, impacts to existing access, and changes in traffic, noise and disruption compared to the existing baseline.

All businesses are considered to be key assets to the local community as they are an important source of employment and services, however, at this phase of the assessment, all local businesses in the study area are not individually mapped. The location of properties and businesses have been taken into account as far as possible in the routing of the route corridor options. These include but are not limited to Annalitten Foods Limited; IGWT Poultry Services Ltd – McCaughey Irish Turkeys; Kingspan Group; Martin Pallets; Wright Concrete Products; and McConnon’s Vehicle Recovery. Any direct impacts to businesses will be avoided as far as possible, ensuring access to these key employment sources are not impeded. Any direct impacts to commercial properties will be fully assessed at Phase 3 as part of the Environmental Impact Assessment.

Material Assets assessments often includes an assessment of impacts on key infrastructure such as transport, waste management and utilities such as energy and water. However, transport infrastructure in relation to the road network has been assessed as part of the engineering assessment (See Volume 1 of this Option Selection Report) and infrastructure relevant to active travel has been assessed as part of the Physical Activity Appraisal (See Volume 1 Section 9.9).

Waste has been assessed within Section 6 of this report. Utilities have been assessed as part of the Stage 1 Assessment and the locations of key utilities are shown in Figures 10.3 – 10.6, Volume 2 of this Option Selection Report.

Residential properties are not included in this section. They have already been considered as part of the Visual, Air Quality and Noise sections. Residential properties are important non-agricultural properties but similarly to infrastructure, inclusion in this section would result in double counting in the assessment. Additionally, it is not possible at this Phase of the project to reasonably assess the potential acquisitions of properties. The acquisition of properties is dependent on a number of factors including the detail of the proposed scheme within the corridor, which will be designed at the next Phase of the project.

10.2.2 Data, Information and Sources

The following data sources have been used in this assessment:

- Aerial photography and mapping of Study Area (GSI, OSI and online sources);
- Surveys from publicly accessible lands;
- Monaghan County Development Plan (2019 – 2025)⁸⁹<https://monaghan.ie/planning/new-county-development-plan/>;
- Louth County Development Plan (2015 – 2021)⁹⁰;
- IPCC licensed facilities - EPA Historic landfill sites - Monaghan County Council;
- Schools/colleges - Department of Education and Skills;
- Industrial estates and places of worship - online sources;
- GAA clubs, sports clubs, community centres and scenic routes - county council data;
- Nursing homes - Health Service Executive;
- Hotel spas and golf clubs - Fáilte Ireland; and
- Trails - Sport Ireland.

10.2.3 Assessment Methodology

The methodology for assessing the impact of the proposed Route Corridor Options on Material Assets (Non-Agricultural) comprised of the following:

- A desktop survey and a windscreen survey to identify any 'community assets' of value. Community Assets within the Route Corridor plus an additional 300m equating to a total corridor width of 1km, were identified;
- Using the guidance on Stage 2 Project Appraisal Matrix in Step 4 of the Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis⁹¹ and the DMRB guidelines on Population and Human Health⁹² the assessment was undertaken on each option to include:
 - quantitative (no. of receptors impacted); and
 - qualitative (sensitivity of the receptor and magnitude of the impact) assessment.
- The sensitivity of each asset was determined based on the nature and setting of the property;
- The magnitude of the impact on each asset was considered to determine the overall impact. The windscreen survey allowed a greater understanding of the magnitude of impacts on certain receptor; and
- The significance of the overall impact of each Route Corridor was then determined based on professional judgement of the impacts on each receptor in combination along that route.

⁸⁹ <https://monaghan.ie/planning/new-county-development-plan>

⁹⁰ <https://www.louthcoco.ie/en/publications/development-plans/louth-county-council-development-plans/louth-county-development-plan-2015-2021.html>

⁹¹ TII. 2016. Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis. PE-PAG-02031.

⁹² Highways England, Transport Scotland, Llywodraeth Cymru, Department for Infrastructure, January 2020. Design Manual for Roads and Bridges, Sustainability and Environmental Appraisal, LA 112 Population and Human Health.

Types of Impacts likely to occur

The impacts which are likely to occur as a result of the proposed scheme range from loss of the receptor entirely loss of lands associated with the receptor to more general disruption and disturbance which may impact the quality and integrity of a receptor. Some receptors will be much more sensitive to land loss such as churches which are irreplaceable in terms of their historic setting. Depending on individual receptors and the location and size of the area of land lost, the impact on the receptor in terms of its ability to continue to function its purpose for the community will be important and will vary. For the purposes of this initial assessment, it has been considered unlikely that there would be any positive impacts from any land loss.

The impacts on the integrity and quality of receptors will also vary depending on the receptor type. For example, the integrity and quality of some community receptors such as schools, churches and care homes may be negatively impacted by increased disruption and disturbance as a result of increased noise and/or traffic whereas other community receptors such as sports and recreational facilities will be less vulnerable to such changes. Likewise, a receptor which is sensitive to noise for example a school or church, may be affected in a positive way if the level of traffic passing by was to decrease by directing traffic away from the existing N2 to a re-aligned or proposed new route.

Some commercial properties may be negatively impacted in terms of trade if the level of through traffic is decreased or their access arrangements are affected. Some commercial properties may be less vulnerable to increases in noise with a few exceptions for example businesses which have gardens, such as beer gardens and hotels which have gardens popular for walks with visitors. Similarly, some commercial businesses may also be positively or negatively impacted if they have an increased or decreased level of through traffic as result of the proposed scheme. Direct impacts to commercial properties will be assessed in more detail at Phase 3 as part of the Environmental Impact Assessment.

Community Severance will be assessed in Phase 3 of the project, however it has been considered as part of this Phase 2 Stage 2 assessment. The proposed scheme will involve removal of private accesses to the existing N2 to improve safety and these will be replaced by a number of full and restricted movement junctions. It is anticipated that there could be community severance or inconvenience caused to those who lose direct access from their property to the existing N2. This will be considered in more detail within the Environmental Impact Assessment in terms of what can be done to minimise and where possible avoid severance within the study area. The potential locations of junctions have not been included in this assessment but will be at the next phase of the project.

10.2.4 Assessment Criteria

The comparative evaluation of the Route Corridor Options was assisted by scoring the level of impacts of each Route Corridor using the Stage 2 Project Appraisal Matrix in Step 4 of the Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis. Each option must be assigned a level of significance in terms of its overall effect and is scored based on a seven-point scale ranging from 1 (Major Negative) to 7 (Major Positive).

As discussed in Section 10.2.2, in order to determine the potential significance of effect, sensitivity and magnitude must be determined first.

The sensitivity of each receptor was determined using the criteria detailed in Table 10.1. In combination with the sensitivity of the receptor to change, the magnitude of the impact informs the level or significance of impact on the receptor and as a result of the route. The magnitude of impacts on individual receptors was determined using the criteria detailed in Table 10.2.

Table 10.1: Criteria for determining sensitivity of receptors (informed by DMRB guidelines)

Receptor Sensitivity	Description
High	Receptors which are the following: <ul style="list-style-type: none"> • there is little or no capacity to experience changes without resulting in disruption to its quality and integrity; and • there are no reasonable alternative facilities available or they are only available in the wider local planning authority area; and • the level of use is frequent (daily or several times a week).
Medium	Receptors which are one or more of the following: <ul style="list-style-type: none"> • there is some limited or average capacity to experience changes without resulting in disruption to its quality and integrity; and • some limited reasonable alternative facilities are available at a local level within adjacent communities; and / or • the level of use is reasonably frequent (monthly).
Low	Receptors which are one or more of the following: <ul style="list-style-type: none"> • there is an adequate capacity to experience changes without resulting in disruption to its quality and integrity; or • there are reasonable alternative facilities available within the same community or at a local level within the wider community; or • the level of use is infrequent (monthly or less frequent).

Table 10.2: Criteria for determining magnitude of impacts (informed by DMRB guidelines)

Magnitude of Impact	Criteria
High Negative	Loss of the entire receptor due to permanent closure or to loss of the receptor/site or a significant area of land vital to the functioning of the receptor leaving it unusable for its intended purpose; or Permanent and significant disruption to quality and integrity of receptor preventing it from continuing to provide its function or serve its' purpose for the community.
Medium Negative	Loss of part of receptor or some lands associated with the receptor changing the way in which the receptor to provide its function for the community; and / or Permanent disruption to the quality and integrity of receptor changing the way in which the receptor serves its purpose for the community.
Low Negative	Loss of a small area of land which is unessential to the functioning of the receptor; and / or Minor or temporary disruption to the quality and integrity of receptor however its function for the community continues in the same manner.
Negligible / Slight	Results in an impact on receptor but of insufficient magnitude to affect either use or integrity.
Low Beneficial	Results in minor improvement of receptor quality and integrity such as small decreases in noise, disturbance and traffic or increased business/trade as a result of a small increase in through traffic.
Medium Beneficial	Results in moderate improvement of receptor quality and integrity such as moderate decreases in noise, disturbance and traffic or an increase in business/trade as a result of a moderate increase in through traffic.
High Beneficial	Results in major improvement of receptor quality and integrity such as significant decreases in noise, disturbance and traffic or an increase in business/trade as a result of a significant increase in through traffic.

The criteria for the seven-point scale as shown in Table 10.3 and a number was assigned according to the significance of the effect.

Table 10.3: Key for Scoring Effects

Score	Significance of Effect	Criteria
7	Major or Highly Positive	Multiple High sensitivity receptors within the Route Corridor have Positive impacts and no Negligible or Negative Impacts
6	Moderately Positive	Positive impacts on more than one High or Medium sensitivity receptor and no Negligible or Negative Impacts
5	Minor or Slightly Positive	Positive impacts on at least 1 receptor and no Negligible or Negative Impacts
4	Not Significant or Neutral	No impacts / A small number of Negligible Magnitude Impacts on Medium or Low sensitivity receptors
3	Minor or Slightly Negative	Mostly Low Magnitude Impacts on High – Low sensitivity receptor or Medium Magnitude impacts on no more than one High sensitivity receptors and no more than two Medium sensitivity receptors.
2	Moderately Negative	Medium Magnitude Impacts on more than one High sensitivity receptors within the Route Corridor.
1	Major or Highly Negative	One or Multiple High sensitivity receptors within the Route Corridor have High Magnitude Impacts

10.3 Existing Environment

The constraints in the Study Area have been mapped are presented in Volume 2 (Figures 10.1) of this Option Selection Report.

10.3.1 Key Communities

The Study Area is mainly rural in nature and the largest key communities include Ardee, the third largest town in County Louth, and Carrickmacross and Castleblayney, the second and third largest towns in County Monaghan. There are smaller settlements within the Study Area which include, but are not limited to, Cookstown, Edmondstown, Reaghstown, Essexford, Killanny, Ballymackney, Donaghmoynne, Derryilan, Broomfield, Lisdoonan, Annalitten, and Tullynacross.

10.3.2 Key Receptors

Identified community assets within the Study Area were collated from the desktop and windscreen survey are mapped in Figure 10.1 (Volume 2 of this Option Selection Report). Significant receptors within each Route Corridor or within 300m from the route corridor only are detailed in Table 10.4 below.

Table 10.4: Receptors within 1km buffer of a Route Corridor Centreline and Sensitivity

Community Assets	Receptor Category	Sensitivity to Change Rating	Rationale
Castleross Nursing Home	Health / Care Facility	High	Key community/care facility for vulnerable groups which will have little or no capacity to experience change without resulting in disruption to its quality and integrity of the nursing home. This receptor would be in constant use by residents and subject to frequent daily visits by staff and visitors.
Nuremore Hotel and Country Club	Key Commercial	High	Key business for tourism and employment which will have little or no capacity to experience change without resulting in disruption to its quality and integrity of the hotel which would be used daily by customers and staff.
St Patricks National School, Broomfield	School	High	Key Educational Building with a high level of frequent use (daily by pupils and staff). Pupils may have little capacity to experience change without resulting in disruption to the quality of their education.
St Patricks Church, Broomfield	Place of Worship	High	Key Religious Building with a high level of frequent use (weekly or more). The church would have little capacity to experience change without resulting in disruption to the quality and integrity of its use.
Annalitten National School	School	High	Key Educational Building with a high level of frequent use (daily by pupils and staff). Pupils may have little capacity to experience change without resulting in disruption to the quality of their education.
St Malachy's Church, Reaghstown	Place of Worship	High	Key Religious Building with a high level of frequent use (weekly or more). The church would have little capacity to experience change without resulting in disruption to the quality and integrity of its use.

Community Assets	Receptor Category	Sensitivity to Change Rating	Rationale
Church of Our Lady of the Snows, Stonetown	Place of Worship	High	Key Religious Building with a high level of frequent use (daily/weekly). The church would have little capacity to experience change without resulting in disruption to the quality and integrity of its use.
Killanny Community Centre	Local Recreational / Community	Medium	Local community centre with frequent use (for some it may be daily but for the majority of the community it would be weekly to monthly). Users would have an average capacity to experience the change without resulting in disruption to the quality and integrity of the receptor. There are some limited alternatives in adjacent communities.
Meeting House Café	Local Commercial	Medium	Local business which would have some capacity to experience change without incurring significant impact. This has been assessed as a Medium sensitivity to change rating because of the nature of the building.
Dooley's Restaurant & Bar	Local Commercial	Low	This business by its nature relies on a mix of passing trade and the local community. Access to the business will be maintained regardless of which route corridor option is selected. The sensitivity to change is low because it is a roadside business and its operation would be less sensitive to a new road scheme compared to e.g. the Castleross Nursing Home or a school. This sensitivity to change rating does not reflect on the importance of the business to the community.

Community Assets	Receptor Category	Sensitivity to Change Rating	Rationale
McCaughey's Garage	Local Commercial	Low	This business by its nature relies on a mix of passing trade and the local community. Access to the business will be maintained regardless of which route corridor option is selected. The sensitivity to change is low because it is a roadside business and its operation would be less sensitive to a new road scheme compared to e.g. the Castleross Nursing Home or a school. This sensitivity to change rating does not reflect on the importance of the business to the community.
Aclint 5-a-side pitches	Local Recreational facility	Low	Local recreational/sports facility. Local business/sports facility where users would have an adequate capacity to experience the change without incurring significant impact.
Killanny GAA Club	Local Recreational / Community	Low	Local recreational/sports facility. where users would have an adequate capacity to experience the change without resulting in disruption to the quality and integrity of the receptor.
Annaghminnion GAA Club	Local Recreational / Community	Low	Local recreational/sports facility. where users would have an adequate capacity to experience the change without resulting in disruption to the quality and integrity of the receptor.

10.4 Route Corridor Option Comparison

10.4.1 Assessment of Potential Impacts

As described in Section 10.3.2, the Significance of Effect was determined based on the combination of impacts on receptors along the entire Route Corridor. The size and nature of the proposed scheme, means that there are a number of receptors within each Route Corridor Option which are likely to be impacted:

- Three routes have negligible or no impact on receptors within the Study Area, therefore these routes are all considered to have Neutral effect on Material Assets/Non-Agricultural Properties overall.
- Routes with only low and/or one medium magnitude impacts on receptors of any sensitivity are considered to result in 'Minor Negative effect,
- Routes with more than one medium magnitude impact on high sensitivity receptors are considered to be Moderate Negative effect; and

- There are no routes receiving high magnitude impacts on high sensitivity receptors, therefore no route has received a 'Major Negative' effect.

Table 10.5 illustrates the results of the full impact assessment of all Route Corridor Options in the scheme.

Table 10.5: Assessment of Impacts on receptors within the 1km of the centreline of a Route Corridors Option

Receptors	Magnitude of Impact by Routes					
	Option A (Yellow)	Option B (Yellow + Blue)	Option C (Green)	Option D (Orange)	Option E (Orange + Link 1 + Green)	Option F (Orange + Link 2 + Green)
Community Assets						
High Sensitivity Receptors						
Castleross Nursing Home	Low	Low	N/A	N/A	N/A	N/A
Nuremore Hotel and Country Club	Medium	Medium	N/A	N/A	N/A	N/A
St Patricks National School Broomfield	Low	Medium	N/A	N/A	N/A	N/A
St Patricks Church Broomfield	Low	Medium	N/A	N/A	N/A	N/A
Annalitten National School	Low	Low	N/A	Low	N/A	N/A
St Malachy's Church, Reaghstown	Negligible	Negligible	N/A	N/A	N/A	N/A
Church of Our Lady of the Snows	N/A ⁹³	N/A	N/A	Negligible	N/A	N/A
Medium Sensitivity Receptors						
Killanny Community Centre	N/A	N/A	Negligible	N/A	N/A	N/A
Meeting House Café	Low	N/A	N/A	N/A	N/A	N/A
Low Sensitivity Receptors						
McCaughey's Garage	Low	Low	N/A	N/A	N/A	N/A
Dooleys Pub	Low	Low	N/A	N/A	N/A	N/A

⁹³ Receptors are Not Applicable to the assessment as they are outside the 1km buffer from the centreline of a Route Corridor Option.

Receptors	Magnitude of Impact by Routes					
	Option A (Yellow)	Option B (Yellow + Blue)	Option C (Green)	Option D (Orange)	Option E (Orange + Link 1 + Green)	Option F (Orange + Link 2 + Green)
Aclint 5-a-side pitches	Low	Low	N/A	N/A	N/A	N/A
Killanny GAA Club	N/A	N/A	Negligible	N/A	N/A	N/A
Annaghminnion GAA Club	N/A	N/A	N/A	Negligible	N/A	Negligible
Development / Zoned Land						
Carrickmacross: Industry/Enterprise/Employment, Strategic Residential Reserve, Existing Residential, and Recreational/Amenity, Community Services/Facilities	Low	Low	N/A	N/A	N/A	N/A
Overall Significance of Effect	Minor or Slightly Negative	Moderately Negative	Not Significant or Neutral	Minor or Slightly Negative	Not Significant or Neutral	Not Significant or Neutral

10.4.2 Comparison of Options

Option B (Yellow+Blue) is the only Route Corridor Option which has been predicted to have 'Moderate Negative' overall impact. Option A (Yellow) and Option D (Orange) have received Minor overall effect score and the remainder of routes (Option C (Green), Option E (Orange + Link 1 + Green) and Option F (Orange+ Link 2 +Green) have received a Neutral score.

Option A (Yellow) and Option B (Yellow+Blue) are similar with the exception of a diversion of Broomfield on the Option B (Yellow+Blue) Route Corridor Option. Both options impact a high number of non-agricultural properties due to being majority online routes and therefore having large numbers of properties in close proximity. Both of these routes also follow the existing N2 on the outskirts of Carrickmacross and therefore the corridor is within a number of areas of land zoned development within the County Development Plan. As detailed in Table 10.5 these are zoned for development in the following areas: Industry/Enterprise/Employment, Strategic Residential Reserve, Existing Residential, and Recreational/Amenity, Community Services/Facilities. However, given that the N2 already passes through/past these zoned lands, it is anticipated that these impacts will be low.

The key differentiator between Option B (Yellow+Blue) (moderate) and Option A (Yellow) (minor) is that the Option B (Yellow+Blue) route has a greater magnitude of impact (medium magnitude) on two Highly sensitive receptors, St Patricks National School and Church in Broomfield; where the Blue section of the route deviates from the existing N2 route with the result that the school would be located between the existing N2 and the proposed N2. However, if Option B (Yellow+Blue) were brought forward to the next Phase, there may be scope to refine the alignment within the corridor to avoid land losses. Other indirect impacts such as increased noise levels from increased traffic it is assumed that the integrity and quality of the school and church will be impacted to a moderate level. The school is located approximately 160m away from the existing N2 and; if selected, Option B (Yellow+Blue) would position the school approximately 75m from the proposed N2. Therefore, noise levels would increase as a result. In addition to this, the school is located on a local road which may provide future links between the existing and proposed N2, potentially increasing traffic passing the school. The impacts on these two receptors as a result of the Option B (Yellow+Blue) are considered to be a greater overall effect than the Option A (Yellow) Route Corridor Option.

The remaining four options interact with far fewer properties. In addition, the largely rural nature of these routes provides more opportunity during the design stage to avoid receptors within the wider corridor.

Despite impacting a much fewer number of receptors than the Option A (Yellow) route, Option D (Orange) has also received a 'Minor Negative' overall effect as it was not considered that those impacts are significant enough to differentiate the two. This option has low and negligible magnitude impacts on three separate receptors, including Annalitten National School, Church of Our Lady of the Snows, Annaghminnion GAA Club.

The remainder of routes (Option C (Green); Option E (Orange + Link 1 + Green); and Option F (Orange + Link 2 + Green)) have all been assumed to have Neutral effect on Material Assets in the Study Area. Option E (Orange + Link 1 + Green) impacts no receptors within the Study Area and is therefore considered to be Neutral. Option C (Green) and Option F (Orange + Link2 + Green) result in solely Negligible impacts on Medium and Low sensitivity receptors, it can be assumed that the overall effect will also be Neutral.

10.5 Conclusions

Option B (Yellow+Blue) is the only Route Corridor Option which has been predicted to have Moderate overall effect. Option A (Yellow) and Option D (Orange) have received Minor overall effect score and the remainder of routes (Option C (Green), Option E (Orange + Link 1 + Green) and Option F (Orange+ Link 2 +Green) have received a Neutral score. Option A (Yellow) and Option B (Yellow+Blue) are similar with the exception of a diversion of Broomfield on the Option B (Yellow+Blue) Route Corridor Option. Both options impact a high number of non-agricultural properties due to being majority online routes and therefore having large numbers of properties in close proximity. The key differentiator between Option B (Yellow+Blue) (moderate) and Option A (Yellow) (minor) is that the Option B (Yellow+Blue) route has a greater magnitude of impact (medium magnitude) on two Highly sensitive receptors, St Patricks National School and Church in Broomfield; where the Blue section of the route deviates from the existing N2 route. The remaining four options interact with far fewer properties. In addition, the largely rural nature of these routes provides more opportunity during the design stage to avoid receptors within the wider corridor.

Table 10.6: Summary of Significance of Effects and Performance Score of Each Route Corridor Option – Material Assets

Option	PAG Unit 7.0 Significance of Effect	PAG Unit 7.0 Performance Score
Option A (Yellow)	Minor or Slightly Negative	3
Option B (Yellow+Blue)	Moderately Negative	2
Option C (Green)	Not Significant or Neutral	4
Option D (Orange)	Minor or Slightly Negative	3
Option E (Orange + Link 1 + Green)	Not Significant or Neutral	4
Option F (Orange + Link 2 + Green)	Not Significant or Neutral	4

11. Agriculture

11.1 Introduction

As part of the works associated with the proposed N2 Ardee to Castleblayney Road Scheme, Philip Farrelly & Co. were engaged by Jacobs to assess the agricultural impact of the Route Corridor Options. The assessment on agricultural impacts is documented within this section of the report.

The land quality in the N2 Ardee to Castleblayney Study Area is considered good with the land undulation ranging in height from 25 meters to 204 meters ordnance datum. There are some flat to gently undulating land areas in the south of the Study Area in County Louth which are suited to tillage farming. There are some rolling and steep drumlin style hills throughout the Study Area. Agriculture in this area is intensive in nature due to the relatively high quality of the soil.

The majority of the farmland in the Study Area is in grassland. Of the land that is in grassland, the vast majority of holdings are either beef and/or sheep farms. Fields with paddocking and grazing infrastructure and or yards observed with milking facilities are assumed to be involved in dairying. Holdings with horses or equine facilities observed are categorised as equine. Fields with cereals or vegetable crops are categorised as tillage. There are some intensive tillage farms located in North County Louth where the land is suitable for tillage purposes. There are some poultry farms, mushroom enterprises and some areas of forestry located within the Study Area.

11.2 Methodology

This report documents the assessment of the potential impact of the Route Corridor Options on agriculture and was prepared having regard to the following documents.

- Draft guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2017)
- Project Management Guidelines (TII, 2017)
- Project Management Guidelines (NRA, 2010) Project Appraisal Guidelines (TII, 2016)

The assessment of the agricultural impact consisted of a desktop survey of available aerial photography mapping, land folio and Route Corridor information, Census of Agriculture Data, and a windshield survey from the road/publicly accessible lands within the Study Area. Land registry data (Public Registry Authority Ireland: PRAI data) was used to determine boundaries of land holdings affected by the various Route Corridor Options. Details on land operations such as conacre was not obtained at this phase of the project but it will be at the next. It should be noted that the number of land holdings identified on each Route Corridor Option may not reflect the total number of farms affected due to fragmentation of farms.

Consultation also took place with local Teagasc advisors, agricultural consultants along with representatives from the main farming organisations to compile information on agricultural enterprises within the Study Area. Information was also obtained from the Public Consultation in June and October 2019.

Both qualitative and quantitative assessments of the impacts to key agricultural enterprises within the Study Area were carried out. Consultation with landowners was not undertaken for this stage of the Option Selection process, therefore specific information in relation to individual farming systems is not yet known. Consultation with affected landowners will take place during Phase 3 (Design & Environmental Evaluation) of the project.

The agricultural enterprises considered most sensitive to a proposed scheme development consists mainly of dairy and equine enterprises.

11.2.1 Assessment Methodology

The Route Corridor Option assessment considered the potential impact which each Route Corridor Options may have on agriculture.

Land Use, land severance, soil type, and key agricultural enterprises were considered in the qualitative assessment.

Land Use (percentage of holdings), land take (approx. ha), route length (km), number of farmyards/facilities in within and in close proximity to Route Corridor Options and the key enterprise types within the Route Corridor Options were considered in the quantitative assessment. Land Use in the Study Area, based on the CORINE Land Cover is shown in Figure 11.1, Volume 2 of this Option Selection Report.

Details of the scoring used and the significance ratings attributed to agriculture are defined and outlined in Table 11.1.

Tables 11.2 – 11.10 provide details of the agricultural assessment. This assessment will contribute towards the assessment of the Route Corridor Options. This study carried out an assessment of the agricultural impacts associated with each of the six unique Route Corridor Options and allocated a significance of effect score to each Route Corridor Option.

11.2.2 Assessment Criteria

The assessment of the impact on agricultural holdings was based on a number of Sub-Criteria Elements, including:

- Potential Land take;
- Land quality;
- Land use;
- Land severance; and
- Proximity of Route Corridor Options to farm yard/facility i.e. any within or in close proximity to the Route Corridor Options.

The assessment of the proposed scheme under the above sub-criteria elements (i.e. land use) was based on the number of land holdings falling within each sub- category as defined in Table 11.5 (e.g. land use - grassland). Using the PRAI data, the assessment of these categories is based on an assessment of individual land holdings using folio numbers.

Land quality and land use were assessed by visual assessment by conducting surveys from roads and publicly accessible lands and using aerial photography.

Land severance was assessed on each individual holding taking account of land folio information sourced from the Land Registry. The land take and footprint for the scheme is not yet known, and for the purposes of comparative assessment of the Route Corridor Options, a land take width of 50m was assumed (25m either side of the centreline of the Route Corridor Options). An indicative land take per Route Corridor is estimated using the length of the Route Corridor multiplied by the draft indicative 50m land take width. The assumed working corridor width of approximately 50m is to accommodate the proposed road itself and to allow for cutting and filling, construction activities, and for the construction of accommodation roads (subject to change upon confirmation of the width of the working corridor at the next phase of the project. The actual land take required will be subject to change and will be determined in later Phases of the design process.

Where the Route Corridor may wholly or partly impact upon a farmyard or animal handling facilities, the farmyard was recorded under proximity of the Route Corridor to farm yard/facility for the purpose of this assessment.

The Route Corridor Options pass through productive agricultural land which impact on individual agricultural land holdings. The overall impacts of any potential road scheme were generally found to be negative, as with agricultural holdings the negative impacts will be found to be greater than any potentially positive impact that may arise. Farm holdings were individually assessed for agricultural impact based on land take, land severance, land use and proximity of Route Corridor Options to farmyard/facilities.

In general, negative impacts from the development of a proposed scheme are mainly due to the level of land take, land severance, and access problems to land and farmyard facilities. This assessment identified the key agricultural enterprises that would be considered most sensitive to the construction and operation of a proposed scheme. Intensive farm enterprises may be particularly affected by the loss of direct access to severed lands. This is particularly important in the case of dairy enterprises where daily access is required from the grazing platform to milking facilities on a twice daily basis during the grazing season.

Dairy farms are known to be particularly sensitive to the location of a major road. A dairy farm is one of the most intensive land-based farming enterprises and can be entirely dependent on the land holding or grazing paddocks adjacent to the farmyard. In addition to the land take involved, the location of a major road may cause severance of the land holding into smaller areas or severance of the access from the farmyard/milking parlour to the grazing paddocks. This may impact on the future viability of the farm or its continuation in dairying.

Equine farms also have the potential to be severely impacted by a road scheme, as equine stock are of a more nervous disposition than other stock types and are prone to stress caused by irregular noise and moving vehicles. Beef cattle and sheep are not as sensitive as horses to the noise impact of a major road. Where there is a significant impact on a grassland farm, the farming practices on these farms may need to be adapted to mitigate the overall impact.

A road scheme may have a lower impact on a tillage farm or enterprise than on a livestock farm. Land take and land severance may occur on a tillage farm, although the impact will largely consist of access problems for machinery to a severed area. It is preferable for the Route Corridor to pass through tillage and beef and or sheep farms rather than through dairy or equine farms.

The comparative evaluation of the Route Corridor Options was assisted by scoring the agricultural impacts of each route on sensitive receptors using the Stage 2 Project Appraisal Matrix suggested in Step 4 of the Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis⁹⁴. Each Route Corridor Options was awarded a score based on the seven-point scale as shown in Table 11.1 and a number was assigned according to the significance of the effect. The effect of a new route will have different levels of impact on particular farms in a given area depending on a number of factors such as the land use, land quality, the type of enterprise and the proximity of the Route Corridor Option to the farm. There are seven effect ratings from Highly Positive to Major Negative. Only three of these (Minor negative, Moderate Negative and Major Negative) are deemed to be applicable to the assessment.

Table 11.1 Key for Scoring Effects

Score	Significance of Effect	Criteria
7	Major or Highly Positive	No effect on agricultural lands.
6	Moderately Positive	No effect on agricultural lands.
5	Minor or Slightly Positive	No effect on agricultural lands.
4	Not Significant or Neutral	No effect on agricultural lands.

⁹⁴ TII. 2016. Project Appraisal Guidelines for National Roads Unit 7.0 - Multi Criteria Analysis. PE-PAG-02031.

Score	Significance of Effect	Criteria
3	Minor or Slightly Negative	<p>Land use is grass based with medium levels of non-grassland parcels such as wetlands and forestry.</p> <p>Land quality is average and is less suited to intensive agricultural production.</p> <p>Impact/land severance is Low to Medium.</p> <p>There are no impacts on farmyards.</p> <p>There are no impacts on sensitive farming enterprises e.g. horticulture, equine, dairy.</p>
2	Moderately Negative	<p>Land use is mainly grass based with low levels of rough grazing or forestry.</p> <p>Land quality is average to good and is suited to intensive agricultural uses.</p> <p>Impact/land severance is predominately Medium.</p> <p>Impact on a low number of farmyards.</p> <p>Medium to high impacts on sensitive farming enterprises, e.g. horticulture, equine or dairy.</p>
1	Major or Highly Negative	<p>Land use is primarily grass or arable.</p> <p>Land quality is good being suited to a wide range of agricultural uses.</p> <p>Impact/land severance is predominately Medium to High.</p> <p>Impact on a medium to high number of farmyards.</p> <p>Significant or highly significant impact on a large number of sensitive farming enterprises, e.g. horticulture, equine or dairy.</p>

11.3 Existing Environment

The N2 Ardee to Castleblayney Study Area encompasses land in both County Louth and County Monaghan, however the majority of the Study Area is located in County Monaghan. The southern section of the Study Area is located in County Louth. The Study Area is mainly rural in nature as it extends northwards from Ardee, Co. Louth passing into Co. Monaghan to the east of Carrickmacross and terminates south of Castleblayney. The Route Corridor Options commence in the townland of Mullanstown, Co. Louth and terminate in the townland of Tullyvin, Co. Monaghan.

The land within the Study Area is primarily in agricultural use. Tillage is the prevalent land use in north Co. Louth towards the border of Co. Monaghan. Long term grassland pastures account for practically all of the land within the Study Area apart from the area tillage land in north Co. Louth. Land use is almost entirely grassland based. Farming practices are predominantly beef and or sheep related with some dairy farms located within the Study Area.

The farmland is mainly good quality suited to intensive farming. Intensive farming is carried out in the Study Area with some intensive tillage, dairy, and beef and/or sheep farms dispersed throughout the Study Area.

The majority of farmers within the Study Area are involved in mixed livestock farming. Some equine farms are located within the Study Area. However, no Equine farms have been identified as being directly impacted by any of the Route Corridor Options.

A number of dairy farms were identified within the Study Area and the majority of the routes impact on dairy farms; this is not unusual given the rapid expansion of the dairy sector in Ireland since the abolition of Milk Quotas in 2015.

11.3.1 Agriculture in Counties Monaghan and Louth

11.3.1.1 Agriculture in County Monaghan

According to the Central Statistics Office (CSO) in the Census of Agriculture (2010), the total agricultural area of Co. Monaghan is 106,288ha excluding commonage. There are 4,565 farms with an average farm size of 23.3 ha which is considerably lower than the national average of 32.7ha.

Grassland based livestock farming is very important in Co. Monaghan. Some 3,115 farms (68% of total) are involved in specialised beef farming, while 98 farms are involved in specialised sheep farming and 599 farms are specialist dairy farms.

Cereals and other arable crops are of less significance in Co. Monaghan. Some 25 farms are specialist tillage farms and 728 farms are mixed enterprises. The Census of Agriculture collects information on the structural characteristics of agricultural holdings such as land use, farm size, and enterprise type every 10 years.

11.3.1.2 Agriculture in County Louth

According to the Central Statistics Office (CSO) in the Census of Agriculture (2010), the total agricultural area of Co. Louth is 60,938 ha excluding commonage. There are 1,676 farms with an average farm size of 36.4 ha which is considerably higher than the national average of 32.7ha. Grassland based livestock farming is important in Co. Louth. Some 668 farms (40% of total) are involved in specialist beef farming, while 149 farms are involved in specialist sheep farming and 138 farms are specialist dairy farms.

Cereals and other arable crops are important in Co. Louth. 291 farms are specialist tillage farms. 397 farms are mixed enterprises.

11.3.2 Agriculture within the Study Area

The data from the Central Statistics Office (CSO 2010) indicates three rural districts for Co. Louth, the rural district of Louth, Ardee, and Dundalk and four rural districts for Co. Monaghan; the rural district of Monaghan, Clones, Castleblayney, and Carrickmacross. The Study Area for the N2 Ardee to Castleblayney scheme is located in the rural districts of Ardee and Dundalk in Co. Louth and in the rural districts of Carrickmacross and Castleblayney in Co. Monaghan.

The total number of farms for the rural district of Ardee is 511, the total area farmed (UAA) was 23,627 ha. Rough grazing accounts for 4.6% of land use. The total number of farms for the rural district of Dundalk is 872, the total area farmed (UAA) was 24,766 ha. Rough grazing accounts for 1.1% of land use. The total number of farms for the rural district of Carrickmacross is 1,021, the total area farmed (UAA) was 22,597 ha. Rough grazing accounts for 3.7% of land use. The total number of farms for the rural district of Castleblayney is 1,057, the total area farmed (UAA) was 21,924 ha. Rough grazing accounts for 4.1% of land use.

The low level of rough grazing confirms the land is good quality land. The high level of pasture and silage demonstrates the intensive nature of farming within the Study Area.

The dominant agricultural use in the Study Area is grassland-based enterprises comprising of dairy, beef and or sheep farming, with some tillage enterprises located in North Louth. There are some dairy farms located within the Study Area which are which are affected by the various Route Corridor Options within the Study Area, including in the townlands of Annamarran, Lisnashnagh, Clonturk, Cormoy, Dumneill, Mullanavannog and Tully. There are some areas of Forestry land within the Study Area.

Poultry and Mushroom enterprises are located within in the Study Area. Some poultry enterprises are impacted by the Route Corridor Options. Poultry enterprises were identified in the townland of Tullyvaragh Upper. No Mushroom enterprises were identified in close proximity to the Route Corridor Options.

Generally, poultry enterprises are intensive in nature, the proximity of a proposed Route Corridor development may pose a risk to biosecurity for the enterprise. Pathogens may be released where soil is disturbed during the construction phase of the proposed scheme.

Surveys were completed over three days from roads and publicly accessible land within the Study Area in February 2020. These surveys confirmed the nature of farming practice within the Study Area. The majority of surveys from roads and publicly accessible land confirmed that tillage, dairy, beef, and/or sheep farms are prevalent within the Study Area.

11.3.3 Soils

Soil types influence the nature and intensity of farming that can be carried out. In this section reference is made to the Irish Soil Information System digital data downloaded from the Irish Soil Information website in February 2020⁹⁵. Ballylanders is the main soil type identified within the Study Area. It is a fine loamy soil over shale or slate bedrock. The soil is associated with flat and gently rolling topography. It is Moderate well drained soil of clay loam texture. This soil association has a Moderate wide use range. It is suitable for grassland but is also suitable for tillage.

The land quality in the N2 Ardee to Castleblayney Study Area is considered good with the land undulation ranging in heights from 25 meters to 204 meters above ordnance datum.

11.3.4 Agricultural Receptors

The agricultural receptors within the Study Area comprise of key farming enterprises which are considered sensitive to road development works. These key agricultural enterprises consist of dairy farms and in some cases intensive beef and/or sheep farms.

11.4 Route Corridor Option Comparison

The results of the assessment for each Route Corridor are shown in the following sections for land take, land quality, land use, land severance and farmyards/facilities in close proximity to Route Corridor Options.

11.4.1 Land Take

Table 11.2 illustrates other key considerations for land take, comprising of the length of the Route Corridor Options (which will impact the overall land take assumed to be required), the number of Agricultural Receptors impacted in terms of the number of farm holdings affected and the number of farmyards/ facilities in close proximity to the Route Corridor Options.

⁹⁵ Soils and Subsoils digital data from Environmental Protection Agency and Teagasc <http://gis.teagasc.ie/soils/>

Table 11.2 Key Considerations for Agricultural Receptors

Key Considerations	Option A (Yellow)	Option B (Yellow + Blue)	Option C (Green)	Option D (Orange)	Option E (Orange + Link1 + Green)	Option F (Orange + Link2 + Green)
Length of Route Corridor (km)	31.3	31.2	29.8	30.4	30.1	30.5
Number of farms/holdings on Route Corridor	126	113	157	167	154	159
Assumed Land take per Route Corridor (ha)	156	156	150	151	150	172
Number of Farm yard/ facilities in close proximity to Route Corridor Options	7	6	4	5	6	5

The approximate land take area (ha) of each route corridor is based on a 50-meter-wide working route corridor (subject to change upon confirmation of the width of the working corridor at the next Phase of the project).

11.4.2 Land Quality

The definitions for the assessment categories under land quality are presented in Table 11.3.

Table 11.3 Definitions of Land Quality⁹⁶

Land Quality Status	Descriptor
Good quality land	High agricultural value and potential. Accessibility is good and the maintenance level is very high. The drainage is very good or the soil is free draining. It is suitable for a wide range of arable and livestock enterprises at an intensive level.
Medium quality land	Medium agricultural value with a medium to high agricultural potential. There may be drainage problems in these areas. These areas may require maintenance work to increase productivity. It is suitable for a wide range of arable and livestock enterprises.
Poor quality land	Low agricultural value and potential. These areas are unsuitable for intensive grazing by livestock enterprises. They are suitable for extensive stocking, rough grazing, forestry or peat production.

The breakdown of percentage of each 400m Route Corridor Option within Good, Medium and Poor land quality is detailed in Table 11.4. The impact on agriculture is greater where the affected land is of good quality. Good quality land has a high agricultural potential and the value attached to that land is greater as a result.

⁹⁶ Definitions of Land Quality prepared by Philip Farrelly & Co.

Table 11.4 Assessment of Land Quality within the 400m Route Corridor Options

Route Corridor Option	PRAI Land Holdings	Land Quality		
		Good	Medium	Poor
Option A (Yellow)	126	100%	-	-
Option B (Yellow + Blue)	113	84%	16%	-
Option C (Green)	157	95.5%	4.5%	-
Option D (Orange)	167	93%	7%	-
Option E (Orange + Link1 + Green)	154	95%	5%	-
Option F (Orange + Link2 + Green)	159	91%	9%	-

The majority of the land within each of the six Route Corridor Options is good quality land.

11.4.3 Land Use

The definitions for the assessment categories under land use are presented in Table 11.5.

Table 11.5 Land Use Categories

Land Use	Descriptor
Grass	This consists of areas of grassland.
Tillage	This consists of areas used for crop production.
Forestry	This consists of areas of natural woodland, commercial forestry and areas with significant levels of scrub and hazel.
Other	This consists of lands which are in other uses such as for horticultural use, or grassland areas currently unutilised.

The assessment of land use in the Study Area is important to establishing the most suitable Route Corridor Option. Agricultural land will be impacted differently and to various extents depending on what type of agriculture the land is designated to. For example, land for livestock production will be more impacted than land used for crop production.

Table 11.6 Assessment of Land Holdings

	Land Use (% of Land Parcels)			
	No. of Land Holdings	Grass	Forestry	Tillage
Option A (Yellow)	126	83%	1%	16%
Option B (Yellow + Blue)	113	68%	4%	28%
Option C (Green)	157	76%	-	24%
Option D (Orange)	167	81%	1%	18%
Option E (Orange + Link1 + Green)	154	80%	-	20%
Option F (Orange + Link2 + Green)	159	80%	1%	19%

Land use within the six route corridor options is predominately grasslands and used for livestock production. Tillage is prevalent to the south of the Study Area. A small number of land holdings are used for forestry. The farmland is generally good quality suited to all farming enterprises. The grassland-based activities comprise of beef and/or sheep enterprises and some dairy enterprises. The impact on agriculture is greatest in the grassland category. The land parcels categorised as grassland are primarily used for livestock-based enterprises which are most affected by land take reduction in area farmed, access to land, and land severance or severance of farm yards/ facilities from large land areas or proximity of the Route Corridor to farmyards or animal handling facilities.

11.4.4 Land Severance

The definitions for the assessment categories under land severance and used to assess the severance of land parcels are presented in Table 11.7.

Table 11.7 Definitions of Land Severance

Land Severance	Descriptor
Major	Major severance refers to land parcels that are characterised by the route splitting the parcel in two resulting in a significant area of the parcel becoming inaccessible or landlocked. It also occurs in smaller parcels where the route may occupy a significant portion of the parcel area. The route may impact on farmyard buildings or a significant agricultural facility.
Moderate	Moderate severance refers to land parcels where a significant portion is separated from the rest by the new development. The isolated portion is large enough to continue to be farmed in a productive manner. There will be operational difficulties when moving livestock or machinery. Alternative access and/or gateways may need to be provided. Animal handling facilities or a farmyard area may be affected.
Minor	Minor severance denotes land parcels that are characterised by having a relatively small portion of land isolated by the route or a realignment of a local road, or where the land take is along the boundary of a land parcel and impacts upon access to remaining lands. Small severed parcels of land may be too small to farm in a productive manner.
Not Significant	Not significant severance refers to land parcels that are impacted along the boundary of the parcel or where a corner of a field is removed. It generally involves a low level of land take. There is no impact on access to lands.

The level of significant land severance which is regarded as the combined levels from the major and moderate categories together with the proximity of Route Corridor Options to farmyard/facilities are often the most influential factors that impact on agriculture. Depending on the agricultural enterprise, the impact derived from land severance varies. Severance of livestock-based farm holdings can have a high impact due to the difficulties created in stock movement around the farm or access to and from the fields to the farmyard. Severance may have a greater impact on a dairy enterprise where twice daily access is required from land to milking facilities during the grazing season. Daily access to severed land would not typically be required on tillage enterprises.

In this assessment, proximity of the centreline of Route Corridor Options to farmyard/facilities was recorded. Such facilities may comprise of animal housing or fodder storage facilities and also applies to animal-handling facilities such as yards and cattle pens.

The assessment of severance has omitted the impact of the Route Corridor Options on land drainage or the provision of services such as electricity and water supply. It is been assumed that the provision of land drainage will be restored and services to severed land will be restored.

Table 11.8 Land Severance and Close Proximity of Route Corridor Options to Farmyard/ Facilities

Route Corridor Options	PRAI Land Parcels	Land Severance (% of Land Parcels)				Close proximity of Route Corridor Options to farmyard/ facilities
		Major	Moderate	Minor	Not Significant	
Option A (Yellow)	126	-	-	5%	95%	6%
Option B (Yellow + Blue)	113	5%	7%	10%	78%	5%
Option C (Green)	157	19%	29%	20%	32%	3%
Option D (Orange)	167	19%	27%	25%	29%	3%
Option E (Orange + Link1 + Green)	154	24%	24.5%	24.5%	27%	4%
Option F (Orange + Link2 + Green)	159	20%	32%	24%	24%	3%

11.4.5 Assessment of Potential Impacts

Following an assessment of each Route Corridor under the various sections of land take, land quality, land use, land severance and proximity of Route Corridor Options to farm yard/facilities, the data gathered was combined to qualitatively assess and determine the level of impact for each Route Corridor. This is presented in Table 11.9 below and described further in this section.

Table 11.9 Assessment of Potential Impacts

Assessment Criteria	Option A (Yellow)	Option B (Yellow + Blue)	Option C (Green)	Option D (Orange)	Option E (Orange + Link1 + Green)	Option F (Orange + Link2 + Green)
Land Take						
Approx. Land take per Route Corridor (ha)	156	156	150	151	150	172
Land Quality (% of holdings)						
Good	100%	84%	95.5%	92.8%	95.5%	90.6%
Medium	-	16%	4.5%	7.2%	4.5%	9.4%
Poor	-	-	-	-	-	-
Land Use by Key Enterprises (% of holdings)						
Forestry	0.8%	3.5%	-	0.6%	-	0.6%
Tillage	16.7%	28.3%	23.6%	18%	20.1%	18.9%
Grasslands:						
• Dairy	-	2.7%	-	1.8%	1.9%	1.9%
• Poultry	0.8%	0.9%	-	-	-	-
• Beef/Sheep	81.7%	64.6%	76.4%	79.6%	78%	78.6%
Impact of Severance (% of holding)						
Major	-	4%	19%	19%	23%	20%
Moderate	-	7%	29%	27%	25%	32%
Minor	5%	11%	20%	25%	25%	24%
Not Significant	-	78%	33%	29%	27%	24%
No Severance	95%	-	-	-	-	-
Close proximity of Route Corridor Options to farmyard/ facilities	6%	5%	3%	3%	4%	3%
Agricultural Impact	Moderately Negative	Moderately Negative	Moderately Negative	Major/ Highly Negative	Moderately Negative	Moderately Negative

11.4.6 Comparison of Options

This study carried out an assessment of the agricultural impact on each of the six Route Corridor Options and allocated them an agricultural impact using the criteria as presented in Table 11.9. The impact of the individual Route Corridor on agriculture has been assessed under several sub-criteria including agricultural land take, land quality, land use, land severance and proximity of Route Corridor Options to farmyard/facilities. The land quality under all Route Corridor Options is predominately good quality land suited to land intensive agriculture.

Farming in the Study Area appears to be of high intensity and none of the farms are of national or regional importance. The permanent loss of agricultural land in the Study Area would affect agriculture at local level only.

Option A (Yellow) impacts on one of the lowest numbers of land holdings and does not result in significant severance as a significant portion of the route is online.

Option B (Yellow + Blue) impacts on a low number of land holdings impacted and low percentage of significant severance. The route does impact on some dairy farms, and a poultry enterprise. Some of the corridor is offline

Option C (Green) impacts on a high number of land holdings and results in a high level of significant severance along the route.

Option D(Orange) impacts on a high number of land holdings impacted and results in a high level of significant severance along the route. Some of the holdings classified as being significantly severed are dairy enterprises.

Option E (Orange + Link1 + Green) impacts on a high number of land holdings and results in a high level of significant severance along the route and impacts on sensitive farm enterprises.

Option F (Orange + Link2 + Green) impacts on a high number of land holdings and results in significant severance along the route and impact on sensitive farm enterprises.

11.5 Conclusions

The assessment of potential impacts indicates that there will be some level of differentiation between the Route Corridor Options regarding the level of impacts or risks associated. A comprehensive desktop review collated with information from the visual survey undertaken from roads and publicly assessable lands confirmed that all of the Route Corridor Options will impact on key enterprises and that all of the Route Corridor Options will impact on good quality land.

The main influences on the impact allocated to each of the Route Corridor Options are the number of land holdings impacted, land use and level of significant severance. Option D(Orange) has been assessed to have a major negative effect as it impacts on a high number of land holdings impacted and results in a high level of significant severance along the route. Some of the holdings classified as being significantly severed are dairy enterprises.

Table 11.10 Summary of Significance of Effect and Performance Score for Each Route Corridor Option – Agriculture

Route Corridor Option	PAG Unit 7.0 Significance of Effect	PAG Unit 7.0 Performance Score
Option A (Yellow)	Moderately Negative	2
Option B (Yellow + Blue)	Moderately Negative	2
Option C (Green)	Moderately Negative	2
Option D (Orange)	Major or Highly Negative	1
Option E (Orange + Link1 + Green)	Moderately Negative	2
Option F (Orange + Link2 + Green)	Moderately Negative	2

12. Summary and Conclusions

The Environment Appraisal has been undertaken in accordance with TII's PMM, *TII's PAG Unit 7.0: Multi-Criteria Analysis*, TII's Environmental Planning Guidelines, and other relevant national and international guidance. The purpose of this appraisal is to comparatively assess the impact of each Route Corridor Option against the existing baseline conditions in terms of how each option performs against the Main Sub-Criterion of Environment.

The following topics were assessed for the Environment Appraisal:

- Air Quality & Climate;
- Noise;
- Landscape and Visual;
- Biodiversity;
- Waste;
- Soils & Geology;
- Hydrogeology;
- Hydrology;
- Cultural Heritage (Archaeological & Architectural);
- Material Assets (Non-Agricultural);
- Material Assets (Agriculture).

TII's PAG unit 7.0's seven-point performance scoring system has been adopted for this appraisal, where an impact level ('*Highly Positive*' to '*Highly Negative*') is determined for each Route Corridor Option against the environmental topic above. Then, each impact level is assigned a performance score based on the defined seven-point scale (i.e. '7 – *Highly Positive*', '1 – *Highly Negative*').

Upon the determination of a single overall performance score for each of the environmental, an overall Environment Appraisal Performance Score was calculated for each of the Route Corridor Options.

A summary of the appraisal of environmental sub-criteria, along with a summary of the overall Environment Appraisal is provided in the sections below.

12.1 Air Quality & Climate

The calculation of the Index of Overall Change in Exposure allows a comparison of the overall air quality impact on people from each Route Corridor Option to be carried out. The Index is based on identifying the number of sensitive receptor locations (e.g. residential properties) within 50m of the indicative working alignment of all Route Corridor Options that would experience a significant change in traffic for each of the options.

Pollution from traffic sources increases at low traffic speeds and during congested traffic conditions. An improvement in the road infrastructure is likely to improve traffic flow, relative to the existing N2 alignment.

It is predicted that receptors along the new alignments have the potential to experience a minor negative impact on the local air quality. This is due to the existing good standard of air quality in the area and the relative levels of traffic.

For Air Quality & Climate, it was concluded that all Route Corridor Options had a 'Minor Negative' Impact. With reference to TII's PAG Unit 7.0 seven-point scale, all options are allocated a performance score of 3. A summary of the results is provided in Table 12.1 below.

Table 12.1: Performance Scores for Air Quality and Climate

Description	Option A (Yellow)	Option B (Yellow+Blue)	Option C (Green)	Option D (Orange)	Option E (Orange+Link1+Green)	Option F (Orange+Link2+Green)
Significance of Effect	Minor /Slightly Negative	Minor /Slightly Negative	Minor /Slightly Negative	Minor /Slightly Negative	Minor /Slightly Negative	Minor /Slightly Negative
PAG Unit 7.0 Performance Score	3	3	3	3	3	3

12.2 Noise

The noise assessment demonstrates the range of values for each of the six Route Corridor Options under assessment. Based on a count of properties within distance bands of up to 300m of the draft indicative centreline of each option, the assessment has determined that Option F (Orange + Link 2 + Green) has lowest Potential Impact Rating (PIR) value but that is noted to be broadly similar to Option C (Orange) and Option C (Orange+Link2+Green). Option A (Yellow) has the highest PIR score with Option B (Yellow+Blue) at a similarly high value however, it is noted that a high proportion of receivers along these route corridors are in the vicinity of the existing N2 alignment and are already subject to noise from the existing road.

Taking account of indicative noise levels associated with the future traffic flows along each option, the number of properties that have the potential to require noise mitigation in accordance with the criteria set out in the TII guidelines for national road schemes has been calculated. Option E (Orange + Link 1 +Green) and Option F (Orange + Link 2 +Green) have the least number of properties requiring mitigation (84 no. and 97 no. respectively), followed by Option A (Yellow) (105 no.), Option D (Orange) (110 no.), and Option B (Yellow+Blue) (117 no.). Option C (Green) has the highest number of properties requiring mitigation (138 no.).

The result of this assessment has indicated that Option E (Orange + Link1 + Green) has the lowest potential impact with Moderately negative impact. All other options have been determined to have a Moderately Negative impact except for Option C (Green) which has a Major/Highly Negative impact.

In conclusion, and with respect to the above, and the impacts identified for each option, a performance score in accordance with TII’s PAG Unit 7.0 seven-point scale, was allocated to each option and are presented in Table 12.2 below.

Table 12.2: Performance Scores for Noise

Description	Option A (Yellow)	Option B (Yellow+Blue)	Option C (Green)	Option D (Orange)	Option E (Orange+Link1+Green)	Option F (Orange+Link2+Green)
Significance of Effect	Moderately Negative	Moderately Negative	Major /Highly Negative	Moderately Negative	Moderately Negative	Moderately Negative
PAG Unit 7.0 Performance Score	2	2	1	2	2	2

12.3 Landscape & Visual

This section of the Option Selection Report identifies the existing landscape character of the Study Area, landscape elements and sensitive visual receptors and has been completed by Macro Works Limited. The likely sensitivity of each have been assessed along with the predicted likely magnitude of effect of the proposed scheme resulting in judgements regarding likely significance of effects.

Option A (Yellow) has been assessed to have a Minor Negative level of impact, largely because landscape character and visual amenity is already strongly influenced by the existing N2 corridor. This is also the case for Option B (Yellow+Blue) - Minor Negative. The remaining options have an increased landscape and visual effects (Moderately Negative) primary due to their offline nature and are located further away from the existing N2. Options D - F have impacts on the Monaghan Way walking trail and to the tourist and recreational receptors at Knockabbey Castle demesne. Consequently, it was assessed that Options C to F have a Moderately Negative Impact.

In conclusion, and with respect to the above, and the impacts identified for each option, a performance score in accordance with TII's PAG Unit 7.0 seven-point scale, was allocated to each option and are presented in Table 12.3 below.

Table 12.3: Performance Scores for Landscape & Visual

Description	Option A (Yellow)	Option B (Yellow+Blue)	Option C (Green)	Option D (Orange)	Option E (Orange+Link1+Green)	Option F (Orange+Link2+Green)
Significance of Effect	Minor /Slightly Negative	Minor /Slightly Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative
PAG Unit 7.0 Performance Score	3	3	2	2	2	2

12.4 Biodiversity – Flora & fauna (Ecology)

Ecological sites were identified based on collation of available existing information, aerial photography and surveys from publicly accessible land. Values were assigned based on national guidance and focussed on the potential ecological value for the habitats present.

All Annex I habitats that lie outside of European sites, are valued as being of national importance, given that these habitats are of high conservation concern. However, priority Annex I habitat types are valued as being of international importance given that they are of the highest conservation concern at a European level (i.e. natural habitat types in danger of disappearance). The basis of this assessment has been that if a Route Corridor Option impacts directly on one or more ecological sites valued as international or national importance, the Route Corridor Option is scored as major negative.

All of the assessed 400m wide corridors will result in a Major/Highly Negative Impact on biodiversity as a result of direct impacts on ecological sites valued at international importance. Some of the Route Corridor Options could have reduced levels of significance with careful routing at the next Phase of the project as the proposed scheme will be much narrower than the assessed corridor.

Option E (Orange + Link1 + Green) is likely to result in the least significant negative impact on biodiversity. This is because it directly impacts the smallest number of ecological sites (i.e. ten in total), the smallest number of ecological sites valued as being of international importance (i.e. five in total) and the smallest total area of ecological sites valued as being of international importance (i.e. c. 4ha).

Option A (Yellow) and B (Yellow+Blue) are very similar in terms of the total number of ecological sites that may be directly impacted (i.e. 33 and 34 respectively), the total number of ecological sites valued as being of international importance that may be directly impacted (i.e. 14 for each), Both these Route Corridor Options will directly impact on Lough Naglack pNHA as the site is adjacent to the existing N2, which the Route Corridor Options follow. Routing at the next phase of the project could avoid any direct impacts to this designated site. The level of significance for these two options could be reduced to Moderately Negative, however that will require further surveys and assessment at the next phase of the project.

Options F (Orange + Link2 + Green) and D (Orange) directly impact 13 and 14 sites respectively, eight of which are valued as being of international importance. Option C (Green) will impact directly on a total of 17 ecological sites, eight of which are valued as being of international importance. The nature of these sites relative to the route corridor means that it will be unlikely to avoid these sites through routing.

In conclusion, and as stated above, all options have been determined to have a 'Major/Highly Negative' Impact. With reference to TII's PAG Unit 7.0 seven-point scale, all Route Corridor Options have been allocated a Performance Score of 1. A summary of the results is provided in Table 12.4 below.

Table 12.4: Performance Scores for Biodiversity (Flora and Fauna)

Description	Option A (Yellow)	Option B (Yellow+Blue)	Option C (Green)	Option D (Orange)	Option E (Orange+Link1+Green)	Option F (Orange+Link2+Green)
Significance of Effect	Major /Highly Negative	Major /Highly Negative	Major /Highly Negative	Major /Highly Negative	Major /Highly Negative	Major /Highly Negative
PAG Unit 7.0 Performance Score	1	1	1	1	1	1

At the next Phase of the project, in-line with TII and CIEEM guidance, further assessment will be undertaken on the Preferred Route Corridor to help to minimise the effects as far as possible. Surveys will be undertaken of the affected ecological site to clarify their ecological value and routing and mitigation can be used to minimise the effects as far as possible. Further measures such as habitat compensation will also be considered.

12.5 Waste

The potential for impacts on waste associated with the proposed scheme was assessed based on national and international guidance. Any large infrastructure project has the potential to generate waste of different types. The proposed scheme is within both the Connacht Ulster Waste Region and the Eastern and Midlands Waste region. The EPA identifies three current waste management facilities and current capacities within County Monaghan and County Louth that could take waste from the proposed scheme (subject to clarification at the time of construction). Volumes of waste, the level of associated traffic and the routes in would take will be set out at the next phase of the project when the design is developed further. Indicative routes within the route corridors have been assessed to see what the likely earthworks would be in terms of cutting and fill. Following consideration of two different scenarios based on the re-use of material, it was determined that Option D (Orange) may have a minor negative effect. The remaining Route Corridor Options have increasingly level of material for disposal and therefore may have an increased impact.

For Waste, it was concluded that Route Corridor Option D had a Minor Negative Impact, Option A (Yellow) had a Moderately Negative Impact, with the remaining options being assessed as having a Major/Highly Negative Impact.

Following which, a performance score in accordance with TII's PAG Unit 7.0 seven-point scale, was allocated to each option and are presented in Table 12.5 below.

Table 12.5: Performance Scores for Waste

Description	Option A (Yellow)	Option B (Yellow+Blue)	Option C (Green)	Option D (Orange)	Option E (Orange+Link1+Green)	Option F (Orange+Link2+Green)
Significance of Effect	Moderately Negative	Major /Highly Negative	Major /Highly Negative	Minor /Slightly Negative	Major /Highly Negative	Major /Highly Negative
PAG Unit 7.0 Performance Score	2	1	1	3	1	1

12.6 Soils, Geology and Hydrogeology

The soils and geology effects of the six proposed Route Corridor Options have been assessed in accordance with the TII Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.

In terms of soils and geology, differentiation between corridors can be limited because of the large-scale geological conditions in the study area. All six of the Route Corridor Options have similar effects on peat deposits, potential crushed rock and aggregates deposits and disused mines. None of the Route Corridors will impact quarries or known contaminated land. There are numerous karst landforms (134 features, comprising caves, enclosed depressions, springs, swallow holes and turloughs) mapped in the central part of the Study Area. Options A (Yellow) and B (Yellow+Blue) will impact a larger number of karst landforms compared to the other corridors.

All six of the Route Corridor Options are assessed to have a Moderately Negative effect due to the potential impacts from karst effects and/or the impacts to potential crush rock deposits.

In conclusion, and with respect to the above, and the impacts identified for each option, a performance score in accordance with TII’s PAG Unit 7.0 seven-point scale, was allocated to each option and are presented in Table 12.6 below.

Table 12.6: Performance Scores for Soils & Geology

Description	Option A (Yellow)	Option B (Yellow+Blue)	Option C (Green)	Option D (Orange)	Option E (Orange+Link1+Green)	Option F (Orange+Link2+Green)
Significance of Effect	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative	Moderately Negative
PAG Unit 7.0 Performance Score	2	2	2	2	2	2

The hydrogeology effects of the six proposed Route Corridor Options have been assessed in accordance with TII Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.

All of the Route Corridor Options are assessed to be moderate or major negative. However, Option A (Yellow) and Option B (Yellow + Blue) have three Public Supply abstraction sources within their 400m corridors. These features relate to groundwater abstractions for public water supply and are considered to be of high sensitivity. Option C (Green) and Option D (Orange) generate potential impacts of Major/Highly Negative due to significant interaction with areas of higher groundwater vulnerability.

It should be noted that the differences between Route Corridor Options are relatively small and are not be considered significant compared to other factors.

In conclusion, and with respect to the above, and the impacts identified for each option, a performance score in accordance with TII’s PAG Unit 7.0 seven-point scale, was allocated to each Route Corridor Option and are presented in Table 12.7 below.

Table 12.7: Performance Scores for Hydrogeology

Description	Option A (Yellow)	Option B (Yellow+Blue)	Option C (Green)	Option D (Orange)	Option E (Orange+Link1+Green)	Option F (Orange+Link2+Green)
Significance of Effect	Moderately Negative	Moderately Negative	Major /Highly Negative	Major /Highly Negative	Moderately Negative	Moderately Negative
PAG Unit 7.0 Performance Score	2	2	1	1	2	2

12.7 Hydrology

This section discusses the potential impact of each of the proposed Route Corridors on the hydrology in the project Study Area and has been completed by Jacobs. Road schemes have the potential to significantly affect surface water bodies such as rivers, lakes/ponds, estuaries and reservoirs. The hydrology assessment considers the impacts on the following:

- Surface Water Quality; and
- Flood Risk

All Route Corridor Options have been determined to have minor negative impact on surface water quality. There are some differences between the Route Corridor Options, as significance of impacts is determined by considering sensitivity of the receptor and magnitude of impacts. Therefore, the higher the sensitivity of a watercourse the more significant the impact could be. In terms of magnitude of impacts, the options assessment considered the number of different watercourse crossings on any particular route and also, if any watercourses were to be crossed more than once; the more crossings there are present, the increased risk of a pollution incident; and the more crossings on a single water body, the greater the risk of cumulative impacts leading to a significant impact on the status of the water body. Although there is a range in the number of crossings of water bodies on each route, it is not considered that this range is wide enough to determine that one route would result in a higher magnitude of impact than another; particularly with construction best practices, controls and mitigation measures in place and being adhered.

All Route Corridor Options have been determined to have minor negative impact on flood risk. There are some differences between the Route Corridors, as the significance of impacts is determined by considering the nature and magnitude of flood risk impacts arising from a route. Specifically, the crossing of broad areas of floodplain that would be identified as Flood Zone A or B has the potential for a more significant impact on flood risk compared to minor drains. The options assessment considered the number and nature of floodplain and the potential impact on flood risk. There is a range in the number and nature of crossings of flood risk areas made by each route however, this is not sufficient to determine that any one Route Corridor Option would result in a more significant impact than another.

In conclusion, and with respect to the above, and the impacts identified for each option, a performance score in accordance with TII’s PAG Unit 7.0 seven-point scale, was allocated to each option and are presented in Table 12.8 below.

Table 12.8: Performance Scores for Hydrology

Description	Option A (Yellow)	Option B (Yellow+Blue)	Option C (Green)	Option D (Orange)	Option E (Orange+Link1+Green)	Option F (Orange+Link2+Green)
Significance of Effect	Minor /Slightly Negative	Minor /Slightly Negative	Minor /Slightly Negative	Minor /Slightly Negative	Minor /Slightly Negative	Minor /Slightly Negative
PAG Unit 7.0 Performance Score	3	3	3	3	3	3

12.8 Cultural Heritage

During the identification of the Route Corridor Options, every effort was made to avoid known archaeological and architectural heritage sites wherever possible. However, all Route Corridor Options are likely to have an adverse effect on Cultural Heritage, including known and currently unidentified archaeological remains and architectural heritage assets. In addition, all Route Corridors have the potential to encounter currently unrecorded archaeological sites and other cultural heritage features. The actual likely impact of the Preferred Route Corridor will be assessed in more detail during later phases of the design process.

Options A (Yellow) and B (Yellow+Blue), compared to the other four Route Corridors are mostly on-line on the existing N2, which reduces the overall risk of encountering previously unrecorded archaeology, although, as stated above, all options have the potential to encounter previously unrecorded archaeological sites. Previous archaeological excavations on the N2 have illustrated the potential for this to occur, with significant archaeological sites (particularly in the townlands of Monanny and Cloughvalley Upper) being identified and recorded during construction of the N2 Carrickmacross Bypass. Widening of the existing N2 could impact on un-excavated portions of sites preserved *in-situ* following these excavations and could impact one or two Protected Structures (Cookstown House and/or Charlestown Rectory) towards their southern limits.

No direct impacts on any Recorded Monuments are predicted for Option A (Yellow). An indirect Potentially Significant negative impact on archaeology associated with two Recorded Monuments (raths). Option B (Yellow+Blue) could have a Significant Negative direct impact on one Recorded Monument (rath) and St Patrick’s Church and could have a Potentially Significant direct impact on the site of two other raths. Option C (Green) could have a Significant Negative impact on five Recorded Monuments (four ringforts and one enclosure). Option D (Orange) mainly traverses open fields and farmland, and crosses the area designated ‘Kavanagh Country’ although no cultural heritage assets associated with the Kavanagh Trail would be impacted. The assessment found that Option D (Orange) could have a Significant Negative impact on five Recorded Monuments (four ringforts and a souterrain). Option E (Orange + Link1 + Green) could have a Significant Negative impact on five Recorded Monuments (four ringforts, and one souterrain which would be removed within the 25m route corridor). Option F (Orange + Link 2 + Green) could have Significant Negative impacts on nine Recorded Monuments (six raths, one souterrain, two enclosures and a burial ground). Option F (Orange + Link2 + Green) could potentially encounter significant subsurface archaeological remains associated with these sites.

In conclusion, and with respect to the above, and the impacts identified for each option, a performance score in accordance with TII’s PAG Unit 7.0 seven-point scale, was allocated to each option and are presented in Table 12.9 below.

Table 12.9: Performance Scores for Cultural Heritage

Description	Option A (Yellow)	Option B (Yellow+Blue)	Option C (Green)	Option D (Orange)	Option E (Orange+Link1+Green)	Option F (Orange+Link2+Green)
Significance of Effect	Minor /Slightly Negative	Moderately Negative	Major /Highly Negative	Major /Highly Negative	Major /Highly Negative	Major /Highly Negative
PAG Unit 7.0 Performance Score	3	2	1	1	1	1

12.9 Material Assets (Non-Agricultural)

Option B (Yellow+Blue) is the only Route Corridor Option, which has been predicted to have Moderate Impact in relation to Material Assets (Non-Agricultural). Option A (Yellow) and Option D (Orange) have been assessed as having a Minor Negative Impact and the remainder of routes (Option C (Green), Option E (Orange + Link 1 + Green) and Option F (Orange+ Link 2 +Green) have been assessed as having a Neutral Impact.

Option A (Yellow) and Option B (Yellow+Blue) are similar with the exception of a diversion of Broomfield on the Option B (Yellow+Blue) Route Corridor Option. Both options impact a high number of non-agricultural properties due to being majority online routes and therefore having large numbers of properties in close proximity. The key differentiator between Option B (Yellow+Blue) (moderate) and Option A (Yellow) (minor) is that the Option B (Yellow+Blue) route has a greater magnitude of impact (medium magnitude) on two Highly sensitive receptors, St Patricks National School and Church in Broomfield; where the Blue section of the route deviates from the existing N2 route. The remaining four options interact with far fewer properties. In addition, the largely rural nature of these routes provides more opportunity during the design stage to avoid receptors within the wider corridor.

In conclusion, and with respect to the above, and the impacts identified for each option, a performance score in accordance with TII’s PAG Unit 7.0 seven-point scale, was allocated to each option and are presented in Table 12.10 below.

Table 12.10: Performance Scores for Material Assets-Non-Agricultural

Description	Option A (Yellow)	Option B (Yellow+Blue)	Option C (Green)	Option D (Orange)	Option E (Orange+Link1+Green)	Option F (Orange+Link2+Green)
Significance of Effect	Minor /Slightly Negative	Moderately Negative	Not Significant/ Neutral	Minor /Slightly Negative	Not Significant/ Neutral	Not Significant/ Neutral
PAG Unit 7.0 Performance Score	3	2	4	3	4	4

12.10 Agriculture

The assessment of potential impacts indicates that there will be some level of differentiation between the route corridors regarding the level of impacts or risks associated. A comprehensive desktop review collated with information from the visual survey from roads and publicly accessible lands confirmed that all of the Route Corridor Options will have the potential to impact on agricultural enterprises and that all of the Route Corridors will impact on good quality land. All of the routes except Option F (Orange + Link2 + Green) Route are broadly similar in overall length. Option F (Orange + Link2 + Green) is the longest at 30.5km. The main influences on the impact allocated to each of the Route Corridor Options are the number of land holdings impacted, land use and level of significant severance. Option D (Orange) is has been assessed to have major negative impact as it impacts on a high number of land holdings impacted and results in a high level of significant severance along the route. Some of the holdings classified as being significantly severed are dairy enterprises.

For Material Assets (Agricultural), it was concluded that all Route Corridor Options with the exception of Option D (Orange) had a Moderately Negative Impact, with Option D having a Major/Highly Negative Impact. Following which, a performance score in accordance with TII’s PAG Unit 7.0 seven-point scale, was allocated to each option and are presented in Table 12.11 below.

Table 12.11: Performance Scores for Agriculture

Description	Option A (Yellow)	Option B (Yellow+Blue)	Option C (Green)	Option D (Orange)	Option E (Orange+Link1+Green)	Option F (Orange+Link2+Green)
Significance of Effect	Moderately Negative	Moderately Negative	Moderately Negative	Major /Highly Negative	Moderately Negative	Moderately Negative
PAG Unit 7.0 Performance Score	2	2	2	1	2	2

12.11 Environment Appraisal – Summary of Results

After a performance score (1-7) was assigned to each of the 11 Sub-Criteria, each of these scores was added together to provide an Overall Environment Appraisal Performance Score out of a maximum of 77) for each of the Route Corridor Options. Subsequently, the score was then expressed as marks out of 100 to align with marking system of the other five Main Criteria of the Stage 2 Appraisal. The results of the Environment Appraisal are shown in Table 12.12 below.

Table 12.12: Environment Appraisal – Performance Scores Summary Table

Sub-Criterion Ref. No.	Sub-Criterion Description	Option A (Yellow)	Option B (Yellow+Blue)	Option C (Green)	Option D (Orange)	Option E (Orange+Link1+Green)	Option F (Orange+Link2+Green)
1	Air Quality and Climate	3	3	3	3	3	3
2	Noise	2	2	1	2	2	2
3	Landscape & Visual	3	3	2	2	2	2
4	Biodiversity	1	1	1	1	1	1
5	Waste	2	1	1	3	1	1
6	Soils & Geology	2	2	2	2	2	2
7	Hydrogeology	2	2	1	1	2	2
8	Hydrology	3	3	3	3	3	3
9	Cultural Heritage (Archaeological & Architectural)	3	2	1	1	1	1
10	Material Assets – Non-Agricultural	3	2	4	3	4	4
11	Agriculture	2	2	2	1	2	2
Overall Environment Appraisal Performance Score (Out of 77)		26	23	21	22	23	23
Overall Environment Appraisal Performance Score (Expressed as Marks out of 100)		34	30	27	29	30	30

Appendix 4.1 Landscape Appendices

The landscape and visual receptors identified in Sections 4.3 and 4.4 of the Options Selection Report are used as the basis for this part of the assessment process. Landscape and visual receptors will be examined separately for potential impacts.

The assessment of the significance of impact is a result of the combination of the assessments of the receptor sensitivity in Section 4.3 and Section 4.4 of the Options Selection Report with the magnitude of impact, relative to the scale / level of importance (i.e. local level or at a wider level – regional, national or international).

1.1 Assessment of Potential Impacts - Landscape

The tables below illustrate the differences between the landscape impacts of for each of the route corridor options and assumes a worst-case scenario that does not include mitigation.

1.1.1 Likely Magnitude of Impacts on Landscape Character Areas

- Table A4.1 Likely Magnitude of Effects on Landscape Character Areas

Option	Landscape Character Area	LCA Sensitivity	Description of Impact of Route Corridor	Likely Magnitude of Impact on LCAs	Likely Significant Impact on LCA	Level of Importance
Option A (Yellow)	Muirhevna Plain	Medium	Effect of earthworks on physical landform minimal as route corridor traces alignment of existing N2. Route corridor represents a localised upgrade of existing linear infrastructure. Area within route corridor already characterised by transport corridor formed by existing N2 roads.	Low	No	-
	Louth Drumlin & Lake Areas	Medium	Effect of earthworks on physical landform minimal as route corridor traces alignment of existing N2. Route corridor represents a localised upgrade of existing linear infrastructure.	Low	No	-

Option	Landscape Character Area	LCA Sensitivity	Description of Impact of Route Corridor	Likely Magnitude of Impact on LCAs	Likely Significant Impact on LCA	Level of Importance
			Area within route corridor already characterised by transport corridor formed by existing N2 roads.			
	9 - Carrickmacross Drumlin & Lowland Farmland	Medium-Low	<p>Effect of earthworks on physical landform minimal as route corridor traces alignment of existing N2.</p> <p>Route corridor represents a localised upgrade of existing linear infrastructure.</p> <p>Area within route corridor already characterised by transport corridor formed by existing N2 roads.</p>	Low	No	-
	8 - Drumlin and Upland Farmland of South Monaghan	Medium-Low	<p>Effect of earthworks on physical landform minimal as route corridor traces alignment of existing N2.</p> <p>Route corridor represents a localised upgrade of existing linear infrastructure.</p> <p>Area within route corridor already characterised by transport corridor formed by existing N2 roads.</p>	Low	No	-
Option B (Yellow + Blue)	Muirhevna Plain	Medium	<p>Effect of earthworks on physical landform minimal as route corridor traces alignment of existing N2.</p> <p>Route corridor represents a localised upgrade of existing linear infrastructure.</p> <p>Area within route corridor already characterised by transport corridor formed by existing N2 roads.</p>	Low	No	-
	Louth Drumlin & Lake Areas	Medium	Effect of earthworks on physical landform minimal as route corridor traces alignment of existing N2.	Low	No	-

Option	Landscape Character Area	LCA Sensitivity	Description of Impact of Route Corridor	Likely Magnitude of Impact on LCAs	Likely Significant Impact on LCA	Level of Importance
			<p>Route corridor represents a localised upgrade of existing linear infrastructure.</p> <p>Area within route corridor already characterised by transport corridor formed by existing N2 roads.</p>			
	9 - Carrickmacross Drumlin & Lowland Farmland	Medium-Low	<p>Effect of earthworks on physical landform minimal as route corridor traces alignment of existing N2.</p> <p>Route corridor represents a localised upgrade of existing linear infrastructure.</p> <p>Area within route corridor already characterised by transport corridor formed by existing N2 roads.</p>	Medium-Low	No	-
	8 - Drumlin and Upland Farmland of South Monaghan	Medium-Low	<p>Effect of earthworks on physical landform minimal as the majority of the route corridor traces alignment of existing N2.</p> <p>A relatively short section would likely generate disruption to / division of the drumlin swarm and agricultural field patterns although it will remain in close proximity to existing N2 corridor.</p> <p>Route corridor represents a localised upgrade of existing linear infrastructure.</p> <p>Area within route corridor already characterised by transport corridor formed by existing N2 roads.</p>	Medium	No	-
	Muirhevna Plain	Medium	<p>Effect of earthworks on physical landform is large as majority of route corridor passes through farmed</p>	Medium	Yes	Regional

Option	Landscape Character Area	LCA Sensitivity	Description of Impact of Route Corridor	Likely Magnitude of Impact on LCAs	Likely Significant Impact on LCA	Level of Importance
Option C (Green)			<p>drumlins and will generate considerable cut and fill and divide agricultural field patterns.</p> <p>New major road represents a notable intensification of the road network in this LCA.</p>			
	Louth Drumlin & Lake Areas	Medium	<p>Effect of earthworks on physical landform is relatively large as majority of route corridor passes through farmed drumlins and will generate considerable cut and fill and divide agricultural field patterns.</p> <p>New major road represents a notable intensification of the road network in this LCA.</p>	Medium	Yes	Regional
	9 - Carrickmacross Drumlin & Lowland Farmland	Medium-Low	<p>Effect of earthworks on physical landform is relatively large as majority of route corridor passes through farmed drumlins and will generate considerable cut and fill and divide agricultural field patterns.</p> <p>New major road represents a notable intensification of the road network in this LCA.</p>	Medium	No	-
	8 - Drumlin and Upland Farmland of South Monaghan	Medium-Low	<p>Effect of earthworks on physical landform is large as majority of route corridor passes through farmed drumlins and will generate considerable cut and fill and divide agricultural field patterns.</p> <p>New major road represents a notable intensification of the road network in this LCA.</p>	Medium	No	-
	Muirhevna Plain	Medium	<p>Effect of earthworks on physical landform is relatively large as majority of route corridor passes through</p>	Medium	Yes	Regional

Option	Landscape Character Area	LCA Sensitivity	Description of Impact of Route Corridor	Likely Magnitude of Impact on LCAs	Likely Significant Impact on LCA	Level of Importance
Option D (Orange)			<p>farmed drumlins and will generate considerable cut and fill and divide agricultural field patterns.</p> <p>New major road represents a notable intensification of the road network in this LCA.</p>			
	Louth Drumlin & Lake Areas	Medium	<p>Effect of earthworks on physical landform is large as majority of route corridor passes through farmed drumlins and will generate considerable cut and fill and divide agricultural field patterns.</p> <p>New major road represents a notable intensification of the road network in this LCA.</p>	Medium	Yes	Regional
	9 - Carrickmacross Drumlin & Lowland Farmland	Medium-Low	<p>Effect of earthworks on physical landform is relatively large as majority of route corridor passes through farmed drumlins and will generate considerable cut and fill and divide agricultural field patterns.</p> <p>New major road represents a notable intensification of the road network in this LCA.</p>	Medium	No	-
	8 - Drumlin and Upland Farmland of South Monaghan	Medium-Low	<p>Effect of earthworks on physical landform is large as majority of route corridor passes through farmed drumlins and will generate considerable cut and fill and divide agricultural field patterns.</p> <p>New major road represents a notable intensification of the road network in this LCA.</p>	Medium	No	-
Option E (Orange +	Muirhevna Plain	Medium	<p>Effect of earthworks on physical landform is relatively large as majority of route corridor passes through</p>	Medium	Yes	Regional

Option	Landscape Character Area	LCA Sensitivity	Description of Impact of Route Corridor	Likely Magnitude of Impact on LCAs	Likely Significant Impact on LCA	Level of Importance
Link 1 + Green)			<p>farmed drumlins and will generate considerable cut and fill and divide agricultural field patterns.</p> <p>New major road represents a notable intensification of the road network in this LCA.</p>			
	Louth Drumlin & Lake Areas	Medium	<p>Effect of earthworks on physical landform is relatively large as majority of route corridor passes through farmed drumlins and will generate considerable cut and fill and divide agricultural field patterns.</p> <p>New major road represents a notable intensification of the road network in this LCA.</p>	Medium	Yes	Regional
	9 - Carrickmacross Drumlin & Lowland Farmland	Medium-Low	<p>Effect of earthworks on physical landform is relatively large as majority of route corridor passes through farmed drumlins and will generate considerable cut and fill and divide agricultural field patterns.</p> <p>New major road represents a notable intensification of the road network in this LCA.</p>	Medium	No	-
	8 - Drumlin and Upland Farmland of South Monaghan	Medium-Low	<p>Effect of earthworks on physical landform is relatively large as majority of route corridor passes through farmed drumlins and will generate considerable cut and fill and divide agricultural field patterns.</p> <p>New major road represents a notable intensification of the road network in this LCA.</p>	Medium	No	-

Option	Landscape Character Area	LCA Sensitivity	Description of Impact of Route Corridor	Likely Magnitude of Impact on LCAs	Likely Significant Impact on LCA	Level of Importance
Option F (Orange + Link 2 + Green)	Muirhevna Plain	Medium	<p>Effect of earthworks on physical landform is relatively large as majority of route corridor passes through farmed drumlins and will generate considerable cut and fill and divide agricultural field patterns.</p> <p>New major road represents a notable intensification of the road network in this LCA.</p>	Medium	Yes	Regional
	Louth Drumlin & Lake Areas	Medium	<p>Effect of earthworks on physical landform is relatively large as majority of route corridor passes through farmed drumlins and will generate considerable cut and fill and divide agricultural field patterns.</p> <p>New major road represents a notable intensification of the road network in this LCA.</p>	Medium	Yes	Regional
	9 - Carrickmacross Drumlin & Lowland Farmland	Medium-Low	<p>Effect of earthworks on physical landform is relatively large as majority of route corridor passes through farmed drumlins and will generate considerable cut and fill and divide agricultural field patterns.</p> <p>New major road represents a notable intensification of the road network in this LCA.</p>	Medium	No	-
	8 - Drumlin and Upland Farmland of South Monaghan	Medium-Low	<p>Effect of earthworks on physical landform is relatively large as majority of route corridor passes through farmed drumlins and will generate considerable cut and fill and divide agricultural field patterns.</p> <p>New major road represents a notable intensification of the road network in this LCA.</p>	Medium	No	-

1.1.2 Likely Magnitude of Effects on Landscape Elements

▪ Table A4.1 Likely Magnitude of Effects on Landscape Character Areas

Option	Landscape Element	Sensitivity	Description of Effect	Likely Magnitude of Effect on Landscape Elements	Likely Significant Effect	Level of Importance
Option A (Yellow)	Rahanna House Demesne	High-Medium	Clips the demesne layout with potential loss of vegetation and potential historic features adjacent to N2 but the core curtilage of house with mature parkland trees are unlikely to be impacted.	Low	No	-
	Cookstown House Demesne	Medium-Low	Demesne occurs entirely within the route corridor so will likely involve loss of some mature vegetation and may potentially be divided.	Very High-High	Yes	Local
	Monalty House Demesne	Medium	Drumever Woods will likely largely or completely to be avoided but could be clipped. Likely loss of mature trees at the curtilage of the house and potentially the house itself.	High	Yes	Local
	Sa15 - Lough Naglack	High	Road upgrades likely to be restricted to the area at the existing water crossing in the eastern extend in an area already characterised by the N2 road corridor.	Low	No	-
	Sa14 - Lisanisk Lake	High	Road upgrades likely to be restricted to the area at the existing water crossing in the eastern extend in an area already characterised by the N2 road corridor.	Low	No	-
Option B (Yellow + Blue)	Rahanna House Demesne	High-Medium	Clips the demesne layout with potential loss of vegetation and potential historic features adjacent to N2 but the core curtilage of house with mature parkland trees are unlikely to be impacted.	Low	No	-

Option	Landscape Element	Sensitivity	Description of Effect	Likely Magnitude of Effect on Landscape Elements	Likely Significant Effect	Level of Importance
	Cookstown House Demesne	Medium-Low	Demesne occurs entirely within the route corridor so will likely involve loss of some mature vegetation and may potentially be divided.	Very High-High	Yes	Local
	Monalty House Demesne	Medium	Drumever Woods will likely largely or completely to be avoided but could be clipped. Likely loss of mature trees at the curtilage of the house and potentially the house itself.	High	Yes	Local
	Sa15 - Lough Naglack	High	Road upgrades likely to be restricted to the area at the existing water crossing in the eastern extend in an area already characterised by the N2 road corridor.	Low	No	-
	Sa14 - Lisanisk Lake	High	Road upgrades likely to be restricted to the area at the existing water crossing in the eastern extend in an area already characterised by the N2 road corridor.	Low	No	-
Option C (Green)	Rahanna House Demesne	High-Medium	Clips the demesne layout with potential loss of vegetation and potential historic features adjacent to N2 but the core curtilage of house with mature parkland trees are unlikely to be impacted.	Low	No	-
	Cookstown House Demesne	Medium-Low	Demesne occurs entirely within the route corridor so will likely involve loss of some mature vegetation and may potentially be divided.	Very High-High	Yes	Local
	Arthurstown House Demesne	Medium	Route corridor clips a large proportion of the demesne but mature trees adjoining the house are avoided.	Medium	Yes	Regional

Option	Landscape Element	Sensitivity	Description of Effect	Likely Magnitude of Effect on Landscape Elements	Likely Significant Effect	Level of Importance
	Potential Demesne At Rahans	Low	Route corridor clips a large proportion of the demesne, but no identifiable historic features remain.	Low	No	-
Option D (Orange)	Louth Hall Demesne	High	The valuable area of trees captured within the pNHA site are unlikely to be affected.	Negligible	No	-
	Knockabbey Castle Demesne	High	Severs the historic boundary for the demesne but mature trees in the eastern side are likely to be avoided.	Medium	Yes	National
Option E (Orange + Link 1 + Green)	Louth Hall Demesne	High	The valuable area of trees captured within the pNHA site are unlikely to be affected.	Negligible	No	-
	Knockabbey Castle Demesne	High	Severs the historic boundary for the demesne but mature trees in the eastern side are likely to be avoided.	Medium	Yes	National
	Potential Demesne At Rahans	Low	Route corridor clips a large proportion of the demesne, but no identifiable historic features remain.	Low	No	-
Option F (Orange + Link 2 + Green)	Louth Hall Demesne	High	The valuable area of trees captured within the pNHA site are unlikely to be affected.	Negligible	No	-
	Knockabbey Castle Demesne	High	Severs the historic boundary for the demesne but mature trees in the eastern side are likely to be avoided.	Medium	Yes	National

1.2 Assessment of Potential Impacts - Landscape

Table A4.3 Likely Magnitude of Impacts on Visual Receptors

Option	Receptor Type	Name	Sensitivity	Assessment of visual impact	Likely Magnitude of Impact	Likely Significant Impact	Level of Importance
Option A (Yellow)	Settlement	Reaghstown	Medium	Proposed scheme unlikely to be visible from the majority of dwellings in this settlement.	Low-Negligible	No	-
	Recreational trail	The Lakes Walking Trail	Medium	Route Corridor Option envelopes a considerable portion of this trail. But local landscape and view area already characterised by N2. Trail likely to be retained but possibly rerouted slightly in places, make crossing points safer.	Low	No	-
	Settlement	Carrickmacross	Medium	Intensification of infrastructure within the views is likely to be noticeable within the context of a busy settlement where transport infrastructure and general built development is already characteristic feature of views	Medium	Yes	Local
	Tourism and recreation	Nuremore Hotel & Country Golf Club	High	Potential infringement into golf course. Potentially a notable change to existing views enjoyed by golfers and hotel guests.	High	Yes	Regional

Option	Receptor Type	Name	Sensitivity	Assessment of visual impact	Likely Magnitude of Impact	Likely Significant Impact	Level of Importance
	Recreational trail	Town, Avenue & Lakeside Walk	High	Road upgrades likely to be restricted to the area at the existing N2 which is already characterised by a major road corridor. Small degree of visual change likely.	Low	No	-
	Recreational trail	Pilgrims' Way Tin Church Trail Short	High-Medium	Road upgrades likely to be restricted to the area at the existing N2 which is already characterised by a major road corridor. Minimal degree of visual change likely.	Low	No	-
	Designated Scenic Route / View	SV20 - View of Slieve Gullion at Taplagh, Broomfield	Medium	Likely that vegetation that screens views towards Slieve Gullion will be removed resulting in an improvement to the view.	Negligible / Positive	No	-
	Designated Scenic Route / View	SV19 - Distant views of Lough Muckno & Slieve Gullion	High	Road upgrades likely to be restricted to the area at the existing N2 which is already characterised by a major road corridor. Minimal degree of visual change likely.	Negligible	No	-
	Designated Scenic Route / View	SV18 - Distant views of Lough Muckno & Slieve Gullion	High	Road upgrades likely to be restricted to the area at the existing N2 which is already characterised by a major road	Negligible	No	-

Option	Receptor Type	Name	Sensitivity	Assessment of visual impact	Likely Magnitude of Impact	Likely Significant Impact	Level of Importance
				corridor. Minimal degree of visual change likely.			
	Settlement	Broomfield	Medium	Intensification of infrastructure within the views is likely to be noticeable however views are already characterised by existing N2.	Medium	Yes	Local
Option B (Yellow + Blue)	Settlement	Reaghstown	Medium	Proposed scheme unlikely to be visible by the majority of dwellings in this settlement.	Low-Negligible	No	-
	Recreational trail	The Lakes Walking Trail	Medium	Route Corridor Option envelopes a considerable portion of this trail. But local landscape and view area already characterised by N2. Trail likely to be retained but possibly rerouted slightly in places, make crossing points safer.	Low	No	-
	Settlement	Carrickmacross	Medium	Intensification of infrastructure within the views is likely to be noticeable within the context of a busy settlement where transport infrastructure and general built development is already characteristic feature of views	Medium	Yes	Local

Option	Receptor Type	Name	Sensitivity	Assessment of visual impact	Likely Magnitude of Impact	Likely Significant Impact	Level of Importance
	Tourism and recreation	Nuremore Hotel & Country Golf Club	High	Potential infringement into golf course. Potentially a notable change to existing views enjoyed by golfers and hotel guests.	High	Yes	Regional
	Recreational trail	Town, Avenue & Lakeside Walk	High	Road upgrades likely to be restricted to the area at the existing N2 which is already characterised by a major road corridor. Small degree of visual change likely.	Low	No	-
	Recreational trail	Pilgrims' Way Tin Church Trail Short	High-Medium	Road upgrades likely to be restricted to the area at the existing N2 which is already characterised by a major road corridor. Minimal degree of visual change likely.	Low	No	-
	Designated Scenic Route / View	SV20 - View of Slieve Gullion at Taplagh, Broomfield	Medium	Likely that vegetation that screens views towards Slieve Gullion will be removed resulting in an improvement to the view.	Negligible / Positive	No	-
	Designated Scenic Route / View	SV19 - Distant views of Lough Muckno & Slieve Gullion	High	Road upgrades likely to be restricted to the area at the existing N2 which is already characterised by a major road corridor. Minimal degree of visual change likely.	Negligible	No	-

Option	Receptor Type	Name	Sensitivity	Assessment of visual impact	Likely Magnitude of Impact	Likely Significant Impact	Level of Importance
	Designated Scenic Route / View	SV18 - Distant views of Lough Muckno & Slieve Gullion	High	Road upgrades likely to be restricted to the area at the existing N2 which is already characterised by a major road corridor. Minimal degree of visual change likely.	Negligible	No	-
	Settlement	Broomfield	Medium	Route corridor would result in settlement becoming contained between major roads. Potential cumulative visual impacts.	High-Medium	Yes	Local
Option C (Green)	Designated Scenic Route / View	SV20 - View of Slieve Gullion at Taplagh, Broomfield	Medium	Runs close to the southern end of the route, intersecting at portion that is enclosed in nature with roadside vegetation screening views towards Slieve Gullion to the north-east.	Low	No	-
	Designated Scenic Route / View	SV19 - Distant views of Lough Muckno & Slieve Gullion	High	Runs close to the southern end of the route, intersecting at portion that is at a low elevation and enclosed in nature with roadside vegetation screening views towards Lough Muckno & Slieve Gullion to the north-east. However, from the more elevated sections of the scenic route, views will be afforded of the route corridor	Medium	Yes	Regional

Option	Receptor Type	Name	Sensitivity	Assessment of visual impact	Likely Magnitude of Impact	Likely Significant Impact	Level of Importance
				where it traverses a drumlin hill in the lower middle ground of the view. Change to view will be an intrusion rather than an obstruction as long distance views will be retained. The introduction of light from vehicle headlights will be a new feature in the middle ground of the view at night, however it is unlikely for views to be afforded to Lough Muckno & Slieve Gullion even in twilight hours.			
	Designated Scenic Route / View	SV18 - Distant views of Lough Muckno & Slieve Gullion	High	Road upgrades likely to be restricted to the area at the existing N2 which is already characterised by a major road corridor. Minimal degree of visual change likely.	Negligible	No	-
Option D (Orange)	Tourism and recreation	Knockabbey Castle Demesne	High	Potential for glimpse views of new major road corridor passing through the adjoining rural landscape – loss of tranquillity.	High	Yes	Regional
	Recreational trail	Monaghan Way	High-Medium	National Waymarked Walking Route passes route corridor at Ardkirk but high degree of intervening terrain screening so less than 1.5km of walking	Medium	Yes	National

Option	Receptor Type	Name	Sensitivity	Assessment of visual impact	Likely Magnitude of Impact	Likely Significant Impact	Level of Importance
				route is likely to be afforded close views. When views are afforded it will be of a major road through farmed rolling drumlins. Intrusion likely to occur but obstruction is unlikely.			
Option E (Orange + Link 1 + Green)	Tourism and recreation	Knockabbey Castle Demesne	High	Potential for glimpse views of new major road corridor passing through the adjoining rural landscape – loss of tranquillity.	High	Yes	Regional
	Designated Scenic Route / View	SV20 - View of Slieve Gullion at Taplagh, Broomfield	Medium	Runs close to the southern end of the route, intersecting at portion that is enclosed in nature with roadside vegetation screening views towards Slieve Gullion to the north-east.	Low	No	-
	Designated Scenic Route / View	SV19 - Distant views of Lough Muckno & Slieve Gullion	High	Runs close to the southern end of the route, intersecting at portion that is at a low elevation and enclosed in nature with roadside vegetation screening views towards Lough Muckno & Slieve Gullion to the north-east. However, from the more elevated sections of the scenic route views will be	Medium	Yes	Regional

Option	Receptor Type	Name	Sensitivity	Assessment of visual impact	Likely Magnitude of Impact	Likely Significant Impact	Level of Importance
				afforded of the route corridor where it traverses a drumlin hill in the lower middle ground of the view. Change to view will be and intrusion rather than an obstruction as long distance views will be retained. The introduction of light from vehicle headlights will be a new feature in the middle ground of the view at night, however it is unlikely for views to be afforded to Lough Muckno & Slieve Gullion even in twilight hours.			
	Designated Scenic Route / View	SV18 - Distant views of Lough Muckno & Slieve Gullion	High	Road upgrades likely to be restricted to the area at the existing N2 which is already characterised by a major road corridor. Minimal degree of visual change likely.	Negligible	No	-
Option F (Orange + Link 2 + Green)	Tourism and recreation	Knockabbey Castle Demesne	High	Potential for glimpse views of new major road corridor passing through the adjoining rural landscape. – loss of tranquillity	High	Yes	Regional
	Designated Scenic Route / View	SV20 - View of Slieve Gullion at Taplagh, Broomfield	Medium	Runs close to the southern end of the route, intersecting at portion that is enclosed in nature with roadside	Low	No	-

Option	Receptor Type	Name	Sensitivity	Assessment of visual impact	Likely Magnitude of Impact	Likely Significant Impact	Level of Importance
				vegetation screening views towards Slieve Gullion to the north-east.			
	Designated Scenic Route / View	SV19 - Distant views of Lough Muckno & Slieve Gullion	High	Runs close to the southern end of the route, intersecting at portion that is at a low elevation and enclosed in nature with roadside vegetation screening views towards Lough Muckno & Slieve Gullion to the north-east. However, from the more elevated sections of the scenic route views will be afforded of the route corridor where it traverses a drumlin hill in the lower middle ground of the view. Change to view will be and intrusion rather than an obstruction as long distance views to will be retained. The introduction of light from vehicle headlights will be a new feature in the middle ground of the view at night, however it is unlikely for views to be afforded to Lough Muckno & Slieve Gullion even in twilight hours.	Medium	Yes	Regional

Option	Receptor Type	Name	Sensitivity	Assessment of visual impact	Likely Magnitude of Impact	Likely Significant Impact	Level of Importance
	Designated Scenic Route / View	SV18 - Distant views of Lough Muckno & Slieve Gullion	High	Road upgrades likely to be restricted to the area at the existing N2 which is already characterised by a major road corridor. Minimal degree of visual change likely.	Negligible	No	-

Appendix 5.1 Results of Ecology Desktop Study

Common Name	Scientific Name	Protection ⁹⁷	Red-Listing Status ⁹⁸
Flora			
Blunt-fruited Pottia	<i>Tortula modica</i>	n/a	Vulnerable
Bud-headed Groove-moss	<i>Aulacomnium androgynum</i>	n/a	Vulnerable
Common Extinguisher-moss	<i>Encalypta vulgaris</i>	n/a	Near Threatened
Eight-stamened Waterwort	<i>Elatine hydropiper</i>	n/a	Vulnerable
Large White-moss	<i>Leucobryum glaucum</i>	n/a	Least Concern
Red-neck Forklet-moss	<i>Dicranella cerviculata</i>	n/a	Near Threatened
Smooth Brome	<i>Bromus racemosus</i>	n/a	Vulnerable
Swamp Meadow-grass	<i>Poa palustris</i>	n/a	Vulnerable
Woodsy Thyme-moss	<i>Plagiomnium cuspidatum</i>	n/a	Near Threatened
Fauna			
Atlantic salmon	<i>Salmo salar</i>	HD V	Vulnerable
Barn Owl	<i>Tyto alba</i>	WA	Red listed under BoCCI
Barn Swallow	<i>Hirundo rustica</i>	WA	Amber listed under BoCCI
Black-headed Gull	<i>Chroicocephalus ridibundus</i>	WA	Red listed under BoCCI
Blind Snail	<i>Cecilioides acicula</i>	n/a	Near Threatened
Brown Long-eared Bat	<i>Plecotus auritus</i>	WA, HD IV	Least Concern
Common Coot	<i>Fulica atra</i>	WA, BD II, III	Amber listed under BoCCI
Common Frog	<i>Rana temporaria</i>	WA, HD V	Least Concern
Common Goldeneye	<i>Bucephala clangula</i>	WA, BD II	Amber listed under BoCCI
Common Kestrel	<i>Falco tinnunculus</i>	WA	Amber listed under BoCCI
Common Kingfisher	<i>Alcedo atthis</i>	WA, BD I	Amber listed under BoCCI
Common Linnet	<i>Carduelis cannabina</i>	WA	Amber listed under BoCCI
Common Lizard	<i>Zootoca vivipara</i>	WA	Least Concern
Common Pheasant	<i>Phasianus colchicus</i>	WA, BD II, III	Green listed under BoCCI
Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	WA, HD IV	Least Concern
Common Pochard	<i>Aythya ferina</i>	WA, BD II, III	Amber listed under BoCCI
Common Quail	<i>Coturnix coturnix</i>	WA	Red listed under BoCCI
Common Redshank	<i>Tringa totanus</i>	WA	Red listed under BoCCI
Common Sandpiper	<i>Actitis hypoleucos</i>	WA	Amber listed under BoCCI
Common Shelduck	<i>Tadorna tadorna</i>	WA	Amber listed under BoCCI
Common Snipe	<i>Gallinago gallinago</i>	WA, BD II, III	Amber listed under BoCCI
Common Starling	<i>Sturnus vulgaris</i>	WA	Amber listed under BoCCI
Common Swift	<i>Apus apus</i>	WA	Amber listed under BoCCI
Common Tern	<i>Sterna hirundo</i>	WA, BD I	Amber listed under BoCCI
Common Whorl Snail	<i>Vertigo pygmaea</i>	n/a	Near Threatened
Common Wood Pigeon	<i>Columba palumbus</i>	WA, BD II, III	Green listed under BoCCI
Corn Crake	<i>Crex crex</i>	WA, BD I	Red listed under BoCCI
Daubenton's Bat	<i>Myotis daubentonii</i>	WA, HD IV	Least Concern
English Chrysalis Snail	<i>Leiostryla anglica</i>	n/a	Vulnerable
Eurasian Badger	<i>Meles meles</i>	WA	Least Concern
Eurasian Curlew	<i>Numenius arquata</i>	WA, BD II	Red listed under BoCCI

⁹⁷ HDII/IV/V = Habitats Directive Annexes II/IV/V; FPO = Flora Protection Order; WA = Wildlife Acts; BD I = Birds Directive Annex I.

⁹⁸ Mammal Red-list from Marnell *et al.*, 2019. Birds from *Birds of Conservation Concern in Ireland 2014–2019* (Colhoun & Cummins, 2013); Vascular Flora from the Irish Red Data Book 1 Vascular Plants (Curtis & McGough 2005); Fish, Amphibians and Reptiles from (King *et al.*, 2011); Bryophytes Red List from Lockhart *et al.* 2012; Cetaceans conservation status from NPWS (2013b).

Common Name	Scientific Name	Protection ⁹⁷	Red-Listing Status ⁹⁸
Eurasian Oystercatcher	<i>Haematopus ostralegus</i>	WA	Amber listed under BoCCI
Eurasian Pygmy Shrew	<i>Sorex minutus</i>	WA	Least Concern
Eurasian Sparrowhawk	<i>Accipiter nisus</i>	WA	Amber listed under BoCCI
Eurasian Teal	<i>Anas crecca</i>	WA, BD II, III	Amber listed under BoCCI
Eurasian Tree Sparrow	<i>Passer montanus</i>	WA	Amber listed under BoCCI
Eurasian Wigeon	<i>Anas penelope</i>	WA, BD II, III	Amber listed under BoCCI
Eurasian Woodcock	<i>Scolopax rusticola</i>	WA, BD II, III	Amber listed under BoCCI
European Eel	<i>Anguilla anguilla</i>	n/a	Critically Endangered
European Golden Plover	<i>Pluvialis apricaria</i>	WA, BD I, II, III	Red listed under BoCCI
European Greenfinch	<i>Carduelis chloris</i>	WA	Amber listed under BoCCI
European Hedgehog	<i>Erinaceus europaeus</i>	WA	Least Concern
European Otter	<i>Lutra lutra</i>	WA, HD II, IV	Least Concern
European Robin	<i>Erithacus rubecula</i>	WA	Amber listed under BoCCI
Gadwall	<i>Anas strepera</i>	WA, BD II	Amber listed under BoCCI
Globular Pea Mussel	<i>Pisidium hibernicum</i>	n/a	Near Threatened
Goldcrest	<i>Regulus regulus</i>	WA	Amber listed under BoCCI
Great Black-backed Gull	<i>Larus marinus</i>	WA	Amber listed under BoCCI
Great Cormorant	<i>Phalacrocorax carbo</i>	WA	Amber listed under BoCCI
Great Crested Grebe	<i>Podiceps cristatus</i>	WA	Amber listed under BoCCI
Greater Scaup	<i>Aythya marila</i>	WA, BD II, III	Amber listed under BoCCI
Grey Partridge	<i>Perdix perdix</i>	WA, BD II, III	Red listed under BoCCI
Grey Plover	<i>Pluvialis squatarola</i>	WA	Amber listed under BoCCI
Grey Wagtail	<i>Motacilla cinerea</i>	WA	Red listed under BoCCI
Greylag Goose	<i>Anser anser</i>	WA, BD II, III	Amber listed under BoCCI
Gypsy Cuckoo Bee	<i>Bombus bohemicus</i>	n/a	Near Threatened
Heath Snail	<i>Helicella itala</i>	n/a	Vulnerable
Herring Gull	<i>Larus argentatus</i>	WA	Red listed under BoCCI
House Martin	<i>Delichon urbicum</i>	WA	Amber listed under BoCCI
House Sparrow	<i>Passer domesticus</i>	WA	Amber listed under BoCCI
Irish Damselfly	<i>Coenagrion lunulatum</i>	n/a	Vulnerable
Irish Hare	<i>Lepus timidus subsp. hibernicus</i>	WA	Least Concern
Irish Stoat	<i>Mustela erminea subsp. hibernica</i>	WA	Least Concern
Jack Snipe	<i>Lymnocyrtus minimus</i>	WA, BD II III	Green listed under BoCCI
Lake Orb Mussel	<i>Musculium lacustre</i>	n/a	Vulnerable
Large Red Tailed Bumble Bee	<i>Bombus lapidarius</i>	N/A	Near Threatened
Leisler's Bat	<i>Nyctalus leisleri</i>	WA, HD IV	Near Threatened
Lesser Black-backed Gull	<i>Larus fuscus</i>	WA	Amber listed under BoCCI
Lesser Bulin	<i>Merdigera obscura</i>	n/a	Endangered
Little Grebe	<i>Tachybaptus ruficollis</i>	WA	Amber listed under BoCCI
Mallard	<i>Anas platyrhynchos</i>	WA, BD II, III	Green listed under BoCCI
Marsh Fritillary	<i>Euphydryas aurinia</i>	HD II	Vulnerable
Marsh Whorl Snail	<i>Vertigo antivertigo</i>	n/a	Vulnerable
Meadow Pipit	<i>(Anthus pratensis</i>	WA	Red listed under BoCCI
Merlin	<i>Falco columbarius</i>	WA, BD I	Amber listed under BoCCI
Mew Gull	<i>Larus canus</i>	WA	Amber listed under BoCCI
Mistle Thrush	<i>Turdus viscivorus</i>	WA	Amber listed under BoCCI
Moss Bladder Snail	<i>Aplexa hypnorum</i>	n/a	Vulnerable
Moss Chrysalis Snail	<i>Pupilla muscorum</i>	n/a	Endangered
Mute Swan	<i>Cygnus olor</i>	WA	Amber listed under BoCCI

Common Name	Scientific Name	Protection ⁹⁷	Red-Listing Status ⁹⁸
n/a	<i>Bagous frit</i>	n/a	Vulnerable
n/a	<i>Cyphon punctipennis</i>	n/a	Vulnerable
n/a	<i>Haliphus lineolatus</i>	n/a	Near Threatened
n/a	<i>Hydraena testacea</i>	n/a	Vulnerable
n/a	<i>Laccornis oblongus</i>	n/a	Near Threatened
n/a	<i>Labiobaetis atrebatinus</i>	n/a	Endangered
n/a	<i>Leptophlebia marginata</i>	n/a	Vulnerable
n/a	<i>Procloeon bifidum</i>	n/a	Vulnerable
Natterer's Bat	<i>Myotis nattereri</i>	WA, HD IV	Least Concern
Northern Lapwing	<i>Vanellus vanellus</i>	WA, BD II	Red listed under BoCCI
Northern Pintail	<i>Anas acuta</i>	WA, BD II, III	Red listed under BoCCI
Northern Shoveler	<i>Anas clypeata</i>	WA, BD II, III	Red listed under BoCCI
Peregrine Falcon	<i>Falco peregrinus</i>	WA, BD I	Green listed under BoCCI
Pine Marten	<i>Martes martes</i>)	WA, HD V	Least Concern
Pink-footed Goose	<i>Anser brachyrhynchus</i>	WA, BD II	Green listed under BoCCI
Point Snail	<i>Acicula fusca</i>	n/a	Vulnerable
Prickly Snail	<i>Acanthinula aculeata</i>	n/a	Near Threatened
Red Grouse	<i>Lagopus lagopus</i>	WA, BD II III	Red listed under BoCCI
Red Squirrel	<i>Sciurus vulgaris</i>	WA	Near Threatened
Red-breasted Merganser	<i>Mergus serrator</i>	WA, BD II	Green listed under BoCCI
Rock Pigeon	<i>Columba livia</i>	WA, HD II	Green listed under BoCCI
Sand Martin	<i>Riparia riparia</i>	WA	Amber listed under BoCCI
Sky Lark	<i>Alauda arvensis</i>	WA	Amber listed under BoCCI
Smooth Grass Snail	<i>Vallonia pulchella</i>	n/a	Vulnerable
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	WA, HD IV	Least Concern
Spotted Flycatcher	<i>Muscicapa striata</i>	WA	Amber listed under BoCCI
Stock Pigeon	<i>Columba oenas</i>	WA	Amber listed under BoCCI
Stonechat	<i>Saxicola torquata</i>	WA	Amber listed under BoCCI
Striated Whorl Snail	<i>Vertigo substriata</i>	n/a	Near Threatened
Swan Mussel	<i>Anodonta cygnea</i>	n/a	Vulnerable
Tree Snail	<i>Balea perversa</i>	n/a	Vulnerable
Tufted Duck	<i>Aythya fuligula</i>	WA, BD II, III	Amber listed under BoCCI
Wall	<i>Lasiommata megera</i>	n/a	Endangered
Water Rail	<i>Rallus aquaticus</i>	WA	Amber listed under BoCCI
Whinchat	<i>Saxicola rubetra</i>	WA	Amber listed under BoCCI
Whirlpool Ramshorn	<i>Anisus vortex</i>	n/a	Vulnerable
Whooper Swan	<i>Cygnus cygnus</i>	WA, BD I	Amber listed under BoCCI
Yellowhammer	<i>Emberiza citrinella</i>	WA	Red listed under BoCCI

Appendix 5.2 Ecological Sites within the Study Area

Ecological Site No.	Description	Ecological Value	Option
1	Semi-improved wet grassland and dense scrub.	Local High	Option A (Yellow) Option B (Yellow+Blue) Option D (Orange)
2	Dense scrub.	Local High	Option D (Orange)
3	Wet woodland (potentially Alluvial woodland [*91E0]), dense scrub, exposed rock and improved wet grassland.	International	Option D (Orange)
4	Planted broadleaved woodland.	Local High	Option A (Yellow) Option B (Yellow+Blue)
5	Sparse semi-natural broadleaved woodland and semi-natural/improved grassland	Local High	Option D (Orange)
6	Potentially species-rich wet grassland, large dense patches of scrub and semi-natural broadleaved woodland.	County	Option A (Yellow) Option B (Yellow+Blue)
7	Semi-natural broadleaved woodland.	Local High	Option D (Orange)
8	Semi-improved wet grassland and dense scrub.	Local High	Option A (Yellow) Option B (Yellow+Blue)
9	Planted mixed woodland along at top of the banks of Annahale stream.	Local High	Option C (Green) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)
10	Planted broadleaved woodland.	Local High	Option C (Green) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)
11	Planted broadleaved woodland.	Local High	Option A (Yellow)
12	Dense scrub.	Local High	Option B (Yellow+Blue)
13	Large area of semi-natural broadleaved woodland.	County	Option B (Yellow+Blue)
14	Species-rich wet grassland (potentially <i>Molinia</i> meadows [6410]) and wet woodland/willow carr (Alluvial woodland [*91E0]).	International	Option C (Green) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)
15	Edengirley fen, comprising fen (potentially <i>Cladium</i> fen [*7210] and alkaline fen [7230]) and freshwater marsh habitats.	International	Option A (Yellow) Option B (Yellow+Blue)
16	Semi-natural wet grassland and area of semi-natural broadleaved woodland	County	Option F (Orange+Link 2+Green)
17	Drumharrif Lough with surrounding habitats of reed swamp, fen (<i>Cladium</i> fen [*7210] and alkaline fen [7230]) and semi-natural wet grassland	International	Option A (Yellow) Option B (Yellow+Blue)
18	Semi-natural broadleaved woodland.	Local High	Option A (Yellow) Option B (Yellow+Blue)
19	Dystrophic lake Coolair Lough and Tullymackilmartin watercourse with adjacent habitats of reed swamp, fen, wet grassland, freshwater marsh, wet woodland and transition mires and quaking bog (potentially <i>Cladium</i> fen [*7210], alluvial woodland [*91E0], <i>Molinia</i> meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]).	International	Option D (Orange) Option F (Orange+Link 2+Green)
20	Planted broadleaved woodland.	Local High	Option A (Yellow) Option B (Yellow+Blue)
21	Semi-natural broadleaved woodland.	Local High	Option A (Yellow) Option B (Yellow+Blue)
22	Acid oligotrophic Altiduff Lough and unnamed lake with surrounding habitats of reed swamp, fen, species-rich wet grassland, freshwater marsh and bog/wet woodland (potentially <i>Cladium</i> fen [*7210], bog woodland [*91D0] and alluvial woodland [*91E0], <i>Molinia</i> meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]).	International	Option D (Orange), Option F (Orange+Link 2+Green)

23	Planted broadleaved woodland.	Local High	Option A (Yellow) Option B (Yellow+Blue)
24	Semi-natural broadleaved woodland and dense scrub.	Local High	Option D (Orange), Option F (Orange+Link 2+Green)
25	Donaghmoyne fen and transition mire and quaking bog habitats (<i>Cladium</i> fen [*7210], transition mires [7140] and alkaline fen [7230]).	International	Option A (Yellow) Option B (Yellow+Blue)
26	Planted mixed woodland.	Local High	Option A (Yellow) Option B (Yellow+Blue)
27	Semi-natural broadleaved woodland.	Local High	Option A (Yellow) Option B (Yellow+Blue)
28	Linear broadleaved woodland along the banks of River Rossdreenagh, possibly wet woodland (potentially Alluvial woodland [*91E0]). In close proximity to Tober Lasair Spring and Aghavilla Spring.	International	Option A (Yellow) Option B (Yellow+Blue)
29	Acid oligotrophic lake Blittoge Lough with surrounding habitats of reed swamp, fen and wet woodland (potentially <i>Cladium</i> fen [*7210], alluvial woodland [*91E0], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]).	International	Option D (Orange) Option F (Orange+Link 2+Green)
30	Freshwater marsh, transition mire and quaking bog, semi-natural broadleaved woodland, possibly wet woodland, and dense scrub (potentially Alluvial woodland [*91E0] and transition mires [7140]). Nafarty River flowing along western boundary of ecological site.	International	Option A (Yellow) Option B (Yellow+Blue)
31	Semi-natural broadleaved woodland.	Local High	Option C (Green) Option E (Orange+Link 1+Green)
32	Wet woodland (potentially Alluvial woodland [*91E0]) along the banks of the River Rossdreenagh.	International	Option C (Green) Option E (Orange+Link 1+Green)
33	Heath, bog woodland and dense scrub (potentially dry heath [4030] and bog woodland [*91D0]).	International	Option D (Orange) Option F (Orange+Link 2+Green)
34	Ross Lough with surrounding habitats of reed swamp, fen, species-rich grassland and wet woodland (potentially <i>Cladium</i> fen [*7210], alluvial woodland [*91E0], <i>Molinia</i> meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]).	International	Option D (Orange) Option F (Orange+Link 2+Green)
35	Lough Naglack pNHA. Calcareous lake with surrounding habitats of reed swamp, fen, wet grassland, freshwater marsh and mixed woodland, possibly wet woodland (potentially <i>Cladium</i> fen [*7210], alluvial woodland [*91E0], <i>Molinia</i> meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]).	International	Option A (Yellow) Option B (Yellow+Blue)
36	Acid oligotrophic lake and Drumever wet woodland (potentially <i>Cladium</i> fen [*7210], alluvial woodland [*91E0], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]).	International	Option A (Yellow) Option B (Yellow+Blue)
37	Semi-natural broadleaved woodland, including bog woodland (potentially Bog woodland [*91D0]). River Radrumskean to the north.	International	Option C (Green) Option E (Orange+Link 1+Green)
38	Semi-improved wet grassland.	Local High	Option C (Green) Option E (Orange+Link 1+Green)
39	Semi-natural broadleaved woodland.	Local High	Option A (Yellow) Option B (Yellow+Blue)
40	Lake with surrounding habitats of reed swamp, fen, species-rich wet grassland and wet woodland (potentially <i>Cladium</i> fen [*7210], alluvial woodland [*91E0], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]).	International	Option D (Orange) Option F (Orange+Link 2+Green)
41	Acid oligotrophic lake Lisnashannagh Lough with surrounding habitats of reed swamp, fen, species-rich wet grassland and wet woodland/willow carr (potentially <i>Cladium</i> fen [*7210], alluvial woodland [*91E0], <i>Molinia</i> meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]). River Aclint flows through the ecological site.	International	Option A (Yellow) Option B (Yellow+Blue)
42	Wet woodland (potentially Alluvial woodland [*91E0]).	International	Option C (Green)

			Option E (Orange+Link 1+Green)
43	Planted broadleaved woodland.	Local High	Option A (Yellow) Option B (Yellow+Blue)
44	Planted broadleaved woodland.	Local High	Option A (Yellow) Option B (Yellow+Blue)
45	Acid oligotrophic lake Clonturk (Duffs) Lough with surrounding habitats of reed swamp, fen and wet woodland (potentially <i>Cladium</i> fen [*7210], alluvial woodland [*91E0], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]).	International	Option A (Yellow) Option B (Yellow+Blue)
46	Planted broadleaved woodland.	Local High	Option A (Yellow) Option B (Yellow+Blue)
47	Semi-natural broadleaved woodland including bog woodland and oak-ash-hazel woodland and possibly wet woodland and poor fen (bog woodland [*91D0] and possibly dry heath [4030]). Some areas cut. Drumboory River present along western section.	International	Option A (Yellow) Option B (Yellow+Blue)
48	Planted broadleaved woodland.	Local High	Option A (Yellow) Option B (Yellow+Blue)
49	Wet woodland (potentially Alluvial woodland [*91E0]) along the River Glyde.	International	Option C (Green)
50	Wet woodland (potentially Alluvial woodland [*91E0]) along the River Glyde.	International	Option C (Green)
51	Planted mixed woodland.	Local High	Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)
52	Acid oligotrophic lake Annahean Lough, with surrounding habitats of reed swamp, fen and wet grassland, transitioning into semi-natural broadleaved woodland (potentially <i>Cladium</i> fen [*7210], alluvial woodland [*91E0], <i>Molinia</i> meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]). It flows into Drumgeeny River.	International	Option A (Yellow) Option B (Yellow+Blue)
53	Species-rich wet grassland (potentially <i>Molinia</i> meadows [6410]) and freshwater marsh.	National	Option C (Green)
54	Heathland, bog woodland and dense scrub (potentially bog woodland [*91D0] and dry heath [4030]).	International	Option A (Yellow) Option B (Yellow+Blue)
55	Reed swamp, fen, species-rich grassland and wet woodland (potentially <i>Cladium</i> fen [*7210], alluvial woodland [*91E0], <i>Molinia</i> meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]).	International	Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)
56	Species-rich wet grassland (potentially <i>Molinia</i> meadows [6410]).	National	Option C (Green)
57	Artificial pond with surrounding wet habitats.	Local High	Option C (Green)
58	Lake with surrounding habitats of reed swamp, fen, species-rich wet grassland and wet woodland/willow carr (<i>Cladium</i> fen [*7210], alluvial woodland [*91E0], <i>Molinia</i> meadows [6410], hydrophilous tall-herb swamp [6430], transition mires [7140] and alkaline fen [7230]).	International	Option C (Green)
59	Wet woodland (potentially Alluvial woodland [*91E0]) with Rathory River flowing along its western section.	International	Option A (Yellow) Option B (Yellow+Blue)
60	Planted mixed woodland.	Local High	Option A (Yellow) Option B (Yellow+Blue) Option C (Green)
61	Planted mixed woodland.	Local High	Option A (Yellow) Option B (Yellow+Blue) Option C (Green)
62	Freshwater marsh and wet woodland (potentially alluvial woodland [*91E0]).	International	Option A (Yellow) Option B (Yellow+Blue) Option C (Green)
63	Species-rich wet grassland (potentially <i>Molinia</i> meadows [6410]).	National	Option A (Yellow) Option B (Yellow+Blue)
64	Marsh and wet wood (Thomastown).	International	N/A

65	Broadleaved deciduous wet woodland.	International	N/A
66	Small area of broadleaved deciduous woodland.	Local High	N/A
67	Artnalevery scrub and marsh.	County	N/A
68	Scrub, wet ground. Crowmartin. Marsh, wet wood, scrub, reed swamp.	National	N/A
69	Linear broadleaved woodland.	Local High	N/A
70	Legghimore Fen. Transition Mire.	International	N/A
71	Derryglam Spring, calcareous spring.	International	N/A
72	Cummoge Well, Calcareous Spring, possibility of fen habitats.	International	N/A
73	Longfield Otra Spring, calcareous spring.	International	N/A
74	Broadleaved deciduous wet woodland.	International	N/A
75	Rathmore Spring, calcareous spring.	International	N/A
76	Tullyskerry Fields. Wet grassland, river, reed swamp.	National	N/A
77	Limited visibility. Broadleaved woodland.	Local High	N/A
78	Linear broadleaved deciduous woodland.	Local High	N/A
79	Moyland Lough cNHA. Lake, fully flooded beyond area in aerials. Broadleaved woodland on edges.	International	N/A
80	Broadleaved deciduous woodland.	Local High	N/A
81	Tober Bridgey Spring. Planted broadleaved woodland, possible calcareous spring present.	International	N/A
82	Drumgowna wetland of marsh, wet grassland.	National	N/A
83	Previously identified wetland site at Rootate North. Small young patch of broadleaved woodland scrub.	Local High	N/A
84	Wet grassland and scrub.	County	N/A
85	Killeen wet woodland. Very small area.	International	N/A
86	Pond feature.	Local High	N/A
87	Rathneestin North, marsh, scrub.	Local High	N/A
88	Wet grassland flooded and scrub willow, gorse, bramble.	National	N/A
89	Nicholastown (Ed Tallanstown); Marsh, wet grassland, scrub, reed swamp. Nicholastown South, Reed swamp.	International	N/A
90	Half Moon (Ballyloughan), calcareous spring, wet grassland Magheross watercourse.	National	N/A
91	Broadleaved deciduous wet woodland.	International	N/A
92	Wet grassland with scrub willow, drainage ditches.	Local High	N/A
93	Small area of wet woodland.	International	N/A
94	Planted linear woodland on road embankments.	Local High	N/A
95	Wet grassland.	National	N/A
96	Small area of broadleaved deciduous woodland.	Local High	N/A
97	Broadleaved deciduous wet woodland along Drumcattan stream.	International	N/A
98	Broadleaved deciduous wet woodland.	International	N/A
99	Broadleaved deciduous wet woodland and scrub, west of Blittoge stream.	International	N/A
100	Broadleaved deciduous wet woodland/willow carr.	International	N/A
101	Possibly broadleaved deciduous wet woodland along Drumcattan Stream.	International	N/A
102	Wet grassland.	County	N/A
103	Broadleaved deciduous woodland.	Local High	N/A
104	Linear broadleaved woodland.	Local High	N/A
105	Linear broadleaved woodland.	Local High	N/A

106	Planted woodland/demesne.	Local High	N/A
107	Appears to be planted woodland along Rathory river, possibly wet woodland.	International	N/A
108	Mixed planted woodland along river.	Local High	N/A
109	Possibly broadleaved woodland.	Local High	N/A
110	Possibly wet broadleaved deciduous woodland along Rathgeenan watercourse.	International	N/A
111	Broadleaved deciduous wet woodland.	Local High	N/A
112	Broadleaved deciduous woodland.	Local High	N/A
113	Broadleaved deciduous woodland.	Local High	N/A
114	Green-winged orchid <i>Anacamptis morio</i> and basil thyme <i>Clinopodium acinos</i> records. Previously noted as Annex 6210 and non-Annex. Appears quite improved.	National	N/A
115	Young broadleaved woodland, but may contain pocks of heath. Areas of improved wet grassland.	National	N/A
116	Broadleaved deciduous wet woodland.	International	N/A
117	Broadleaved deciduous woodland.	Local High	N/A
118	Wet grassland and scrub habitat. Appears to have buildings/structures on site.	County	N/A
119	Wetland feature surrounded by broadleaved vegetation.	Local High	N/A
120	Very small area of broadleaved deciduous woodland.	Local High	N/A
121	Possibly wet woodland along the Rathory river.	International	N/A
122	Wet grassland, scrub, willow and gorse.	National	N/A
123	Broadleaved deciduous woodland with some conifers present.	Local High	N/A
124	Broadleaved deciduous woodland.	Local High	N/A
125	Very small lake/pond feature, with reed fringe habitat and wet woodland patches.	International	N/A
126	Wet woodland by road.	International	N/A
127	Broadleaved deciduous wet woodland.	International	N/A
128	Willow scrub.	Local High	N/A
129	Poor species rich wet grassland.	National	N/A
130	Broadleaved deciduous woodland.	Local High	N/A
131	Broadleaved deciduous woodland along Lurgans river.	International	N/A
132	Broadleaved deciduous woodland dominated by birch, bog, heath and bracken present. Possible bog woodland (*91D0) and dry heath (4030).	International	N/A
133	Artnalevery and Cookstown wet grassland and wet woodland.	International	N/A
134	Louth Hall and Ardee Woods pNHA.	National	N/A
135	Broadleaved deciduous woodland south of River Bawn, possibly wet woodland.	International	N/A
136	Mountrush River and surrounding wet woodland habitat.	International	N/A
137	Tullakeel. Transition mire, wet wood.	International	N/A
138	Mixed woodland incl. conifers. Deciduous trees more dominant.	County	N/A
139	Broadleaved deciduous woodland.	Local High	N/A
140	Broadleaved deciduous woodland.	Local High	N/A
141	Wet deciduous woodland and mixed woodland (incl. conifers).	International	N/A
142	Killark lough, watercourses and surrounding wetland habitats.	International	N/A
143	Tullyallen Lough with surrounding wetland habitats including deciduous broadleaved woodland.	International	N/A
144	Corradoran Lough (Monaghan/Louth). Reed swamp, wet grassland, wet woodland and scrub.	International	N/A

145	Artificial pond/reed swamp at Mullaghmeen.	Local High	N/A
146	Reillys Lough. Reed swamp, marsh, transition mire, mesotrophic lake.	International	N/A
147	Lannat and Tullydrum. Cutover bog, scrub, wet Grassland. Appears to be young woodland and scrub.	National	N/A
148	Broadleaved deciduous wet woodland, scrub and lakeshore habitat at Stradeen Lough.	International	N/A
149	Young deciduous woodland, possibly bog/heathland habitats in parts.	International	N/A
150	Hoarstone mire (possible heathland/transition mire), scrub. Deciduous broadleaved woodland.	International	N/A
151	Drumilland Lough with surrounding wetland habitats.	International	N/A
152	Drumaavarn Lough with surrounding wetland habitats.	International	N/A
153	Lake with surrounding wetland habitats including wet deciduous woodland. Area of broadleaved deciduous woodland to north.	International	N/A
154	Nure Beg Lake, Fen and Marsh. Marsh, transition mire, mesotrophic lake, wet grass.	International	N/A
155	Spring and Corcrin Loughs pNHA. Lake with surrounding wetland habitats.	International	N/A
156	Broadleaved deciduous woodland.	Local High	N/A
157	Toberheals Spring, calcareous spring. Corcuilloge Lough, lake, reed swamp, wet wood, wet grass. Woodland in surrounding.	International	N/A
158	Capragh Lough with surrounding woodland habitat, dry in parts. Broadleaved deciduous woodland north of site.	International	N/A
159	Wetland feature surrounded by broadleaved vegetation.	Local High	N/A
160	Killarus Lough. Lake, river, scrub, fen, reed swamp.	International	N/A
161	Lough Aphuca with surrounding wetland habitat. Scrub/broadleaved woodland north.	International	N/A
162	Lough Boughagh/reservoir with surrounding wet woodland, fringing lakeshore habitat and planted woodland (including conifers).	International	N/A
163	Derrylauan Spring.	International	N/A
164	Drumgoan Fen. Reed swamp, wet wood, alkaline lake, transition mire.	International	N/A
165	Cormoy spring, calcareous spring, possibility of fen habitats.	International	N/A
166	Creevy Lough pNHA. Lake and surrounding wetland habitat.	International	N/A
167	Lough Nagarnaman. Reservoir, scrub. Fringing wetland habitat.	International	N/A
168	Linear stretch of broadleaved woodland.	Local High	N/A
169	Ballingarry Lough - reed swamp, marsh, transition mire, mesotrophic lake, wet wood. Lough to the south.	International	N/A
170	Garrifly spring. Wetland site. Could possibly contain fen.	International	N/A
171	Tullymackilmartin calcareous spring. Could possibly contain fen.	International	N/A
172	Monanagirr. Marsh, artificial pond.	Local High	N/A
173	Edmonstown. Reed swamp, wet wood, eutrophic lake, marsh. Planted wood.	International	N/A
174	Edmonstown. Reed swamp, wet wood, eutrophic lake, marsh. Planted wood. Broadleaved deciduous woodland along Kilbride watercourse.	International	N/A
175	Isolated patches of planted woodland (broadleaved and conifers).	Local High	N/A
176	Planted broadleaved deciduous woodland.	Local High	N/A
177	Tober Lasair Spring. Wet grassland.	National	N/A
178	Drumgowna and Muff. Wet wood, scrub, reed swamp, marsh.	International	N/A
179	Wet grass, marsh, wet wood along the Lowrath South watercourse.	International	N/A
180	Wet woodland. Fields directly west, flooded, north and south of road.	International	N/A
181	Tobernamucky spring, calcareous spring.	International	N/A
182	Drumbooy Lough. Wooded area, possibly wet grassland, along river/stream.	International	N/A

183	Wet deciduous woodland. Alder. Broadleaved woodland with some Scot's pine and laurel to the south.	International	N/A
184	Possibly wet woodland along the River Glyde. Flooded fields.	International	N/A
185	Annahean Loughs South. Lake, scrub, wet grassland, river, reed swamp and fen habitats.	International	N/A
186	Scrub on site.	Local High	N/A
187	Killgally fen. Transition mire.	International	N/A
188	Probably wet woodland.	International	N/A
189	Fen type vegetation, and patches of willow scrub.	International	N/A
190	Knockreagh Drumganus Lake. Lake, reed swamp, wet grass, fen and scrub.	International	N/A
191	Broadleaved deciduous woodland.	Local High	N/A
192	Broadleaved deciduous woodland and improved grassland.	Local High	N/A
193	Gorse/willow scrub with bracken.	Local High	N/A
194	Wet deciduous woodland and wet grassland.	International	N/A
195	Reed fringe habitat all along Drumganny lake. Scrub, improved grassland beyond.	International	N/A
196	Scrubby, wet grassland, probably slightly improved.	Local High	N/A
197	Dense scrub habitat.	Local High	N/A
198	Reaghstown Marsh pNHA. Lake with surrounding wetland habitat, including wet woodland/willow carr.	International	N/A
199	Tully. Marsh, wet grassland and scrub.	National	N/A
200	Dense scrub.	Local High	N/A
201	Louth Hall and Ardee Woods pNHA.	National	N/A
202	Magheraboy. Reed swamp, wet grassland and mesotrophic lake. Improved in parts.	International	N/A
203	Flooded field. Potential fen. Road flooded. Wet woodland. Proules to the south.	International	N/A
204	Broadleaved deciduous wet woodland, other wetland habitats and scrub. Noted as "Tirgarvan Spring. Calcareous spring. Tirgarvan Fen cNHA, marsh, scrub, wet grass, reed swamp" in WSI website.	International	N/A
205	Small patches of planted broadleaved woodland, including patch along the Lurgans river. Could possibly be wet.	International	N/A
206	Patches of broadleaved deciduous woodland.	Local High	N/A
207	Wet grassland.	National	N/A
208	Broadleaved deciduous woodland/scrub.	Local High	N/A
209	Wet woodland with scrub.	International	N/A
210	Tobernagallia Spring.	International	N/A
211	Corleck spring, possibility of fen habitats.	International	N/A
212	Planted broadleaved woodland.	Local High	N/A
213	Corleck Spring with broadleaved woodland. Could possibly contain fen.	International	N/A
214	Possibly broadleaved woodland.	Local High	N/A
215	Broadleaved deciduous wet woodland.	International	N/A
216	Wet woodland, completely flooded either side of road.	International	N/A
217	Planted woodland.	Local High	N/A
218	Rathneestin. Eutrophic lake, reed swamp.	Local High	N/A
219	Noted as: Muff (Louth). Bog wood, cutover bog, wet grassland. Bog woodland.	International	N/A
220	Wet woodland. Possibly wet grassland as well.	International	N/A
221	Very flooded fields, with reed type habitat. Possibly a Lake.	International	N/A

222	Mixture of wet grassland and wooded area with deciduous trees.	National	N/A
223	Broadleaved deciduous wet woodland and scrub, south of Blittoge stream.	International	N/A
224	Broadleaved deciduous woodland. Possibly wet as there appears to be a number of ditches running through it. Improved wet grassland also present.	International	N/A
225	Broadleaved woodland.	Local High	N/A
226	Patches of broadleaved woodland.	Local High	N/A
227	Broadleaved deciduous wet woodland with patches of scrub (gorse). Quarry present.	International	N/A
228	Planted broadleaved deciduous woodland.	Local High	N/A
229	Losset Norht Lake (scrub, mesotrophic lake). Lake with surrounding wetland habitat (incl. woodland).	International	N/A
230	Wet broadleaved woodland. Drumgoosat spring Knocknacran.	International	N/A
231	Possibly broadleaved woodland. Along Calga stream and may be wet woodland.	International	N/A
232	Broadleaved deciduous woodland along Lurgans River. Possibly wet.	International	N/A
233	Broadleaved deciduous wet woodland along Lurgans River.	International	N/A
234	Wet woodland and wet grassland (flooded during survey).	International	N/A
235	Wet grassland, willow and bramble.	County	N/A
236	Cashland east springs, possibility of fen habitats.	International	N/A
237	Corlea spring, calcareous spring, possibility of fen habitats.	International	N/A
238	Cashlan East Spring and broadleaved deciduous woodland.	International	N/A
239	Broadleaved deciduous woodland.	Local High	N/A
240	Broadleaved deciduous woodland along Rosdreenagh river. Liscall Spring, calcareous spring.	International	N/A
241	Broadleaved deciduous woodland.	Local High	N/A
242	Wet grassland and small patches of broadleaved woodland by Rosdreenagh watercourse. Possibly wet.	International	N/A
243	Broadleaved deciduous wet woodland along Nafarty River.	International	N/A
244	Scrub habitat, but may also contain heathland habitats.	National	N/A
245	Wet grassland, although rush dominated.	Local High	N/A
246	Planted linear woodland on road embankments.	Local High	N/A
247	Kinnagin swamp. Reed swamp, wet grassland, wet wood, river, scrub.	International	N/A
248	Potentially scrub/wet woodland.	International	N/A
249	Small patch of broadleaved woodland.	Local High	N/A
250	Wet woodland. Gorse, birch, improved wet grassland in parts.	International	N/A
251	Broadleaved deciduous wet woodland/willow carr.	International	N/A
252	Wet grassland with reed swamp and sparse willow. Cloghoge and Tievadinna.	National	N/A
253	Small patch of broadleaved woodland.	Local High	N/A
254	Heath, lots of gorse, birch, similar to south bit. Scrub/gorse/willow carr/wetland wood by lake.	International	N/A
255	Wet grassland and willow carr/scrub.	National	N/A
256	Broadleaved deciduous wet woodland.	International	N/A
257	Possibly bog, woodland, wet/acid grassland habitats.	International	N/A
258	Small area of possibly broadleaved deciduous wet woodland.	International	N/A
259	Broadleaved deciduous woodland.	County	N/A
260	Heathland, wet woodland/willow carr, possibly bog woodland	International	N/A
261	Possibly wet woodland. Uncertain.	International	N/A

262	Could possibly contain pockets of heathland habitat. Patches of gorse scrub presented and improved grassland	National	N/A
263	Planted woodland with scrub, but may contain pockets of heathland habitat	National	N/A
264	Broadleaved deciduous wet woodland/willow carr	International	N/A
265	Possible heathland/bog woodland. <i>Calluna vulgaris</i> present along with scrub. Unsure if annex, would require surveys.	International	N/A
266	Patches of woodland.	Local High	N/A
267	Young broadleaved woodland.	Local High	N/A
268	Dunaree Flush, could correspond to fen habitat.	International	N/A
269	Wet grassland and scrub. Pools of water.	National	N/A
270	Wet woodland/willow carr. Heath species in parts as well.	International	N/A
271	Lake, flooded, reed swamp, wooded. Muckno Lake pNHA.	International	N/A
272	Wet grassland willow carr near lake/Gorteens watercourse.	National	N/A
273	Planted woodland with scrub, but may contain pockets of heathland habitat.	Local High	N/A
274	Planted woodland.	Local High	N/A
275	Areas of dense scrub, which possibly contains heathland habitat.	National	N/A
276	Scrub habitat, which contains wet grassland, dense bracken and spoil. It may also contain pockets of heathland habitats.	National	N/A
277	Planted conifers/broadleaved trees; however, may contain pockets of heathland habitats.	National	N/A
278	Lough Egish pNHA and nearby wooded/scrub area. Scattered scrub/gorse. Variety of non-Annex grasslands.	International	N/A
279	Scattered patches of broadleaved woodland along Annahale Stream. Could be wet in parts.	International	N/A
280	Appears to be planted conifers and deciduous woodland.	County	N/A
281	Fragrant Agrimony <i>Agrimonia procera</i> present. Patches of broadleaved woodland.	Local High	N/A
282	Planted woodland and scrub.	Local High	N/A
283	Round-leaved Wintergreen <i>Pyrola rotundifolia subsp. rotundifolia</i> record within field. Red-list near threatened.	Local High	N/A
284	Non-FPO, near threatened Red List species Slender Thistle <i>Carduus tenuiflorus</i> present.	Local High	N/A
285	Lough Fea and surrounding wetland habitats to the south. Lough Fea Demesne pNHA to the north. Planted mixed woodland. Record of Corn Marigold. Cherry laurel and rhododendron present.	International	N/A
286	Area of broadleaved deciduous woodland.	Local High	N/A
287	Area of broadleaved deciduous woodland.	Local High	N/A
288	Area of broadleaved deciduous woodland.	Local High	N/A
289	Area of broadleaved deciduous woodland.	Local High	N/A

Appendix 7.1 Geology and Soils Features within the Study Area

Corridor option Geology & Soils	Option A (Yellow)	Option B (Yellow + Blue)	Option C (Green)	Option D (Orange)	Option E (Orange + Link 1 + Green)	Option F (Orange + Link 2 + Green)
% of 400m corridor within Peat Deposits	9.32	9.30	10.33	7.87	9.40	6.99
No. Mines within the 400m corridor	5	5	3	3	3	3
No. Quarries within the 400m corridor	0	0	0	0	0	0
% of 400m corridor through Sand & Gravel deposits	15.86	15.69	10.38	7.03	10.24	7.17
% of 400m corridor through Potential Granular Aggregate deposits (High or Very High potential)	6.44	6.45	3.17	1.66	1.60	1.63
% of 400m corridor through Potential Crushed Rock deposits (High or Very High potential)	51.76	54.49	46.14	58.40	38.29	47.52
No. Landfill sites within 400m corridor	0	0	0	0	0	0
No. Karst Landforms within 400m corridor	10	10	0	0	0	0
% of 400m corridor through Geological Heritage Sites	0.27	0.27	0	0	0	0

Appendix 7.2 Hydrogeological Features within the Study Area

Corridor option Hydrogeology	Option A (Yellow)	Option B (Yellow+Blue)	Option C (Green)	Option D (Orange)	Option E (Orange + Link 1 + Green)	Option F (Orange + Link 2 + Green)
% of 400m corridor within Vulnerable and Regionally Important Aquifer (Karstified bedrock, Fissured bedrock or Extensive sand & gravel)	34.97	34.98	3.44	0.00	3.40	1.26
% of 400m corridor within Sand & Gravel Aquifer	0	0	0	0	0	0
% of 400m corridor within high Groundwater Vulnerability (Extreme, High, Rock near surface or Karst)	70.57	73.27	75.16	85.25	73.30	74.54

Appendix 9.1 Preliminary Inventory of Archaeological Heritage

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AY009
Legal Status	Recorded Monument
Reference No.	MO025-008----
Townland	MULLAGHANEE
Site Type	Ringfort - rath
Coordinates (ITM)	683901816025
Description	Scheduled for inclusion in the next revision of the RMP: Yes Located at the summit of a NW-SE drumlin ridge. This rath, or rath (MO025-009----) which is c. 170m to the ESE, is depicted on McCrea's map of County Monaghan (1793) and on the 1834 and 1907 editions of the OS 6-inch map. It is a subcircular grass-covered area (dims 47.6m NE-SW; 39.6m NW-SE) that slopes down to the SE (H 1.5m) defined by an earthen bank (Wth of base 4.2-4.6m; int. H 0.3-0.6m; ext. H 1.5m at NW to 2.2m at SE) which is incorporated in a field bank SW-N, and a complete outer fosse or drain (Wth of base 1-1.3m; D 0.3m). There is a widened entrance (Wth of base 4.1m) and causeway (Wth of top 6m; H 0.35m) at SE. The perimeter is truncated slightly by a NW-SE field bank at NE.
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY010
Legal Status	Recorded Monument
Reference No.	MO025-009----
Townland	MULLAGHANEE
Site Type	Ringfort- rath (Listed on RMP as an Earthwork site)
Coordinates (ITM)	684118 815953
Description	Scheduled for inclusion in the next revision of the RMP: Yes Located at the summit of a NW-SE drumlin ridge. This rath, or rath (MO025-009----) which is c. 170m to the ESE, is depicted on McCrea's map of County Monaghan (1793) and on the 1834 and 1907 editions of the OS 6-inch map. It is a subcircular grass-covered area (dims 47.6m NE-SW; 39.6m NW-SE) that slopes down to the SE (H 1.5m) defined by an earthen bank (Wth of base 4.2-4.6m; int. H 0.3-0.6m; ext. H 1.5m at NW to 2.2m at SE) which is incorporated in a field bank SW-N, and a complete outer fosse or drain (Wth of base 1-1.3m; D 0.3m). There is a widened entrance (Wth of base 4.1m) and causeway (Wth of top 6m; H 0.35m) at SE. The perimeter is truncated slightly by a NW-SE field bank at NE.
Source(s)	SMR

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AY015
Legal Status	Recorded Monument
Reference No.	MO025-016---
Townland	DRUMHARRIFF NORTH
Site Type	Ringfort - rath
Coordinates (ITM)	683615815095
Description	<p>Scheduled for inclusion in the next revision of the RMP: Yes</p> <p>Situated on the E-facing spine of a WNW-ESE drumlin ridge. This rath is depicted on McCrea's map of County Monaghan (1793) and on the 1834 and 1907 editions of the OS 6-inch map. It is a subcircular grass-covered area (dims 35m N-S: 30m E-W) planted with deciduous trees which is defined by an earthen bank (Wth 6.4-7.6m; int. H 0.6-1m; ext. H 2.5-3m) and an outer fosse (Wth of top 9m; Wth of base 1m; D 2m) WNW-NE (upslope) and SE-S (Wth of top 6m; Wth of base 2.6m; D 0.4m). There is an outer bank (at NW: Wth of base 8m; Wth of top 3.4m; ext. H 1m) WNW-NNE with a stone-faced field bank on top of it that surrounds the whole monument, incorporating the outer face of the inner bank ESE-S. The original entrance is probably that (Wth of base c. 2m) with traces of an outer causeway (Wth of top c. 2m; H 0.4m) at SSE. The rath was circumvented by a WNW-ESE lane S-NW as recorded on McCrea's map and the 1834 OS 6-inch map but there is no evidence of this now.</p>
Source(s)	SMR

	OPTION D
Identification No.	N2/A-C/CS/AY018
Legal Status	Recorded Monument
Reference No.	MO025-019
Townland	Gorteens
Site Type	Redundant record [Church Site Possible]
Coordinates (ITM)	685936, 815167
Description	<p>Scheduled for inclusion in the next revision of the RMP: No</p> <p>This was classified as an unlocated church at Gorteens in the SMR (1985) on the basis of a folk reference (IFC, Schools Mss: (933) 133-4: www.duchas.ie/en/cbes), and provided with a location in the RMP (1996). The school in the reference is at Inishkeen, and the Gorteen is probably the one just over the boundary in Co. Louth, although the local school at Drumsinnot, Co. Louth, the townland just to its E, has no reference to a church.</p>
Source(s)	SMR/RMP

OPTION D (ORANGE)	
Identification No.	N2/A-C/CS/AY019
Legal Status	Recorded Monument
Reference No.	MO025-020----
Townland	Coolskeagh
Site Type	Ringfort - rath
Coordinates (ITM)	685640815764
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situated at the SE end of a NW-SE ridge with a parallel ridge c. 170m to the NE. This is an oval grass-covered area (dims 42.5m E-W; 34.5m N-S) defined by an overgrown earthen bank (Wth c. 3; int. H c. 0.5-1m; ext. H c. 1.5m) with some bushes. There is no visible fosse and there is a large entrance (Wth 4m) at SE, which might be the original one.
Source(s)	SMR/RMP

OPTION C (GREEN), OPTION E (ORANGE+LINK1+GREEN); OPTION F (ORANGE+LINK2+GREEN)	
Identification No.	N2/A-C/CS/AY023
Legal Status	Recorded Monument
Reference No.	MO025-024----
Townland	Cornahawla
Site Type	Ringfort - rath
Coordinates (ITM)	683921814104
Description	Scheduled for inclusion in the next revision of the RMP: Yes Located at the E end of a WNW-ESE drumlin ridge. A circular embanked enclosure (ext. diam. c. 40-45m) is depicted only on the 1834 edition of the OS 6-inch map where it is described in gothic lettering as a 'fort'. No archaeological feature is visible at ground level in improved pasture.
Source(s)	SMR

	OPTION B (YELLOW+BLUE); OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AY027
Legal Status	Recorded Monument
Reference No.	MO025-028----
Townland	LISAQUILL
Site Type	Ringfort - rath
Coordinates (ITM)	684434813531
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situating on a SE-facing slope. This is an oval grass-covered area (dims 48m NW-SE; 31m NE-SW) that slopes down to the SE (H 1.9m) defined by an earthen bank (at NW: Wth of base 4.6m; int. H 1.2m; ext. H 1.3m) with some bushes W-N which is much reduced (at SE: Wth of base 7m; int. H 0.1m; ext. H 0.8m) N-ESE, but it is absent SSE-W. There is no visible fosse and a road bank surrounds the perimeter ESE-S. The original entrance is not identified.
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE);
Identification No.	N2/A-C/CS/AY034
Legal Status	Recorded Monument
Reference No.	MO025-035----
Townland	BRACKAGH
Site Type	Ringfort - rath
Coordinates (ITM)	685110 813092
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situating at the SE end of a NW-SE drumlin ridge. This is a D-shaped grass and furze-covered area (dims 41m NW-SE; 29m NW-SE) defined by an overgrown earthen bank (Wth of base 5.4-6.5m; int. H 0.3-0.5m; ext. H 1.5-1.6m) ESE-W-NNW frequently reduced to an external scarp (at SW: H 2.8m). The original entrance is likely to be that at SW (Wth of base 2.3m). The rath is cut by a NW-SE field bank with a drain on the SW side at NE.
Source(s)	SMR

	OPTION D (ORANGE)
Identification No.	N2/A-C/CS/AY037
Legal Status	Recorded Monument
Reference No.	MO025-038----
Townland	KNOCKREAGH LOWER
Site Type	Ringfort - rath
Coordinates (ITM)	686660813393
Description	Scheduled for inclusion in the next revision of the RMP: Yes

	Located on a SE-facing slope. A circular enclosure is depicted here at Knockreagh Lower on McCrea's map of County Monaghan (1793), and on the 1834 and 1907 editions of the OS 6-inch map. This is a raised circular and grass-covered area (diam. 34m NW-SE; 31.5m NE-SW) defined by the slight remains of an earthen bank that is largely reduced to an overgrown scarp (at SSW: H 2.5m), with a field boundary on top of it N-E. The monument is cut slightly by a NE-SW field bank and hedge at SE (L c. 20m). There is no visible fosse and the original entrance is not identified.
Source(s)	SMR

	OPTION D (ORANGE)
Identification No.	N2/A-C/CS/AY039
Legal Status	Recorded Monument
Reference No.	MO025-040
Townland	Knockreagh Upper
Site Type	Redundant record [Earthwork Site]
Coordinates (ITM)	686870813115
Description	This was classified as a located earthwork in the RMP (1996) on the basis of a second enclosure depicted on McCrea's map of County Monaghan (1793) close to rath (MO025-038----), but the second, southern, enclosure is the rath (MO025-039----).
Source(s)	SMR

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AY059
Legal Status	Recorded Monument
Reference No.	MO028-009----
Townland	Clonavogy
Site Type	Ringfort - rath (Listed on RMP as Moated Site)
Coordinates (ITM)	684146812448
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situating at the summit of a drumlin. This rath is depicted on McCrea's map of Co. Monaghan (1793). It is represented as a circular embanked enclosure described as a 'fort' in gothic lettering on the 1834 edition of the OS 6-inch map, and as a sub-circular or D-shaped feature on the 1907 edition. This is a circular or subrectangular grass-covered area (dims 44m NE-SW; 37.5m NNW-SSE) that slopes down to the SE (H c. 2m) defined by an overgrown earthen bank NW-N (Wth of base 10m; int. H 2m; ext. H 4m) that is reduced to an internal lip (H 0.5m) and external scarp (Wth 4m; H 4m) at S. A fosse (Wth of top 7-10.5m; ext. D 1m at S to 3m at N) separates it from an outer bank (at N: Wth of base 6.5m; Wth of top 2m; ext. H 1m) that is much reduced (Wth of base 5m; ext. H 2m) at S. There is a slight outer fosse (Wth of top 5m; ext. D 0.5m) at N (max. ext. diam. 68m N-S). The entrance (Wth of base 2.4m) though the inner bank and the remains of a causeway are at ESE.
Source(s)	SMR/RMP

OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN); OPTION F (ORANGE+LINK2+GREEN)	
Identification No.	N2/A-C/CS/AY060
Legal Status	Recorded Monument
Reference No.	MO028-010----
Townland	Lisnafinelly
Site Type	Ringfort - rath
Coordinates (ITM)	684355811850
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situated on top of a drumlin. This rath is depicted on McCrea's map of Co. Monaghan (1793). It is an overgrown oval area (int. dims 42m NNW-SSE; 28m ENE-WSW) defined by an overgrown earthen bank (Wth 5-7m; int. H 0.8-1.3m; ext. H 2.9-3.2m), with an outer fosse (at SE: Wth of top 4.5m; Wth of base 2m; ext. D 1m) that is best preserved NW-E-S. The entrance (Wth of base 2.4m) and causeway (Wth of top 2.8m) are at SE.
Source(s)	SMR

OPTION A (YELLOW); OPTION B (YELLOW+BLUE)	
Identification No.	N2/A-C/CS/AY061
Legal Status	Recorded Monument
Reference No.	MO028-011----
Townland	Taplagh
Site Type	Ringfort -rath
Coordinates (ITM)	685187 812498
Description	Scheduled for inclusion in the next revision of the RMP: Yes Located at the SE end of a fairly low NW-SE drumlin ridge. This is a subcircular grass and scrub-covered area (dims 33m WNW-ESE: 28.8m NNE-SSW) defined by an earthen bank (at E: Wth 4.5m; int. H 0.2m; ext. H 1.6m), with slight traces of an outer fosse NNE-ESE. The interior is divided by a NNE-SSW field bank a little W of the centre, and an E-W field bank truncates the perimeter slightly at S. A slight dip in the perimeter at WNW may indicate the location of the original entrance.
Source(s)	SMR

OPTION A (YELLOW); OPTION B (YELLOW+BLUE)	
Identification No.	N2/A-C/CS/AY062
Legal Status	Recorded Monument
Reference No.	MO028-012----
Townland	Garranroe
Site Type	Ringfort - rath
Coordinates (ITM)	685094 812010
Description	Scheduled for inclusion in the next revision of the RMP: Yes

	Situated at the SE angle of a small triangular plateau. It is depicted as a circular embanked enclosure (ext. diam. c. 40-45m) described as a 'fort' in gothic lettering on the 1834 edition of the OS 6-inch map. At that time it was bisected by a NE-SW field bank and a NW-SE field bank touched the perimeter at NW. On the 1907 edition of the map the NW-SE field bank has been extended across the interior, and the perimeter was only extant on the NE side of the NW-SE field bank. Today the perimeter only survives (Wth of base 4m; int. H 0.2m; ext. H 1.5m) with an outer drain (Wth 2m; D 0.5m) NE-SE, but the outline can be traced in the other quadrants (diam. c. 40m).
Source(s)	SMR

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN)
Identification No.	N2/A-C/CS/AY090
Legal Status	Recorded Monument
Reference No.	MO028-039----
Townland	Drumharrif
Site Type	Ringfort - rath
Coordinates (ITM)	685581810588
Description	Scheduled for inclusion in the next revision of the RMP: Yes Located towards the SE end and towards the summit of a NW-SE drumlin ridge. This is an oval grass-covered area (dims 61m WNW-ESE; 52m NNE-SSW) that slopes down to the SE (H 3.8m). It is defined by an earthen bank (Wth 2-4.6m; int. H 0.6-1m; ext. H 1.5-2.8m) and hedge which is incorporated into the bank of a lane WNW-NW, with an outer fosse or drain (at ESE: Wth 3.2m; ext. D 0.8m) ESE-SSW. The original entrance is not identified.
Source(s)	SMR

	OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AY091
Legal Status	Recorded Monument
Reference No.	MO028-040----
Townland	Drumillard
Site Type	Ringfort - rath
Coordinates (ITM)	685967811184
Description	Scheduled for inclusion in the next revision of the RMP: Yes Located towards the SE end of a NW-SE drumlin ridge. This is an oval grass-covered area (dims 47m E-W; 40.8m N-S) defined by an overgrown earthen bank (at SSE: Wth 6.2m; int. H 0.8m; ext. H 2.8m) SE-E that is reduced to a scarp (at NNW: Wth 7m; H 4m) elsewhere, with an outer fosse (Wth of top 4.8m; Wth of base 2.2m; ext. D 0.2m) E-S, which might be obscured by field banks outside the perimeter elsewhere. There is an entrance gap (Wth of base 2.5m) at SE, which might be the original entrance.
Source(s)	SMR

OPTION D (ORANGE)	
Identification No.	N2/A-C/CS/AY095
Legal Status	Recorded Monument
Reference No.	MO028-044----
Townland	Kilnacranfy
Site Type	Ringfort - rath
Coordinates (ITM)	687113810880
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situating at the NW end of a NW-SE drumlin ridge. This is a circular grass-covered area (diam. 36m NW-SE; 36m NE-SW) defined by an earthen bank (Wth 5-6m; int. H 0.4m normally to 0.9m SE-S; ext. H 1.6-1.7m normally to 2.6m at NE) with some bushes, which is incorporated into a field bank SSE-WSW. Traces of an outer fosse are visible ESE-S and W-NNE, but the original entrance is not identified.
Source(s)	SMR

OPTION D (ORANGE)	
Identification No.	N2/A-C/CS/AY096
Legal Status	Recorded Monument
Reference No.	MO028-045----
Townland	Kilnacranfy
Site Type	Ringfort - rath
Coordinates (ITM)	687162810469
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situating on a rise at the bottom of the SW-facing slope of a ridge with a small NW-SE stream c. 25m to the SW. This is a circular grass-covered area (diam. 38m NE-SW: 37m NW-SE) defined by an earthen bank (Wth 4-6.5m; int. H 0.2-0.4m; ext. H 1.5-2m) and hedge which has been eroded away S-SW, with an outer fosse (Wth of top 6.6m; Wth of base 1.6-2.5m; ext. D 0.7-1m) NNW-SE and traces of an outer bank (at NNE: Wth 3.8m; ext. H 0.5m) NNW-ESE. The original entrance is not identified.
Source(s)	SMR

OPTION F (ORANGE+LINK2+GREEN)	
Identification No.	N2/A-C/CS/AY097
Legal Status	Recorded Monument
Reference No.	MO028-046----
Townland	Coolcair
Site Type	Ringfort - rath
Coordinates (ITM)	686804810081
Description	Scheduled for inclusion in the next revision of the RMP: Yes Located at the SE end of a NW-SE drumlin ridge. This rath is depicted on McCrea's map of County Monaghan (1793) and on subsequent OS 6-inch maps. It is a subcircular grass and scrub-covered area (dims 35m NW-SE; 29m NE-SW) that slopes down slightly to the SE (H 1.2m)

	defined by an earthen bank (Wth 5.2-7.8m; int. H 0.8m at SE to 2m at NW; ext. H 2.7-2.8m) with an outer fosse (at NW: Wth of top 6.4m; Wth of base 2m; ext. D 1.5m) that declines in magnitude to the SE. There is a wide gap (Wth of base 4.7m) at SE which has been widened but it might be the original entrance. The rath is now overgrown (OSAP 2005). References: McCrea, W. 1793 A map of the county of Monaghan. National Library of Ireland, Manuscripts 16.1.10 (1-4). OSAP - Ordnance Survey Aerial Photographs. Photographic collection. Ordnance Survey of Ireland. Dublin
Source(s)	SMR

	OPTION D (ORANGE); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AY098
Legal Status	Recorded Monument
Reference No.	MO028-047----
Townland	Lisnamoyle Etra
Site Type	Enclosure (Listed on RMP as Ringfort (Rath/Cashel))
Coordinates (ITM)	687134810036
Description	Scheduled for inclusion in the next revision of the RMP: Yes Located in a slight col with slightly higher ground to the NW and SE and lower ground to the NE and SW. This is a subcircular grass-covered area (dims 66m NW-SE; 60.6m NE-SW) that slopes down to the SE. It is defined by an earthen bank (at W: Wth of base 4m; Wth of top 1.8m; int. H 0.9m; ext. H 1.5m) W-NE, which has disappeared elsewhere with a fosse (at W: Wth of top c. 3m; Wth of base 0.45m) WSW-N-ESE and an outer bank (at W: of base c. 5m; Wth of top 2.45m; int. H 1.7m; ext. H 1.2m) WSW-NW, which is incorporated into a field bank NW-ESE. There is an entrance gap (Wth 2.5m) in the inner scarp at SE, but there is no evidence of any internal features. The banks had some bushes in 1967 but these had been removed by 1995 (OSAP), and the monument appears to have been removed apart from the perimeter incorporated into the field bank NW-E.
Source(s)	SMR/RMP

	OPTION D (ORANGE); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AY099
Legal Status	Recorded Monument
Reference No.	MO028-048---
Townland	Lisnamoyle Etra
Site Type	Ringfort - rath
Coordinates (ITM)	687193809684
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situating at the NW end of a low NW-SE ridge in a low-lying landscape with the original E edge of the sub-rectangular and now almost dried up Coolcair Lough c. 40m to the W. This is a subcircular overgrown area (dims 29.4m NE-SW; 26m NW-SE;) defined by an earthen bank (at SE: Wth 3.6m; int. H 1.2m; ext. H 1.4m) which is absent SSW-WNW, separated by a fosse (Wth of top 6-6.8m; Wth of base 1.8-2.4m; ext. D 0.8m at NW to 1.7m at SE) from a complete outer bank (Wth 4.2-4.6m; ext. H 0.3m at SW to 1.2m at NW). The original entrance through the

	inner (Wth of base 2.1m) and outer (Wth of base 2.6m) banks and the causeway (Wth of top 2.4m; H 0.8m) is at E. The monument is bisected by a NW-SE field bank.
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY111
Legal Status	Recorded Monument
Reference No.	MO028-060
Townland	Toneyellida
Site Type	Ringfort – rath (Listed on RMP as Earthwork site)
Coordinates (ITM)	684623 808530
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situating on the spine of a NW-SE drumlin ridge. Two adjoining enclosures are marked on McCrea's map of County Monaghan (1793) at Toneyellida, but they are not recorded on any other map and the precise location of this eastern feature is not known. No archaeological feature is visible at ground level in pasture.
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY121
Legal Status	Recorded Monument
Reference No.	MO028-070
Townland	Toneyellida
Site Type	Ringfort -rath (Listed on RMP as Earthwork site)
Coordinates (ITM)	684533 808450
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situating at the SW-facing slope of a low NW-SE spur. Two adjoining enclosures are marked on McCrea's map of County Monaghan (1793) at Toneyellida, but they are not recorded on any other map and the precise location of this western feature is not known. No archaeological feature is visible at ground level in pasture.
Source(s)	SMR/RMP

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY122
Legal Status	Recorded Monument
Reference No.	MO028-071----
Townland	Tullyvaragh Lower

Site Type	Ringfort - rath
Coordinates (ITM)	684833 809192
Description	Scheduled for inclusion in the next revision of the RMP: Yes: Situated towards the top of the S-facing slope of the spine of a N-S drumlin ridge. This ridge and the monument were once planted in trees. This is a circular grass-covered area (diam. 38.4m NNE-SSW; 34.4m WNW-ESE) that slopes down steeply to the S. It is defined by an earthen bank (Wth 5m; int. H 0.1m at S to 1m at N; ext. H 1m at N and S) which is incorporated into a field bank and hedge ENE-SW , and an outer fosse (at NNE: Wth of top 6.4m; Wth of base 2.8m; D 1m) SW-N-E. There is no visible entrance.
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY123
Legal Status	Recorded Monument
Reference No.	MO028-072----
Townland	Tullyvaragh Upper
Site Type	Ringfort - rath
Coordinates (ITM)	684798 808664
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situating on a steep S-facing slope in a low-lying landscape between drumlins. This was described in 1967 as a broad oval or D-shaped and overgrown area (dims 55m WNW-ESE; 38m NNE-SSW) defined by an overgrown earthen bank (at N: Wth of base 6m; int. H 1.5m; ext. H 1.7m) and an outer flat-bottomed fosse (at N: Wth of top 6.6m; Wth of base 2m; ext. D 0.6m) SW-N-E backing onto a steep slope (H 4.3m) down to an E-W road at S. There was an entrance (Wth of base 2.4m) at ENE. The visible monument had been removed by 1995 (OSAP). Archaeological testing (05E1064) c. 40m to the SE on the other side of the road produce no related material (Duffy 2008).
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY126
Legal Status	Recorded Monument
Reference No.	MO028-075----
Townland	Tullyvaragh Lower
Site Type	Ringfort - rath
Coordinates (ITM)	684845 809849
Description	Scheduled for inclusion in the next revision of the RMP: No Located in a low-lying landscape between drumlins. A circular embanked enclosure (ext. diam. c. 35m) is depicted on the 1834 edition of the OS 6-inch map where it is described in gothic lettering as a 'fort', and it is represented as an arc of hachures N-E running into a curving field bank E-S on the 1907 edition of the map. The area is now occupied by farm buildings.
Source(s)	SMR

	OPTION C (GREEN); OPTION E (ORANGE + LINK + GREEN)
Identification No.	N2/A-C/CS/AY129
Legal Status	Recorded Monument
Reference No.	MO028-078----
Townland	Aghateskin
Site Type	Ringfort - rath (Listed on RMP as Earthwork Site)
Coordinates (ITM)	685915809909
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situated on a slight rise in a low-lying landscape. A circular embanked enclosure (ext. diam. c. 35-40m) is depicted only on the 1834 edition of the OS 6-inch map where it is described in gothic lettering as a 'fort'. No archaeological feature is visible at ground level in pasture.
Source(s)	SMR/RMP

	OPTION C (GREEN); OPTION E (ORANGE + LINK + GREEN)
Identification No.	N2/A-C/CS/AY131
Legal Status	Recorded Monument
Reference No.	MO028-080----
Townland	Monanagirr
Site Type	Ringfort - rath
Coordinates (ITM)	685942809578
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situated on a shelf of rock outcrop in a level, low-lying landscape. This is an oval or D-shaped grass-covered area (dims 39m NNW-SSE; 24m ENE-WSW) defined by an earthen bank (at WSW: Wth of base 6m; Wth of top 2.4m; int. H 0.7m; ext. H 1.8m) and outer flat-bottomed fosse (at WSW: Wth of top 7.6m Wth of base 3m; ext. D 0.3m) S-NNW reduced to a scarp (at N: Wth 2.2m; H 1.2m) elsewhere but backing onto a cliff of rock outcrop (H 4m) at E. There is an entrance gap (Wth of base 2.9m) at NW that is probably modern as it leads to farm buildings, and the perimeter supports some mature deciduous trees.
Source(s)	SMR

	OPTION C (GREEN); OPTION E (ORANGE + LINK + GREEN)
Identification No.	N2/A-C/CS/AY137
Legal Status	Recorded Monument
Reference No.	MO028-086----
Townland	Lurganboys
Site Type	Ringfort – rath (Listed on RMP as Earthwork Site]
Coordinates (ITM)	686423808735

Description	Scheduled for inclusion in the next revision of the RMP: Yes Situated on a col between hills to the N and S and lower ground to the W and E. A circular embanked enclosure (ext. diam. c. 45m) is depicted only on the 1834 edition of the OS 6-inch map where it is described in gothic lettering as a 'fort'. No archaeological feature is visible at ground level in pasture.
Source(s)	SMR/RMP

	OPTION D (ORANGE); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AY139
Legal Status	Recorded Monument
Reference No.	MO028-088----
Townland	Lurganboys/Cloghoge and Tievadinna
Site Type	Crannog
Coordinates (ITM)	687346808700
Description	Scheduled for inclusion in the next revision of the RMP: Yes Located in an overgrown marsh that was once Attaduff Lough, a subrectangular lake (original dims c. 350m N-S; c. 340m E-W). A small oval feature (dims c. 40m NE-SW; c. 15m NW-SE) is depicted in the lake on the 1834 edition of the OS 6-inch map. It is inaccessible.
Source(s)	SMR

	OPTION D (ORANGE); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AY140
Legal Status	Recorded Monument
Reference No.	MO028-089----
Townland	Mullanavannog
Site Type	Ringfort - rath (Listed on RMP as Earthwork Site)
Coordinates (ITM)	687346809091
Description	Scheduled for inclusion in the next revision of the RMP: Yes Located on a slight col on an E-W drumlin ridge. A circular embanked enclosure (ext. diam. c. 30m) described in gothic lettering as a 'fort' is depicted with field banks approaching it from E and W only on the 1834 edition of the OS 6-inch map. No archaeological feature is visible at ground level in pasture, but a WNW-ESE field bank bisects the location.
Source(s)	SMR/RMP

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY165
Legal Status	Recorded Monument
Reference No.	MO028-113----
Townland	Lisgall
Site Type	Ringfort - rath

Coordinates (ITM)	684008 806609
Description	Scheduled for inclusion in the next revision of the RMP: Yes Located at the SE end of a NW-SE drumlin ridge. This is a raised and circular grass-covered area (diam. 42.8m NNW-SSE; 42.5m E-W) defined by an overgrown earthen bank (Wth 6.2-9m; int. H 0.8-1m; ext. H 2.4-2.9m) with traces of an inner stone facing. There is an outer fosse (Wth of top 7.6-8.4m; Wth of base 1.8-2.2m; ext. D 1.4m) SE-W-N, and traces of an outer bank (at SSE: Wth of base 4.5m; Wth of top 1.5m; ext. H 0.45m) SSE-SW. The entrance (Wth of base 2.8m) and causeway (Wth of top 4m; H 1.5m) are at SE.
Source(s)	SMR

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN);
Identification No.	N2/A-C/CS/AY180
Legal Status	Recorded Monument
Reference No.	MO028-126----
Townland	Drumlusty
Site Type	Ringfort - rath
Coordinates (ITM)	687665806488
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situated on a slight rise in a low-lying landscape between drumlins. This is a circular grass-covered area (diam. c. 35m N-S; 32.5m E-W) defined by an overgrown earthen bank NE-S-NW that survives best at S (Wth 9m; int. H 0.6m; ext. H 3.6m), but the perimeter is reduced to a grass-covered scarp NW-NE. There is a berm (Wth c. 4m) around the base of the bank or scarp SSE-WNW, and the entrance (Wth of base 2.7m) is at E.
Source(s)	SMR

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN)
Identification No.	N2/A-C/CS/AY181
Legal Status	Recorded Monument
Reference No.	MO028-127----
Townland	Drumlusty
Site Type	Ringfort - rath
Coordinates (ITM)	687518806764
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situated on a low ENE-WSW ridge in a low-lying landscape between drumlins. This is a raised subcircular grass-covered area (dims 38.5m ENE-WSW; 34m NNW-SSE) defined by an overgrown earthen bank (Wth of base 6-7m; int. H 0.4-0.5m; ext. H 2-2.5m), with no visible fosse apart from a berm SSE-SW. The entrance is a wide gap (Wth at base 2.2m) at S. The interior has become overgrown since 1967.
Source(s)	SMR

OPTION D (ORANGE); OPTION F (ORANGE+LINK2+GREEN)	
Identification No.	N2/A-C/CS/AY186
Legal Status	Recorded Monument
Reference No.	MO028-132----
Townland	Blittoge
Site Type	Ringfort - rath
Coordinates (ITM)	688513806876
Description	Scheduled for inclusion in the next revision of the RMP: Yes Located towards the bottom of a SW-facing slope in a little NNW-SSE valley that opens out to a small lake c. 200m to the SSE. This is depicted as an arc of hachures S-W-N only on the 1907 edition of the OS 6-inch map. This is a grass-covered area (diam. 40m N-S) defined by a bank (H 0.5m) at S morphing into a scarp with a hedge SW-N (H 2m), but the perimeter is not discernible elsewhere. There is no visible fosse or entrance.
Source(s)	SMR

OPTION D (ORANGE); OPTION F (ORANGE+LINK2+GREEN)	
Identification No.	N2/A-C/CS/AY201
Legal Status	Listed on SMR
Reference No.	MO028-146----
Townland	Momony
Site Type	Ringfort - rath
Coordinates (ITM)	689224806365
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situated in a low-lying position between drumlins. A circular earthwork is depicted on McCrea's map of County Monaghan (1793) south of the W-E road from Drumlusty. It is not marked on later OS maps but the monument is visible as a vegetation mark of a circular enclosure (diam. c. 25m) defined by a single fosse feature on aerial images (OSAP 1995).
Source(s)	SMR

OPTION A (YELLOW); OPTION B (YELLOW+BLUE)	
Identification No.	N2/A-C/CS/AY223
Legal Status	Recorded Monument
Reference No.	MO031-013----
Townland	Monanny
Site Type	Ringfort - rath
Coordinates (ITM)	684255 805385
Description	Scheduled for inclusion in the next revision of the RMP: Yes

	<p>Located at the SE tip of NW-SE spur. A large embanked enclosure (diam. c. 40m) is depicted on the 1834 edition of the OS 6-inch map where it is described in gothic lettering as a 'fort'. Faint traces of a circular enclosure (diam. c. 28m) are visible as a low bank (Wth 3.2m; H 0.1m) and fosse (Wth of top 3.6m; D 0.3m) in pasture NW-NE. It is visible as a cropmark defined by two fosse features on the OSi aerial images (1995).</p> <p>A gradiometer and resistance survey was carried out in 2001 as part of the desk based assessment work for the N2 Carrickmacross-Aclint Road Realignment. This demonstrated that it as a bivallate rath measuring c. 90m x 76m externally and 54m x 46m internally with possible entrances at the N and S (Walsh 2004, 1).</p> <p>References: Walsh, F. 2004 N2 Carrickmacross-Aclint road re-alignment, site 112, Monanny 3. Unpublished excavation report (03E1256), National Monuments Section, Heritage and Planning Division, Department of the Environment, Heritage and Local Government, Dublin</p>
Source(s)	SMR

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN);
Identification No.	N2/A-C/CS/AY231
Legal Status	Recorded Monument
Reference No.	MO031-021----
Townland	Drumhillagh
Site Type	Ringfort - rath
Coordinates (ITM)	687622806106
Description	<p>Scheduled for inclusion in the next revision of the RMP: Yes</p> <p>Located in a NW-SE valley with a low hill c. 200m to the ENE and the summit of a NW-SE drumlin ridge is c. 300m to the WSW. This is a large, oval, raised and grass-covered area (dims c. 60m E-W; c. 50m N-S) defined by the remains of an earthen bank and hedge WSW-NW and E-SSE, which is incorporated into a field bank and hedge NW-E but completely absent SSE-WSW. There is an external fosse (at NW: Wth of top 4.14m; Wth of base 2.4m; int. D 2.45m; ext. D 1m) NW-N-SE. There are several gaps in the bank but the original entrance (Wth of base 2.1m) and causeway (H 0.5m) are at NE.</p>
Source(s)	SMR

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN)
Identification No.	N2/A-C/CS/AY258
Legal Status	Recorded Monument
Reference No.	MO031-057----
Townland	Drumhillagh
Site Type	Ringfort - rath
Coordinates (ITM)	688034805395
Description	<p>Scheduled for inclusion in the next revision of the RMP: Yes</p> <p>Situated on a slight NE-SW rise in a low-lying landscape with a SE-NW section of a small stream or drain c. 75m to the SW. This is a raised grass-covered oval are (dims 35.6m NE-SW; 28m WNW-ESE) defined by an overgrown scarp (at SE: Wth 3.7m; H 2m; at NW: Wth 5.7m; H</p>

	2m). There is no visible bank or fosse, but there is a ramp entrance (Wth c. 2m) at NNW that rises tangentially up the scarp and is hardly the original entrance.
Source(s)	SMR

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN)
Identification No.	N2/A-C/CS/AY259
Legal Status	Recorded Monument
Reference No.	MO031-058
Townland	Ballingarry
Site Type	Souterrain
Coordinates (ITM)	688620804474
Description	Scheduled for inclusion in the next revision of the RMP: No Possibly located on top of a NW-SE drumlin ridge. There is local information about the discovery of what might be a souterrain at Ballingarry made by the County Engineer in 1935 in the vicinity of ringfort (MO031-106 [AY307]) and it may be connected with the fort, but the precise location of both features is not known.
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY299
Legal Status	Recorded Monument
Reference No.	MO031-097----
Townland	Shanmullagh
Site Type	Ringfort - rath
Coordinates (ITM)	686608 801659
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situated on a shelf on a N-facing slope. It is depicted as a wooded enclosure incorporated in a NW-SE wooded boundary (Wth c. 10m) of the demesne of Monalty House, which is c. 320m to the N, on the 1834 and 1907 editions of the OS 6-inch map, and it has been adapted as a tree-ring. This is an oval scrub-covered area (dims 38m NW-SE; 33m NE-SW) planted with mature deciduous trees, which is defined by an earthen bank (Wth 3-4.4m; int. H 0.3-0.4m; ext. H 0.6-1.1m), with slight traces of an external fosse W-NW. The perimeter is incorporated into the wooded ornamental boundary SSE-W and N-NE. The original entrance is not identified.
Source(s)	SMR

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN)
Identification No.	N2/A-C/CS/AY307
Legal Status	Recorded Monument
Reference No.	MO031-106
Townland	Ballingarry

Site Type	Ringfort – rath [Listed on RMP as Earthwork Site]
Coordinates (ITM)	688765804305 [note: this site is not plotted on the online SMR]
Description	Scheduled for inclusion in the next revision of the RMP: No Located on the summit of a NW-SE ridge. A circular earthwork is depicted on the McCrea Map of County Monaghan (1793) at Ballingarry, but its exact location is not known. There is local information about the discovery of what might be a souterrain (MO031-058 [AY259]) made by the County Engineer in the vicinity and it may be connected with the fort, but its precise location is not known. Archaeological testing (06E0872) in the vicinity failed to produce any related material (Seaver 2009).
Source(s)	SMR/RMP

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN)
Identification No.	N2/A-C/CS/AY311
Legal Status	Recorded Monument
Reference No.	MO031-112----
Townland	Garlegobban
Site Type	Ford (Listed on RMP as 'Potential Site - Map')
Coordinates (ITM)	689202803735
Description	Scheduled for inclusion in the next revision of the RMP: Yes On the seventh of September, 1599, Richard Deveroux, the second Earl of Essex and Lord Lieutenant of Ireland, met and parleyed with Hugh O'Neill, the Earl of Tyrone, then in rebellion against Queen Elizabeth I. Essex had arrived in Ireland in April with over 17,000 troops, the largest army ever dispatched to Ireland by a Tudor monarch. Once in Ireland Essex dissipated and dispersed his forces on forays into the midlands and south. Finally, and by his own account (Shirley 1845, 108-11; 1879, 103-06), as he approached Ulster he had only 2700 foot and 300 horse and was being shadowed by a force twice that size under O'Neill, who asked to parley. This occurred at the ford of Bellaclinthe, and afterwards at the nearby castle of Garret Fleming at Lagan (LH013-001001-), which is c. 7.5km S of Garlegobban but only 2.5 km from Aclint. Nothing significant emerged from the talks, but a peace was arranged, which could be extended. Essex required a respite from campaigning and used the peace as an opportunity to return to England, while O'Neill was negotiating for Spanish aid and would welcome a delay. The precise location Bellaclinthe ford is not known but it is likely to be in the vicinity of Aclint Bridge on the main N2 Ardee to Carrickmacross road between Annagh and Aclint townlands in Co. Louth, and Drumgreeny and Annahean on the Monaghan side of the River Lagan or Glyde (Shirley 1845, 109fn). The Ordnance Survey placed the location between Garlegobban, Co. Monaghan and Essex Ford, Co. Louth where there is no river of any substance, and described it as 'Essex Ford (Site of)', only on the 1907 edition of the OS 6-inch map. However, Shirley (ibid.) records that a bronze axe and a silver spur were discovered here when the bridge was built in 1842, and it may have been an ancient ford. References: Shirley, E.P. 1845 Some account of the territory or dominion of Farney, in the Province of Ulster. London. Pickering Shirley, E.P. 1879 (Reprint 1988) The history of the county of Monaghan. London. Pickering.
Source(s)	SMR

OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN);	
Identification No.	N2/A-C/CS/AY313
Legal Status	Listed on SMR
Reference No.	MO031-119001-
Townland	Stradeen
Site Type	Ringfort - rath
Coordinates (ITM)	689243802916
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situated in a low-lying level landscape. Aerial photographs (CUCAP: AVG 62; AVG 63) from the 1970s show the cropmark of a circular enclosure (diam. c. 40m) defined by a single fosse feature. There is a large pit inside the perimeter at W, which may be a macula, i.e. the site of an uprooted tree, as there are other similar features in the same field. According to local information, an underground passage or souterrain also exists in this area. No archaeological feature is visible at ground level in pasture.
Source(s)	SMR

OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN)	
Identification No.	N2/A-C/CS/AY314
Legal Status	Listed on SMR
Reference No.	MO031-119002-
Townland	Stradeen
Site Type	Souterrain
Coordinates (ITM)	689237802917
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situated in a low-lying level landscape. According to local information, an underground passage or souterrain exists in the area of rath (MO031-119001-). Aerial photographs (CUCAP: AVG 62; AVG 63) from the 1970s show the cropmark of a large pit inside the perimeter of the rath at W, which may be a macula, i.e. the site of an uprooted tree, as there are other similar features in the same field. No archaeological feature is visible at ground level in pasture.
Source(s)	SMR

OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN)	
Identification No.	N2/A-C/CS/AY315
Legal Status	Listed on SMR
Reference No.	MO031-120----
Townland	Rahans
Site Type	Ringfort - rath
Coordinates (ITM)	687590805803
Description	Scheduled for inclusion in the next revision of the RMP: Yes Located on the SE-facing slope of a long, high NE-SW drumlin ridge, and c. 160m NW of the site of Rahans House, a large farm complex depicted on the 1834 and 1907 editions of the OS 6-inch map but no longer

extant. The feature is depicted as a shapeless copse on the 1834 and as a small circular enclosure on the 1907 editions of the map. This is a circular grass-covered area (diam. 23m N-S; 23m E-W) defined by a low earthen bank (at S: Wth of base 3.7m; int. H 0.1m; ext. H 1.9m) with some bushes and trees. There is no visible fosse or recognisable entrance. This could be a rath that was adapted as a tree ring.

Source(s) SMR

OPTION A (YELLOW); OPTION B (YELLOW+BLUE)

Identification No. N2/A-C/CS/AY316

Legal Status Listed on SMR

Reference No. MO031-124----

Townland Monanny

Site Type House - Neolithic

Coordinates (ITM) 684208 805228

Description **Scheduled for inclusion in the next revision of the RMP: No**
 Discovered prior to road construction (Excavation Licence No. 03E1254). Situated in a low lying area, in a S-curving loop of a small meandering stream at a point where it changes from a general N-S course to a general E-W course. The burnt mound (MO031-139---) and fulacht fia (MO031-127----) are further E on the same stream. A spread of burnt stone material (dims 8m x 5m; max. D 0.4m) was initially uncovered. Excavation of this revealed two hearths, a posthole and two troughs. The smaller trough (1.4m N-S x 1.23m E-W) had 14 waterlogged planks at its base and the larger trough (1.74m N-S x 1.55m E-W) had a large flat stone at its base. A plank from the trough produced a calibrated C14 date of 1377-896 BC (Walsh 2011, 517-8). (Walsh 2006, 406-7).

References:

Walsh F. 2006, Monanny 2 Prehistoric. In I. Bennett (ed.), Excavations 2003: summary accounts of archaeological excavations in Ireland, 406-7 (No. 1504). Bray. Wordwell

Walsh, F. 2011 A tale of two townlands (Part I) Clogher Record, vol. 20, No. 3, 500-20.

Source(s) SMR

OPTION A (YELLOW); OPTION B (YELLOW+BLUE)

Identification No. N2/A-C/CS/AY317

Legal Status Listed on SMR

Reference No. MO031-125

Townland Monanny

Site Type House - Neolithic

Coordinates (ITM) 684209 805257

Description **Scheduled for inclusion in the next revision of the RMP: No**
 Discovered prior to road construction (Excavation Licence No. 03E0888) and situated on a gentle S-facing slope in a low-lying area with a NW-SE section of a small meandering stream c. 40m to the S. Excavation revealed the walls of a rectangular structure (13.5m E-W x 8m N-S) with an internal dividing wall towards the E end and an entrance at the NW. Finds included a large assemblage of early Neolithic pottery, flint and a polished stone axe. It produced three C14 dates varying from calibrated dates of 3776-3655 to 3701-3526 BC. It was found in association with two other Neolithic structures (MO031-124---- and MO031-126----). (Walsh 2006, 404-5; 2011, 507-08).

	References: Walsh, F. 2011 A tale of two townlands (Part I) Clogher Record, vol. 20, No. 3, 500-20. Walsh F. 2006, Monanny 1, Neolithic, Bronze Age, post-medieval. In I. Bennett (ed.), Excavations 2003: summary accounts of archaeological excavations in Ireland, 404-6 (No. 1503). Bray. Wordwell
Source(s)	SMR

OPTION A (YELLOW); OPTION B (YELLOW+BLUE)	
Identification No.	N2/A-C/CS/AY318
Legal Status	Listed on SMR
Reference No.	MO031-126----
Townland	Monanny
Site Type	House – Neolithic
Coordinates (ITM)	684193 805257
Description	<p>Scheduled for inclusion in the next revision of the RMP: No</p> <p>Discovered prior to road construction (Excavation Licence No. 03E0888) and situated on a gentle S-facing slope in a low-lying area with a NW-SE section of a small meandering stream c. 40m to the S. Excavation revealed the walls of a rectangular structure (12m E-W x 7-8.5m N-S) with a possible entrance at the SE and a possible internal wall. A large assemblage of early Neolithic pottery was recovered from the slot trenches and post holes. It produced three C14 dates varying from calibrated dates of 3939-3702 to 3711-3656 BC. The house was found in association with two other Neolithic structures (MO031-124---- and MO031-125----). (Walsh 2006, 405; 2011, 509-12).</p> <p>References: Walsh F. 2006, Monanny 1, Neolithic, Bronze Age, post-medieval. In I. Bennett (ed.), Excavations 2003: summary accounts of archaeological excavations in Ireland, 404-6 (No. 1503). Bray. Wordwell</p>
Source(s)	SMR

OPTION A (YELLOW); OPTION B (YELLOW+BLUE)	
Identification No.	N2/A-C/CS/AY319
Legal Status	Listed on SMR
Reference No.	MO031-127----
Townland	Monanny
Site Type	Fulacht fia
Coordinates (ITM)	684177 805227
Description	<p>Scheduled for inclusion in the next revision of the RMP: No</p> <p>Discovered prior to road construction (Excavation Licence No. 03E0888). It is situated immediately to the N of a NW-SE section of a small meandering river which forms part of the Glyde river system. Excavation revealed a spread of burnt material (c. 15m E-W x 5m N-S; max. D 0.5m) with a sub-rectangular trough underneath it (c. 3m x 1.2m; D 0.5m). The trough had a large timber plank at the base of it. The oak plank produced a calibrated C14 date of 1873-1134 BC. The remains of a burnt mound (MO031-139----) was found on the S side of the stream in Cloghally Lower townland, jut to the W and another fulacht fia (MO031-134----) is c. 40m to the SW on the N side of the stream. (Walsh 2006, 406; 2011, 516-7).</p>

	References: Walsh F. 2006, Monanny 1, Neolithic, Bronze Age, post-medieval. In I. Bennett (ed.), Excavations 2003: summary accounts of archaeological excavations in Ireland, 404-6 (No. 1503). Bray. Wordwell
Source(s)	SMR

	OPTION A (YELLOW) ; OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY320
Legal Status	Listed on SMR
Reference No.	MO031-128----
Townland	Monanny
Site Type	Burial
Coordinates (ITM)	684195805239
Description	Scheduled for inclusion in the next revision of the RMP: No A single supine inhumation, orientated E-W, was discovered close to the river prior to road construction (Excavation Licence No. 03E0888). This was an adult of indeterminate sex aged between 33 and 48 years and produced a calibrated radiocarbon date of AD 1216-1286 (Walsh 2012, 98). A small quantity of disarticulated were found further W. (Walsh 2006, 406). References: Walsh F. 2006, Monanny 1, Neolithic, Bronze Age, post-medieval. In I. Bennett (ed.), Excavations 2003: summary accounts of archaeological excavations in Ireland, 404-6 (No. 1503). Bray. Wordwell Walsh, F. 2012 A tale of two townlands (Part II) Clogher Record, vol. 21, No. 1, 91-101.
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY321
Legal Status	Listed on SMR
Reference No.	MO031-129----
Townland	Monanny
Site Type	Kiln - corn-drying
Coordinates (ITM)	684157 805254
Description	Scheduled for inclusion in the next revision of the RMP: No Archaeological excavation (03E0888) prior to roadworks recorded a corn-drying kiln as an irregularly-shaped cut (dims 2.9m x 1.1m; D c. 04m) containing a single charcoal-rich layer over layers of ash and burnt clay at the bottom. A large quantity of barley and lesser amounts of wheat and other grains were recorded. A calibrated radiocarbon date of AD 433-634 was produced by a sample of hazelnuts shells and an oats sample produced a calibrated date of AD 426-592). (Walsh 2012, 92-4). References: Walsh, F. 2012 A tale of two townlands (Part II) Clogher Record, vol. 21, No. 1, 91-101.
Source(s)	SMR

OPTION A (YELLOW); OPTION B (YELLOW+BLUE)	
Identification No.	N2/A-C/CS/AY322
Legal Status	Listed on SMR
Reference No.	MO031-130----
Townland	Lisanisk
Site Type	Ringfort - rath
Coordinates (ITM)	685096803693
Description	<p>Scheduled for inclusion in the next revision of the RMP: No</p> <p>Situated at the crest of the SW-facing slope of a broad hill. Discovered prior to road construction (Excavation Licence 03E0890). Located on top of a drumlin, overlooking Lisanisk Lake and crannóg (MO031-037----). Excavation revealed a double ditched enclosure (diam. 60m) with a causeway entrance at the SE. Two possible structures were identified within it. An articulated human skeleton was recovered from the upper fill of the outer ditch. Finds included medieval pottery and a number of iron objects. (Coughlan 2006, 399-400)</p> <p>References: Coughlan, T. 2006, Site 108, Lisanisk 2 Ringfort. In I. Bennett (ed.), Excavations 2003: summary accounts of archaeological excavations in Ireland, 399-400 (No. 1490). Bray. Wordwell</p>
Source(s)	SMR

OPTION A (YELLOW); OPTION B (YELLOW+BLUE)	
Identification No.	N2/A-C/CS/AY323
Legal Status	Listed on SMR
Reference No.	MO031-131----
Townland	Lisanisk
Site Type	Excavation - miscellaneous
Coordinates (ITM)	685214 803567
Description	<p>Scheduled for inclusion in the next revision of the RMP: No</p> <p>Discovered prior to road construction (Excavation Licence No. 03E0891). Located on the S slope of a low drumlin. A number of pits forming no coherent pattern were excavated. Possibly associated with the rath excavated to the N (MO031-130----). (Coughlan T. 2006, 398-9).</p> <p>References: Coughlan, E. 2006, Site 107, Lisanisk 1 Possible late medieval land clearance In I. Bennett (ed.), Excavations 2003: summary accounts of archaeological excavations in Ireland, 398-9 (1489). Bray. Wordwell</p>
Source(s)	SMR

OPTION A (YELLOW); OPTION B (YELLOW+BLUE)	
Identification No.	N2/A-C/CS/AY324
Legal Status	Listed on SMR
Reference No.	MO031-132----
Townland	Monaltyduff

Site Type	Excavation - miscellaneous
Coordinates (ITM)	686016 802359
Description	Scheduled for inclusion in the next revision of the RMP: No Discovered prior to road construction (Excavation Licence No. 03E1298). Excavation revealed a circular charcoal filled pit (diam. 2m; D 0.6m).
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY325
Legal Status	Listed on SMR
Reference No.	MO031-133----
Townland	Monaltybane
Site Type	Excavation - miscellaneous
Coordinates (ITM)	686428 802018
Description	Scheduled for inclusion in the next revision of the RMP: No Discovered prior to road construction (Excavation Licence 03E1297). Excavation revealed an isolated circular pit (diam. 1.5m; D 0.5m).
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY326
Legal Status	Listed on SMR
Reference No.	MO031-134----
Townland	Monanny
Site Type	Fulacht fia
Coordinates (ITM)	684107 805199
Description	Scheduled for inclusion in the next revision of the RMP: No Discovered prior to road construction (Excavation Licence No. 03E1254). Situated in a low lying area, in a S-curving loop of a small meandering stream at a point where it changes from a general N-S course to a general E-W course. The burnt mound (MO031-139---) and fulacht fia (MO031-127----) are further E on the same stream. A spread of burnt stone material (dims 8m x 5m; max. D 0.4m) was initially uncovered. Excavation of this revealed two hearths, a posthole and two troughs. The smaller trough (1.4m N-S x 1.23m E-W) had 14 waterlogged planks at its base and the larger trough (1.74m N-S x 1.55m E-W) had a large flat stone at its base. A plank from the trough produced a calibrated C14 date of 1377-896 BC (Walsh 2011, 517-8). (Walsh 2006, 406-7). References: Walsh F. 2006, Monanny 2 Prehistoric. In I. Bennett (ed.), Excavations 2003: summary accounts of archaeological excavations in Ireland, 406-7 (No. 1504). Bray. Wordwell Walsh, F. 2011 A tale of two townlands (Part I) Clogher Record, vol. 20, No. 3, 500-20.
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY327
Legal Status	Listed on SMR
Reference No.	MO031-135----
Townland	Cloghvally Lower
Site Type	Burial ground
Coordinates (ITM)	684218 805105
Description	<p>Scheduled for inclusion in the next revision of the RMP: No</p> <p>Discovered prior to road construction (Excavation Licence No. 03E1255). Fifteen to seventeen inhumation burials in fourteen grave-cuts, some partially stone-lined, were excavated along with a number of disarticulated remains which possibly accounted for a further three to four individuals. The burials were centered on two NNW-SSE lines and a single ENE-WSW line with a single isolated burial c. 10m to the N. All the burials were orientated in an E-W direction, with the heads to the W, and are likely to be from a single extended family. There were six adult males and five adult females with three juveniles. Three calibrated radiocarbon dates range from AD 538-647 to AD 660-773). (Walsh F. 2004c, 9; 2006, 396-7; 2012 94-98).</p> <p>References:</p> <p>Walsh, F. 2004c N2 Carrickmacross-Aclint road re-alignment, site 110, Cloghvally Upper 1. Unpublished excavation report (03E1255), National Monuments Section, Heritage and Planning Division, Department of the Environment, Heritage and Local Government, Dublin.</p> <p>Walsh F. 2006, Cloughvalley Upper 1, Early medieval, post-medieval. In I. Bennett (ed.), Excavations 2003: summary accounts of archaeological excavations in Ireland, 396-7 (No. 1483). Bray. Wordwell</p> <p>Walsh, F. 2012 A tale of two townlands (Part II) Clogher Record, vol. 21, No. 1, 91-101.</p>
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY328
Legal Status	Listed on SMR
Reference No.	MO031-136----
Townland	Cloghvally Lower
Site Type	Burnt mound
Coordinates (ITM)	684149805227
Description	<p>Scheduled for inclusion in the next revision of the RMP: Yes Located at the SE tip of NW-SE spur. A large embanked enclosure (diam. c. 40m) is depicted on the 1834 edition of the OS 6-inch map where it is described in gothic lettering as a 'fort'. Faint traces of a circular enclosure (diam. c. 28m) are visible as a low bank (Wth 3.2m; H 0.1m) and fosse (Wth of top 3.6m; D 0.3m) in pasture NW-NE. It is visible as a cropmark defined by two fosse features on the OSi aerial images (1995).</p> <p>A gradiometer and resistance survey was carried out in 2001 as part of the desk based assessment work for the N2 Carrickmacross-Aclint Road Realignment. This demonstrated that it as a bivallate rath measuring c. 90m x 76m externally and 54m x 46m internally with possible entrances at the N and S. (Walsh 2004d, 1)</p> <p>References:</p>

	Walsh, F. 2004d N2 Carrickmacross-Aclint road re-alignment, site 112, Monanny 3. Unpublished excavation report (03E1256), National Monuments Section, Heritage and Planning Division, Department of the Environment, Heritage and Local Government, Dublin.
Source(s)	SMR

	OPTION D (ORANGE); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AY334
Legal Status	Recorded Monument
Reference No.	MO032-004001-
Townland	Drumgristin Upper
Site Type	Burial ground
Coordinates (ITM)	690516804947
Description	Scheduled for inclusion in the next revision of the RMP: Yes Located towards the bottom of the undulating E-facing slope of a drumlin. It is depicted faintly as trapezoidal feature (dims c. 20-4-m NW-SE; c. 20m NE-SW) described in gothic lettering as a 'Caldragh' or 'Ancient Burial Ground' on the 1834 edition of the OS 6-inch map. It is not visible at ground level, but there is a local tradition of bones and headstones being found during ploughing. No archaeological feature is visible at ground level in pasture but it is within an ecclesiastical enclosure (MO032-004003-), and the bullaun stone (MO032-004002-) is against the field bank just to the ESE.
Source(s)	SMR

	OPTION D (ORANGE); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AY335
Legal Status	Recorded Monument
Reference No.	MO032-004002-
Townland	Drumgristin Upper
Site Type	Bullaun stone
Coordinates (ITM)	690556804942
Description	Scheduled for inclusion in the next revision of the RMP: Yes Located at the bottom of the undulating E-facing slope of a drumlin. A bullaun stone (dims 0.6m x 0.45m; H 0.35m) with a single basin (diam. 0.25m; D 0.05m) is against a field bank at ESE on the perimeter of the ecclesiastical enclosure (MO032-004003-) and just E of the site of the burial ground (MO032-004001-).
Source(s)	SMR

	OPTION D (ORANGE); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AY336
Legal Status	Recorded Monument
Reference No.	MO032-004003-

Townland	Coolderry, Drumgristin Upper
Site Type	Ecclesiastical enclosure
Coordinates (ITM)	690512804968
Description	<p>Scheduled for inclusion in the next revision of the RMP: Yes</p> <p>Located towards the bottom of the undulating E-facing slope of a drumlin. A large enclosure (dims c. 150m N-S; c. 100m E-W) defined by field banks S-W-N and by a townland boundary with Coolderry (par. Donaghmoynes) elsewhere is depicted on the 1834 edition of the OS 6-inch map with a burial ground at the centre. The enclosure is a grass-covered area defined by a low grass-covered bank (Wth 3m; int. H 0.2m; ext. H 1.2m) or scarp S-W-N and by the field bank and townland boundary elsewhere. There is no evidence of the burial ground, but a bullaun stone (MO032-004002-) is at the field bank ESE of the centre. There is a local tradition that a St. Derrig had a monastery here, but this cannot be confirmed (Ó Riain 2011).</p> <p>References: Ó Riain, P. 2011 A dictionary of Irish Saints. Dublin. Four Courts Press.</p>
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/ AY363
Legal Status	Recorded Monument
Reference No.	MO034-023001-
Townland	Drumgeeny
Site Type	Fulacht fia
Coordinates (ITM)	688987798216
Description	<p>Scheduled for inclusion in the next revision of the RMP: No</p> <p>One of three possible fulachtaí fia first recorded in 1967 (SMR file) as follows: 'Mr. Nicholas Marran of Drumgeeny, Co. Monaghan, noticed three small mounds while working in a field in Drumgeeny 7 or 8 years ago. This field is the second, on the W side of the road, from Aclint Bridge and Mr. Marran pointed out the site of these mounds, on the 6-inch OS map, just south of a NW-SE stream where it flows out of Drumgeeny Lough. When Mr. Marron "went down in the mounds" he found "pieces of cut sandstone", burnt wood (charcoal) and ash and a decorated pot. The pottery vessel had a "wee flower decoration on outside, except towards the bottom, about 9 inches circumference" and same in height which he broke. He found a stone axe and a quern nearby. Many small iron horse shoes have turned up in the same field. The 3 mounds were roughly in a triangle, each about 12 yards from each other. The pot was found in the largest of the mounds. They averaged 5 yards in diameter and 2 feet in height.' No visible surface trace of the monuments survived in 1967 and the site is now covered over by a concrete products facility. (Brindley 1986, no. 72)</p> <p>References: Brindley, A. 1986 Archaeological inventory of County Monaghan. Dublin. Stationery Office.</p>
Source(s)	SMR

OPTION A (YELLOW); OPTION B (YELLOW+BLUE)	
Identification No.	N2/A-C/CS/ AY364
Legal Status	Recorded Monument
Reference No.	MO034-023002-
Townland	Drumgeeny
Site Type	Fulacht fia
Coordinates (ITM)	688987798216
Description	<p>Scheduled for inclusion in the next revision of the RMP: Yes</p> <p>One of three possible fulachtaí fia first recorded in 1967 (SMR file) as follows: 'Mr. Nicholas Marran of Drumgeeny, Co. Monaghan, noticed three small mounds while working in a field in Drumgeeny 7 or 8 years ago. This field is the second, on the W side of the road, form Aclint Bridge and Mr. Marran pointed out the site of these mounds, on the 6-inch OS map, just south of a NW-SE stream where it flows out of Drumgeeny Lough. When Mr. Marron "went down in the mounds" he found "pieces of cut sandstone", burnt wood (charcoal) and ash and a decorated pot. The pottery vessel had a "wee flower decoration on outside, except towards the bottom, about 9 inches circumference" and same in height which he broke. He found a stone axe and a quern nearby. Many small iron horse shoes have turned up in the same field. The 3 mounds were roughly in a triangle, each about 12 yards from each other. The pot was found in the largest of the mounds. They averaged 5 yards in diameter and 2 feet in height.' No visible surface trace of the monuments survived in 1967 and the site is now covered over by a concrete products facility. (Brindley 1986, no. 72)</p> <p>References: Brindley, A. 1986 Archaeological inventory of County Monaghan. Dublin. Stationery Office.</p>
Source(s)	SMR

OPTION A (YELLOW); OPTION B (YELLOW+BLUE)	
Identification No.	N2/A-C/CS/ AY365
Legal Status	Recorded Monument
Reference No.	MO034-023003-
Townland	Drumgeeny
Site Type	Fulacht fia
Coordinates (ITM)	688987798216
Description	<p>Scheduled for inclusion in the next revision of the RMP: Yes</p> <p>One of three possible fulachtaí fia first recorded in 1967 (SMR file) as follows: 'Mr. Nicholas Marran of Drumgeeny, Co. Monaghan, noticed three small mounds while working in a field in Drumgeeny 7 or 8 years ago. This field is the second, on the W side of the road, form Aclint Bridge and Mr. Marran pointed out the site of these mounds, on the 6-inch OS map, just south of a NW-SE stream where it flows out of Drumgeeny Lough. When Mr. Marron "went down in the mounds" he found "pieces of cut sandstone", burnt wood (charcoal) and ash and a decorated pot. The pottery vessel had a "wee flower decoration on outside, except towards the bottom, about 9 inches circumference" and same in height which he broke. He found a stone axe and a quern nearby. Many small iron horse shoes have turned up in the same field. The 3 mounds were roughly in a triangle, each about 12 yards from each other. The pot was found in the largest of the mounds. They</p>

	averaged 5 yards in diameter and 2 feet in height.’ No visible surface trace of the monuments survived in 1967 and the site is now covered over by a concrete products facility. (Brindley 1986, no. 72) References: Brindley, A. 1986 Archaeological inventory of County Monaghan. Dublin. Stationery Office.
Source(s)	SMR

	OPTION D (ORANGE); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AY371
Legal Status	Recorded Monument
Reference No.	LH010-001----
Townland	Rootate
Site Type	Ringfort - rath
Coordinates (ITM)	691192802272
Description	Scheduled for inclusion in the next revision of the RMP: Yes Oval platform (int. dims. 29m E-W, 20m N-S, H 0.5-2m), the top of which is enclosed by a much-degraded earthen bank now reduced to a scarp. Traces of internal fosse (Wth 3.3m, D 0.3m) at W. Ancient entrance at NE represented by a depression in the scarp (Wth 1.8m). Modern depression in scarp at NNW.
Source(s)	SMR

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN);
Identification No.	N2/A-C/CS/AY379
Legal Status	Recorded Monument
Reference No.	LH010-007----
Townland	Tully
Site Type	Enclosure
Coordinates (ITM)	690992799902
Description	Scheduled for inclusion in the next revision of the RMP: Yes Cropmarks indicating sub-circular enclosure (max. dims. c. 58m N-S, c. 55m E-W) on aerial photographs (CUCAP, BDP 41, BDS 75).
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY385
Legal Status	Recorded Monument
Reference No.	LH010-012----
Townland	Aclint
Site Type	Souterrain
Coordinates (ITM)	689332797963

Description	Scheduled for inclusion in the next revision of the RMP: Yes Local tradition of souterrain, which was opened in early twentieth century, to NW of Aclint motte (LH010-013----). Inaccessible at time of survey.
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY386
Legal Status	Recorded Monument
Reference No.	LH010-013----
Townland	Aclint
Site Type	Castle - motte and bailey
Coordinates (ITM)	689334797917
Description	Scheduled for inclusion in the next revision of the RMP: Yes The site consists of a large flat-topped mound (diam. of base c. 36m; top c. 15m, H c. 8m) with a deep wide fosse (Wth c. 9m, D c. 1.7m) and a sub-rectangular bailey (c. 37m by 36m, H c. 1.7m) at the SE. It is sited on a long drumlin overlooking the Lagan River. On the summit of the motte there is a circular area (diam. c. 5m) enclosed by a low bank, probably the remains of a superstructure. A very slight fosse is visible along the SE side of the bailey. At the time of inspection it could be seen that the upper two thirds of the mound were composed of earth and stone. In places the bailey is up to 1.7m above ground level and its surrounding fosse is up to 0.65m deep. (CLAJ 1924, 279). References: Anon. 1924 Louth Ordnance Survey Letters. County Louth Archaeological and Historical Society Journal, vol. 5, 4, 278-82.
Source(s)	SMR

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN);
Identification No.	N2/A-C/CS/AY388 [see also AY311]
Legal Status	Recorded Monument
Reference No.	LH010-015----
Townland	Essexford
Site Type	Ford
Coordinates (ITM)	689202803732
Description	[The SMR Zone for this site is 4km by c.150m. This appears to be an error] Scheduled for inclusion in the next revision of the RMP: Yes On the seventh of September, 1599, Richard Deveroux, the second Earl of Essex and Lord Lieutenant of Ireland, met and parleyed with Hugh O'Neill, the Earl of Tyrone, then in rebellion against Queen Elizabeth I. Essex had arrived in Ireland in April with over 17,000 troops, the largest army ever dispatched to Ireland by a Tudor monarch. Once in Ireland Essex dissipated and dispersed his forces on forays into the midlands and south. Finally, and by his own account (Shirley 1845, 108-11; 1879, 103-06), as he approached Ulster he had only 2700 foot and 300 horse and was being shadowed by a force twice that size under O'Neill, who asked to parley. This occurred at the ford of Bellaclinthe, and afterwards at the nearby castle of Garret Fleming, which is otherwise unknown. Nothing significant emerged from the talks, but a peace was arranged, which could be extended. Essex required a

respite from campaigning and used the peace as an opportunity to return to England, while O'Neill was negotiating for Spanish aid and would welcome a delay.

The precise location Bellaclinthe ford is not known but it is likely to be in the vicinity of Aclint Bridge on the main N2 Ardee to Carrickmacross road between Annagh and Aclint townlands in Co. Louth, and Drumgreeny and Annahean on the Monaghan side of the River Lagan or Glyde (Shirley 1845, 109fn). The Ordnance Survey placed the location between Garlegobban, Co. Monaghan and Essex Ford, Co. Louth where there is no river of any substance, and described it as 'Essex Ford (Site of)', only on the 1907 edition of the OS 6-inch map. However, Shirley (ibid.) records that a bronze axe and a silver spur were discovered here when the bridge was built in 1842, and it may have been an ancient ford.

References:

Shirley, E.P. 1879 (Reprint 1988) The history of the county of Monaghan. London. Pickering.

Shirley, E.P. 1845 Some account of the territory or dominion of Farney, in the Province of Ulster. London. Pickering.

Source(s)	SMR
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OPTION D (ORANGE); OPTION F (ORANGE+LINK2+GREEN)	
Identification No.	N2/A-C/CS/AY391
Legal Status	Listed on SMR
Reference No.	LH010-017----
Townland	Stonetown Lower
Site Type	Burial ground
Coordinates (ITM)	691402803002
Description	Scheduled for inclusion in the next revision of the RMP: Yes Locally known as 'the graveyard field'; bones unearthed in the vicinity. (IFC Schools MSS 668, 221).
Source(s)	SMR

OPTION D (ORANGE); OPTION F (ORANGE+LINK2+GREEN)	
Identification No.	N2/A-C/CS/AY393
Legal Status	Recorded Monument
Reference No.	LH010A001----
Townland	Rosslough
Site Type	Ringfort - rath
Coordinates (ITM)	690832804411
Description	Scheduled for inclusion in the next revision of the RMP: Yes Sub-circular area (int. dims. c. 29m N-S, c. 24m E-W) enclosed by two earth and stone banks. Inner bank (Wth 3.5m, H 0.3m internally, 0.8m externally) much degraded except at N. Possible traces of internal stone facing to inner bank at SSW. Outer bank (Wth 3m, H 0.9m internally, 0.6m externally). Flat intervening space (Wth 6m) between the two banks may represent filled-in fosse.
Source(s)	SMR

OPTION D (ORANGE); OPTION E (ORANGE+LINK1+GREEN); OPTION F (ORANGE+LINK2+GREEN)	
Identification No.	N2/A-C/CS/AY404
Legal Status	Recorded Monument
Reference No.	LH011-078----
Townland	Nicholastown (Ardee By)
Site Type	Earthwork
Coordinates (ITM)	692271798982
Description	Scheduled for inclusion in the next revision of the RMP: Yes Cropmark arc forming semi-circle (C 38m NW-SE) on aerial photograph (CUCAP, BDS 74). Possible remains of roughly circular enclosure.
Source(s)	SMR

OPTION C (GREEN)	
Identification No.	N2/A-C/CS/AY405
Legal Status	Recorded Monument
Reference No.	LH011-079----
Townland	Thomastown
Site Type	Enclosure
Coordinates (ITM)	692151798243
Description	Scheduled for inclusion in the next revision of the RMP: Yes Cropmarks indicating sub-circular enclosure (max. dims. c. 40m NW-SE, c. 32m SW-NE) enclosed by two concentric ditches on aerial photograph (CUCAP, BDS 73).
Source(s)	SMR

OPTION D (ORANGE)	
Identification No.	N2/A-C/CS/AY408
Legal Status	Recorded Monument
Reference No.	LH011-082----
Townland	Rathbody
Site Type	Enclosure
Coordinates (ITM)	693021797983
Description	Scheduled for inclusion in the next revision of the RMP: Yes Cropmarks defining oval area enclosed by two ditches (max. dims. c. 38m NW-SE, c. 22m SW-NE) on aerial photograph (CUCAP, BDS 72).
Source(s)	SMR

OPTION D (ORANGE); OPTION E (ORANGE+LINK1+GREEN); OPTION F (ORANGE+LINK2+GREEN)	
Identification No.	N2/A-C/CS/AY410
Legal Status	Recorded Monument
Reference No.	LH011-083002-
Townland	Cavanrobert
Site Type	Souterrain
Coordinates (ITM)	693441797783
Description	Scheduled for inclusion in the next revision of the RMP: Yes The information for this record has not yet been uploaded to the HEV.
Source(s)	SMR

OPTION D (ORANGE); OPTION E (ORANGE + LINK + GREEN); OPTION F (ORANGE+LINK2+GREEN)	
Identification No.	N2/A-C/CS/AY413
Legal Status	Listed on SMR
Reference No.	LH011-120----
Townland	Cavanrobert
Site Type	Enclosure
Coordinates (ITM)	693384797617
Description	Scheduled for inclusion in the next revision of the RMP: Yes Aerial photograph (GB89.C.17) shows cropmark of a circular enclosure defined by a fosse.
Source(s)	SMR

OPTION A (YELLOW); OPTION B (YELLOW+BLUE)	
Identification No.	N2/A-C/CS/AY419
Legal Status	Recorded Monument
Reference No.	LH013-003----
Townland	REAGHSTOWN
Site Type	Ringfort - rath
Coordinates (ITM)	690702796853
Description	Scheduled for inclusion in the next revision of the RMP: Yes Oval platform area (int. diam. 45m, H 2-2.6m) built on a natural rise and enclosed by much-degraded bank, reduced to a scarp. No visible trace of fosse or entrance. There is a gap (Wth 2.6m) on the WSW of the scarp, but it is uncertain whether this is the original entrance.
Source(s)	SMR

OPTION C (GREEN)	
Identification No.	N2/A-C/CS/AY456
Legal Status	Recorded Monument
Reference No.	LH014-001----
Townland	Rathbody
Site Type	Ringfort - rath
Coordinates (ITM)	692654797425
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situated on top of natural ridge. Sub-circular area (int. dims. 26m E-W, 19m N-S) enclosed by much-degraded earthen bank (Wth 4.5m, H 0.4m internally, 1.3m externally) now visible as scarp platform, except in W quadrant. Traces of fosse (Wth 4m, D 0.7m) and internal berm-like feature (Wth 5.5m) at base of platform. No visible trace of ancient entrance. Much of the W half of interior is taken up by a depression and banks of uncertain significance.
Source(s)	SMR

OPTION D (ORANGE); OPTION E (ORANGE + LINK + GREEN); OPTION F (ORANGE+LINK2+GREEN)	
Identification No.	N2/A-C/CS/AY457
Legal Status	Recorded Monument
Reference No.	LH014-002----
Townland	Rathbody
Site Type	Standing stone
Coordinates (ITM)	693552797223
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situated on slight rise in undulating countryside. Slab of shale, triangular in plan (max. dims. H 3m, 1.5m by 0.6m in section), orientated roughly NE-SW.
Source(s)	SMR

OPTION D (ORANGE); OPTION E (ORANGE + LINK + GREEN); OPTION F (ORANGE+LINK2+GREEN)	
Identification No.	N2/A-C/CS/AY459
Legal Status	Recorded Monument
Reference No.	LH014-004----
Townland	Louth Hall
Site Type	Souterrain
Coordinates (ITM)	694121796815
Description	Scheduled for inclusion in the next revision of the RMP: Yes Local tradition of a souterrain at Springhill. (IFC Schools MSS 667, 155; 668, 180). Now inaccessible.
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY460
Legal Status	Recorded Monument
Reference No.	LH014-014001-
Townland	Knocklore
Site Type	Enclosure
Coordinates (ITM)	692691795213
Description	Scheduled for inclusion in the next revision of the RMP: Yes Indicated on current OS 25 inch sheet as oval platform (max. dims. 54m NNE-SSW, 42m WNW-ESE) with bank on top in NW quadrant. Local recollections of finding human bones. No visible surface trace. (See also LH014-014002-)
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY461
Legal Status	Recorded Monument
Reference No.	LH014-014002-
Townland	Knocklore
Site Type	Burial mound
Coordinates (ITM)	692695795211
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situated in destroyed enclosure (LH014-014001-) and consisting of an artificially raised mound which contained about twenty burials according to a local informant in 1967. A ridge or bank extended through the centre of the site. The graves consisted of rectangular trenches c. 1.8m long and were filled with dark earth. The burials were orientated E-W. The above description is based on information received from the then owner of the land at the time of the destruction of the enclosure. The site is referred to as 'Lis na Kelic' in the OS Letters (CLAJ 1910, 291), which is possibly a corruption of 'Liss na Relig'.
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE); OPTION C (GREEN)
Identification No.	N2/A-C/CS/AY466
Legal Status	Recorded Monument
Reference No.	LH014-016001-
Townland	Cookstown
Site Type	Castle - unclassified
Coordinates (ITM)	693223 794432
Description	Scheduled for inclusion in the next revision of the RMP: Yes The ruins of a tower and an adjacent gabled structure is depicted at Cookstown (71) on the Down Survey (1656-8) barony map in Charlestown parish, for which see this web-page accessed on 5 May 2016

	<p>http://downsurvey.tcd.ie/down-survey-maps.php#bm=Atherdee&c=Louth It is depicted on the 1835 ed. of the OS 6-inch map as a rectangular roofless structure (dims c. 8m E-W; c. 5m N-s) and on the 1907 ed. as if the N wall might partially survive. It is described locally as having a slit window and cellars, by which is probably meant a vault, but it was removed in the early twentieth century. No feature is visible at ground level. Archaeological testing (00E0913) in the vicinity failed to produce any related material (Clutterbuck 2002). The possible souterrain (LH014-016002-) is c. 20m to the S. (Stubbs 1909, 132)</p> <p>References: Clutterbuck, R. 2002 Cookstown. Vicinity of Castle. In I. Bennett (ed.), Excavations 2001: summary accounts of archaeological excavations in Ireland, 214. Bray. Wordwell Stubbs F.W. 1909 Place Names in the County of Louth. County Louth Archaeological and Historical Journal, Vol. 2, 2 128-38.</p>
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE); OPTION C (GREEN)
Identification No.	N2/A-C/CS/AY467
Legal Status	Recorded Monument
Reference No.	LH014-016002
Townland	Cookstown
Site Type	Souterrain
Coordinates (ITM)	693221 794413
Description	Scheduled for inclusion in the next revision of the RMP: Yes Local tradition of a 'cave' close to Cookstown Castle (LH014-016001-).
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE); OPTION C (GREEN)
Identification No.	N2/A-C/CS/AY478
Legal Status	Recorded Monument
Reference No.	LH014-032----
Townland	Mullanstown
Site Type	Enclosure
Coordinates (ITM)	694691 792664
Description	Scheduled for inclusion in the next revision of the RMP: Yes Cropmark suggesting roughly circular enclosure (max. diam c. 70m NW-SE) on aerial photograph (CUCAP, AYM 18).
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE); OPTION C (GREEN)
Identification No.	N2/A-C/CS/AY486
Legal Status	Recorded Monument

Reference No.	LH014-012-
Townland	Mullanstown
Site Type	Castle - unclassified
Coordinates (ITM)	695003 792338
Description	<p>Scheduled for inclusion in the next revision of the RMP: Yes A roofless gabled house is depicted at Mullanstown (73) in Ardee parish on the Down Survey (1656-8) barony map, for which see this web-page accessed on 5 May 2016 http://downsurvey.tcd.ie/down-survey-maps.php#bm=Atherdee&c=Louth</p> <p>A castle is shown on Taylor and Skinner's map of 1777, but not on the 1778 edition (P 38). It is marked as the site of a castle on the 1835 and 1907 eds of the OS 6-inch map. The location is now disused quarry pit and no features are visible at ground level.</p> <p>References: Taylor and Skinner 1777 Road map of Ireland. Reproduced by the County Louth Archaeological Society, 1982. Taylor and Skinner 1778 (Reprint 1969) Maps of the Roads of Ireland. Shannon. Irish University Press.</p>
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE); OPTION C (GREEN);
Identification No.	N2/A-C/CS/AY492
Legal Status	Recorded Monument
Reference No.	LH014-058----
Townland	Cookstown
Site Type	Font
Coordinates (ITM)	693791794013
Description	<p>Scheduled for inclusion in the next revision of the RMP: Yes</p> <p>A greenstone holy water or baptismal font, located outside the SE wall of the former Charlestown Rectory. Cylindrical in shape with a small rib projecting slightly at the base. The basin is 0.29m in depth and tapers considerably from a large circular mouth (diam. 0.27m) to a small flat circular bottom (diam. 0.06m). (SMR file)</p>
Source(s)	SMR

	OPTION D (ORANGE); OPTION E (ORANGE + LINK + GREEN); OPTION E (ORANGE + LINK + GREEN);
Identification No.	N2/A-C/CS/AY493
Legal Status	Listed on SMR
Reference No.	LH014-062----
Townland	Pepperstown
Site Type	Barrow - unclassified
Coordinates (ITM)	695031794224
Description	<p>Scheduled for inclusion in the next revision of the RMP: Yes</p> <p>Soilmark during ploughing in field known locally as 'Mount field'. Local tradition of bones being unearthed.</p>

Source(s)	SMR
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	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY494
Legal Status	Listed on SMR
Reference No.	LH014-064----
Townland	Tattyboys
Site Type	Fulacht fia
Coordinates (ITM)	692279795517
Description	Scheduled for inclusion in the next revision of the RMP: No Description: Discovered prior to road construction (Excavation Licence No. 98E0125 (site A)). Excavation revealed a spread of burnt stone and charcoal-rich soil (9m x 5m; D c. 0.25m) which overlaid a shallow posthole, an oval pit and a rectangular pit. (Breen 2000, 153)
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY495
Legal Status	Listed on SMR
Reference No.	LH014-065----
Townland	Tattyboys
Site Type	Burnt spread
Coordinates (ITM)	692481795363
Description	Scheduled for inclusion in the next revision of the RMP: No Description: Discovered prior to road construction (Excavation Licence No. 98E0125 (site B)). Excavation revealed a thin spread of grey, charcoal flecked soil, which contained fragments of burnt cow's teeth. (Breen 1998, 4) Compiled by: Claire Breen
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY496
Legal Status	Listed on SMR
Reference No.	LH014-066----
Townland	Knocklore
Site Type	Burnt spread
Coordinates (ITM)	692581 795283
Description	Scheduled for inclusion in the next revision of the RMP: No Description: Discovered prior to road construction (Excavation Licence No. 98E0125 (Sites C, D and E)). Excavation revealed thin spreads of grey soil, with occasional charcoal flecks. No diagnostic finds were recovered from these spreads. (Breen 2000, 153)
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY497
Legal Status	Listed on SMR
Reference No.	LH014-067----
Townland	Knocklore
Site Type	Fulacht fia
Coordinates (ITM)	692788795206
Description	Scheduled for inclusion in the next revision of the RMP: No Discovered prior to road construction (Excavation Licence No. 98E0125 (Site G)). Excavation uncovered three circular hollow areas which were filled with burnt stones and charcoal rich soil. (Breen 2000, 153). References: Breen, T. 2000. Tattyboys/Knocklore/Cookstown/Rahanna/Harristown/Glebe. In I. Bennett (ed.), Excavations 1998: summary accounts of archaeological excavations in Ireland, 153 (No. 471). Bray. Wordwell.
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY498
Legal Status	Listed on SMR
Reference No.	LH014-068
Townland	Cookstown
Site Type	Fulacht Fia
Coordinates (ITM)	692865 795041
Description	Scheduled for inclusion in the next revision of the RMP: No Discovered prior to road construction (Excavation Licence No. 98E0125 (Site H)). Excavation revealed a spread of burnt stones and charcoal rich soil (8m x 6m). (Breen 2000, 153). References: Breen, T. 2000. Tattyboys/Knocklore/Cookstown/Rahanna/Harristown/Glebe. In I. Bennett (ed.), Excavations 1998: summary accounts of archaeological excavations in Ireland, 153 (No. 471). Bray. Wordwell.
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY499
Legal Status	Listed on SMR
Reference No.	LH014-069----
Townland	Cookstown
Site Type	Fulacht fia
Coordinates (ITM)	693038 794933

Description	<p>Scheduled for inclusion in the next revision of the RMP: Yes Discovered prior to road construction (Excavation Licence No. 98E0125 (Site I)). Excavation revealed a spread of burnt stones and charcoal rich soil (11m x 9m) under which was a rectangular pit (2.5m x 1.2m) cut into the natural clay. A stone with incised lines on it, together with animal bone and teeth and some fragments of burnt bone were recovered. (Breen 2000, 153).</p> <p>References: Breen, T. 2000 Tattyboys/Knocklore/Cookstown/Rahanna/Harristown/Glebe. In I. Bennett (ed.), Excavations 1998: summary accounts of archaeological excavations in Ireland, 153 (No. 471). Bray. Wordwell.</p>
Source(s)	SMR

OPTION A (YELLOW); OPTION B (YELLOW+BLUE)	
Identification No.	N2/A-C/CS/AY500
Legal Status	Listed on SMR
Reference No.	LH014-070----
Townland	Knocklore
Site Type	Cremated remains
Coordinates (ITM)	692581795183
Description	<p>Scheduled for inclusion in the next revision of the RMP: No</p> <p>Discovered prior to road construction (Excavation Licence No. 98E0125 (Site F)). Excavation revealed a circular spread of grey charcoal rich soil (diam. 0.9m), from which fragments of cremated human bone and cattle bone were recovered. (Breen 2000, 153).</p> <p>References: Breen, T. 2000 Tattyboys/Knocklore/Cookstown/Rahanna/Harristown/Glebe. In I. Bennett (ed.), Excavations 1998: summary accounts of archaeological excavations in Ireland, 153 (No. 471). Bray. Wordwell.</p>
Source(s)	SMR

OPTION D (ORANGE); OPTION E (ORANGE + LINK + GREEN); OPTION F (ORANGE+LINK2+GREEN)	
Identification No.	N2/A-C/CS/AY503
Legal Status	Listed on SMR
Reference No.	LH014-082----
Townland	Louth Hall
Site Type	Enclosure
Coordinates (ITM)	694241796890
Description	<p>Scheduled for inclusion in the next revision of the RMP: Yes</p> <p>Aerial photograph (GB89.C.26) shows cropmark of a curvilinear enclosure, with traces of internal detail, defined by a fosse.</p>
Source(s)	SMR

OPTION D (ORANGE); OPTION E (ORANGE + LINK + GREEN); OPTION F (ORANGE+LINK2+GREEN)	
Identification No.	N2/A-C/CS/AY504
Legal Status	Listed on SMR
Reference No.	LH014-083----
Townland	Pepperstown
Site Type	Enclosure
Coordinates (ITM)	695181794309
Description	Scheduled for inclusion in the next revision of the RMP: Yes Aerial photograph (GB89.D.20) shows cropmark of a curvilinear enclosure defined by a fosse with an entrance facing southwest; a second concentric fosse extends from the inner enclosure and encompasses the western half of the monument with an entrance coinciding with the above. A contiguous oval enclosure extends to the northwest. One of a group of five closely spaced enclosures.
Source(s)	SMR

OPTION D (ORANGE); OPTION E (ORANGE + LINK + GREEN); OPTION F (ORANGE+LINK2+GREEN)	
Identification No.	N2/A-C/CS/AY505
Legal Status	Listed on SMR
Reference No.	LH014-084----
Townland	Pepperstown
Site Type	Enclosure
Coordinates (ITM)	695021794506
Description	Scheduled for inclusion in the next revision of the RMP: Yes Aerial photograph (GB89.D.20) show cropmark of a circular enclosure defined by a fosse. One of a group of five closely spaced enclosures.
Source(s)	SMR

OPTION D (ORANGE); OPTION E (ORANGE + LINK + GREEN); OPTION F (ORANGE+LINK2+GREEN)	
Identification No.	N2/A-C/CS/AY508
Legal Status	Listed on SMR
Reference No.	LH014-087----
Townland	Pepperstown
Site Type	Enclosure
Coordinates (ITM)	695024794680
Description	Scheduled for inclusion in the next revision of the RMP: Yes Aerial photograph (GB89.D.21) shows faint cropmark of a curvilinear enclosure. Adjacent to a group of five closely spaced enclosures.
Source(s)	SMR

	OPTION D (ORANGE); OPTION E (ORANGE + LINK + GREEN); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AY509
Legal Status	Listed on SMR
Reference No.	LH014-088----
Townland	Pepperstown
Site Type	Enclosure
Coordinates (ITM)	694971794381
Description	Scheduled for inclusion in the next revision of the RMP: Yes Aerial photograph (GB89.D.20) shows cropmark of a curvilinear enclosure defined by a fosse; two fosses extending outwards suggest a larger contiguous enclosure. One of a group of five closely spaced enclosures.
Source(s)	SMR

	OPTION D (ORANGE); OPTION E (ORANGE + LINK + GREEN); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AY510
Legal Status	Listed on SMR
Reference No.	LH014-090----
Townland	Rathbody
Site Type	Enclosure
Coordinates (ITM)	693608797081
Description	Scheduled for inclusion in the next revision of the RMP: Yes Aerial photograph (GB89.C.41) shows cropmark of small circular enclosure defined by a fosse, with an outer irregular fosse.
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY515
Legal Status	Recorded Monument
Reference No.	LH010-023--
Townland	ACLINT
Site Type	Ringfort - rath
Coordinates (ITM)	689577 797885
Description	Scheduled for inclusion in the next revision of the RMP: Yes Situated on a N-facing slope. The faint cropmark of a circular area (diam. c. 35m) defined by a single fosse feature is visible only on Google Earth (29/06/2018), but the fosse appears to be absent S-W. It was first reported by Anthony Murphy.
Source(s)	SMR

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AY516
Legal Status	Recorded Monument Listed on SMR
Reference No.	MO031-139-
Townland	MONALTYDUFF
Site Type	Road- Hollow way
Coordinates (ITM)	685639 802740
Description	<p>Scheduled for inclusion in the next revision of the RMP: Yes Located on a slight N-facing slope down to a small canalized WSW-ENE stream (L c. 400m) connecting Lough Naglack just to the W with Moynalty Lough c. 400m to the E. The line of an old road is depicted faintly on the 1834 edition of the OS 6-inch map approaching Broken Bridge from the S while the present line is depicted running parallel with it just to the W. A hollow way (L c. 200m) is visible as a sunken area (Wth of top c. 4.5m; Wth of base 2.75m; D 0.6-0.75m) with a straight edge on the W side running S-N towards the bridge, which is probably an eighteenth century structure with one arch (Coughlan 2003, Fig. 22, Pl. 17). Archaeological testing (02E1212) in four trenches across the N end of the hollow way showed topsoil (D 0.15-0.2m) lying directly on subsoil and produced no datable material (Coughlan 2009, 6-7). Much of the hollow way survives undisturbed in a wood bordering the E side of the present by-road.</p> <p>References: Coughlan, T. 2003 Preliminary Report on the Archaeological Testing of the the N2 Carrickmacross – Aclint Road Realignment. Licence No. 03E0388. Unpublished report, Irish Archaeological Consultancy Coughlan, T. 2009 Report on Archaeological Assessment at Site 105; Hollowway. N2 Carrickmacross – Aclint Road Realignment. Licence No. 03E0388. Unpublished report Irish Archaeological Consultancy</p>
Source(s)	SMR

Appendix 9.2 Preliminary Inventory of Architectural Heritage

	OPTION A (YELLOW)
Identification No.	N2/A-C/CS/AH001
Legal Status	RPS; Listed on NIAH
Reference No.	RPS 41402504; NIAH 41402511
NIAH RATING	Regional
Townland	Brackagh
Site Type	Grave monument: An Eaglais
Coordinates (ITM)	685154813581
Description	Two free-standing polished granite monuments, erected c.1930, to graves in graveyard to front (south) of former Broomfield Presbyterian Church. One rectangular-plan black granite obelisk, dated 1893, and one round-plan red granite monument, dated 1905, each with urn to top and carved inscriptions to shaft commemorating multiple former church members. Limestone bases, with limestone kerbing to graves. These monuments have a striking presence in the graveyard to the front of the former Presbyterian church. They are physical reminders of the congregation and former life of the church. Well designed and executed, they show skilled stone-cutting and carving techniques. Urns were often used as funerary motifs, and a similar form of urn atop a column can also be seen in the Dawson Memorial near Dartrey House.
Source(s)	NIAH

	OPTION A (YELLOW)
Identification No.	N2/A-C/CS/AH002
Legal Status	Protected Structure; Listed on NIAH
Reference No.	RPS 41402504; NIAH 41402510
NIAH Rating	Regional
Townland	Brackagh
Site Type	Church:Broomfield Presbyterian Church (An Eaglais)
Coordinates (ITM)	685169813610
Description	Free-standing gable-fronted Presbyterian church, dated 1842, having three-bay side elevations, and recent two-storey extension to rear (north). Now in use as crafts and coffee shop. This building is a typical example of a mid-nineteenth-century Presbyterian Church and is representative of the architecture of the community. Despite renovations in the late twentieth century, the church retains its original form and much of its early character. The surrounding graveyard further enhances the picturesque setting of the building, with a combination of crosses and curved and rectangular headstones. The graveyard is no longer in use.
Source(s)	NIAH

OPTION A (YELLOW)	
Identification No.	N2/A-C/CS/AH003
Legal Status	Protected Structure; Listed on NIAH
Reference No.	RPS 41402505 NIAH 41402518
NIAH Rating	Local
Townland	Brackagh
Site Type	House/manse: Mount Carmel Glebe, Brackagh Broomfield
Coordinates (ITM)	685308813486
Description	<p>Front facade and end walls remain of detached five-bay two-storey former Presbyterian manse, built c.1800, with remains of single-storey outbuildings to rear. Now under reconstruction, roofless and missing rear and all internal walls. Projecting eaves. Roughcast rendered walls with smooth rendered plinth. Square-headed window openings with stone sills having one-over-one pane timber sliding sash windows with timber panelled internal shutters. Bull's-eye window openings to first floor level to end walls. Elliptical-headed door opening to front (south) elevation with timber door surround comprising round-plan timber columns supporting plain entablature and spoked fanlight, and four-panelled timber door with bolection panels. Three stone steps to entrance. Rear elevation, internal walls and first floor are missing. Elevated site having mature trees. Rubble stone walls enclosing former yard to rear. Single-storey rubble stone outbuilding to west edge of rear yard having no roof, end stone chimneystack and red brick elliptical-arch door opening to east elevation.</p> <p>This former rectory is similar in scale and design to many comparable buildings of this period in Ireland. Its symmetrical façade, bull's-eye windows, timber sash windows and door are all common features of nineteenth-century small country houses. Despite its derelict state it retains a number of early features. This structure's close association with the near-by former Presbyterian church contributes to its social importance. The outbuilding may pre-date the house which appears to have been built on the site of an earlier house.</p>
Source(s)	NIAH

OPTION A (YELLOW); OPTION B (YELLOW+BLUE)	
Identification No.	N2/A-C/CS/AH004
Legal Status	Protected Structure; Listed on NIAH
Reference No.	RPS 41402507NIAH 41402514
NIAH Rating	Regional
Townland	Taplagh
Site Type	Church: St Patrick's Catholic Church, Taplagh, Broomfield
Coordinates (ITM)	685142812835
Description	<p>Freestanding Early English Gothic-style gable-fronted cruciform-plan Catholic church with five-bay nave, chancel to south, transepts to east and west, gabled sacristy to south-east internal angle, four-stage tower abuts west elevation of nave north bay, built 1898-1901, by James Lynne of Dundalk to designs by George O'Connor, extended 1908 John Brennan of Belfast & Dublin, remodelled 1915 and 1930 to designs by John McGahon of Dundalk, reconstructed 1941 to designs by Thomas Cullen.</p> <p>The Catholic church at Broomfield is given an attractive appearance by the contrasting use of rock-faced limestone masonry with smooth limestone dressings and by the variety of differently shaped window openings. Its finely designed bell tower contributes further to the visual appeal of the structure. The good quality rubble stone boundary wall to the north completes the setting of this well-designed structure. Its plain, remodelled interior is enhanced by stained glass windows.</p>

Source(s)	NIAH
OPTION A (YELLOW); OPTION B (YELLOW+BLUE)	
Identification No.	N2/A-C/CS/AH005
Legal Status	Protected Structure; Listed on NIAH
Reference No.	RPS 41402508; NIAH 41402515
NIAH Rating	Regional
Townland	Taplagh
Site Type	Cottage: Worker's house
Coordinates (ITM)	685197812871
Description	Detached three-bay single-storey house with attic and projecting gabled porch, dated 1877, of exposed coursed rubble with brick dressings to openings and having decorative and fascia boards; openings refitted, c. 1985. This well-constructed stone cottage with decorative detailing that retains much of its original character. Its exposed site facing a road junction and in the vicinity of a church and school gives it a strong presence in the local landscape. The date plaque to the entrance porch bears the letter 'B' indicating that the house was commissioned by the Bath estate. The simple symmetrical form with raised quoins is also seen on other Bath Estate buildings in the vicinity.
Source(s)	NIAH
OPTION A (YELLOW); OPTION B (YELLOW+BLUE)	
Identification No.	N2/A-C/CS/AH006
Legal Status	Protected Structure
Reference No.	RPS 41402509
NIAH Rating	N/A
Townland	Taplagh
Site Type	Graveyard (grave of Thomas Hughes V.C.)
Coordinates (ITM)	685293812690
Description	Headstone and grave of Thomas Hughes V.C., died 1942.
Source(s)	RPS
OPTION A (YELLOW); OPTION B (YELLOW+BLUE)	
Identification No.	N2/A-C/CS/AH027
Legal Status	Protected Structure
Reference No.	RPS 41403114; NIAH MO-35-H-867021
NIAH Rating	N/A
Townland	Monaltybane
Site Type	House: Monalty House

Coordinates (ITM)	686699801999
Description	Detached five-bay three-storey gable-ended double-pile house with basement, c. 1810, with round-headed stone Doric doorcase with side-lights; retains many small pane sash windows and original internal features; large rear extension added, c. 1900.
Source(s)	RPS

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN)
Identification No.	N2/A-C/CS/AH029
Legal Status	Protected Structure
Reference No.	RPS 41403118; NIAH 41403113
NIAH Rating	Regional
Townland	Garlegobban
Site Type	Public house: McArdles Public House, Garlegobban, Inniskeen
Coordinates (ITM)	689164803744
Description	Detached L-plan two-storey house, built c.1880, having six-bay east and five-bay south elevations, with lower single-bay two-storey addition to west gable. Also in use as public house. This substantial building forms a triangular block at the junction of three roads in the village of Essexford, at the boundary of counties Monaghan and Louth. It is a long established public house, previously also a shop, and typically of the late nineteenth century, it also provided accommodation for the family and employees. The simple well-proportioned forms and patina of age make it a notable landmark in the area. The building played and continues to play an important role in giving the small village of Essexford a somewhat urban character.
Source(s)	NIAH

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN)
Identification No.	N2/A-C/CS/AH030
Legal Status	Protected Structure; Listed on NIAH
Reference No.	RPS 41403119; NIAH 41403114
NIAH Rating	Regional
Townland	Garlegobban
Site Type	Forge/smithy
Coordinates (ITM)	689184803722
Description	Detached two-bay single-storey forge, dated 1869, having horseshoe arch to front (north) gable, and having projecting bay with catslide roof to west elevation. Now disused, although recently substantially refurbished. Pitched slate roof with timber bargeboards and exposed rafter ends, limestone chimneystack with cut-stone coping, and cast-iron rainwater goods. Rubble limestone walls with dressed and margined quoins. Cast-iron date plaque to front gable having relief coronet, 'B' for Bath estate, and date. Square-headed window openings with recent cut limestone lintels and sills, and replacement one-over-one timber sliding sash windows. Horseshoe arch to front gable, having cut-stone voussoirs and timber battened double-leaf door. Two cast-iron lion-heads with tethering rings to either side of door. Situated on roadside with stream to rear of site.

	This pleasant forge was recently refurbished, having fallen into dereliction. Its horseshoe entrance makes it distinctive, as well as clearly marking it out as a forge. The quality of its stone detailing, and the retention of tethering rings and the date plaque enhance the heritage qualities of the structure. The building shares many characteristics with a similar forge located some 10 kilometres north-west in Drummanreagh, built in the same year. The date plaques on both buildings bear the letter 'B', indicating that they were commissioned by the Bath estate. The forge once provided a vital service in the rural community.
Source(s)	NIAH

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE)
Identification No.	N2/A-C/CS/AH032
Legal Status	Protected Structure
Reference No.	RPS 41403185
NIAH Rating	N/A
Townland	Monaltybane
Site Type	House: Monalty House
Coordinates (ITM)	686663802033
Description	Range of two-storey outbuildings on U-shaped plan, c. 1810, with cut stone dressing to openings and arches and rear basement to right.
Source(s)	RPS

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN)
Identification No.	N2/A-C/CS/AH039
Legal Status	Protected Structure; Listed on NIAH
Reference No.	RPS LHS010-001; NIAH 13901001
NIAH Rating	Regional
Townland	Essexford
Site Type	House: Kilanney Glebe Rectory, Essexford
Coordinates (ITM)	689248803306
Description	Detached three-bay two-storey former rectory, built c. 1780, now private house. Gable-fronted entrance breakfront and three-bay two-storey wing to west. Hipped slate roof to main house, pitched slate roof to west, clay ridge tiles, red brick corbelled chimneystacks, cast-iron gutters on corbelled eaves course, cast-iron downpipes, stone verge coping to breakfront and gables of west wing. Painted roughcast rendered walling, smooth rendered plinth. Square- and segmental-headed window openings, smooth rendered reveals and soffits, stone sills, painted timber six-over-six sliding sash windows to ground floor, six-over-three to first floor. Round-headed door opening, painted smooth rendered surround, painted timber door with eight raised-and-fielded panels, surmounted by spoked fanlight, accessed by flight of stone steps. Situated in extensive grounds; accessed through uncoursed rendered square-profile gate piers flanked by quadrant walls; random rubble, brick and rendered outbuildings to west; random rubble wall with soldier coping to east. This fine former rectory stands in its own extensive grounds. The retention of original materials and features enliven the structure and some windows have exposed sash cases, an early architectural feature. The house, though large in scale, is unadorned and simple in its design, creating a pleasing symmetry.

Source(s)	NIAH
	OPTION D (ORANGE); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AH043
Legal Status	Protected Structure; Listed on NIAH
Reference No.	RPS Lhs011-003; NIAH 13901108
NIAH Rating	Regional
Townland	Tully
Site Type	Thatched cottage/farmhouse: Tully thatched cottage
Coordinates (ITM)	692093800769
Description	<p>Detached four-bay single-storey straw thatched dwelling, built c. 1830. Straw thatched roof, metal ridge, red brick chimneystacks. Lime-washed masonry walling. Square-headed window openings, painted sills, containing two-over-two timber sliding sash windows. Square-headed door opening at projecting doorway containing timber panelled door, opening onto garden bounded by low painted rendered walling with flat coping stones. Rectangular gate piers containing wrought-iron gate. Farmyard to rear (east) with number of corrugated metal sheeting farm buildings. Located on quiet country road.</p> <p>This is a very fine example of a well-maintained thatched house. Although modest and unpretentious it is full of appeal and representative of a vernacular type. The survival of the original fenestration adds to its significance.</p>
Source(s)	NIAH

	OPTION D (ORANGE); OPTION E (ORANGE+LINK1+GREEN); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AH060
Legal Status	Protected Structure
Reference No.	RPS LHS014-012; NIAH 13901404
NIAH Rating	Regional
Townland	Mullacloe
Site Type	Farm house: Mullacloe House
Coordinates (ITM)	695567793052
Description	<p>Detached three-bay single-storey house, built c. 1840. L-plan, projecting hipped roof single-bay to south, lean-to and flat-roofed extensions to west c.1970. Pitched slate roofs, clay ridge tiles, painted smooth rendered corbelled chimneystacks, profiled cast-iron gutter supported on corbels, uPVC downpipes. Painted roughcast-rendered walling to south and east elevations, painted smooth rendered plinth, frieze and cornice; painted smooth rendered ruled-and-lined walling to north and west elevations. Square-headed window openings, painted tooled stone sills, smooth rendered reveals and soffits, painted timber six-over-six sliding sash windows to east elevation, four-over-four sliding sash window to north elevation, uPVC and painted timber casement windows to other elevations and extensions. Square-headed door opening to east elevation, flanked by painted timber engaged colonettes, plain-glazed sidelights on painted tooled stone sills, supporting fluted frieze and plain-glazed overlight, painted timber door with four flat panels, stone steps to entrance. Random rubble stone outbuildings to west, pitched slate roof, square-headed window and door openings to ground floor, loop windows to first floor, red brick dressings;</p>

	segmental-headed integral carriage arch; outbuildings form west boundary of bitmac yard to north-west of house. House situated within own grounds, bounded to north by painted roughcast-rendered wall, gate piers and mild steel gates c.1980. Mullacloe House is a small country residence in the villa style which retains some attractive original fenestration. The varied render treatments, along with the attractive frieze and corbelled cornice, enliven the structure and the central entrance with flanking bays creates a pleasing symmetry on the east elevation. The survival of the extensive stone outbuildings to the west add to the group of structures which make a positive addition to the architectural heritage of the area.
Source(s)	NIAH

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE); OPTION C (GREEN)
Identification No.	N2/A-C/CS/AH061
Legal Status	Protected Structure; Listed on NIAH
Reference No.	RPS LHS014-013; NIAH 13901406
NIAH Rating	Regional
Townland	Cookstown
Site Type	House:Cookstown House
Coordinates (ITM)	693657794040
Description	Detached five-bay two-storey house, built c. 1790.... ... Cookstown House displays a number of different building phases, adding to its architectural interest. Fine rendered detailing and cast-iron work are of artistic note while the building's balanced proportions form an impressive façade on approach from the north-west gateway. A handsome collection of outbuildings and arched gateway represent an important survival, preserving the original context of the site. The house retains a wealth of original and early fabric and is an important component of Louth's architectural heritage.
Source(s)	NIAH

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE); OPTION C (GREEN)
Identification No.	N2/A-C/CS/AH062
Legal Status	Protected Structure; NIAH
Reference No.	RPS LHS014-014 / NIAH 13901407
NIAH Rating	Regional
Townland	Cookstown
Site Type	Charlestown Rectory / curate's house
Coordinates (ITM)	693779794032
Description	Detached four-bay two-storey former rectory, built c. 1770, now in private domestic use. The former Charlestown Rectory is a well-preserved house and a particularly fine example of architectural developments in the second half of the eighteenth century. Finely balanced proportions create a harmonious façade and the tripartite window openings to east and west elevations are an attractive feature. Later additions largely compliment the original design and handsome outbuildings and wrought-iron gates help preserve the original site context. The house is enhanced by its still largely rural setting.
Source(s)	NIAH

	OPTION C (GREEN)
Identification No.	N2/A-C/CS/AH067
Legal Status	Protected Structure; Listed on NIAH
Reference No.	RPS LHS014-024; NIAH 13901420
NIAH Rating	Regional
Townland	Arthurstown
Site Type	Presbytery
Coordinates (ITM)	693005796448
Description	<p>Presbytery: Former Parochial House, Arthurstown</p> <p>Detached three-bay two-storey former parochial house, built c. 1880, now in private domestic use. Rectangular-plan, timber porch to south elevation. Hipped slate roof, clay ridge tiles, smooth rendered chimneystacks, projecting eaves, painted timber soffit, moulded cast-iron gutters, circular cast-iron downpipes. Smooth rendered ruled-and-lined walling, rendered chamfered plinth, projecting quoins. Square-headed window openings, tooled limestone sills, supported by brackets on ground floor south elevation, paired painted timber one-over-one sliding sash windows to ground floor south elevation separated by engaged stone colonette; two-over-two sliding sash window to west and first floor south elevation. Open gable-fronted entrance porch, pitched roof supported by painted timber Doric columns on stone plinth, segmental-headed door opening, recessed within chamfered reveals and soffit, painted timber door with six raised-and-fielded panels, plain-glazed overlight, limestone steps to entrance. Gravelled area to south. House set within own grounds, entrance to south-west comprising square profile gate piers and cast-iron gates.</p> <p>This handsome former parochial house retains many of its original features including timber sliding sash windows and an attractive timber entrance porch to the main door. Built for residence of the local parish priest this house also has a social significance to the townland of Arthurstown and surrounding areas.</p>
Source(s)	NIAH

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE); OPTION C (GREEN); OPTION D (ORANGE); OPTION E (ORANGE+LINK1+GREEN); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AH070
Legal Status	N/A (Listed on NIAH)
Reference No.	NIAH 41402506
NIAH Rating	Regional
Townland	Clonavogy
Site Type	Farm house: Annevale House
Coordinates (ITM)	683921816622
Description	<p>Detached double-pile three-bay two-storey farmhouse, built c.1880, possibly incorporating earlier fabric, having flat-roofed and porch to front (west) elevation, gabled porch to rear elevation, single-storey extension with pitched slate roof to north gable of rear pile, and recent conservatory to north gable of front pile. Outbuildings to yard to rear. Pitched M-profile slate roofs with decorative timber bargeboards, and yellow brick chimneystacks. Rendered walls. Square-headed window openings having two-over-two pane timber sliding sash windows to front elevation, and replacement uPVC windows to south gable and rear elevation. Square-headed door opening to south side of porch</p>

	having recent timber panelled door and console surround. Set back from road having recent site entrance. Separate yard entrance to south having wrought-iron gate and limewashed rubble gate piers. This farmhouse was apparently built on or near the site of an earlier house, or incorporates its fabric. Its irregularly-spaced windows and simple forms contribute to its character. The retention of a timber panelled door and sash windows enhances its architectural heritage value. The accompanying outbuildings are well built and substantial and apparently predate the house.
Source(s)	NIAH

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE); OPTION C (GREEN); OPTION D (ORANGE); OPTION E (ORANGE+LINK1+GREEN); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AH071
Legal Status	N/A (Listed on NIAH)
Reference No.	NIAH 41402522
NIAH Rating	Regional
Townland	Clonavogy
Site Type	Farmyard complex: Annevale House
Coordinates (ITM)	683956816631
Description	Outbuildings to yard to rear of Annevale House, built c.1790, comprising two-storey multiple-bay ranges to east and south of yard, and single-storey range to north side, much of latter being open-sided and supported on round-plan banded cast-iron columns. Pitched and hipped slate roofs, lime-washed rubble stone walls, square-headed openings with timber battened doors, shutters and single-pane timber windows. Round-arch openings to west elevation of east range having timber battened double-leaf doors. South range with segmental relieving arch to west gable and elliptical carriage arches, now blocked, to south elevation. Entrance into yard by way of single-leaf wrought-iron gate. Accompanying three-bay two-storey two-pile house post-dates farmyard. This farmyard comprises well-built and substantial outbuildings. Their slate roofs and whitewashed stone walls present a distinctive and high-quality ensemble. The various vehicular entrances, pitching doors and other entrances, and the vertical and square windows, are modestly typical of such buildings. the accompanying later house adds to the setting.
Source(s)	NIAH

	OPTION C (GREEN)
Identification No.	N2/A-C/CS/AH072
Legal Status	Listed on NIAH Garden Survey
Reference No.	NIAH 1303 / LH-36-N-927965
NIAH Rating	N/A
Townland	Arthurstown
Site Type	Historic Demesne: Arthurstown House
Coordinates (ITM)	692631 796511
Description	Small two-storey house within a modest-sized demesne, which descends to the south.

Source(s)	NIAH
	OPTION A (YELLOW); OPTION B (YELLOW+BLUE); OPTION C (GREEN)
Identification No.	N2/A-C/CS/AH083
Legal Status	Associated with Protected Structure (see AH062)
Reference No.	NIAH 13901407
NIAH Rating	N/A
Townland	Cookstown
Site Type	Historic Demesne: Charlestown Rectory
Coordinates (ITM)	693827793987
Description	Small demesne associated with Charlestown Rectory (AH062)
Source(s)	Historical Maps: 6-inch OS (1835) / 25-inch (1859–1909)

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN)
Identification No.	N2/A-C/CS/AH091
Legal Status	N/A / Listed on NIAH
Reference No.	NIAH 41402819
NIAH Rating	Regional
Townland	School: Drumlusty School
Site Type	Drumlusty
Coordinates (ITM)	687728806681
Description	Detached three-bay single-storey school, built c.1850, having gabled entrance porch to front (south-east) elevation, and lean-to addition to south-west gable. Now disused. Pitched slate roof. Rubble stone walls with remains of lime render. Square-headed window openings having red brick surrounds and cut-stone sills throughout, and six-over-six pane timber sliding sash windows. Fixed six-pane timber windows to entrance porch. Square-headed door opening having red brick surround and timber battened door. Recess for name plaque over door. Located at crossroads having single stone gate post remaining to front of site. This is a well-proportioned school building with a symmetrical front elevation. Although currently vacant, it retains its character and early features such as timber sash windows. Its prominent site at a crossroads emphasises its social significance to the local community.
Source(s)	NIAH

	OPTION A (YELLOW); OPTION B (YELLOW+BLUE); OPTION C (GREEN)
Identification No.	N2/A-C/CS/AH092
Legal Status	Listed on NIAH Garden Survey
Reference No.	NIAH 6018 / LH-36-N-942930
NIAH Rating	N/A
Townland	Harristown

Site Type	House: Harristown House
Coordinates (ITM)	694180 793081
Description	Modest late Georgian two-storey house and grounds, with fine mature trees and maintained ornamental gardens.
Source(s)	NIAH

	OPTION D (ORANGE); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AH094
Legal Status	Listed on NIAH Garden Survey
Reference No.	NIAH 1278 / MO-35-H-892059
NIAH Rating	N/A
Townland	Kiltybegs
Site Type	House & Gardens
Coordinates (ITM)	689550 806087
Description	House and gardens depicted on historical maps.
Source(s)	NIAH; Historical Maps: 6-inch OS (1835) / 25-inch (1859–1909)

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN)
Identification No.	N2/A-C/CS/AH104
Legal Status	Listed on NIAH Garden Survey
Reference No.	NIAH 1277 / MO-35-H-876056
NIAH Rating	N/A
Townland	Rahans
Site Type	Potential House/Gardens Site: Rahans
Coordinates (ITM)	687711 805641
Description	House and gardens depicted on historical maps.
Source(s)	NIAH; Historical Maps: 6-inch OS (1835) / 25-inch (1859–1909)

	OPTION A (YELLOW)
Identification No.	N2/A-C/CS/AH108
Legal Status	N/A (Listed on NIAH)
Reference No.	NIAH 41402513
NIAH Rating	Regional
Townland	Brackagh
Site Type	Church/chapel
Coordinates (ITM)	685229813149

Description	Graveyard and site of Church of Ireland church, dating to 1841, comprising two grassy terraces mounted by flights of cut-stone steps, parapets and landings flanked by mature trees providing access to elevated site of former church and flanked by yew trees, to form yew walk. Concrete represent footprint of church, reflecting buttresses to corners and along nave long walls. Road boundary comprises rubble limestone walls with rubble copings, with decorative cast-iron double-leaf gate between detailed carved stone piers, in turn flanked by matching railings on cut-stone plinth. Hedgerows to north, south and west. This cemetery with its elevated setting and designed landscape elements has a striking visual impact along the roadside. The yew trees, strongly associated with churchyards and cemeteries, define the pathway on a central axis with the former church. The decorative cut-stone piers provide an eye-catching contrast to the rubble stone boundary wall, and demonstrate highly skilled craftsmanship.
Source(s)	NIAH

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AH109
Legal Status	Listed on NIAH
Reference No.	NIAH 41402519
NIAH Rating	Regional
Townland	Aghadreenan
Site Type	Store/warehouse
Coordinates (ITM)	683884815004
Description	Detached four-bay three-storey grain store, built c. 1820, part of former corn and flax mill. No roof. Gabled walls, red brick eaves course. Rubble stone walls, portion of wall to front (south) elevation missing. Red brick segmental-headed openings. Standing on roadside at entrance to former mill complex, having dressed stone gate piers abutting west gable. Ruinous rubble stone linear structure to west. This substantial stone grain store has a striking presence in its rural setting. Its rubble stone walls, red brick detailing and simple form are typical of mill structures. Mills were vital structures in Irish society and important for the economic life of local communities. This provides a physical reminder of their role and the industrial legacy of County Monaghan.
Source(s)	NIAH

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN)
Identification No.	N2/A-C/CS/AH121
Legal Status	Listed on NIAH
Reference No.	NIAH 41403109
NIAH Rating	Regional
Townland	Garlegobban
Site Type	Bridge
Coordinates (ITM)	689063803807
Description	Single-arch limestone bridge carrying road north-south over stream, built c.1800, on boundary of counties Monaghan and Louth. Round arch with tooled-stone voussoirs. Rubble stone walls, soffit and parapet. Arch on east elevation springs from rubble stone wall to south bank. Cut-stone copings to parapet walls having rock-faced coping stones. Water pump on east side of bridge. Stone steps to east side north bank.

	<p>Adjacent second bridge carrying road east-west over same stream, having round arch, stone voussoirs and rubble stone walls to south elevation.</p> <p>These two stone bridges facilitated the road infrastructure at Essexford crossroads at the boundary of counties Monaghan and Louth. The rubble stone walls give the bridges a rustic quality suited to their modest size and rural setting. The curved west parapet is an unusual feature that accentuates the bridges' presence and appears to have been recently repaired. The stone steps would have allowed access for water collection, before the installation of the pump above. The location is of historic importance as the site of a battle in the late medieval period.</p>
Source(s)	NIAH

OPTION C (GREEN)	
Identification No.	N2/A-C/CS/AH122
Legal Status	N/A / Listed on NIAH
Reference No.	NIAH 41403110
NIAH Rating	Regional
Townland	Garlegobban
Site Type	Post box
Coordinates (ITM)	689167803779
Description	<p>Wall-mounted cast-iron post box, erected c.1890, with royal monogram of Queen Victoria, and 'POST OFFICE' in raised lettering on hood of opening. Maker's mark to base of box. Set into rubble stone wall at 'T' junction in Essexford village.</p> <p>This appealing post box was supplied by W. T. Allen and Company of London (fl. 1881-1955), representing an early example of mass-produced cast-iron work making a pleasant, if discreet contribution to the built heritage of Essexford. Raised detailing enlivens the design value of the composition, including the royal cipher, of additional significance as a tangible reminder of the period when Ireland was a British colony.</p>
Source(s)	NIAH

OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN)	
Identification No.	N2/A-C/CS/AH123
Legal Status	N/A / Listed on NIAH
Reference No.	NIAH 41403111
NIAH Rating	Regional
Townland	Garlegobban
Site Type	Railway station: Essexford Railway Station
Coordinates (ITM)	689204803859
Description	<p>Detached six-bay single-storey railway station, built c.1886, with rail-side elevation to north, and substantial recent extensions to east. Now in use as house. Pitched slate roof with roll-top ridge tiles, replacement uPVC rainwater goods and decorative eaves-boards and red brick chimneystacks. Red brick walls. Square-headed window openings having concrete lintels and sills, and replacement uPVC windows. Square-</p>

	headed door opening to north elevation with replacement uPVC door and concrete lintel. Set back from the roadside and accessed by driveway. Associated former stationmaster's house to south-west. Despite recent additions this former railway station adds interest to the locality and is of social importance due to its former function as a public building. Together with the nearby railway bridge (to west) and stationmaster's house (to south-west) the group forms an important reminder of the former Carrickmacross Branch of the Great Northern Railway line, closed since the mid-twentieth century. The red brick is notable, as newer brick structures, such as the extensions, normally use brick as a facing rather than structural material and hence limited its use to stretcher bond.
Source(s)	NIAH

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+GREEN)
Identification No.	N2/A-C/CS/AH124
Legal Status	N/A / Listed on NIAH
Reference No.	NIAH 41403112
NIAH Rating	Regional
Townland	Garlegobban
Site Type	Building misc
Coordinates (ITM)	689186803782
Description	Detached five-bay two-storey barn over byre or warehouse, built c.1890, having first entrance doorway to first floor, with gablet over, accessed by external concrete steps, and with single-storey addition to north-east gable. Pitched slate roof with timber bargeboards and brick eaves course. Rubble stone walls having tooled-stone quoins. Square-headed window openings having red brick block-and-start surrounds and stone sills. Some timber battened shutters remaining. First floor doorway has red brick jambs, granite plinth blocks, concrete lintel, and timber battened door. Square-headed pitching door to first floor of south-west gable, having red brick block-and-start surround, stone threshold, and timber battened door. Carriage opening to ground floor at west end of front elevation, having sliding corrugated-iron door. Situated on south edge of roadside. Attached single-storey building, now roofless, with rubble stone walls and evidence of pitched roof. This finely-constructed building adds to the variety of historic structures at Essexford. Its symmetrical appearance suggests that it may have been a railway warehouse, although its form is also that of a hay barn over a cow byre. Its contrasting stone treatments, and the use of red brick to articulate openings, adds a clear formality, as does the symmetrical arrangement of openings, particularly on the first floor.
Source(s)	NIAH

	OPTION C (GREEN); OPTION E (ORANGE+LINK1+ GREEN)
Identification No.	N2/A-C/CS/AH125
Legal Status	N/A/ Listed on NIAH
Reference No.	NIAH 41403115
NIAH Rating	Regional
Townland	Garlegobban
Site Type	Water pump
Coordinates (ITM)	689186803782

Description	<p>Freestanding cast-iron water pump, erected c.1890, with round-plan shaft having octagonal-plan lower part, fluted and banded to upper part. Curved cow's-tail pumping arm, and domed cap with crenellation-like detail to rim, and pointed finial. Maker's mark to rear. Located on east side of bridge over stream and on boundary between counties Monaghan and Louth.</p> <p>Water pumps once played an important social and functional role in Ireland providing a communal water source. Located adjacent to a crossroads and opposite a forge it was a critical focal point within the surrounding rural hinterland, and serves as a reminder of this today. Unusually, the water source for this pump is visible. Unlike post boxes which were commissioned centrally, pumps can provide interesting examples of local ironwork, like this one, manufactured by Russells of Park Street, Dundalk, County Louth. The 'fir tree' finial, the cap, and non-round-plan base are all unusual and notable features enlivening this functional object.</p>
Source(s)	NIAH

	OPTION C (GREEN); OPTION E (ORANGE+LINK1 +GREEN)
Identification No.	N2/A-C/CS/AH126
Legal Status	N/A / Listed on NIAH
Reference No.	NIAH 41403116
NIAH Rating	Regional
Townland	Garlegobban
Site Type	Bridge
Coordinates (ITM)	689199803721
Description	<p>Single-arch railway bridge, built 1866, carrying road over former Carrickmacross Branch railway line. Elliptical arch with five header courses of greyish brick, and skewly-laid brick soffit. Rock-faced rusticated stone walls, piers and parapets having cut-stone string course and impost course. Moulded brick copings to parapet walls terminating at north and south ends with cut-stone copings. North end of east parapet missing.</p> <p>This well-built bridge over the former Great Northern Railway line has an impressive brick vault. It continues a tradition of railway infrastructure constructed using traditional arch methods. The Carrickmacross branch (Inishkeen-Carrickmacross) was closed in the mid-twentieth century, but the bridge continues to provide important road infrastructure. A bridge of similar construction can be seen three kilometres north-east in Kednaminsha.</p>
Source(s)	NIAH

	OPTION D (ORANGE); OPTION E (ORANGE+LINK1+GREEN); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AH142
Legal Status	Listed on NIAH Garden Survey
Reference No.	NIAH 1307 / LH-36-N-952969
NIAH Rating	N/A
Townland	Louth Hall
Site Type	Historic Demesne: Louth Hall
Coordinates (ITM)	694580 796477

Description	Once a very fine large demesne now lost, though retaining its original layout and some features. Established by the Plunkett family c. 1320; the castle was subsequently enlarged, the land surrounding it remained in the family possession until the 20th century. Now intensively farmed. Landscape park for house positioned in a prominent position with vistas to south over falling ground and ponds below, a plantation with walks lead to the walled garden to the west. A wide area beyond served as parkland and was heavily studded with trees in the 19th century. At that time the approach drive curved as for a landscape park; two very long straight internal avenues probably had an earlier origin.
Source(s)	NIAH Garden Survey

	OPTION D (ORANGE); OPTION E (ORANGE+LINK1+GREEN); OPTION F (ORANGE+LINK2+GREEN)
Identification No.	N2/A-C/CS/AH145
Legal Status	Listed on NIAH Garden Survey; associated with a Protected Structure
Reference No.	LH-36-N-929988
NIAH Rating	N/A
Townland	Thomastown
Site Type	Historic Demesne: Thomastown Castle [Knock Abbey]
Coordinates (ITM)	692832 798815
Description	A long-inhabited site with a medieval tower house. A medium-sized demesne for mid-18th century house was laid out by the early 19th century, perhaps incorporating earlier garden features, with a block of woodland and small parkland flanking the house to north. Extensive orchards and productive gardens south of house, which is set on high ground, commanding a vista to north and south. Tree-lined canals "Fish Ponds", were a major feature - typically to be found in notable 17th century gardens. Site much altered in the mid-19th century when the house was extended and walled garden built, with a new entrance and two lodges. Parkland planted up to replaced former productive (and ornamental) gardens and ponds added to the canals. Extension to house burnt 1920s. Grounds later suffered neglect. Subject to grant from Great Gardens of Ireland Scheme in 1990s. Upgraded and fully maintained. Public Access: Open to the public at specified opening times.
Source(s)	NIAH Garden Survey

Appendix 9.3 Cultural Heritage Appendix 3: Inventory of Other Cultural Heritage Assets

ROUTE	AH ASSET REF.	TYPE	TOWNLAND	ITM EASTING	ITM NORTHING	IMPORTANCE RATING	SOURCE
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-01	Bridge - named <i>Mullaghanee bridge</i> on 1st Edition and 25-inch OS Map. Direct impact on Route A only	MULLAGHANEY	684556	815516	Local	1st Edition OS Map; 25-inch OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-02	Bridge (extant) Named <i>Rosslough bridge</i> on 25-inch OS Map.	COOLDERRY	690765	804612	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-03	Culvert (possible) (possibly extant on E side of N2). Direct impact on Route A only	GARRANROE or CORNAMUCKLAG H	685295	812009	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-04	Culvert (site of)	TULLYVARAGH LOWER	684692	810067	Local	1st Edition OS Map
Option B (Yellow+Blue)	N2/A-C/RS/CH-05	Vernacular building (extant - in use house). Well-marked on 25-inch OS Map.	AGHADREENAN	684512	814585	Local	1st Edition OS Map
Option B (Yellow+Blue)	N2/A-C/RS/CH-06	Vernacular building (extant - in use as house). Marked as 'Broomfield Post Office' on 2nd Edition	CORNAHAWLA	684606	813811	Local	1st Edition OS Map; 25-inch OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-07	Lane	BALLINGARRY	688515	804374	Local	1st Edition OS Map
Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-08	Lane	CHARLESTOWN	694742	794972	Local	1st Edition OS Map

ROUTE	AH ASSET REF.	TYPE	TOWNLAND	ITM EASTING	ITM NORTHING	IMPORTANCE RATING	SOURCE
Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-09	Lane	CHARLESTOWN	694603	795288	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-10	Lane	CLONAVOGY	684227	812620	Local	1st Edition OS Map
Option D (Orange)	N2/A-C/RS/CH-11	Lane	DERRYILAN	686946	812189	Local	1st Edition OS Map
Option D (Orange)	N2/A-C/RS/CH-12	Lane	DRUMACONVERN	687065	811686	Local	1st Edition OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-13	Lane	DRUMGOWNA	691633	801663	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-14	Lane	DRUMHIIIAGH	687661	806089	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-15	Lane	DUNANNY	687300	807273	Local	1st Edition OS Map
Option D (Orange)	N2/A-C/RS/CH-16	Lane	KILNACRANFY	687265	810953	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-17	Lane	LANNAT	689473	802059	Local	25-inch OS Map OS
Option C (Green)	N2/A-C/RS/CH-18	Lane	LISNAKELLY	688172	804826	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-19	Lane / path visible as cropmark. Not part of Rahanna historic demesne.	RAHANNA	694252	793320	Local	1st Edition OS Map; Google

ROUTE	AH ASSET REF.	TYPE	TOWNLAND	ITM EASTING	ITM NORTHING	IMPORTANCE RATING	SOURCE
Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-20	Lane	RATHNEESTIN	693777	797362	Local	1st Edition OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-21	Lane	ROSSLOUGH	691114	804140	Local	1st Edition OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-22	Lane	ROSSLOUGH	690997	804250	Local	1st Edition OS Map
(Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-23	Lane	STONETOWN LOWER	691472	803055	Local	1st Edition OS Map
Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-24	Lane	THOMASTOWN	692719	798499	Local	1st Edition OS Map
Option D (Orange)	N2/A-C/RS/CH-25	Lane	TULLANACRUNAT NORTH	686079	814225	Local	1st Edition OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-26	Lane	TULLY	692179	800040	Local	1st Edition OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-27	Lane	TULLY	692129	800360	Local	1st Edition OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-28	Lane	DRUMGOWNA	691425	801694	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-29	Lane	CLONAVOGY	684344	812187	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-30	Lane	DRUMHARIFF	685805	810657	Local	1st Edition OS Map

ROUTE	AH ASSET REF.	TYPE	TOWNLAND	ITM EASTING	ITM NORTHING	IMPORTANCE RATING	SOURCE
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-31	Lane	LANNAT	689945	801272	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-32	Lane	LANNAT	689448	802105	Local	25-inch OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-33	Lane	LANNAT	689446	802110	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-34	Vernacular building (ruin)	LISGALL	684257	806952	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-35	Lane (25-inch OS Map)	COGHVALLY UPPER / CLOGHVALLY LOWER	684297	804988	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-36	Lane (Esmore Hall)	DRUMMOND OTRA	685534	802993	Local	1st Edition OS Map
Option B (Yellow+Blue)	N2/A-C/RS/CH-37	Lane (extant) leading to site of 'rocks'	AGHADREENAN	684659	814380	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-38	Lane (extant - part surviving) N2 extant here	ALCINT	689893	797685	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-39	Lane (extant in part)	CLONTURK (Mason)	687590	800086	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-40	Lane (extant in part)	DRUMTURK	687728	779994	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-41	Lane (extant in part) N2 extant here	ALCINT	690106	797130	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-42	Lane (extant in part) N2 extant here	ALCINT	690117	797291	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-43	Lane (survives as field boundary)	ALCINT	690145	797263	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-44	Lane (to farmyard complex with 5 extant buildings)	ANNAMARRAN	688024	799612	Local	1st Edition OS Map

ROUTE	AH ASSET REF.	TYPE	TOWNLAND	ITM EASTING	ITM NORTHING	IMPORTANCE RATING	SOURCE
Option A (Yellow)	N2/A-C/RS/CH-45	Path (site of) (in grounds of Broomfield ho)	BRACKAGH	685151	813592	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-46	Plantation (site of)	CLOGHVALLY UPPER	684269	804992	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-47	Plantation (site of) N2 extant	LISGALL	684281	806683	Local	1st Edition OS Map
Option A (Yellow)	N2/A-C/RS/CH-48	Police Station (extant possibly survives as a shed at rear of house).	DRUMAGNUS LOWER	685025	813766	Local	1st Edition OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-49	Railway line (GNR Carrickmacross branch line)	ESSEXFORD	690723	804670	Local	25-inch OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-50	Railway line (GNR Ireland Carrickmacross branch line)	ESSEXFORD	689009	803792	Local	25-inch OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-51	Railway line (site of) GNR IRELAND CARRICKMACROSS BRANCH LINE	DRUMMOND OTRA	685477	803116	Local	25-inch OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-52	School House - marked as Mullaghaneer School Ho on 25-inch OS Map. Extant	MULLAGHANEER	684374	815880	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-53	School house on 1st edition (site of ?). Direct impact on Route A only.	TAPLAGH	685327	812604	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-54	Thornbush (site of ?)	THOMASTOWN	692166	797922	Local	1st Edition OS Map
Option D (Orange)	N2/A-C/RS/CH-55	Vernacular building (ruin)	LISNAMOYLE OTRA	687324	810230	Local	1st Edition OS Map

ROUTE	AH ASSET REF.	TYPE	TOWNLAND	ITM EASTING	ITM NORTHING	IMPORTANCE RATING	SOURCE
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-56	Vernacular building (extant - in use house and shed)	GARRANROE or CORNAMUCKLAGH	685300	811983	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-57	Vernacular building (extant)	ANNAMARRAN	688414	799224	Local	1st Edition OS Map
Option D (Orange)	N2/A-C/RS/CH-58	Vernacular building (extant)	KNOCKREAGH LOWER	868861	813407	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-59	Vernacular building (extant)	LANNAT	689494	801986	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-60	Vernacular building (extant). Direct impact on Route A only.	TAPLAGH	685347	812243	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-61	Vernacular building (extant) in use as house	DRUMHARRIFF	685022	811149	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-62	Vernacular building (extant) in use as shed. Direct impact on Route A only.	TAPLAGH	685339	812326	Local	1st Edition OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-63	Vernacular building (extant) ruin - house and shed	DRUMGOWNA	691581	801395	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-64	Vernacular building (extant) well marked on 25-inch OS Map. Direct impact on Route A only.	TAPLAGH	685342	812484	Local	1st Edition OS Map
Option A (Yellow)	N2/A-C/RS/CH-65	Vernacular building (house) Much extended but some original surviving? Marked as Broomfield on 25-inch OS Map	DRUMAGNUS LOWER	684994	813899	Local	1st Edition OS Map

ROUTE	AH ASSET REF.	TYPE	TOWNLAND	ITM EASTING	ITM NORTHING	IMPORTANCE RATING	SOURCE
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-66	Vernacular building (extant) (in use)	CLONAVOGY	683622	816824	Local	1st Edition OS Map
Option A (Yellow)	N2/A-C/RS/CH-67	Vernacular building (marked as Smithy on 25-inch OS Map)	BRACKAGH	685088	813687	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-68	Vernacular building (ruin)	CORDRUMMANS UPPER	686809	808185	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-69	Vernacular building (ruin)	DRUMHARRIFF	685827	810653	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-70	Vernacular buildings (2) (extant in part) 1 building surviving	CORNALOUGH	683758	815351	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-71	Vernacular buildings (2) (extant)	DRUMILLARD	685388	811231	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-72	Vernacular buildings (2) (extant) - in use as house and shed. Direct impact on Route A only.	TAPLAGH	685295	812009	Local	1st Edition OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-73	Vernacular buildings (2) (ruin)	ROSSLOUGH	691480	803626	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-74	Vernacular buildings (3)	CLONAVOGY	684347	812206	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-75	Vernacular buildings (4): 25-inch OS shows 2 possibly still extant. Direct impact on Route A only.	MULLAGHANE	684272	816073	Local	1st Edition OS Map; 25-inch OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-76	Vernacular buildings (extant) in use as sheds. Direct impact on Route A only.	MULLAGHANE	684667	815413	Local	1st Edition OS Map

ROUTE	AH ASSET REF.	TYPE	TOWNLAND	ITM EASTING	ITM NORTHING	IMPORTANCE RATING	SOURCE
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-77	Vernacular buildings (site of)	LANNAT	689727	801655	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-78	Vernacular buildings (site of)	STRADEEN	689472	863015	Local	1st Edition OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-79	Vernacular building (site of) and lane (now a road)	CLOGHOGE & TIEDVADINNA	687669	808545	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-80	Vernacular building (extant) extended on 2nd Edition	DRUMGEENY	688819	798686	Local	1st Edition OS Map; 25-Inch OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-81	Vernacular building (site of)	MULLAGHANEE	684451	815789	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-82	Vernacular building (site of)	TULLYVARAGH LOWER	684692	810067	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue) Option C (Green)	N2/A-C/RS/CH-83	Vernacular buildings (2) (extant possibly)	MONYGORBET	684718	815193	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue) Option C (Green)	N2/A-C/RS/CH-84	Vernacular building (site of)	GARRANROE or CORNAMUCKLAG H	685167	811594	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-85	Vernacular buildings (2) (site of)	GARRANROE	685200	811859	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-86	Vernacular building (site of)	GARRANROE or CORNAMUCKLAG H	685207	811985	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-87	Vernacular buildings (4) (extant - 2) in use as sheds?	LEEG	688822	798506	Local	1st Edition OS Map

ROUTE	AH ASSET REF.	TYPE	TOWNLAND	ITM EASTING	ITM NORTHING	IMPORTANCE RATING	SOURCE
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-88	vernacular buildings (3) possibly 1 extant	ANNAMARRAN	687949	799798	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-89	Vernacular building (house and farmyard) (Extant)	DRUMGEENY	689218	798190	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-90	Vernacular building (site of)	LEEG	688726	798877	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-91	Vernacular building (site of)	COOKSTOWN	693784	793906	Local	1st Edition OS Map
Option A (Yellow) Option B (Yellow+Blue)	N2/A-C/RS/CH-92	Road (earthwork)	AGHAVILLA	684142	806241	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-93	Vernacular building (site of)	THOMASTOWN	692197	797892	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-94	Road (site of)	NICHOLASTOWN	691786	798427	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-95	Lane (site of)	NICHOLASTOWN	691701	798542	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-96	Lane	LANNAT	689945	801272	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-97	Road	LANNAT	689695	801626	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-98	Vernacular building (site of)	LANNAT	689586	801888	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-99	Vernacular building (site of)	LANNAT	689561	801899	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-100	Bridge (possible) site of	LANNAT	689446	802110	Local	1st Edition OS
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-101	Vernacular building (site of)	LANNAT	689459	802144	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-102	Lane (site of)	LANNAT	689412	802318	Local	1st Edition OS

ROUTE	AH ASSET REF.	TYPE	TOWNLAND	ITM EASTING	ITM NORTHING	IMPORTANCE RATING	SOURCE
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-103	Vernacular building (site of)	LANNAT	689412	802318	Local	1st Edition OS
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-104	Vernacular building (site of)	DRUMHILLAGH	687682	806049	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-105	Vernacular building (site of)	RAHANS	687575	806678	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-106	Vernacular building (site of)	DUNANNY	687316	807265	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-107	Vernacular building (site of)	DUNANNY	687309	807280	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-108	Vernacular building (site of)	CORDRUMMANS UPPER	686920	807814	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-109	Vernacular building (site of)	CORDRUMMANS UPPER	686881	808124	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-110	Vernacular building (site of)	CORDRUMMANS UPPER	686780	808210	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-111	Vernacular building (site of)	CORRYAGAN	686194	809421	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-112	Vernacular building (site of)	CORRYAGAN	686151	809468	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-113	Lane (site of)	CORRYAGAN	686040	809837	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-114	Vernacular buildings (3) (site of)	CORRYAGAN	686670	809884	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-115	Vernacular building (site of)	CORRYAGAN	685973	810167	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-116	Vernacular buildings (2) (site of)	CORRYAGAN	685935	810332	Local	1st Edition OS Map

ROUTE	AH ASSET REF.	TYPE	TOWNLAND	ITM EASTING	ITM NORTHING	IMPORTANCE RATING	SOURCE
Option A (Yellow) Option B (Yellow+Blue) Option C (Green)	N2/A-C/RS/CH-117	Vernacular building (site of)	GARRANROE or CORNAMUCKLAG H	685132	811530	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-118	Vernacular building (site of)	GARRANROE or CORNAMUCKLAG H	684628	811926	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-119	Vernacular building (site of)	GARRANROE or CORNAMUCKLAG H	684638	811940	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-120	Lane (site of)	GARRANROE or CORNAMUCKLAG H	684643	811948	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-121	Vernacular building (site of)	LISNAFINELLY	684420	812072	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-122	Vernacular building	CLONAVOGY	684306	812179	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-123	Lane (extant)	CLONAVOGY	684283	812816	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-124	Vernacular buildings (3) (site of)	LISAQUILL	684438	813487	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-125	Vernacular buildings (3) (site of)	CORNALOUGH	685823	815506	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-126	Vernacular building (site of)	MULLAGHANE	683880	816290	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-127	Vernacular building (residence in use)	CLONAVOGY	683953	816442	Local	1st Edition OS Map
Option C (Green)	N2/A-C/RS/CH-128	Lane (site of)	CLONAVOGY	683826	816573	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-129	Road (in use)	CLONAVOGY	683823	816652	Local	1st Edition OS Map

ROUTE	AH ASSET REF.	TYPE	TOWNLAND	ITM EASTING	ITM NORTHING	IMPORTANCE RATING	SOURCE
Option C (Green)	N2/A-C/RS/CH-130	Lane (in use)	CLONAVOGY	683658	816880	Local	1st Edition OS Map
Option D (Orange)	N2/A-C/RS/CH-132	Vernacular building (site of)	TULLANACRUNAT NORTH	685954	814439	Local	1st Edition OS Map
Option D (Orange)	N2/A-C/RS/CH-133	Vernacular building (site of)	TULLANACRUNAT NORTH	685959	814336	Local	1st Edition OS Map
Option D (Orange)	N2/A-C/RS/CH-134	Lane	TULLANACRUNAT NORTH	686125	814162	Local	1st Edition OS Map
Option D (Orange)	N2/A-C/RS/CH-135	Road (site of)	KNOCKREAGH LOWER	686617	813600	Local	1st Edition OS Map
Option D (Orange)	N2/A-C/RS/CH-136	Vernacular building (site of)	DERRYVILAN	686802	812395	Local	1st Edition OS Map
Option D (Orange)	N2/A-C/RS/CH-137	Vernacular building (extant)	KNOCKREAGH LOWER	686832	813342	Local	1st Edition OS Map
Option D (Orange)	N2/A-C/RS/CH-138	Lane (extant)	DERRYVILAN	686940	812445	Local	1st Edition OS Map
Option D (Orange)	N2/A-C/RS/CH-139	Vernacular building (site of)	ANNY	687140	811457	Local	1st Edition OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-140	Vernacular building (site of)	LISNAMOYLE ETRA	687207	809820	Local	1st Edition OS Map
Option D (Orange)	N2/A-C/RS/CH-141	Vernacular building (site of)	KILNACRANFY	687301	810658	Local	1st Edition OS Map
Option D (Orange)	N2/A-C/RS/CH-142	Vernacular building (ruin)	LISNAMOYLE OTRA	687324	810230	Local	1st Edition OS Map
Option D (Orange)	N2/A-C/RS/CH-143	Vernacular buildings (2) (Site of)	KILNACRANFY	687345	810597	Local	1st Edition OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-144	Vernacular buildings (2) (site of)	CLOGHOGE & TIEDVADINNA	687567	808753	Local	1st Edition OS Map

ROUTE	AH ASSET REF.	TYPE	TOWNLAND	ITM EASTING	ITM NORTHING	IMPORTANCE RATING	SOURCE
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-145	Vernacular building (site of) and lane (now a road)	CLOGHOGE & TIEDVADINNA	687669	808545	Local	1st Edition OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-146	Vernacular building (2) (site of)	BLITTOGE	688604	806830	Local	1st Edition OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-147	Lane (site of)	BLITTOGE	688622	806822	Local	1st Edition OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-148	Vernacular building (site of)	COOLDERRY	690404	805346	Local	1st Edition OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-149	Vernacular building (site of)	COOLDERRY	690433	805333	Local	1st Edition OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-150	Lane (site of)	COOLDERRY	690499	805350	Local	1st Edition OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-151	Railway line (GNR Carrickmacross branch line)	ESSEXFORD	690723	804670	Local	25-inch OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-153	Lane	ROSSLOUGH	690997	804250	Local	1st Edition OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-154	Vernacular buildings (2) (site of)	ROSSLOUGH	691064	804214	Local	1st Edition OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-155	Lane (site of)	ROSSLOUGH	691068	804200	Local	1st Edition OS Map

ROUTE	AH ASSET REF.	TYPE	TOWNLAND	ITM EASTING	ITM NORTHING	IMPORTANCE RATING	SOURCE
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-156	Vernacular buildings (2) (site of)	TULLY	692169	900199	Local	1st Edition OS Map
Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-157	Vernacular building (site of)	CHARLESTOWN	694719	794913	Local	1st Edition OS Map
Option C (Green) Option E (Orange+Link 1+Green)	N2/A-C/RS/CH-158	Vernacular building (site of)	LANNAT	689586	801888	Local	1st Edition OS Map
Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-159	Vernacular building (site of)	RATHNEESTIN	693685	797330	Local	1st Edition OS Map
Option D (Orange) Option F (Orange+Link 2+Green)	N2/A-C/RS/CH-160	Lane NB - this is possibly associated with ecclesiastical enclosure at Drumgristin Upper	COOLDERRY	690599	805027	Local	1st edition OS and 25-inch OS Maps

Appendix 9.4 Inventory of NMI finds from Heritage Maps

Reg Number	Simple Name	Material	Find Place	Townland	Find Circumstances	Notes from database
1978:259	Pottery	Ceramic	Stickillen	Stickillen	None given	Medieval pottery sherd
1978:260	Plough pebble	Stone	Stickillen	Stickillen	None given	None given
1978:261	Animal bone	Bone	Stickillen	Stickillen	None given	None given
1978:262-5	Potsherds	Ceramic	Stickillen	Stickillen	None given	Post-medieval potsherds
1978:266-7	Glass	Glass	Stickillen	Stickillen	None given	Two glass fragments
1979:35-8	Potsherds	Ceramic	Stickillen	Stickillen	None given	Four medieval potsherds
1979:35-64	Potsherds	Ceramic	Stickillen	Stickillen	None given	Twenty-six post-medieval potsherds
1947:230	Spindle whorl	Stone	Cookstown	Cookstown	None given	None given
1935:62	Stone axe	Stone	Knocklore	Knocklore	None given	None given
IA/259/2007	Carved stone	Stone	Edmonstown	Edmonstown	None given	Numerous carved stones
IA/69/61	Quern stone	Stone	Aclint	Aclint	None given	Four querns
IA/L/1977:5	Axehead	Bronze	Aclint	Aclint	None given	None given
1961:215	Pot	Bronze	Aclint	Aclint	None given	Three-legged bronze pot
Nat. Mus. Area	Bann flake	Stone	Aclint	Aclint	None given	None given
Museum point: Crannog- (311)	Pottery	Ceramic	Monaltyduff	Monaltyduff	None given	(Moynaltylough crannog) Vessel of 4 clay pipes [with lateral perforations]
Museum point: Crannog (312) (a & b)	Rings	Bronze	Monaltyduff	Moynaltyduff	None given	(Moynaltylough crannog) 2 bronze rings, conjoined (312 a&b)
Museum point: Crannog (249)	Iron object	Iron	Moynaltyduff	Moynaltyduff	None given	(Moynaltylough crannog) Possible iron weighing scales?
Museum point: Crannog (250)	Iron rod	Iron	Moynaltyduff	Moynaltyduff	None given	(Moynaltylough crannog) Curved iron rod (portion of a handle?)
Museum Point: Cloghvally Lower	Carved stone figure	Stone	Cloghvally Lower	Cloghvally Lower	None given	None given

Appendix 9.5: Inventory of Previous Archaeological Investigations

Licence No.	Site Name	DIER Ref.	Author	Summary of Findings (www.excavations.ie)
98E0125	TATTYBOYS/ KNOCKLORE/ COOKSTOWN/ RAHANNA/ HARRISTOWN/GLEBE	1998:471	T. BREEN	Group of fulacht fiadh-type features
98E0247	CHARLESTOWN	1998:423	D. MURPHY	Vicinity of a medieval church
99E0044	MANNAN CASTLE, DONAGHMOYNE, Monaghan	1999:725	E. MOORE	Anglo-Norman motte, baileys and stone castle remains
99E0044 (EXT)	DONAGHMOYNE	2000:0794 2001:1073	E. MOORE	Mannan castle, Donaghmoyne. Anglo-Norman motte, baileys and stone castle
99E0260	THOMASTOWN	1999:640	E. O'DONOVAN	Knockabbey, Thomastown: Tower-house
99E0270	LISGALL	1999:727	C. O'DRISCEOIL	Adjacent to Rath
00E0108	DRUMMOND OTRA	2000:0788	N. BERMINGHAM	Carrickmacross Sewerage Scheme: Metalworking area
00E0913	COOKSTOWN	2000:0648	R. CLUTTERBUCK	Vicinity of a castle
00E0927	STONETOWN LOWER	2000:0709 2001:875	F. O'CARROLL	Vicinity of a castle
02E1212	MONALTYDUFF	N/A	T. COUGHLAN	Testing on site of road-holloway (MO031-139)
03E0030	CLONTURK	2003:474	M. MCQUADE	Monitoring: modern drainage features
03E1298	MONATYDUFF	2003:1501	T. COUGHLAN	Site 103 Monaltyduff 1: pit
03E0388	DRUMGEENY	2003:1482	T. COUGHLAN	N2 Carrickmacross-Aclint Road realignment: Testing
03E0888	MONANNY	2003:1503	F. WALSH	Monanny 1: Neolithic, Bronze Age, post-medieval
03E0890	LISANISK	N/A	T. COUGHLAN	Ringfort-rath; human bones.
03E0891	LISANISK	2003:1489	T. COUGHLAN	Site 107, Lisanisk 1; possible late medieval land clearance
03E0922	CHARLESTOWN	2003:1230	F. O'CARROLL	No archaeological significance
03E1254	MONANNY	2003:1504	F. WALSH	Monanny 2: Prehistoric

Licence No.	Site Name	DIER Ref.	Author	Summary of Findings (www.excavations.ie)
03E1255	CLOGHVALLY UPPER	2003:1485	F. WALSH	Cloghvalley Upper 1: Early medieval, post-medieval
03E1256	MONANNY	2003:1505	F. WALSH	Monanny: No archaeological significance
03E1297	MONALTYBANE	2003:1500	T. COUGHLAN	Site 102, Monaltybane 1: Pit
03E1299	MONALTYDUFF	2003:1502	T. COUGHLAN	Site 104 Monaltyduff 2: Possible medieval drainage
04E0089	CLOGHVALLY UPPER	2004:1363	F. WALSH	Monitoring (see Cloghvalley Upper 2 below)
04E0115	CLOGHVALLY UPPER	2004:1364	F. WALSH	Cloghvalley Upper 2: Burnt Mound
04E1537	CORDRUMMANS MIDDLE	2004:1366	C. DUFFY	No archaeological significance
05E0786	TULLYVIN	2005:1286	B. SUTTON	Site 109, Tullyvin No archaeological significance
05E1064	TONYELLIDA	2005:1284	C. DUFFY	No archaeological significance
06E0789	DRUMMOND OTRA	2006:1672	F. O'CARROLL	Various post-medieval features
06E0872	BALLINGARRY	2006:1665	M. SEAVER	Testing within MO031-106 [AY307]. No archaeological remains exposed.
10E0135	EDMONDSTOWN	2010:464	K. CAMPBELL	Early Christian or medieval ditches
13E0289	MULLANSTOWN	2013:193	F. WALSH	Early medieval ditches, kiln and burial
14E0059	EDMONDSTOWN	2014:591	K. CAMPBELL	Zone of potential for Archaeological Complex

Appendix 9.6: Extracts from Irish Folklore Commission Schools Collection

Townland	Collector / Informant	Extract Detail	Dúchas Archive permanent website link
Aghadreenan	Rois Nic A Bhaird	<p>There is a field in Aghadreenan called "Páirc scithiste na saidiúirí" which means the resting field of the soldiers. It is called by this name because Jacobite soldiers cast their tents and stayed in it for a night on their way to a battle. People said they were going to a fight at the battle of the Boyne.</p> <p>In the townland of Drumgoose there is a fort. About thirty eight years ago Issac Marshall levelled the mound on the fort. He threw lots of clay in the hole which was on the fort. But in the morning, all the hair which was on his head the previous day had fallen off. People say that it is not right to interfere with any forts or enchanted places. The fort is called Drumgoose Fort. In Carliss near Crossmaglen there is a fort. People go down very far in the fort. There are very many steps down deep in it. Numerous numbers of dark damp caves are in it too. It is said that if a person goes down far enough, he will know all things and on account of this it is called "Lios an Fios". In it there is a Fairy Palace. The fairies sing beautiful Irish songs at twelve o'clock on Hallow Eve.'</p>	<p>https://www.duchas.ie/en/cbes/4723854/4719281/4758855</p>
Anny	Ita Conlon	<p>The nearest fort to the school is Wilsons fort. Situated in the townland of Dromore about one mile from the school. Its command's a view of the country for miles around. On the northern side can be seen Molyash mountain Sliabh Gullion and the fews mountain Eight lakes can be seen from here. Muckno, lake, Gouldtraps lake. Loughrus. Lough Patrick. Lough Jemmie Lough Peter. Stringers Lough linne. Some people call this a rath. Corliss fort can be seen from here and Anny Art forth. This fort is circular in shape. It is raised about five feet above the fields around It is faced with stones. Rushes and whines are growing round it now.</p>	<p>https://www.duchas.ie/en/cbes/4723852/4719061/4743860</p>
Charlestown	Colman O Brien	<p>Old Graveyards: There are eight graveyards in the parish namely - Tallanstown, Philipstown, Churchtown, Reaghstown, Louth-Hall, Clon, Charlestown Catholic and Protestant. Tallanstown is the local one. Tallanstown is in the townland of Churchpark. Philipstown is in the townland of the Mill of Louth. Churchtown is in the townland of Churchtown. Cluain is in the townland of Corbollis. Louth-Hall is in the townland of Louth Hall. Reaghstown is in the townland of Reaghstown. The two Charlestown graveyards are in the townland of Charlestown. Tallanstown, Philipstown, Churchtown, Reaghstown, Charlestown Catholic and Protestant graveyards are still in use. There are two graveyards disused namely - Cluain and Louth Hall.</p>	<p>https://www.duchas.ie/en/cbes/5008843/4960430/5074484</p>

Townland	Collector / Informant	Extract Detail	Dúchas Archive permanent website link
Cookstown		<p>Archaeological No 55.</p> <p>(1) Old Sword in possession of Peter Farrell the Mill. It was found in the mill hidden behind a beam. On it is an anchor surmounted by a crown. Beside it was a paper and some coins dated 1700. (2) Old Stone Ornament in possession of Mrs Ellen French Bohernamoc. Supposed to be over 300 years old It consists of figs. of dogs supporting two containers - probably meant as a vase. (3) Ancient graves found at Mrs Byrnes Knocklore by Mr. Mullen when digging potatoes. Stone coffins, bones & skulls. Closed up again. (4) Wall at Neary's Cookstown - supposed to be part of the pale. Cookstown Castle connected by cave with a well 150 yds distant. (5) Mullanure Hill (hos). Ruin of castle unearthed when road being built.</p>	https://www.duchas.ie/en/cbes/5008850/4961024/5076578
Coolderry	Eileen Kelly	<p>The Bath Estate:</p> <p>The Bath estate adjoins Trinity College estate in south Monaghan. This estate belonged to an English gentleman named Lord Bath. He had a castle in Carrickmacross where the convent now is which belongs to the St. Louis Nuns. Lord Bath lived mostly in England. He had agents on the estate to collect the rents. The most notorious of these was a man named Trench. His name is detested to the present day. He was very cruel and severe on the tenants. He had men named bailiffs on the estate to spy on the neighbours. Trench rewarded these bailiffs by giving them good houses to live in. Once when Trench was riding on a horse near the school he came to an old woman and he asked her if there was a firm bottom in the field nearby and she said that there was. Trench jumped his horse across the ditch and the horse sank to the girths. Trench was very angry and asked the old woman why she said the bottom was firm and she said: - "So it is, but you are not near the bottom yet".</p>	https://www.duchas.ie/en/cbes/5008846/4960759/5077375
Donaghmoyne	Mrs Boylan	<p>St Patricks Well:</p> <p>There is a well in Donaghmoyne called St. Patrick's well. In the time of St. Patrick there lived a druid named Manning in Donaghmoyne. St Patrick went to this man one day to speak to him and while St trick was speaking, he struck the ground with his staff and immediately a well sprang up.</p>	https://www.duchas.ie/en/cbes/4723817/4716054/4743429
Donaghmoyne	No name given.	<p>When St. Patrick was travelling through Ireland a chieftain named Mannan lived in Donaghmoyne. The St offered to teach him the true faith, but he refused to hear of it. After much arguing an enchantment came on the chief. A small deep lake arose and Mannan was chained at the bottom of it.</p>	https://www.duchas.ie/en/cbes/5162159/5160184/5164132
Donaghmoyne	No name given.	<p>Battle of Donaghmoyne -in the year 1508 a battle was fought at Donaghmoyne church. The McMahon's surrounded the church on St. Patrick's Day. The O'Neills were beaten.</p>	https://www.duchas.ie/en/cbes/4758587/4756934

Townland	Collector / Informant	Extract Detail	Dúchas Archive permanent website link
Drumaconvern	Seamus Breathnach	Irish Elk: -The remains of an Irish Elk, not complete were discovered in a bog in the townland of Drumaconvern Parish of Donaghmoynne, Barony of Farney sometime in 1917. The bog, which is now largely swamp, is situated near a crossroad, known as Flanagan's Cross and about 1 1/2 miles from Culloville Railway station and was owned at the time by Patrick Flanagan locally known as 'Para Bán'. Para Bán was himself the discoverer. The remains were sent to the Museum in Dublin.	https://www.duchas.ie/en/cbes/4428244/4388049/4510369
Drumgeeny	Mary Alice McHugh	This estate extended from Killanny to Drumgeeny bridge. The landlords were the Provost and Fellows of Trinity College. They appointed agents to collect the rent. They were Captain Filgate of Lisrenny and Vaughan from Athlone. These agents employed rent warners. These tenants on the estate would go round and warn others when rent would be collected. The rents were collected by the agent in a house in Killanny. The rents were collected in May and November. These agents gave the the people time to pay if they were unable to pay on the day he came. In the years 1870 to 1880 the rents were high. The tenants were unable to pay, and they put their case before the agent. Only Trinity College could reduce the rent, so the agent put it before them and that about 1881 the rents were reduced. There are many fields in the district divided by a " merrin " or a grassy bank. This was done by the tenants when one of the family was getting married. A portion of the field was given as a fortune or dowry.	https://www.duchas.ie/en/cbes/5008846/4960758/5077374
Drumgowna	Brian Keenan	In the townland of Drumgowna there is a fort known as Lís Cowan an Óir. In this fort there is supposed to be a barrel of sovereigns hidden and a cat minding it. The story goes that this gold can be got at 12 o'clock at night but no one has ever attempted to unearth it. The fort is circular in shape and is surrounded by a deep trench with an outer ring. From this fort it is possible to see seven other forts all in sight of each other.	https://www.duchas.ie/en/cbes/4758590/4757283/4936325
Drumgowna	No name given.	Hedge schools - Hedge Schools existed in the district around Drumgowna but in no set place. The teachers could not remain long in the district as they were chased. Farmers were supposed to report if they found a 'hedge school' on their farms. Irish was taught and the children sat on stones around the 'master'. The teacher was paid by the scholars. The following lines written by a pupil of one of these hedge schools gives us an idea of the school and the life of the teachers and scholars: - When first I started school days, it was in the open air, I enjoyed it most remarkably, while the weather did keep fair Now the winter's coming on and my coat is getting thin But we must keep on the hillside, for none dare let us in. What has become of the Irish race, with their monasteries of old Where the weary soul found refuge, and a shelter from the cold.	https://www.duchas.ie/en/cbes/4758590/4757312/4936355

Townland	Collector / Informant	Extract Detail	Dúchas Archive permanent website link
		<p>Our native race are forced to flee, to the barren rocks and moor With our fertile plains in Saxon hands – No wonder we are poor.</p>	
Drumlusty	Patrick Dooley	<p>The forts in our district, Drumlusty, in the parish of Innisheen, in the barony of Farney, County of Monaghan, are: -</p> <ol style="list-style-type: none"> 1. Drumlusty fort. 2. Three forts in Carraig a Seoin field 3. The scotch man's fort, 4. The round doe. <p>1. Drumlusty fort. Drumlusty fort is a fort with a wall built round it, then there is a mound of ground on top of that, then it is level.</p> <p>2. Carraig a seoin forts. Carraig a seoin forts are level with the field. There is bushes around them.</p> <p>3. Scotch man's fort. There is a cave in the middle of the scotch man's fort. It is a high mound of ground.</p> <p>4. The round doe fort. The round doe is a high mound of ground.</p> <p>These forts are in sight of each other.</p>	https://www.duchas.ie/en/cbes/4742041/4730201/4951014
Drumlusty	Mary Hand	<p>Hedge school: There was a hedge school situated between Essexford and Drumlusty and the man who taught in it was a man by the name of Henry Bryne. He taught the older generation and made many good scholars and some of the relics of his art are yet at hand such as sun-dials.</p>	https://www.duchas.ie/en/cbes/4758589/4757164/4936202
Drumlusty	Margaret McGahan	<p>Place names: The following place names are found in the townland of Drumlusty, Parish of Innisheen, Barony of Farney, County Monaghan.</p> <ol style="list-style-type: none"> 1. Names of Fields: (a) Carrick a Seoin (b) "The Gallda" (c) Parnastackan (d) The Cróca Mór (e) Carnagh Ruaidh (f) "Knocknoryor" 2. Names of Streams: (a) Baile na Sasana (b) Curra Bhog 3. Names of Hills: (a) "Bully Rock" (b) Ballengarry. 	https://www.duchas.ie/en/cbes/4742041/4730225/4951086
Edmondstown	Annie Mohan	<p>Hedge Schools: In the year 1832 there was an old school where Mc Ardles old forge was in Mc Keevers field in lower Edmondstown. The name of the teacher was Peter Mullan. Each pupil had to bring a penny every Monday morning to pay the teacher. My grandfather went to school in it. The chief subjects were Irish and English and Latin. There was also another school in the church yard the name</p>	https://www.duchas.ie/en/cbes/5008844/4960528/5075153

Townland	Collector / Informant	Extract Detail	Dúchas Archive permanent website link
		of the teacher was Owne Matthews who used to write on a slate, and he would make the children do the same.	
Essexford	Mary Corrigan	<p>When the Earl of Essex attempted the conquest of Ulster in the reign of Elizabeth, he came through Louth Via Corcreaghy to the place that is now called Essexford. It seems that the fact of Essex coming in this direction that it took the name of Essexford. In a generation long ago it was called Clochan and it seems that this name originated from the same event as the place at that time was boggy and the horsemen had to cross on stepping stones and that would explain Clochan as that is the Irish for stones. He was opposed by a small Irish force that took up position on Ballingarry hill. They were led by a man called Gairlegobbain, this was a nickname on some Irish Chieftain at least I'm giving it as I got it from the local historians. There was a battle fought here and Essex was successful as the local historian is not clear on this point, but we hear of him taking possession of Carrick afterwards. There is a stream running by the place where this battle was fought dividing Ulster from Leinster and there is a townland called Gairlegobbain running up along this stream to a ford on the river whatever connection this may have with the Irish Chieftain of this name I will leave it to others to solve.</p> <p>It is quite apparent that while this battle lasted it must be fought fairly fiercely as the graves of the English soldiers can yet be pointed out on the side of Drummurvey hill. It is told that there was an ancient Castle on the creast of Ballingarry hill and there was a cave running from it to Mannan Castle that you could drive a coach and four horses through.</p>	https://www.duchas.ie/en/cbes/4758589/4757162/4936201
Harristown	Kathleen Martin	There is a fort in Harristown above Ardee and there is a lot of Soldiers buried in it. Garlic Gaolen, is buried there the head of the army; One day there was a football match near the fort and there was a lot of shouting and laughing going on and Garlic Gaolen came out and asked them what took them there and they answered they were ar a football match. He said he thought they were the orange men coming to fight; There is a cave going into this fort in Harristown.	https://www.duchas.ie/en/cbes/5008844/4960563/5075285
Kiltybegs	Eileen Malone	The Danes came from the sea at Carlingford and advanced north as far as here. They encountered an Irish army in Kiltybegs in a field called the "I sland" and tradition has it that they were defeated by the Irish and they were all slain but two a father and son and these two had a secret way of making wine from heather unknown to the Irish and the Irish tried to force them to devulge this secret so the father said he would tell them how if they put his son to death so when this was carried out he said you may do likewise to me as when he is death theres no one else to tell tale and he was put to death this happened in Dunelty bog and the battlefield I have mentioned is adjacent to the bog and you can see the "rises" in the ground to this day indicating the graves of the slain. There was a monastery and	https://www.duchas.ie/en/cbes/4758589/4757165/4936203

Townland	Collector / Informant	Extract Detail	Dúchas Archive permanent website link
		graveyard on the South side of this in the same townland and it is said that the Danes burned the monastery as they were advancing the graveyard can be traced yet as it was never laboured.	
Kiltybegs	No name given.	<p>Between two and three hundred years ago, there were two ancient graveyards in Inniskeen named Killmurry and Kiltybegs. At that time there lived a planter named Ralph Trueman a villain against Catholics. He wrecked the Little Church and graveyard and got his men and horses and carted the soil from that Sacred Spot and put it out on a hill beside his own house and on a dark night people would see the hill covered with lights which gave the name "Cnoc na Realtha", or the hill of the starts. Sometime after he tilled it and planted a crop of potatoes on it and when they grew no one could eat them for there were teeth and toenails and fingernails sticking out of them. But that didn't stop him from his rascality for on a Christmas Eve night he was watching his Bloodhounds to come as he was going to hunt a priest. To his surprise he saw a lot of "Seletons" [sic] playing hurley on the hill, and each hurler had a tigh or shin bone for a caman, and the ball a skull. He got frightened as the ball rolled to his feet, and he ran in on the front door and out on the back door and was drowned in a pond at the back of the house. He likely had a warm Christmas morning. Killybegs was wrecked about the same time. A few years ago, there were headstones got there, and the Holywater fond and other relics of the Little Church "John Murphy of Stonetown died 1642" was one of the names on the Headstones. Unbaptised children were buried in a field behind Tommy Bur's house (Mullaghinshina) and it is said that many people stood on the graves and were unable to leave the field. This field was called a "Patsharn". At the burning of Dundalk Castle long ago there was an informer called Butchie Kirk who told on the men and got them shot. When he was killed with a blow of a hatchet by an enemy, he wished to be buried in the old cemetery in Innishkeen, but instead he was thrown into the river at O'Rourke's mills and was never seen any more. Dead corpses long ago were taken across the eel wire at Abbey Smith's Miskisk, and on across Blackstaff and it is said that the style at Mickie Own's Woods was a resting place and that stile remains today and is still in a good condition.</p>	https://www.duchas.ie/en/cbes/4742043/4730458/4955090
Knocklore	No name given.	Ancient graves found at Mrs Byrnes Knocklore by Mr. Mullen when digging potatoes. Stone coffins, bones & skulls. Closed up again.	https://www.duchas.ie/en/cbes/5008850/4961024/5076578
Lisnagunnion	Teresa Finegan	My home district is in the parish of Donaghmoyne. The townland in which I live is Lisnagunnion which means the fort of the rabbits. There are nine families in the townland but the pre famine number have been greatly reduced as many of them went on the emigration scheme and this is known by the number of ruins in the townland and the fields called by the names of the people who owned them. The most common name in the district is Burns. My grandmother is the oldest inhabitant in the district. She is nearly a hundred years old. In our district there is a famous lake called Manaan lake and nearby	https://www.duchas.ie/en/cbes/5162735/5159714/5163743

Townland	Collector / Informant	Extract Detail	Dúchas Archive permanent website link
		<p>there are the ruins of the castle. This was owned in the time of St. Patrick by a chief called Manaan who is supposed to be descended from the Tuatha De Danans. When St. Patrick was in Donaghmoynne this man thought to be greater than him and changed himself into many different beasts and when he turned himself into the shape of a fish St. Patrick said " as thou art let thou remain " and he was thrown into the lake and is supposed to be still there and will be there till the day of judgment guarding two pots of gold. Men of the district have often tried to drain the lake, but something has always hobbled them.</p>	
Louth Hall	Thomas McEneaney	<p>Cromwell and this district: It was Cromwell who knocked down the Monastery in Louth. The reason why he knocked it was that he did not like Catholics. Oliver Cromwell was supposed to be seeking Blessed Oliver Plunket. Blessed Oliver Plunket was not much in this district. He was in Donegal. Blessed Oliver Plunket was supposed to be hiding on Cromwell. The Plunkets cut the nose off Cromwell and the sword is in Louth Hall yet. After the battle in Tallanstown the Plunkets lost the title of Lords.</p>	https://www.duchas.ie/en/cbes/5008843/4960452/5074694
Louth Hall	Colman O'Brien	<p>There are eight graveyards in the parish namely - Tallanstown, Philipstown, Churchtown, Reaghstown, Louth-Hall, Clon, Charlestown Catholic and Protestant. Tallanstown is the local one. Tallanstown is in the townland of Churchpark. Philipstown is in the townland of the Mill of Louth. Churchtown is in the townland of Churchtown. Cluain is in the townland of Corbollis. Louth-Hall is in the townland of Louth Hall. Reaghstown is in the townland of Reaghstown. The two Charlestown graveyards are in the townland of Charlestown. Tallanstown, Philipstown, Churchtown, Reaghstown, Charlestown Catholic and Protestant graveyards are still in use. There are two graveyards disused namely - Cluain and Louth Hall.</p>	https://www.duchas.ie/en/cbes/5008843/4960430/5074484
Lurganboys	Mary Martin	<p>My Home District: I live in the townland of Lorganboys. There are six houses in my townland. Our house is an old house, there is another old house also. The rest of the houses are new and slated. Our house is thatched, and the other old house is galvanized. The names of the houses are Martins (8) Callans (1) MacDermots (7) Duffys. Carraghers house is empty the people who lived in it left it and went to live in Bolla [?] of Donaghmoynne. There is one house in our farm. From it you can see Collon grove and Carricklick rock in Co Meath. There is a lake situated on our land. There is an island between two parts of the lake, the island is covered with wood. My father says that the lake used to reach up to the middle of the field. There is a river flowing from the lake that used to support an old mill. The ruins of the mill remain here yet. There is a big flat millstone in our street. Once there was a road between two of our fields, but it is only a drain now.</p>	https://www.duchas.ie/en/cbes/5164162/5159921

Townland	Collector / Informant	Extract Detail	Dúchas Archive permanent website link
Mullanstown	No name given.	Sand pit at Mullanstown (lime, sand & stone foundation).	https://www.duchas.ie/en/cbes/5008850/4961012/5076550
Nicholastown	Angela Martin	Old ruins: There are the ruins of an old monastery in the town Louth. Beside this monastery there is a little house and it was all made of stone; it was supposed to be for holding valuable belonging to the monastery and the monks; there is a legend about this house it is said there came a knock to the monastery door one night, and a monk asked lodging and they would not let him in, he lay down on the ground and in the morning he was dead and this house was found built over him; There are the ruins of an old castle in Nicholastown and the remains of it are to be seen yet it is in Ardee, Co. Louth and there was a dungeon in it for keeping prisoners; There are some large stones there still and there is writing in Latin on them; The castle was built in the year 1816; There are the ruins of an old castle in a field belonging to Jack Murphy it was knocked by a man name Cromwell and this happened in the year 1651.	https://www.duchas.ie/en/cbes/5008844/4960535/5075169
Pepperstown	Rosie Mcgahon	There is a fairy fort in the townland of Pepperstown. It is a round fort. There is an entrance hole in the centre. People have often gone into this entrance and explored the interiors. Some of them got books and others golden watches.	https://www.duchas.ie/en/cbes/5008845/4960700/5077218
Reaghstown	Angela Martin	Mass Rocks: Long ago in the year 1653 when the penal law was in force soldiers would be going around to see if they would be going around to see if they would find any priests saying mass and if they did they would cut off their head and they would get for it, there was a priest going around this district named James Boylan saying Mass, there is a rock in Kelly's field in Reaghstown Ardee, Co Louth, where mass was said and there is to be seen yet an altar at Louth Hall where the priests used to be saying mass. When the priests would be saying mass there would be one or two men watching to see if the soldiers would be coming and if they were, they would go away to hide.	https://www.duchas.ie/en/cbes/5008844/4960526/5075148
Reaghstown	John Durnin	Mass Paths: In 1798 the priests had no chapels to say mass in, they would have to say mass in lonely places safe from the English so that the people had to go long journeys to hear mass; There was one of the places near Reaghstown and the old stone path leading to it is still called the mass pass; Some distance away a few miles there stands the remains of a rock used by the Priests which is to be seen yet. There was a monastery in Louth, and it was burned by the English, but the monks escaped. There was a monk who used to go for goods and one evening he was late, so he was left out, and in the morning, he was found dead in a little stone cabin.	https://www.duchas.ie/en/cbes/5008844/4960527/5075151

Townland	Collector / Informant	Extract Detail	Dúchas Archive permanent website link
Reaghstown	Annie Mohan	There is another fort in Reaghstown known as the Kesh it is owned by James Mc Connan; There is a path going over to it where the fairies used to walk, there was a shop on the path and the fairies used to come and buy their bread in it; These fairies used to come and leave the money on a stone outside the shop and the people would take the money of it and leave the bread on it and the fairies would come and take it away.	https://www.duchas.ie/en/cbes/5008844/4960533/5075161
Shanmullagh	No name given	There is a field in Shanmullagh called the "caldra" in which a lot of people were buried. Some think that a battle was fought there and that the men killed were buried there. Others think it was a graveyard.	https://www.duchas.ie/en/cbes/4723821/4716268/4936419
Stradeen	Teresa Dooley	Ballingarry Hill was the last outpost of the last Mmc Mahon. It was near the pale. It and many fields around are "caved". One great cave goes from Stradeen rectory to Colreagh. These caves often fall in when ploughing is being done.	https://www.duchas.ie/en/cbes/4758589/4757150/4936186
Tully	Colm Mac Uidhir	There are some Fairy Forts around this district. There is a fort in a field of Peter Bellew of Tully. All the houses around had to be swept and thoroughly cleaned every night. The people used to say the fairies would come in and sit at the fire during the night. All their bins were always full of meal.	https://www.duchas.ie/en/cbes/5008836/4959744/5073065
Various Townland	No name given	<p>Townland Names</p> <p>Coolnagrattan - Cúl na Gréatan - Back of the Scraws</p> <p>Coolderry - Coille Dearga - St. Derrig had a monastery here.</p> <p>Dunelty - Dún na h-Ailt - Deer was to be found here.</p> <p>Drumcatton - Druim na Coite - Back of the Withered Hill</p> <p>Druim n-each ... of the Steed.</p> <p>Drumneil - Druim na h-Airne ... of the sloes</p> <p>Drumganny - Druim Áine</p> <p>Dromore - Druim na Gabhar</p> <p>Drumcay - Druim na Ceatha - ... Showers</p> <p>Camagarboge -</p> <p>Lios Sidhe = Fairies Fort is here.</p> <p>Ballykelly - Baile na Cailleach</p> <p>Drumnegrella - Druim na Gréatan scraws</p> <p>Drumnanaline - Druim na Néalta = v. high hills</p>	https://www.duchas.ie/en/cbes/4742042/4730326

Townland	Collector / Informant	Extract Detail	Dúchas Archive permanent website link
		<p>Ednamo - Aghaidh na mBó Carrickavoley - Carga na gCulaidhe - huntsman (Rock of the Fairies) Shancobane - Sean Cú Bán Shancoduff - Sean Cú Dubh Momoney - Ba na mBainne Carricklane - Carraig na Cliath – hurdles Kiltybegs - Coillte Beaga Mullaghinshinagh - Mullach na bhFuinneog - of the ash trees. Dundalk - Dún na nDealg - Thorn in his knee. There is some story connected with an officer who got a thorn in his knee. Inniskeen - Inis Caoin Deagha: there is supposed to have been a monastery built here by St. Daig. Inis (Skeehu) - Scraw of rats The old people pronounce this, Anashkeen.</p>	

Appendix 9.7: Inventory of Townland Names

Townland Name	Option	Gaelic Name	Glossary	Suggested Meaning	Placenames Database URL
Aclint	Option A (Yellow) Option B (Yellow+Blue)	Bhéal Átha Claonta	áth = ford. béal = opening, approach, mouth	Beal átha cloanya - Mouth of the ford of Clint, a family name. In Aclint townland is a moat called Mota Bheul Atha Cloanta. (AL)	https://www.logainm.ie/en/33527?s=Aclint
Aghadreenan	Option A (Yellow) Option B (Yellow+Blue) Option C (Green) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Achadh Draighneach	Achadh = field.	Aghadrena = Thornford. (:OD)	https://www.logainm.ie/en/39664
Aghavilla	Option A (Yellow) Option B (Yellow+Blue)	Achadh an Bhile	Achadh = field. Bhile = (large, sacred) tree.	Achadh an Bhile = Field of the sacred tree. (:OD)	https://www.logainm.ie/en/39382
Agheeshal	Option C (Green) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Achadh Íseal	Achadh = field. Iseal = low.	Aghaheshel = Low ford. (:OD)	https://www.logainm.ie/en/39665?s=Agheeshal
Annaghminnan	Option D (Orange) Option F (Orange+Link 2+Green)	Eanach Meannán	Eanach = marsh or cut out bog.	Eanach mionan = Marsh of the kids. (:OD)	https://www.logainm.ie/en/33871?s=Annaghminnan
Annahaia	Option A (Yellow) Option B (Yellow+Blue)	Achadh na hÁithe	Achadh = field.	No meaning given.	https://www.logainm.ie/en/39292
Annalittin	Option D (Orange)	Eanaigh Litean	Eanach = marsh or cut out bog.	Litton's marsh. (:OD)	https://www.logainm.ie/en/39731?s=Annalittin
Annamarran	Option A (Yellow) Option B (Yellow+Blue)	Eanach Uí Mhearáin	Eanach = marsh or cut out bog.	Marran's marsh. (:OD)	https://www.logainm.ie/en/39408?s=Annamarran

Townland Name	Option	Gaelic Name	Glossary	Suggested Meaning	Placenames Database URL
Anny	Option D (Orange)	Na hEanaigh	Eanach = marsh or cut out bog.	Anny = marshes (:OD)	https://www.logainm.ie/en/39520
Arthurstown	Option C (Green)	Baile Artúir	Baile = townland, town, homestead.	Toigh mor bhaile artuin = Arthurstown house. (AL)	https://www.logainm.ie/en/33634
Arthurstown Little	Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Baile Artúir Beag	Baile = townland, town, homestead. Beag = small.	Baile artuin beg = Arthurstown house. (AL)	https://www.logainm.ie/en/33635?s=Arthurstown+Little
Ballingarry	Option C (Green) Option E (Orange+Link 1+Green)	Bhaile an Gharraí	Baile = townland, town, homestead. Garraí = garden, court.	No meaning given.	https://www.logainm.ie/en/39267
Blittoge	Option D (Orange) Option F (Orange+Link 2+Green)	Bliotóg		Bliochtog = Milky-land. (:OD)	https://www.logainm.ie/en/39548?s=Blittoge
Brackagh	Option A (Yellow) Option B (Yellow+Blue) Option C (Green) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	An Bhreacach		No meaning given.	https://www.logainm.ie/en/39668
Carrickagarvan	Option A (Yellow) Option B (Yellow+Blue) Option C (Green) Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Carraig an Gharbháin	Carraig = rock.	Carraic a Gharbhain = Garbhan's Rock. (:OD)	https://www.logainm.ie/en/39732?s=Carrickagarvan

Townland Name	Option	Gaelic Name	Glossary	Suggested Meaning	Placenames Database URL
Carrickavoley	Option D (Orange) Option F (Orange+Link 2+Green)	Carraig an Ghualaigh	Carraig = rock.	Carraic a bhualaidh = Rock of the striking. (:OD)	https://www.logainm.ie/en/39384?s=Carrickavoley
Cavanrobert	Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Cabhán Roibeaird		Cabhan Roibert = Roberts hollow. (AL)	https://www.logainm.ie/en/33636?s=Cavanrobert
Charlestown	Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Baile an tSiarlaigh	Baile = townland, town, homestead.	Baile an tSiarlaigh = Charlestown. (AL)	https://www.logainm.ie/en/1692
Cloghoge Tievadinna	Option D (Orange) Option F (Orange+Link 2+Green)	An Chlochóg agus Taobh an Duine	Taobh = (hill-)side.	Clochog and (sic) Taobh a duine = Stony land, side of the man. (:OD)	https://www.logainm.ie/en/39385?s=Cloghoge+and+Tievadinna
Cloghally Lower	Option A (Yellow) Option B (Yellow+Blue)	An Chlochbhuaille Íochtarach	Íochtarach = lower.	No meaning given.	https://www.logainm.ie/en/39317?s=Cloghally+Lower
Cloghally Upper	Option A (Yellow) Option B (Yellow+Blue)	An Chlochbhuaille Uachtarach		No meaning given.	https://www.logainm.ie/en/39318?s=Cloghally+Upper
Clonavogy	Option A (Yellow) Option B (Yellow+Blue) Option C (Green) Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Cluain an Bhogaigh	Cluain (also: cluaine) = meadow, pasture.	No meaning given. (see suggested meaning of townland of the same name below)	https://www.logainm.ie/en/39355

Townland Name	Option	Gaelic Name	Glossary	Suggested Meaning	Placenames Database URL
Clonavogy	Option C (Green) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Cluain an Bhogaigh	Cluain (also: cluaine) = meadow, pasture.	Cluain a bhogaighe = Lawn in the boy or morass. (:OD)	https://www.logainm.ie/en/39734
Clonturk (Mason)	Option A (Yellow) Option B (Yellow+Blue)	Chluain Toirc	Cluain (also: cluaine) = meadow, pasture.	No meaning given.	https://www.logainm.ie/en/39409?s=Clonturk+(Mason)
Cookstown	Option A (Yellow) Option B (Yellow+Blue) Option C (Green)	Baile an Chócaigh	Baile = townland, town, homestead.	Baile Chocaigh = Cookstown, Cooke is a family name. (:OD)	https://www.logainm.ie/en/33457
Coolcair	Option C (Green) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Cúil Chéire	Cúil = corner, nook.	Coolkayr or Cul Ceir = Kerr's hill or Back of a hill. "Ceir and Lasair are the only two Saints now remembered at Domhnach Maighean". (:OD)	https://www.logainm.ie/en/39525?s=Coolcair
Coolderry	Option D (Orange) Option F (Orange+Link 2+Green)	Cúldoire	Cúil = corner, nook. Doire = (oak)wood, grove, thicket.	No meaning given.	https://www.logainm.ie/en/39550
Coolreagh	Option C (Green) Option E (Orange+Link 1+Green)	An Chloch Riabhach	Cloch (also: cloich) = stone, stone building. Riabhach = streaked, grey.	Cul riach = Grey brick. (AL)	https://www.logainm.ie/en/39269
Coolskeagh	Option D (Orange)	Cúil na Sceitheach	Cúil = corner, nook.	Cul sgeith = Hill back of the bush or lone thorn. (AL / :OD)	https://www.logainm.ie/en/39669
Cordrummans Upper	Option C (Green) Option E (Orange+Link 1+Green)	Corr Dhromainne Uachtarach	Corr = round hill, pointed hill, hollow; pointed, conspicuous, odd. Droim (also: drom) = ridge.	No meaning given.	https://www.logainm.ie/en/39388?s=Cordrummans+Upper

Townland Name	Option	Gaelic Name	Glossary	Suggested Meaning	Placenames Database URL
Corlygorm	Option A (Yellow) Option B (Yellow+Blue)	Corr Lí Ghoirm	Corr = round hill, pointed hill, hollow; pointed, conspicuous, odd.	Cor li guirm = Hill of the blue colour. (:OD)	https://www.logainm.ie/en/39669
Cormoy Lower	Option C (Green) Option E (Orange+Link 1+Green)	Corr Mhaí Íochtarach	Corr = round hill, pointed hill, hollow; pointed, conspicuous, odd.	Cor muighe = Hill of the plain. (:OD)	https://www.logainm.ie/en/39552?s=Cormoy+Lower
Cormoy Upper	Option D (Orange) Option F (Orange+Link 2+Green)	Corr Mhaí Uachtarach	Corr = round hill, pointed hill, hollow; pointed, conspicuous, odd.	Cor muighe = Hill of the plain. (:OD)	https://www.logainm.ie/en/39553?s=Cormoy+Upper
Cornahawla	Option B (Yellow+Blue) Option C (Green) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Corr na hAbhla	Corr = round hill, pointed hill, hollow; pointed, conspicuous, odd.	Corr na hAbhaille = Round hill of the orchard. (:OD)	https://www.logainm.ie/en/39671
Cornalough	Option C (Green) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Corr na Locha	Corr = round hill, pointed hill, hollow; pointed, conspicuous, odd. Loch = lake; inlet.	Cor na loiche = Hill of the lough. (:OD)	https://www.logainm.ie/en/39736?s=Cornalough
Corryagan	Option C (Green) Option E (Orange+Link 1+Green)	Corr Uí Ágáin	Corr = round hill, pointed hill, hollow; pointed, conspicuous, odd.	Cor Ui Again = O'Hagan's Cur or hill. (:OD)	https://www.logainm.ie/en/39530?s=Corryagan
Creevy (Swinburn)	Option A (Yellow) Option B (Yellow+Blue)	An Chraobhaigh (Swinburn)		Cribhide = Bushy. (:OD)	https://www.logainm.ie/en/39390?s=Creevy+(Swinburn)

Townland Name	Option	Gaelic Name	Glossary	Suggested Meaning	Placenames Database URL
Crover	Option C (Green) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Cruabhar		Crobhar = Hard top. (:OD)	https://www.logainm.ie/en/39362
Derryvilan	Option A (Yellow) Option D (Orange)	N/A		N/A	Not listed.
Dian	Option C (Green) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	An Daingean	Daingean = fortress.	"Dian, daen, daingaen. This is a local corruption of Daingean - a fastness" (sic, should read 'fortress').	https://www.logainm.ie/en/39532?s=Dian
Donaghmoyne	Option A (Yellow) Option B (Yellow+Blue)	Domhnach Maighean	Domhnach = church. Maighdean = virgin.	No meaning given. However, 'Church of Our Lady (of Holy Virgin)' seems likely.	https://www.logainm.ie/ga/1982
Drumaconvern	Option D (Orange)	Droim Achaidh Chonbheirn	Achadh (also: -ach) = field. Droim (also: drom) = ridge.	Druim a chon-bhearn = Ridge of the gap of the dogs. (:OD)	https://www.logainm.ie/en/39533?s=Drumaconvern
Drumcrew	Option A (Yellow) Option B (Yellow+Blue) CDEF	Droim Chraobh	Droim (also: drom) = ridge. Craobh = tree, branch.	Druim craobh = Ridge of the bush. (:OD)	https://www.logainm.ie/en/39739?s=Drumcrew
Drumganus Lower	Option A (Yellow) Option B (Yellow+Blue)	Droim Dhamh Íochtarach	Droim (also: drom) = ridge.	Druim gannas = Ridge of the hatred. (:OD)	https://www.logainm.ie/en/39677?s=Drumganus+Lower
Drumgeeny	Option A (Yellow) Option B (Yellow+Blue)	Dhroim Gaoine	Droim (also: drom) = ridge.	Druim gaoineadh = Ridge of the sand. (:OD)	https://www.logainm.ie/en/39410
Drumgowna	Option D (Orange) Option F (Orange+Link 2+Green)	Droim Gamhna	Droim (also: drom) ridge. Gamhain = calf.	Druim ghamhna = Ridge of the calves. (AL)	https://www.logainm.ie/en/33872

Townland Name	Option	Gaelic Name	Glossary	Suggested Meaning	Placenames Database URL
Drumharriff	Option A (Yellow) Option B (Yellow+Blue) Option C (Green) Option E (Orange+Link 1+Green)	Droim Thairbh	Droim (also: drom) ridge.	Druim thairbh = Ridge of the bull. (AL)	https://www.logainm.ie/en/39535
Drumharriff North	Option C (Green) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Droim Chiorradh	Droim (also: drom) ridge.	Druim thairbh = Ridge of the bull. (AL)	https://www.logainm.ie/en/39681?s=Drumharriff+North
Drumhillagh	Option C (Green) Option E (Orange+Link 1+Green)	Droim Shaileach	Droim (also: drom) = ridge. Sail (also: saileach) = willow-(tree).	Druim shailigh = Ridge of the shallows (AL / :OD)	https://www.logainm.ie/en/39392
Drumillard	Option C (Green) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Droim Iolaird	Droim (also: drom) ridge.	Druim iolairt = Ridge of the eagle (local) (AL / :OD).	https://www.logainm.ie/en/39536
Drumlandrick	Option D (Orange)	Droim Bhlonaise	Droim (also: drom) ridge.	Drumlandrick = Lendrick's ridge. (:OD)	https://www.logainm.ie/en/39682?s=Drumlandrick
Drumlusty	Option C (Green) Option E (Orange+Link 1+Green)	Droim Loiscthe	Droim (also: drom) ridge.	No meaning given.	https://www.logainm.ie/en/39557?s=Drumlusty
Drummond Otra	Option A (Yellow) Option B (Yellow+Blue)	An Dromainn Uachtarach	Droim (also: drom) ridge.	Dromainn Uachtarach = Low ridge.	https://www.logainm.ie/en/39326?s=Drummond+Otra
Drumneill	Option D (Orange) Option F (Orange+Link 2+Green)	Droim Néill	Droim (also: drom) ridge.	Druim Neill = Niall ridge. (AL)	https://www.logainm.ie/en/39560

Townland Name	Option	Gaelic Name	Glossary	Suggested Meaning	Placenames Database URL
Drumturk	Option A (Yellow) Option B (Yellow+Blue)	Druim Thuirc	Droim (also: drom) ridge.	Druim thuirc = Ridge of the hops. (AL)	https://www.logainm.ie/en/1414546
Dunanny	Option C (Green) Option E (Orange+Link 1+Green)	Dún Eanaigh	dún (also: dúnaibh) = fort. Eanach = marsh.	Dun Eannaigh = Enna's fort. (:OD)	https://www.logainm.ie/en/39393?s=Dunanny
Edmondstown	Option A (Yellow) Option B (Yellow+Blue)	Baile Éamainn	Baile = townland, town, homestead.	Baile Mac Éamainn = Edmondstown. (AL)	https://www.logainm.ie/en/1414210
Essexford	Option C (Green) Option E (Orange+Link 1+Green)	Droim Muirbhígh	Droim (also: drom) ridge.	"The townland was formerly called Drumurvey until it was purchased for the Glebe. It was then called Essexford after the house" John O'Donovan letters (1834-41). (AL)	https://www.logainm.ie/en/55968?s=Essexford
Feegavla	Option C (Green) Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Fíodh Gaibhle	Fíodh (also: feá) = wood.	Fíodh gaibhle = The name of a celebrated wood in Leinster "Fewgally". (:OD)	https://www.logainm.ie/en/39395?s=Feegavla
Garlegobban	Option C (Green) Option E (Orange+Link 1+Green)	Gharraí Log Gobáin	Garraí = garden, court. Log (also: lag) = hollow.	Gearr liath gobain = Gobban's grey garden. (:OD)	https://www.logainm.ie/en/39274?s=Garlegobban
Garranroe	Option A (Yellow) Option B (Yellow+Blue) Option C (Green) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	An Garrán Rua	Garrán = grove. Rua (also: ruadh) = red; red place.	Garrán Rua = red copse.	Not listed.

Townland Name	Option	Gaelic Name	Glossary	Suggested Meaning	Placenames Database URL
Glebe	Option A (Yellow) Option B (Yellow+Blue) Option C (Green) Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	An Ghléib	Gleib = glebe (archaic; lands, fields).	Gleib = Glebe.	https://www.logainm.ie/en/33444
Gorteens	Option D (Orange)	Na Gortáin	Gort = Field.	Gurteens / Na goirtinidh = The little gardens or cultivated fields. (AL / :OD)	https://www.logainm.ie/en/39684
Harristown	Option A (Yellow) Option B (Yellow+Blue) Option C (Green)	Baile Anraí	Baile = townland, town, homestead.	Baile ui Andraigh = Henry's town. (AL)	https://www.logainm.ie/en/33460
Keeneraboy	Option D (Orange)	Caonaire Buí	Buí = yellow.	Caonaire buidhe = Yellow mossy land. (AL / :OD)	logainm.ie/en/39539?s=Keeneraboy
Killabrick	Option A (Yellow) Option B (Yellow+Blue)	Coill an Bhroic	Coill = wood. Bhroic = badger.	Coill a bhroic = Wood of the badgers.	https://www.logainm.ie/en/39396?s=Killabrick
Kilnacranfy	Option D (Orange)	Coill na Cranncha	Coill = wood.	Coill na cramhthaidhe = Wood of wild garlic. (:OD)	https://www.logainm.ie/en/39541?s=Kilnacranfy
Kiltybegs	Option D (Orange) Option F (Orange+Link 2+Green)	Na Coillte Beaga	Coill = wood. Beag = small.	Coillte beaga = Small wood.	https://www.logainm.ie/en/39563
Knocklore	Option A (Yellow) Option B (Yellow+Blue) Option C (Green)	Cnoc Lór	Cnoc = hill.	Cnoc lobhair = Hill of the lepor. (AL)	https://www.logainm.ie/en/33461?s=Knocklore
Knockreagh Lower	Option D (Orange)	An Cnoc Riabhach Íochtarach	Cnoc = hill. Riabhach = streaked, grey.	Cnoc Riabhach Íochtarach = Grey hill lower.	https://www.logainm.ie/en/39686?s=Knockreagh+Lower

Townland Name	Option	Gaelic Name	Glossary	Suggested Meaning	Placenames Database URL
Knockreagh Upper	Option D (Orange)	An Cnoc Riabhach Uachtarach	Cnoc = hill. Riabhach = streaked, grey.	Cnoc Riabhach Uachtarach = Grey hill upper.	https://www.logainm.ie/en/39542?s=Knockreagh+Upper
Lannat	Option C (Green) Option E (Orange+Link 1+Green)	Leathnocht	Leath (also: leith) = half, side.	"Leanata, leanatha, lionata from linn - a pool, which is here". (AL)	https://www.logainm.ie/en/55970
Leeg	Option A (Yellow) Option B (Yellow+Blue)	An Líg		Lig = a stone. (AL)	https://www.logainm.ie/en/39412?s=Leeg
Lisanisk	Option A (Yellow) Option B (Yellow+Blue)	Lios an Uisce	Lios = ring-fort, enclosure. Uisce = water.	Lios an uisce = The fort of the water. (:OD)	https://www.logainm.ie/en/39289?s=Lisanisk
Lisaquill	Option B (Yellow+Blue) Option C (Green) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Lios an Choill	Coll (also: call) = hazel. Lios = ring-fort, enclosure.	Lios an choill = Hazel fort. (:OD)	https://www.logainm.ie/en/39689
Liscall	Option A (Yellow) Option B (Yellow+Blue)		Lios = ring-fort, enclosure.	N/A	Not listed.
Lisnafinelly	Option C (Green) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Lios na Fionaile	Lios = ring-fort, enclosure.	Lios na fionnghaile = Fort of the fratricide. (:OD)	https://www.logainm.ie/en/39369?s=Lisnafinelly
Lisnagunnion	Option A (Yellow) Option B (Yellow+Blue)	Lios na gCoincheann	Lios = ring-fort, enclosure. Coinin = rabbit.	Lios na gcoinin = Fort of the rabbits (AL/ :OD)	https://www.logainm.ie/en/39370?s=Lisnagunnion
Lisnakelly	Option C (Green) Option E (Orange+Link 1+Green)	Lios na cailighe	Lios = ring-fort, enclosure.	Lios na cailighe = Fort of the hag / nun. (AL)	https://www.logainm.ie/en/39277?s=Lisnakelly

Townland Name	Option	Gaelic Name	Glossary	Suggested Meaning	Placenames Database URL
Lisnamoyle Etra	Option D (Orange) Option F (Orange+Link 2+Green)	Lios na Maoile Íochtarach	Lios = ring-fort, enclosure. Maol = bare, flat-topped; derelict; bare, flat-topped hillock.	Lios na Maoile = Fort of the bald cows. (AL / :OD)	https://www.logainm.ie/en/39543?s=Lisnamoyle+Etra
Lisnamoyle Otra	Option D (Orange)	Lios na Maoile Uachtarach	Lios = ring-fort, enclosure. Maol = bare, flat-topped; derelict; bare, flat-topped hillock.	Lios na Maoile = Fort of the bald cows. (AL / :OD)	https://www.logainm.ie/en/39543?s=Lisnamoyle+Etra
Lisnashannagh	Option A (Yellow) Option B (Yellow+Blue)	Lios na Seannach	Lios = ring-fort, enclosure. Sionnach = fox.	Lios na Seannach = Fort of the fox. (AL)	https://www.logainm.ie/en/39278
Louth Hall	Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Baile an Tallúnaigh	Baile = townland, town, homestead.	Louth Hall - no irish. Ancient name - Bothar a mhinigh = Road of the lawn. (AL)	https://www.logainm.ie/en/33638?s=Louth+Hall
Lurganboys	Option C (Green) Option E (Orange+Link 1+Green)	An Lorgain Bhuí	Buí - yellow. Lorgain (also: lorga) - long low ridge; strip of land.	Lurgain bhuidhe = Yellos stairs or long hills. (:OD)	https://www.logainm.ie/en/39400?s=Lurganboys
Momony	Option D (Orange) Option F (Orange+Link 2+Green)	Maigh Mónann	Maigh (also: magh) - plain.	Magh Maonaigh = Mooney's plain. (:OD)	https://www.logainm.ie/en/39564?s=Momony
Monaltybane	Option A (Yellow) Option B (Yellow+Blue)	Muinilte Bán	Bán - white; lea-ground, grassy.	Muineilte ban = White plain of the flocks. (AL)	https://www.logainm.ie/en/39279?s=Monaltybane
Monaltyduff	Option A (Yellow) Option B (Yellow+Blue)	Mhuinilte Dubh	Dubh (also: dú-, duí-) = black.	Muineilte dubh = Black plain of the flocks. (AL)	https://www.logainm.ie/en/39280?s=Monaltyduff
Monanagirr	Option C (Green) Option E (Orange+Link 1+Green)	Muine na nGiorria	Muine = thicket. Giorria = hare.	Mona na giorra = Bog of the hare. (:OD)	https://www.logainm.ie/en/39373?s=Monanagirr

Townland Name	Option	Gaelic Name	Glossary	Suggested Meaning	Placenames Database URL
Monanny	Option A (Yellow) Option B (Yellow+Blue)	Maigh nEanaigh	Maigh (also: magh) = plain.	Moin Eannaidh = Enna's Bog. (:OD)	https://www.logainm.ie/en/39401?s=Monanny
Monygorbet	Option A (Yellow)	Maigh na gCarbad	Maigh (also: magh) = plain.	Moin na gCarbat = Bog of the chariots. (AL / :OD)	https://www.logainm.ie/en/39691?s=Monygorbet
Mullacloe	Option A (Yellow) Option B (Yellow+Blue) Option C (Green) Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Mullach Cló	Mullach (also: mullaigh) = hilltop.	Mullach clo = Hill of the slope. (AL)	https://www.logainm.ie/en/33482?s=Mullacloe
Mullaghanee	Option A (Yellow) Option B (Yellow+Blue) Option C (Green) Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Mullach an Fhéich	Mullach (also: mullaigh) = hilltop.	Mullach an aoi = Summit of the science. (:OD)	https://www.logainm.ie/en/39743?s=Mullaghanee
Mullanavannog	Option D (Orange) Option F (Orange+Link 2+Green)	Mullach na bhFeannóg	Mullach (also: mullaigh) = hilltop.	Mullach na bfeannog = Hill-top of the scaldcrows ("raucus", scriosta). (:OD)	https://www.logainm.ie/en/39402
Mullanstown	Option A (Yellow) Option B (Yellow+Blue) Option C (Green)	Baile Mhoilin	Baile = townland, town, homestead.	Baile Mhoilin = Mullan's town. (AL)	https://www.logainm.ie/en/33450?s=Mullanstown

Townland Name	Option	Gaelic Name	Glossary	Suggested Meaning	Placenames Database URL
Nicholastown	Option C (Green) Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Baile Niocóil	Baile = townland, town, homestead.	Baile Niocóil = Nicholas's town. (AL)	https://www.logainm.ie/en/33629
Pepperstown	Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Baile an Phiobaraigh	Baile = townland, town, homestead.	Baile Phiobaraigh = Pippard's town ("as the document before us shows - of the Estate of Benedict Pippard of Pippardstown A.D. 1316" <i>archival notes logainm</i>). (AL)	https://www.logainm.ie/en/33463
Rahanna	Option C (Green)	Ráth Eanchú	Ráth (also: ráith) = ring-fort.	Rath hanathadh / Rath Annaidh = Annadh's rath or fort. (AL)	https://www.logainm.ie/en/33464?s=Rahanna
Rahans	Option C (Green) Option E (Orange+Link 1+Green)	Raithnigh	Ráth (also: ráith) = ring-fort.	Rathnadh / Rathna = the forts. (:OD)	https://www.logainm.ie/en/339403
Rathory	Option A (Yellow) Option B (Yellow+Blue)	Ráth Óraí	Ráth (also: ráith) = ring-fort.	Rathory / Rath tauraigh = Tory's rath or earthen fort. (AL)	https://www.logainm.ie/en/33641?s=Rathory
Rathbody	Option C (Green) Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Ráth Bodaigh	Ráth (also: ráith) = ring-fort.	Rathbody / Rath bhodaigh = Fort of the churl. (AL)	https://www.logainm.ie/en/33640?s=Rathbody
Rathneestin	Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Ráth Nístin	Ráth (also: ráith) = ring-fort.	Rath nistin = Neestin's rath or fort. (AL)	https://www.logainm.ie/en/33631?s=Rathneestin

Townland Name	Option	Gaelic Name	Glossary	Suggested Meaning	Placenames Database URL
Reaghstown	Option A (Yellow) Option B (Yellow+Blue)	Baile an Riabhaigh	Baile = townland, town, homestead. Riabhach = streaked, grey.	Archive notes of Loganim - 'the (translated) irish does not seem satisfactory... the chartularies of St. Marys Abbey note land was held by the Reagh family". (AL)	https://www.logainm.ie/en/33632?s=Reaghstown
Rootate	Option D (Orange) Option F (Orange+Link 2+Green)	Tháite Rú	Rua = red. Tate; a land division of 60 acres.	Taite an reamhain = Rooth's tate / the red bog. (AL)	https://www.logainm.ie/en/33866?s=Rootate
Rosslough	Option D (Orange) Option F (Orange+Link 2+Green)	Ros Locha	Loch = lake; inlet. Ros = (wooded) height; wood; promontory.	Ros loch = Wood of the lake. (AL)	https://www.logainm.ie/en/33867?s=Rosslough
Sandfield	Option D (Orange) Option F (Orange+Link 2+Green)	Achadh an Ghainimh	achadh (also: -ach) = field.	Ach an ghainimh = Field of the sand. (AL)	https://www.logainm.ie/en/33868
Shanmullagh	Option A (Yellow) Option B (Yellow+Blue)	An Seanmhullach	Sean = old.	Sean mullach = Old summit.	https://www.logainm.ie/en/39283
Stonetown Lower	Option D (Orange)	Baile na Cloiche Íochtarach	Baile = townland, town, homestead. Cloch (also: cloich) = stone, stone building.	Baile na Cloiche = Town of the stone. (AL)	https://www.logainm.ie/en/33869?s=Stonetown+Lower
Stradeen	Option C (Green) Option E (Orange+Link 1+Green)	An Sráidín	Straid = Street.	Straidin = Little street. (AL)	https://www.logainm.ie/en/39285?s=Stradeen
Taplagh	Option A (Yellow) Option B (Yellow+Blue)	Taplach		Taplach = Rubbish (local). (:OD)	https://www.logainm.ie/en/39545?s=Taplagh
Tattyboys	Option A (Yellow) Option B (Yellow+Blue)	An Taite Buí	Buí = yellow. Tate; a land division of 60 acres.	Na tataigh buidhe - The yellow tates. (AL)	https://www.logainm.ie/en/33524?s=Tattyboys

Townland Name	Option	Gaelic Name	Glossary	Suggested Meaning	Placenames Database URL
Thomastown	Option C (Green) Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Baile Thomáis	Baile = townland, town, homestead.	Baile Thomáis = Thomas town. (AL)	https://www.logainm.ie/en/33633
Tonyellida	Option A (Yellow) Option B (Yellow+Blue)	Tamhnach Oilealla	Tamhnach = arable place, field.	Toin a gheilide = The gelding's bottom land. (:OD)	https://www.logainm.ie/en/39376?s=Tonyellida
Tullanacrunat North	Option D (Orange)	Tulaigh na Cruithneachta Thuaidh	Tulach (also: tulaigh) = hillock. Cruithneachta = wheat.	Tulaigh na cruithneachta = Wheat hill. (:OD)	https://www.logainm.ie/en/39693?s=Tullanacrunat+North
Tullanacrunat South	Option D (Orange)	Tulaigh na Cruithneachta Theas	Tulach (also: tulaigh) = hillock. Cruithneachta = wheat.	Tulaigh na cruithneachta = Wheat hill. (:OD)	https://www.logainm.ie/en/39694?s=Tullanacrunat+South
Tully	Option C (Green) Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	An Tulaigh	Tulach (also: tulaigh) = hillock.	Currach thullaigh = Tully bog. (AL)	https://www.logainm.ie/en/33873
Tullyvaragh Lower	Option A (Yellow) Option B (Yellow+Blue)	Tulaigh Bhanrach Íochtarach	Tulach (also: tulaigh) = hillock.	Tulaigh mharach = Hill of the mangers. (:OD)	https://www.logainm.ie/en/39379?s=Tullyvaragh+Lower
Tullyvaragh Upper	Option A (Yellow) Option B (Yellow+Blue)	Tulaigh Bhanrach Uachtarach	Tulach (also: tulaigh) = hillock.	Tulaigh mharach = Hill of the mangers. (:OD)	https://www.logainm.ie/en/39380?s=tullyvaragh+Upper

Townland Name	Option	Gaelic Name	Glossary	Suggested Meaning	Placenames Database URL
Tullyvin	Option A (Yellow) Option B (Yellow+Blue) Option C (Green) Option D (Orange) Option E (Orange+Link 1+Green) Option F (Orange+Link 2+Green)	Tulaigh Bhinn	Binn (also: beann) = peak, cliff. Tulach (also: tulaigh) = hillock.	Tulaigh bhinn = Sweet hill. (:OD)	https://www.logainm.ie/en/39747