

# Lissywollen

Climate/Sustainability Appraisal

Alanna Homes

7 December 2020

## Quality information

Prepared by	Checked by	Verified by	Approved by
Marion Delaney Associate Director	Sam Purdon Graduate Environmental Consultant	Peter O'Connor Associate Director	

## Revision History

Revision	Revision date	Details	Authorised	Name	Position
1	28/11/20	Draft	MD	Marion Delaney	
2	02/12/20	Revision following comments	MD	Marion Delaney	

## Distribution List

# Hard Copies	PDF Required	Association / Company Name

Prepared for:

Alanna Homes  
4 Mall  
Main Street  
Lucan  
Dublin  
Ireland

Prepared by:

Marion Delaney  
Associate Director

AECOM Limited  
AECOM House  
63-77 Victoria Street  
St Albans  
Hertfordshire AL1 3ER  
United Kingdom

T: +44(0)1727 535000  
aecom.com

© 2020 AECOM Limited. All Rights Reserved.

This document has been prepared by AECOM Limited ("AECOM") for sole use of our client (the "Client") in accordance with generally accepted consultancy principles, the budget for fees and the terms of reference agreed between AECOM and the Client. Any information provided by third parties and referred to herein has not been checked or verified by AECOM, unless otherwise expressly stated in the document. No third party may rely upon this document without the prior and express written agreement of AECOM.

## Table of Contents

<b>1</b>	<b>Introduction .....</b>	<b>7</b>
1.1	Site Description and Location .....	7
1.2	The Proposed Development .....	9
1.3	Principles of Sustainable Development .....	10
1.4	Scope of the Appraisal .....	10
1.5	Limitations .....	11
<b>2</b>	<b>Policy and Strategic Context.....</b>	<b>12</b>
2.1	National Policy and Guidance .....	12
2.1.1	Paris Agreement .....	12
2.1.2	Kyoto Protocol (2008 – 2012) .....	12
2.1.3	EU 2020 Targets for non-ETS sector emissions .....	12
2.1.4	2015 Energy White Paper .....	12
2.1.5	The EU Climate and Energy Package .....	13
2.1.6	EIA Directive 2014/52/EU .....	13
2.1.7	National Planning Framework – Project Ireland 2040 .....	13
2.1.8	Climate Action and Low Carbon Development Act 2015 .....	14
2.1.9	National Energy Efficiency Action Plan (NEEAP) 2009-2020 .....	14
2.1.10	National Biodiversity Action Plan .....	14
2.1.11	Wildlife Acts, 1976–2012 .....	14
2.1.12	European Communities (Birds and Natural Habitats) Regulations, 2011–2015 .....	15
2.1.13	Sustainable Residential Development in Urban Areas (2009) .....	15
2.1.14	Adaptation to Climate Change .....	16
2.1.15	Sectoral Adaptation Plans .....	16
2.2	Guidance .....	17
2.2.1	Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (EC, 2012) .....	17
2.2.2	Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA, 2017) .....	18
2.2.3	Climate Change and Major Projects (EC, 2016) .....	18
2.2.4	Sectoral Planning Guidelines for Climate Change Adaptation .....	18
2.2.5	Midland Regional Planning Guidelines 2010-2022 .....	18
2.3	Housing Policy .....	18
2.3.1	Rebuilding Ireland; Action Plan for Housing & Homelessness 2016 .....	18
2.4	Environmental/Flood Risk Policy .....	18
2.4.1	Strategic Environmental Assessment (SEA) .....	18
2.4.2	Appropriate Assessment (AA) .....	19
2.4.3	Catchment Flood Risk Assessment and Management (CFRAM) Programme .....	19
2.5	Local Policy and Guidance .....	19
2.5.1	Athlone Town Development Plan 2014-2020 .....	19
2.5.2	Local Level Adaptation .....	20
<b>3</b>	<b>Energy and Climate Change.....</b>	<b>22</b>
3.1	Energy .....	22
3.2	Climate Change .....	24
3.2.1	Introduction .....	24
3.2.2	Methodology .....	25

3.2.3	Vulnerability .....	26
3.2.4	Baseline Environment.....	27
3.2.5	Regional Context.....	27
3.2.6	Local Context.....	30
3.2.7	Potential Impact of the Proposed Project .....	31
3.2.8	Impact Statement - Adaptation Options .....	31
3.2.9	Behavioural Measures – Soft Actions for the Occupied Building.....	32
3.2.10	Construction Phase .....	32
3.2.11	Development Vulnerability .....	33
3.2.12	Future Reduction of GHG Emissions .....	39
<b>4</b>	<b>Sustainability Appraisal .....</b>	<b>40</b>
4.1	Management.....	40
4.2	Health and Well-being.....	40
4.3	Transport.....	41
4.3.1	Site Access Arrangements .....	42
4.3.2	Public Transport.....	45
4.3.3	Car Parking .....	47
4.3.4	Mobility Impaired Parking Electric Vehicle (EV) Parking & Car Sharing.....	48
4.3.5	Cycle Parking.....	48
4.4	Water.....	49
4.4.1	Flood Risk .....	49
4.4.2	Surface Water Drainage.....	50
4.5	Materials .....	51
4.6	Waste.....	52
4.6.1	Significant reduction of Waste Management Planning.....	53
4.7	Land-use and Ecology .....	55
4.8	Pollution .....	64
4.8.1	Light.....	64
4.8.2	Water.....	64
4.8.3	Land .....	64
4.8.4	Air.....	65
	Construction Phase Impacts.....	65
4.9	Cultural Heritage .....	69
4.10	Noise and Vibration .....	69
<b>5</b>	<b>Conclusions .....</b>	<b>70</b>
	Appendix A Document copies.....	70

## Figures

Figure 1.1	Application lands in the context of Athlone town (Planning Report & Statement of Consistency).....	7
Figure 1.2:	Aerial photograph of Lissywollen South with local features (Lissywollen South Framework Plan 2018-2024) .....	8
Figure 3.1:	Windrose for Mullingar <a href="https://www.met.ie/climate-ireland/SummaryClimAvgs.pdf">https://www.met.ie/climate-ireland/SummaryClimAvgs.pdf</a> .....	31
Figure 4.1:	The waste hierarchy .....	54

## Tables

Table 2.5-1:	Summary of Adaptation to Climate Change Actions in Ireland.....	20
Table 3.2-1:	Scale of Likelihood of Climate Hazard .....	.
Table 3.2-2:	Climate Impacts Projections: 30-year overview .....	28
Table 3.2-3:	Mullingar 1979–2008 averages.....	30
Table 3.2-4:	Average Precipitation Mullingar 1979–2008 averages.....	30
Table 3.2-5:	Analysis of Likelihood of Climate Hazards during Construction Phase.....	33
Table 3.2-6:	Climate Hazard Impact Analysis .....	33
Table 3.2-7:	Sensitivity of Project during construction phase to Climate Hazards .....	34
Table 3.2-8:	Exposure of the Project during construction phase to Climate Hazards without Mitigation .....	34
Table 3.2-9:	Vulnerability Analysis of Project to Climate Hazards.....	36
Table 3.2-10:	Analysis of Likelihood of Climate Hazards.....	36
Table 3.2-11:	Climate Hazard Impact Analysis.....	37
Table 3.2-12:	Sensitivity of Project to Climate Hazards.....	37
Table 3.2-13:	Name of Table Exposure of the Development to Climate Hazards without Mitigation..	37
Table 3.2-14:	Vulnerability Analysis of Project to Climate Hazards.....	38
Table 4.3-1:	Athlone Train Station Services(DFBL Mobility Management Plan.....	45



# 1 Introduction

## 1.1 Site Description and Location

AECOM has been commissioned to undertake a Climate/Sustainability Appraisal as part of the Environmental Impact Assessment Report (EIAR) for a proposed Strategic Housing development at Lissywollen (the 'Proposed Development'), Athlone, County Westmeath, for Alanna Roadbridge Developments Ltd.



**Figure 1.1 Application lands in the context of Athlone town (Planning Report & Statement Of Consistency)**

The Lissywollen site is approximately 2km to the northeast of Athlone Town Centre as shown above in Figure 1.1. The subject lands are bounded to the north by the N6 National Road corridor and to the south by the 'Old Rail Trail Greenway' that forms a section of the Galway – Dublin National Cycle Network (NCN). The western boundary of the smaller development plot comprises Athlone Town Stadium lands and Scoil Na Gceirthe Máistrí. The existing Brawney residential development forms the eastern boundary of the smaller development plot and the western boundary of the larger development plot. The larger development plot's eastern boundary comprises a greenfield site and the existing ESB Networks facility.

The subject site is located within the lands designated for the Lissywollen South Framework Plan 2018-2024. General access into the site is currently limited to an existing distributor road serving the Brawney residential area and a range of sporting and recreational facilities including the Regional Sports Centre and Athlone Football Club.



**Figure 1.2: Aerial photograph of Lissywollen South with local features (Lissywollen South Framework Plan 2018-2024)**

The development proposal consists of 576 no. residential dwellings comprised of the following:

**Table 1-1.1-1 Proposed Dwelling Mix (Planning Report & Statement of Consistency)**

Unit Type	1 bed	2 bed	3 bed	4 bed	Total
Houses; 2 storey detached, semi-detached & terraced	-	35	200	50	285
Apartment					
Block G - 2 storey					
Block O - 2 to 4 storey					
Block C, K, N, P, R & T - 3 storey	60	169	17	-	246
Block M - 3 storey with a 4 storey setback					
Block L - 4 storey with a 5 storey setback					
Duplex Units					
Blocks A, B, D, E, F, H, Q & S – 3 storey	-	8	37	-	45
<b>Total</b>	<b>60</b>	<b>212</b>	<b>254</b>	<b>50</b>	<b>576</b>

The Development Proposal includes for the provision of a community hub measuring circa 101m<sup>2</sup> located on the ground floor of the Block D and 2 no. crèches comprised of a 2 storey crèche located adjacent to proposed Block C (measuring circa 321m<sup>2</sup>) and a 1 storey crèche the ground floor of the proposed Block T (measuring 448m<sup>2</sup>).



The development proposal includes for the provision of public open spaces, planting, boundary treatments & all ancillary landscape works, public lighting, drainage and attenuation, car & bicycle parking, bin storage, ESB sub-stations and all associated site development works.

The assessment describes the scope, relevant legislation, assessment methodology and the baseline conditions currently existing in the area. It then presents the potential impacts of the scheme and an evaluation of the significance of the effects.

DBFL Consulting Engineers Traffic and Transport Assessment provides further details on the site location and pre-development conditions.

## 1.2 The Proposed Development

DBFL Consulting Engineers Traffic and Transport Assessment provides further details on the site location and pre-development conditions.

The Proposed Development costs of 576 no. residential dwellings the includes for the provision of a community hub and 2 no. crèches.

The development proposal includes for the provision of public open spaces, planting, boundary treatments & all ancillary landscape works, public lighting, drainage and attenuation, car & bicycle parking, bin storage, ESB sub-stations and all associated site development works.

The subject site will be highly accessible to pedestrians and cyclists. Pedestrians and cyclists will be given priority within the internal site layout to ensure travel desire lines within the site are accommodated providing a good level of service and ensures the risk of vehicle/pedestrian conflict is minimised.

Dedicated pedestrian / cycle paths are proposed throughout the site layout providing a traffic free route between the different sections of the development site. Furthermore, pedestrian facilities are proposed on two sides and two-way cycle facilities on one side of the extended Brawney Road corridor.

The subject development land is bisected by the existing Brawney residential estate and is generally bounded to the north by the N6, Athlone Relief Road, to the south by the Old Rail Trial Greenway, to the west by Scoil na gCeithre Máistrí and to the east by undeveloped lands, further east of which are the ESB Regional Headquarters. The subject site is located within the lands designated for the Lissywollen South Framework Plan 2018-2024.

Access to the subject site will be from Ballymahon roundabout (on the R915) to the west and Garrycastle roundabout (on the R916) to the east. The development proposal includes for road development works from Ballymahon roundabout (on the R915) to the west via and Garrycastle roundabout (on the R916) to the east, and the development of an east-west access route through the subject site as envisaged by the Lissywollen South Framework Plan 2018-2024. The Proposed Development also provides for pedestrian and cyclist connectivity to Old Rail Trail Greenway to the south.

The planning application also includes for the provision of new bicycle infrastructure off-site along Brawney Road and Blackberry Lane corridors linking the subject masterplan lands with the existing bicycle infrastructure at the R915/east. This new bicycle infrastructure will benefit new residents of the Proposed Development to access work, leisure and education facilities to the northwest and northeast in addition to providing new sustainable routing opportunities

for both existing residents of the area and visitors / patrons of the leisure facilities currently located along Brawney Road.

## 1.3 Principles of Sustainable Development

Sustainable development can be distilled into three key roles for sustainability design:

- an economic role – contributing to building a strong, responsive and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth and innovations; and by identifying and coordinating development requirements, including the provision of infrastructure;
- a social role – supporting strong, vibrant and healthy communities, by providing the supply of housing required to meet the needs of present and future generations; and by creating a high quality built environment, with accessible local services that reflect the community's needs and support its health, social and cultural well-being; and
- an environmental role – contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change including moving to a low carbon economy.

These roles should not be undertaken in isolation, because they are mutually dependent. To achieve sustainable development, the key economic, social and environmental gains should be sought jointly and simultaneously through the planning system. A development may be technically exceptional with regards to energy efficiency, water use and other environmental performance factors, but if the resultant development is undesirable to live or work in, or non-financially viable to operate, then the resources will ultimately be wasted and the development cannot be considered to be sustainable.

## 1.4 Scope of the Appraisal

The Climate and Sustainability Appraisal is being produced to appraise the sustainability credentials of the Proposed Development and demonstrate that they are in line with national, regional and local planning policies.

The scope of the report is to provide a review and summary of the suite of technical reports produced in support of the planning application, extracting the information relevant to sustainability issues and demonstrating how the proposals within each comply with national, regional and local planning policies.

The report appraises the following sustainability criteria:

- Management of the development and construction process;
- Health and Well-being of the residents;
- Energy Efficiency and Climate Change;
- Transport;
- Water use and flood risk;
- Materials selection;
- Waste management;
- Land-use and Ecology; and
- Pollution.

The sustainability report will be written in such a manner as to maintain flexibility and minimise the risk of any single approach becoming binding through planning condition. It is understood that the development is seeking to meet all required sustainability standards, but is not seeking exemplar status at this time.

## 1.5 Limitations

This Appraisal relies upon third party data which has been received in good faith as being accurate. Details of the third party data is provided in Appendix A.

## 2 Policy and Strategic Context

This section details the relevant national and local planning policies that must be met.

### 2.1 National Policy and Guidance

#### 2.1.1 Paris Agreement

The Paris Agreement entered into force on the 4<sup>th</sup> November 2016. The Paris Agreement aims to tackle 95% of global emissions through 188 Nationally Determined Contributions (NDCs) which will increase in ambition over time. Ireland's contribution to the Paris Agreement will be via the NDC tabled by the European Union (EU) on behalf of its Member States. This is a binding target for an overall reduction of at least 40% in greenhouse gas emissions by 2030 (relative to 1990 levels). The target will be delivered by the EU by 2030 through reductions in the Emissions Trading Scheme (ETS) and non-ETS sectors of 43% and 30% respectively (relative to 2005).

#### 2.1.2 Kyoto Protocol (2008 – 2012)

The Environmental Protection Agency (EPA) has overall responsibility for the national greenhouse gas inventory in Ireland's national system, which was established in 2007 under Article 5 of the Kyoto Protocol<sup>1</sup>. The EPA's Office of Climate Licensing and Resource Use (OCLR)<sup>2</sup> performs the role of inventory agency in Ireland and undertakes all aspects of inventory preparation and management as well as the reporting of Ireland's submissions annually in accordance with the requirements of Decision 280/2004/EC and the United Nations Framework Convention on Climate Change (UNFCCC).

Ireland currently accounts for greenhouse gas (GHG) emissions under the Kyoto Protocol. The Kyoto Protocol required Ireland to limit total national greenhouse gas emissions to 314.2 Mtonnes of CO<sub>2</sub>eq over the five-year period 2008 – 2012 which is equivalent to 62.8 Mtonnes of CO<sub>2</sub>eq per annum. The Kyoto Protocol limit is calculated as 13% above Ireland's 1990 baseline value which was established and fixed at 55.61 Mtonnes of CO<sub>2</sub>eq following an in-depth review of Ireland's 2006 greenhouse gas inventory submission to the UNFCCC.<sup>3</sup>

#### 2.1.3 EU 2020 Targets for non-ETS sector emissions<sup>4</sup>

Under the EU Commission's Climate and Energy Package, Ireland is required to deliver a 20% reduction in non-ETS greenhouse gas emissions by 2020 (relative to 2005 levels). In addition, Ireland also has binding annual emission limits for the period 2013-2020 to ensure a gradual move towards the 2020 target.

The non-ETS sectors cover those sectors that are outside the EU Emissions Trading Scheme and includes agriculture, transport, built environment (residential, commercial/institutional), waste and non-energy intensive industry. Member States are permitted to meet their annual targets through a number of mechanisms which include carrying forward of a quantity of its annual emission allocation from the following year, use of transfers from other Member States and the limited use of international credits from project activities as long as certain criteria are met.

<sup>1</sup> [http://unfccc.int/kyoto\\_protocol/items/2830.php](http://unfccc.int/kyoto_protocol/items/2830.php)

<sup>2</sup> <http://www.epa.ie/mobile/about/org/oclr/>

<sup>3</sup> [http://unfccc.int/files/national\\_reports/annex\\_i\\_natcom/submitted\\_natcom/application/pdf/nc6\\_br1\\_ire.pdf](http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/nc6_br1_ire.pdf)

<sup>4</sup> <http://www.epa.ie/climate/emissionsinventoriesandprojections/nationalemissionsprojections/>

#### 2.1.4 2015 Energy White Paper

The White Paper on Energy Policy, Ireland's Transition to a Low Carbon Energy Future 2015-2030, published in 2015, sets out a framework to guide energy policy in the period to 2030. The White Paper recognises that a radical transformation of our energy system is required to meet our national, EU and international climate objectives and sets a course for an energy sector where the State will provide the supports that enable consumers to become active energy citizens. It posits a policy approach where our energy system will change from one that is almost exclusively led by Government and utilities to one where individuals and communities are agents of change in the way Ireland generates, transmits, stores, conserves and uses energy. It sets out a vision, a framework and over 90 actions for Irish energy policy up to 2030 as we transition to a low carbon society and economy by 2050.

#### 2.1.5 The EU Climate and Energy Package

In March 2007, the EU's leaders endorsed an integrated approach to climate and energy policy that aims to combat climate change and increase the EU's energy security while strengthening its competitiveness. They committed Europe to transforming itself into a highly energy efficient, low carbon economy. A series of climate and energy targets to be met by 2020 were set; these are known as the "20-20-20" targets and are key to determining subsequent national policy.

These EU wide targets are as follows:

- A 20% reduction in EU greenhouse gas emissions from 1990 levels;
- Raising the share of EU energy consumption produced from renewable resources to 20%; and
- A 20% improvement in the EU's energy efficiency.

#### 2.1.6 EIA Directive 2014/52/EU

Directive 2014/52/EU<sup>5</sup> of the European parliament and of the Council of 16th April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment had to be transposed into national law by 16th May 2017, necessitating changes in laws, regulations, and administrative provisions across a number of legislative codes.

Key changes introduced in the 2014 Directive (in Annex IV - Information referred to in Article 5(1) – Information for the Environmental Impact Assessment Report) and the national transposing regulations (the European Union (Planning and Development)(Environmental Impact Assessment) Regulations, S.I. No. 296 of 2018) include a requirement for information on the impact of a project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change to be provided in the Environmental Impact Assessment Report.

#### 2.1.7 National Planning Framework – Project Ireland 2040

The National Planning Framework (NPF) is the Government's high-level strategic plan for shaping the future growth and development of Ireland out to the year 2040. It is a framework to guide public and private investment, to create and promote opportunities for people, and to protect and enhance the environment - from villages to our cities, and everything around and in between. Section 9 - Realising our Sustainable Future, is of particular pertinence to this statement, addressing issues including:

- Resource Efficiency and Transition to a Low Carbon Economy;

<sup>5</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014L0052>



- Protecting, Conserving and Enhancing Our Natural Capital; and
- Creating a Clean Environment for a Healthy Society.

Covering topics as diverse as:

- Sustainable Land Management and Resource Efficiency;
- Low Carbon Economy;
- Renewable Energy;
- Managing Waste;
- Sustainable Water Management;
- Green Infrastructure Planning;
- Water Quality;
- Promoting Cleaner Air; and
- Noise Management.

### 2.1.8 Climate Action and Low Carbon Development Act 2015

The enactment of the Climate Action and Low Carbon Development Act 2015 was a landmark national milestone in the evolution of climate change policy in Ireland. The Climate Action and Low Carbon Development Act 2015 provides the statutory basis for the national transition objective laid out in the national policy position. It also established the institutional and governance framework within which these plans can be developed and implemented on a cyclical basis.

### 2.1.9 National Energy Efficiency Action Plan (NEEAP) 2009-2020

Ireland's 2009-2020 National Energy Efficiency Action Plan builds on the previous plan submitted to the European Commission in 2007. Published in May 2009, the updated plan outlines 90 measures towards achieving, a 20% reduction in energy demand (over average 2001-2005 levels) across the whole of the economy through energy efficiency measures by 2020. Recognising that Government must lead by example, the public sector is committed to achieving a 33% reduction in energy use.

### 2.1.10 National Biodiversity Action Plan

Ireland's national biodiversity action plan Actions for Biodiversity 2011–2016, in accordance with the Convention on Biological Diversity, is a framework for the conservation and protection of Ireland's biodiversity, with an overall objective to secure the conservation, including, where possible, the enhancement and sustainable use of biological diversity in Ireland and to contribute to collective efforts for conservation of biodiversity globally. The plan is implemented through legislation and statutory instruments concerned with nature conservation. The Planning and Development Acts, 2000–2015 and the European Communities (Environmental Impact Assessment) Regulations, 1989 (as amended) are particularly important in that regard and include a number of provisions directly concerned with the protection of natural heritage and biodiversity.

### 2.1.11 Wildlife Acts, 1976–2012

The Acts, are the principal mechanism for the legislative protection of wildlife in Ireland. They outline strict protection for species that have significant conservation value. In summary, the Wildlife Acts protect species from injury, disturbance and damage to breeding and resting sites. All species listed in the Wildlife Acts must, therefore, be a material consideration in the planning process. An important piece of national legislation for the protection wild flora, i.e.

vascular plants, mosses, liverworts, lichens and stoneworts, is the Flora (Protection) Order, 2015, which makes it illegal to cut, uproot or damage a listed species in any way or to alter, damage or interfere in any way with their habitats. This protection applies wherever the species listed in the Schedules to the Order are found.

#### 2.1.12 **European Communities (Birds and Natural Habitats) Regulations, 2011–2015**

The Regulations, transpose into Irish law Directive 2009/147/EC (the Birds Directive) and the Habitats Directive, which list habitats and species of Community, i.e. European Union (EU), importance for conservation and that require protection. This protection is afforded in part through the designation of areas that represent significant populations of listed species within a European context, i.e. Natura 2000 sites. An area designated for bird species is classed as a Special Protection Area (SPA), and an area designated for other protected species and habitats is classed as a Special Area of Conservation (SAC). Birds listed in Annex I of the Birds Directive in SPAs and habitats and species listed in Annexes I and II, respectively, of the Habitats Directive in SACs in which they are designated features have full European protection. Species listed on Annex IV of the Habitats Directive are strictly protected wherever they occur, whether inside or outside European sites. Annex I habitats outside of SACs are still considered to be of national and international importance and, under Article 27(4)(b) of the European Communities (Birds and Natural Habitats) Regulations, 2011, public authorities have a duty to strive to avoid the pollution or deterioration of Annex I habitats and habitats integral to the functioning of SPAs.

#### 2.1.13 **Sustainable Residential Development in Urban Areas (2009)**

Forecast growth in the Irish economy and population indicates that strong demand for housing will continue with the number of homes in Ireland possibly rising from its current level of 1.8 million to over 2.5 million by 2020. With the majority of these residential dwellings to be built in urban areas, it is vitally important that this is achieved in a way which supports the development of sustainable, integrated neighbourhoods within our cities, towns and villages. In some cases, residential development will be part of a mixed-use scheme, where there will be design challenges in ensuring the amenity of residents, but there are also inherent benefits if these challenges can be met.

The aim of the guidelines is to set out the key planning principles which should be reflected in development plans and local area plans, and which should guide the preparation and assessment of planning applications for residential development in urban areas, and they are accompanied by a non-statutory residential design manual.

The range of relevant national policies summarised above can be distilled into a series of high-level aims for successful and sustainable residential development in urban areas. Housing developers, their design teams, the planning system, and the community share a common goal to create high quality places which:

- Prioritise walking, cycling and public transport, and minimise the need to use cars;
- Deliver a quality of life which residents and visitors are entitled to expect, in terms of amenity, safety and convenience;
- Provide a good range of community and support facilities, where and when they are needed and that are easily accessible;
- Present an attractive, well-maintained appearance, with a distinct sense of place and a quality public realm that is easily maintained;
- Are easy to access for all and to find one's way around;
- Promote the efficient use of land and of energy, and minimise greenhouse gas emissions;

- Provide a mix of land uses to minimise transport demand;
- Promote social integration and provide accommodation for a diverse range of household types and age groups;
- Enhance and protect the green infrastructure and biodiversity; and
- Enhance and protect the built and natural heritage.

#### 2.1.14 Adaptation to Climate Change

- The Irish National Policy Position establishes the fundamental national objective of achieving transition to a competitive, low carbon, climate-resilient and environmentally sustainable economy by 2050. It sets out the context for the objective; clarifies the level of GHG mitigation ambition envisaged; and establishes the process to pursue and achieve the overall objective. Specifically, the National Policy Position envisages that policy development will be guided by a long-term vision based on:
  - an aggregate reduction in carbon dioxide (CO<sub>2</sub>) emissions of at least 80% (compared to 1990 levels) by 2050 across the electricity generation, built environment and transport sectors
  - in parallel, an approach to carbon neutrality in the agriculture and land-use sector, including forestry, which does not compromise capacity for sustainable food production.
- The evolution of climate policy in Ireland will be an iterative process based on the adoption by Government of a series of national plans over the period to 2050. Greenhouse gas mitigation and adaptation to the impacts of climate change are to be addressed in parallel national plans – respectively through National Mitigation Plans and National Climate Change Adaptation Frameworks. The plans will be continually updated, as well as being reviewed on a structured basis at appropriate intervals, and at a minimum, every five years. This will include early identification and ongoing updating of possible transition pathways to 2050 to inform sectoral strategic choices.
- The Department of the Environment, Climate and Communications (DCCAE) published a National Adaptation Framework (NAF) in January 2018. The NAF sets out the national strategy to reduce the vulnerability of the country to the negative effects of climate change and to avail of positive impacts.
- The publication The NAF builds on the work already carried out under the National Climate Change Adaptation Network (NCCAF, 2012). Under the NAF a number of Government Departments will be required to prepare sectoral adaptation plans in relation to a priority area that they are responsible for. Local authorities are required to prepare local adaptation strategies NAF also aims to improve the enabling environment for adaptation through ongoing engagement with civil society, the private sector and the research community.
- The production of aggregates was not specifically identified under the NAF to prepare sectoral adaptation plans in line with the requirements of the Climate Action and Low Carbon Development Act.

#### 2.1.15 Sectoral Adaptation Plans

- Under the NAF, Government Departments have to prepare Sectoral Adaptation Plans. Twelve sectors under 7 Government Departments will prepare plans. The deadline for submitting plans to Government is 30 September 2019. The sectors are:
  - Seafood - Department of Agriculture, Food and the Marine.
  - Agriculture - Department of Agriculture, Food and the Marine.
  - Forestry - Department of Agriculture, Food and the Marine.

- Biodiversity - Department of Culture, Heritage and the Gaeltacht
- Built and Archaeological Heritage - Department of Culture, Heritage and the Gaeltacht.
- Transport infrastructure - Department of Transport, Tourism and Sport.
- Electricity and Gas Networks - Department of Communications, Climate Action and Environment.
- Communications networks - Department of Communications, Climate Action and Environment.
- Flood Risk Management - Office of Public Works.
- Water Quality - Department of Housing, Planning and Local Government.
- Water Services Infrastructure - Department of Housing, Planning and Local Government.
- Health - Department of Health.
- Under the non-statutory 2012 Framework, four Government Departments prepared draft sectoral plans covering 5 sectors. These plans are:
  - Sectoral Adaptation Plan for Flood Risk Management (OPW, 2015);
  - Adaptation Planning - Developing Resilience to Climate Change in the Irish Agriculture and Forest Sector (DAFM, 2017);
  - Adaptation Planning - Developing Resilience to Climate Change in the Irish Transport Sector (DTTAS, 2017);
  - Adaptation Plan for the Electricity and Gas Networks Sector (DCCAE, 2017).
- Government Departments must develop statutory sectoral adaptation plans in accordance with the NAF and with a six-step adaptation planning process described in Sectoral Planning Guidelines for Climate Change Adaptation. This Department published the guidelines for the use of the sectors required to prepare statutory sectoral adaptation plans under the Framework. The guidelines aim to ensure that a coherent and consistent approach to adaptation planning will be adopted by the key sectors in Ireland. Actions in completed plans could include actions that:
  - Mainstream (integrate) adaptation into key sectoral plans and policies;
  - Identify and understand the key vulnerabilities, risks, and opportunities facing their sectors. This should include major cross cutting risks;
  - Ensure that plans related to emergencies assigned to a sectoral department as lead Government department under the Strategic Emergency Planning Guidelines are climate proofed;
  - Identify and collect information on the costs and benefits of adaptation within their sectors;
  - Build capacity within their sectors to cope with climate change;
  - Identify and address key research gaps within their sectors;
  - Improve co-ordination with the local government sector;
  - Develop appropriate monitoring and verification systems within their sectors.

## 2.2 Guidance

### 2.2.1 Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (EC, 2012)<sup>6</sup>

EU Guidelines provide recommendations how to integrate climate change and biodiversity in Environmental Impact Assessment (EIA). The need for action on climate change and biodiversity loss is recognised across Europe and around the world. The guidelines contain explanation as to why climate change and biodiversity are so important in EIA, present the relevant EU-level policy background, provide advice on how to integrate climate change and biodiversity into selected stages of the EIA process. The annexes provide sources of further reading and links to other relevant information, data, and tools.

### 2.2.2 Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA, 2017)<sup>7</sup>

IEMA Guidance provides information to assist practitioners with addressing greenhouse gas (GHG) emissions assessment and mitigation in statutory and non-statutory Environmental Impact Assessment (EIA). It complements IEMA's earlier guide on Climate Change Resilience and Adaptation and builds on the Climate Change Mitigation and EIA overarching principles. The requirement to consider this topic has resulted from the 2014 amendment to the EIA Directive.

### 2.2.3 Climate Change and Major Projects (EC, 2016)<sup>8</sup>

This publication provides guidance for assessing vulnerability and risk from Climate Change for major projects funded by the European Regional Development Fund (ERDF) and the Cohesion Fund and listed in the concerned operational programmes.

### 2.2.4 Sectoral Planning Guidelines for Climate Change Adaptation<sup>9</sup>

The guidelines aim to ensure that a coherent and consistent approach to adaptation planning is adopted by the key sectors in Ireland. Sectors preparing sectoral adaptation plans under the NAF are required to prepare their plans in line with the process described in these guidelines while also being aware of the overall requirements regarding the development of sectoral adaptation plans.

### 2.2.5 Midland Regional Planning Guidelines 2010-2022

The Regional Planning Guidelines (RPGs) for the Midland Region, as adopted by the Midlands Regional Authority in July 2010, sets out specific targets for population growth and future housing land requirements for the Linked Gateway Town of Athlone. These targets now set the framework for planning policy at local level. Estimates of residential land zoning required to accommodate population growth envisaged for the Linked Gateway Town of Athlone have been calculated on the basis of these targets. The RPG population target up to 2022 for Athlone is 26,203.

## 2.3 Housing Policy

### 2.3.1 Rebuilding Ireland; Action Plan for Housing & Homelessness 2016

The overarching aim of Rebuilding Ireland Action Plan for Housing and Homelessness is to ramp up delivery of housing from its current under-supply across all tenures. Among the five core pillars of the plan are the aims to build more homes and accelerate social housing

<sup>6</sup> <http://ec.europa.eu/environment/eia/pdf/EIA%20Guidance.pdf>

<sup>7</sup> <https://www.iema.net/policy/ghg-in-eia-2017.pdf>

<sup>8</sup> [https://ec.europa.eu/clima/sites/clima/files/docs/major\\_projects\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/major_projects_en.pdf)

<sup>9</sup> <https://www.dccae.gov.ie/en-ie/climate-action/topics/adapting-to-climate-change/national-adaptation-framework/Pages/Sectoral.aspx>



delivery. In order to achieve this, an overall target of building 25,000 public and private homes per year nationally over the lifetime of the plan to 2021 has been set.

## 2.4 Environmental/Flood Risk Policy

### 2.4.1 Strategic Environmental Assessment (SEA)

The EU Directive on Strategic Environmental Assessment (SEA) as transposed into Irish legislation requires a systematic evaluation of likely significant environmental effects of implementing any Plan prior to its adoption. Variation No. 3 to the Athlone Town Development Plan 2014-2020 has been screened to determine the need for a SEA, in accordance with provisions of the Planning and Development Strategic Environmental Assessment (Amendment) Regulations S.I. No. 201 of 2011. The Planning Authority has determined that the proposed variation will not have significant adverse effects on the environment, if implemented.

### 2.4.2 Appropriate Assessment (AA)

The EU Directive on Habitats as transposed into Irish law requires the assessment as to whether the implementation of a LAP is likely to have any significant effect on any Natura 2000 site(s). The proposed variation has been subject to a screening for Appropriate Assessment. The AA Screening concludes that the proposed Variation is not foreseen to give rise to any significant adverse effects on designated European sites, alone or in combination with other plans or projects. Furthermore, it was deemed that a Stage 2 – Natura Impact Statement (NIS) is not required for the proposed variation.

### 2.4.3 Catchment Flood Risk Assessment and Management (CFRAM) Programme<sup>10</sup>

The current Catchment Flood Risk Assessment and Management (CFRAM) Programme (see [www.cfram.ie](http://www.cfram.ie)) is the mechanism established to facilitate future adaptation to climate change. It provides for long-term flood risk management in Ireland and the embedment of flood risk assessment in the future development of capital projects. The future scenario flood maps produced under the CFRAM Programme will facilitate this approach, inform other industrial sectors, and provide a valuable resource for local adaptation planning and sustainable land use management and planning.

Strategic Flood Risk Assessment (SFRA)

A Strategic Flood Risk Assessment was undertaken for Athlone as part of the Athlone Town Development Plan 2014 - 2020 process, in accordance with the requirements of 'The Planning System and Flood Risk Management Guidelines for Planning Authorities', 2009 (DEHLG). The SFRA included lands at Lissywollen South.

## 2.5 Local Policy and Guidance

### 2.5.1 Athlone Town Development Plan 2014-2020

The Athlone Town Development Plan (ATP) provides for the continued implementation of the spatial planning framework established under the 2008-2014 Development Plan.

The plan provides for a total of 129.2ha of residential zoned land which is predominantly located within the various Local Area Plans within the town. At an average density of 35 units per hectare the target population increase would imply an increase in households of 3,310 units over the Plan period.

<sup>10</sup> <https://www.cfram.ie/>

The Lissywollen South Framework Plan contains a strategic land bank of 20 ha which is zoned and available for residential development. This land bank which is proximate to the town centre represents a considerable resource not only in the context of the Plan area but in the context of Athlone in realising the population targets prescribed for the town.

The current Athlone Town Development Plan 2014-2020 incorporates a number of policies and objectives relating to the future development of the Plan Area and are set out below. The Core Strategy in particular provides for a 21 ha major sporting and recreational zone within Lissywollen South, which equates to a quarter of the overall plan area. The overarching policies and objectives contained in the ATP guide the content and direction of this Framework Plan. Consequently, this Plan is consistent with the objectives and the provisions of the Athlone Town Development Plan 2014- 2020 and the Core Strategy contained therein.

## 2.5.2 Local Level Adaptation

- The National Adaptation Framework (NAF) identifies the critical role to be played by local authorities in addressing climate change adaptation. This will effectively build on their existing expertise and experience as first responders in emergency planning scenarios. Under the NAF each local authority will also be developing their own adaptation strategies in line with guidelines developed for the sector. Local authorities have been set a deadline for the completion of local adaptation strategies of 30th September 2019.
- The NAF explores how local authorities might adopt a joint or regional approach to adaptation planning. In January 2018 the Department entered into a five-year financial commitment of €10m to establish four Climate Action Regional Offices (CAROs). Building on a business case prepared by the local government sector itself, this commitment recognises the significant obligation which has been placed on local government to develop and implement its own climate action measures, as well as the need to build capacity within the sector to engage effectively with climate change – both in terms of mitigation and adaptation.
- The Climate Action Regional Offices are being operated by a lead local authority in four different regions that have to be grouped together based on a climate risk assessment with a focus on the predominant risk(s) in each geographical area. The establishment of these offices will enable a more coordinated engagement across the whole of government and will help build on the experience and expertise which exists across the sector. Table 2.5-1 : Summary of Adaptation to Climate Change Actions in Ireland summarises the adaptation actions to climate change in Ireland.

**Table 2.5-1 : Summary of Adaptation to Climate Change Actions in Ireland**

Item	Status	Programs
National Climate Adaptation Strategy	Legislation enacted. Statutory Framework adopted	Climate Action and Low Carbon Development Act 2015 National Adaptation Framework
Action Plans	Sectoral Adaptation Plans in development. Local authority plans in development.	Local Authority Adaptation Strategy Development Guidelines (2016) Sectoral Planning Guidelines for Climate Change Adaptation Local Authority Adaptation Support Tool
Impacts, Vulnerability and Adaptation Assessments	National Assessment	Vulnerability 2012 National Climate Change Vulnerability Scoping Study

Climate Change Impacts on Biodiversity in Ireland (2013)

Climate change Impacts on Phenology in Ireland (2013)

COCOADAPT (2013)

2013 Hydro Detect Project

Robust Adaptation to Climate Change in the Water Sector in Ireland (2013)

Ensemble of Regional Climate Projections for Ireland (2015)

Urb-ADAPT

Sectoral Adaptation Plan for Flood Risk Management (OPW, 2015).

Adaptation Planning - Developing Resilience to Climate Change in the Irish Agriculture and Forest Sector (DAFM, 2017)

Adaptation Planning - Developing Resilience to Climate Change in the Irish Transport Sector (DTTAS, 2017).

Adaptation Planning - Developing Resilience to Climate Change in the Irish Transport Sector (DTTAS, 2017).

Research Programs	EPA Research Programme (Climate Pillar)	<a href="http://www.epa.ie">http://www.epa.ie</a>
Climate services / Met Office	Established	<a href="http://www.met.ie">http://www.met.ie</a>
Web Portal	Established	<a href="http://www.climateireland.ie">http://www.climateireland.ie</a>
Monitoring, Methodologies	Indicators, In development	
Training, Education	Ongoing / in development	<a href="http://www.climateireland.ie">http://www.climateireland.ie</a>

# 3 Energy and Climate Change

## 3.1 Energy

This section will appraise the Proposed Development's approach to energy efficiency, the minimisation of carbon dioxide emissions, and resilience to climate change. The design will be appraised against the best practice hierarchy of 'Be Lean, Be Clean, Be Green'. This means the prioritisation of energy efficiency measure, so that energy demand is reduced, then addressing the adoption of decentralised networks, Combined Heat & Power (CHP) plants and district heating systems, where feasible, and finally off-setting carbon emission through localised low carbon energy generation.

The document Quality Housing for Sustainable Communities identifies five principles which new development must meet in order to achieve design for sustainability:

- providing a high-quality environment that meets the needs and, as far as possible, the preferences of the residents and fosters the development of community;
- achieving energy efficiency both at construction stage and during the lifetime of the scheme, e.g., by climate sensitive design which takes account of the orientation, topography and surrounding features so as to control wind effects, while optimising the benefits of daylight and solar gain;
- having due regard to the social and environmental consequences associated with the construction process and the use of materials and resources, e.g., minimising the use of water and energy in construction, making efficient use of land, minimising the use of scarce non-renewable materials and using renewable resources and materials that have minimal environmental consequences, wherever practicable;
- integrating the new housing into the existing natural and built environment in a way that makes a positive contribution to the overall environment of the locality; and
- and designing individual dwellings so that they are comfortable, adaptable to changing needs, cost effective to build and economic to manage and maintain.

These principles have guided the design process for the scheme for the Proposed Development at Lissywollen from conception through to detailed design.

The main drivers for the layout of the site are the landscape features on the site which determine the location and layout of public open space. This feeds into the management of surface water in a sustainable manner and provides the opportunity, through management of surface water (which is a valuable ecological resource) to provide for increased diversity. The presence of water, in the right places in small quantities for even short periods following rainfall events, increases the numbers of insects and small invertebrates which are the foundation of biodiversity. Otherwise, management of surface water has been designed strictly in accordance with the Athlone Town Development Plan.

According to the former General Secretary of the United Nations(UN), Ban Ki-Moon; 'climate change is intrinsically linked to public health, food and water security, migration, peace, and security. It is a moral issue. It is an issue of social justice, human rights and fundamental ethics. We have a profound responsibility to the fragile web of life on this Earth, and to this generation and those that will follow'.

Carbon emissions associated with unsustainable forms of transport, particularly the private motorcar, contribute significantly to emissions. The Environmental Protection Agency (EPA)

estimates that almost 20% of the State's emissions are attributable to transport with that figure expected to increase substantially before it begins to fall.

The proposed design for Lissywollen, taken together with its location close to Athlone Town Centre and the Greenway means that there is an opportunity to engineer a move away from car-based patterns to more sustainable forms of transport such as cycling and walking. Sustainable transport has been provided for in the design for Lissywollen by:

- provision of safe footpaths and cycle routes which are desirable routes for cyclists and pedestrians;
- pedestrian and cycle links convenient to the Greenway; and
- Charging for E-cars will be provided in accordance with the requirements of the Athlone Town Development Plan.

Careful consideration has been given to the efficiency of the built environment in terms of the overall site layout and the design of individual dwellings and other building through:

- Layout provides for orientation of east-west orientated blocks optimum orientation for maximisation of solar gain, sunlight, shelter and delivery of Nearly Zero Energy Buildings (NZEB);
- Recognition of the importance of the retention, preservation and protection of trees, hedgerows, and associated watercourses and their utilisation for sustainable management of surface water; and
- Careful consideration of pedestrian and cyclist permeability.

The development will be required to comply with 2017 Part L Building Regulations, which are aligned with NZEB dwelling standards. There is an emphasis on the embodied qualities of the dwellings to maximise their performance and minimise their energy footprint. Passive house principles will be adopted to reduce the energy demand with features including:

- superior levels of insulation;
- increased levels of air tightness;
- improved Low E windows;
- Use of refined building details that reduce heat loss and minimise thermal bridging.

With the greatly improved levels of air tightness achieved, a heat recovery ventilation (HRV) system is also proposed to be installed in the proposed units to minimise the heat loss associated with fresh air delivery into the units. The system installed tempers the incoming fresh air with the outgoing stale discharge.

All of the above factors combine to deliver houses and apartments that are the benchmark for communal accommodation and fall within the definition of NEZB house performance. From a space heating measure the houses need to consume less than 1.5 litre of heating oil, per square meter, to be considered passive. This equates to circa 15 kWh/m<sup>2</sup>/yr. To achieve such high performance levels the proposed houses will deliver the following enhancements of the 2011 Part L Building Regulations:

- Air tightness 60% better than Regulations; and



- Windows 30% better than Regulations.

For the apartments heating and hot water generation local combi boilers are proposed. All of the units will be connected to a pressurised water main off a centralised water storage tank and booster. This supports the installation of combi boilers which need a minimum pressure for the cold-water supply. The net result is that the apartments will not have local water boosters or hot water cylinders and benefit from more space in the apartments, no noise issues from local pumps and no stand losses from a cylinder.

To deliver the most energy efficient dwellings the majority of the principals are embodied in the design and construction of the envelope and the mechanical systems therein. At the prevailing best practice, Lissywollen will deliver, the economical and practical benefits of insulation, air tightness and thermal bridging have now plateaued and the savings to be achieved on space heating demand are negligible. This is reflected in the fact that twice as much energy will be used to generate hot water as opposed to heating the dwelling and this ratio is more pronounced in apartments, with their reduced exposed envelope.

With consideration to the future, provisions will be made on site for the installation of e-car charging points in accordance with the Athlone Town Development Plan. For the houses / duplex units ducting will be installed to the assigned parking space. In the apartments it is not practical to cable back to the apartments and the supplies will come off the landlord supplies and the charging points will have readers that will facilitate billing back to the user. Units on site will achieve NZEB with a cumulative energy demand of less than 50 kWh/m<sup>2</sup>/yr.

All of the design referred to above will be detailed, constructed and certified in compliance with the requirements of the Building Regulations.

Part L compliance shall be achieved by implementing of high efficiency centralised heating system. The Part L renewable contribution shall be covered by the Roof Mounted PV Panels. A space allowance analysis has been carried out to ensure adequate plant space is provided to facilitate Plant & Equipment and sufficiently sized services risers are provided.

The proposed site location is very well serviced by all major utilities. Major spine services for Gas, Electricity Water and Communications have local network sufficient to meet the needs of the new development.

## 3.2 Climate Change

### 3.2.1 Introduction

Climate change presents a unique challenge for Ireland economy, environment and society. This Section assesses the potential climate related impacts associated with the proposed Lissywollen Strategic Housing Development (SHD).

Ireland is a party to both the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol, which together provide an international legal framework for addressing climate change.

In December 2015, an ambitious new legally binding, global agreement on climate change was agreed in Paris. The Paris Agreement aims to restrict global temperature rise to well below 2°C above pre-industrial levels, and to pursue efforts to limit the temperature increase to 1.5°C. It aims to increase global ability to adapt to the adverse impacts of climate change and to foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten sustainable food production. It also seeks to achieve a balance

between anthropogenic emissions by sources, and removals by sinks, of greenhouse gases in the second half of this century.

The first Irish National Mitigation Plan<sup>11</sup> represents an initial step to set us on a pathway to achieve the level of decarbonisation required. It is a whole-of-Government Plan, reflecting in particular the central roles of the key Ministers responsible for the sectors covered by the Plan – Electricity Generation, the Built Environment, Transport and Agriculture, as well as drawing on the perspectives and responsibilities of a range of other Government Departments.

The measures that will be implemented through the plan will lay foundations for transitioning Ireland to a low carbon, climate resilient and environmentally sustainable economy by 2050. To support this ongoing work, the Plan also includes over 100 individual actions for various Ministers and public bodies to take forward.

Emissions reduction measures and actions set out in this National Mitigation Plan are aligned with and build upon commitments made in the 2015 Energy White Paper. The Paper will be guided by the following strategic objectives:

- policy will contribute to reductions in Ireland's greenhouse gas emissions and enhancement of sinks in a manner that achieves the optimum benefits at least cost;
- a stable and predictable policy and regulatory framework will be underpinned by rigorous analysis and appraisal, supported by strong research and analytical capacity;
- the Government will pursue investment, innovation and enterprise opportunities towards building a competitive, low carbon, climate-resilient and environmentally sustainable economy; and
- the citizen and communities will be at the centre of the transition.

### 3.2.2 Methodology

In Ireland some sectors have independently begun the process of identifying key vulnerabilities for their activities. The report by the Irish Academy of Engineering, Ireland at Risk Critical Infrastructure – Adaptation for Climate Change (The Irish Academy of Engineering, 2009) and the report by the Heritage Council and Fáilte Ireland (the National Tourism Development Authority), Climate Change, Heritage and Tourism, Implications for Ireland's Coast and Inland Waterways (ed. Kelly and Stack, 2009) are examples of initiatives of this kind.

Other research work on adaptation in specific sectors has been carried out or commissioned by other Government Departments / bodies such as the OPW, CoFoRD (programme of competitive forest research for development research programme, etc. (e.g. CLIMADAPT).

A National Climate Change Vulnerability Scoping Study (Sweeney and Coll, 2012) was undertaken to identify first generation vulnerabilities for Ireland based on a sensitivity analysis across key sectors. The analysis identified a clustering of impacts and their importance in relation to an assessment of likely resilience by sector. The assessment methodology used was an impacts-first, science-first classical approach. The priority sectors identified are:

- biodiversity and fisheries;
- water resources and the built coastal environment; and

---

<sup>11</sup> <https://www.dccae.gov.ie/en-ie/climate-action/topics/national-mitigation-plan/Pages/default.aspx>

- forestry and agriculture.

As each sector develops its sectoral adaptation plan (under the Climate Action and Low Carbon Development Act 2015), detailed vulnerability and risk analysis will be required. Some preliminary work has been undertaken on costing the impacts of climate change in Ireland. This is now being supported by more detailed analysis of the current and future costs of flood risk management.

The implementation of adaptation is being supported by the development of a suite of guidelines, tools and approaches. These include the Local Authority Adaptation Strategy Development Guidelines and the Irish climate information platform “Climate Ireland”, which includes data, information, tools and approaches for local level adaptation decision making. Work is ongoing to develop sectoral decision-making tools and supports.

There are no specific tools developed for assessing climate change for the strategic housing. The Climate Change and Major Project guidelines on how to make vulnerable investments resilient to climate change provide methodology for undertaking a vulnerability and risk assessment.

Climate change adaptation and mitigation are to be integrated in the preparation and approval of planned development. Adaptation seeks to ensure adequate resilience of development to the adverse impacts of climate change, based on vulnerability. Mitigation seeks to reduce the emission of greenhouse gases.

### 3.2.3 Vulnerability

Ireland’s unique position on Europe’s north-western extremity increases its relative vulnerability to precipitation extremes and wind-driven rain<sup>12</sup>. These are significant considerations for building and construction activities which should incorporate climate change contingencies into design specifications. In particular winter wind driven rain is likely to become a more important issue due to expected increases in wind speeds and rain<sup>13</sup>. Rainfall will become more seasonal with wetter winters and dryer, more overcast, summers. More extreme rainfall or precipitation events will occur, changing the current pattern of ‘low duration, low intensity’. The likelihood of inland flooding will increase as a result.

Due to projected increases in these parameters, double-leaf housing construction should be used in most cases. Exterior materials specifications and maintenance requirements may require reassessment<sup>14</sup>. Flooding has been identified as the most significant risk facing Ireland today, with both likelihood and impact being given a rating of 4 out of 5 (‘likely’ and ‘high impact’). Recent floods in many ways have been the most exceptional on record; both in scale and extent reaching record levels, including the River Shannon that significantly exceeded the highest levels previously recorded over a period of more than 100 years.

The aim of the vulnerability assessment is to identify the relevant climate hazards for the development at the proposed location. Adaptation through project options, appraisal, and planning will depend on the assessed project vulnerability and risk.

Timescale for the project vulnerability and risk assessment shall correspond to the lifespan of the project. During the lifespan, there could be significant changes in frequency and intensity of weather events due to climate change, which should be taken into account.

---

<sup>12</sup> Co-ordination, Communication and Adaptation for Climate Change in Ireland: an Integrated Approach (COCOADAPT)

<sup>13</sup> Climate Change, Heritage and Tourism: Implications for Ireland’s Coast and Inland Waterways

<sup>14</sup> Climate Impact Screening

The scale for assessing the likelihood of a climate hazard is presented in Table 3.2-1. The output of the likelihood analysis is an estimation of the likelihood for each of the essential climate variables and hazards.

**Table 3.2-1: Scale of Likelihood of Climate Hazard**

Term	Qualitative	Quantitative
Rare	Highly unlikely to occur	5%
Unlikely	Unlikely to occur	20%
Moderate	As likely to Occur	50%
Likely	Likely to Occur	80%
Almost certain	Very likely to occur	95%

Generally all projects will emit greenhouse gas (GHG) emissions to atmosphere during the construction, operational and decommissioning phases. Direct GHG emissions may be caused by operational activities, and project decommissioning. Indirect GHG emissions may be due to increased demand for energy and indirect GHG activities. Indirect GHG activities are linked to the implementation of the proposed project and may include transport, office space heating of buildings or loss of habitats that provide carbon sequestration, (e.g. through land-use change).

The significance of project's GHG emissions should be based on its net impact, which may be positive or negative. Where GHG emissions cannot be avoided, the significance of a project's emissions shall be reduced by mitigation or project design. Where GHG emissions remain significant but cannot be reduced further approaches to compensate project emissions should be considered.

Currently in Ireland, there is no set methodology to evaluate significance criteria or a defined threshold for GHG emissions for strategic housing. Due to the inconsistencies between the different methods and their assumptions for assessment, there is no single agreed method by which to assess a project carbon budget. The method of assessment varies according to the type and scale of the development.

Due to a lack of guidelines and an established methodology, the assessment of significance of the GHG emissions is based on whether the development's GHG emissions cumulatively represent a considerable contribution to the global atmosphere and whether the development as continued or extended will replace existing development that would have a higher GHG profile.

Where the GHG emissions cannot be avoided, the mitigation should aim to reduce the development emissions at all stages.

### 3.2.4 Baseline Environment

### 3.2.5 Regional Context

Observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising sea level are unequivocal evidence of warming of the climate system globally. Global mean temperature has increased by 0.8°C compared with pre-industrial times for land and oceans, and by 1.0°C for land alone. Most of the observed increase in global average temperatures is very likely due to increases in anthropogenic greenhouse gas concentrations.

In future years, landmasses are expected to warm more than the oceans, and northern, middle and high latitudes. Despite possible reductions in average summer precipitation over much of Europe, precipitation amounts exceeding the 95th percentile are very likely in many areas; thus, episodes of severe flooding may become more frequent despite the general trend towards drier summer conditions. In an ensemble-based approach using outputs from 20 global climate models (GCMs), the Mediterranean, north-east and north-west Europe are identified as warming hot spots but with regional and seasonal variations in the pattern and amplitude of warming.

Ireland has a typical maritime climate, with relatively mild and moist winters and cool, cloudy summers. The prevailing winds are south-westerly in direction. The climate is influenced by warm maritime air associated with the Gulf Stream which has the effect of moderating the climate, and results in high average annual humidity across the country. The area of least precipitation is along the eastern seaboard of the country, in the rain shadow of the Leinster uplands.

Mean seasonal temperature will change across Ireland. A number of studies have applied selected IPCC Special Reports on Emissions Scenarios (SRESs) to model climatic changes across Ireland at a regional scale. Despite the different methods and scenario combinations used, there is agreement in projected changes in temperature for Ireland. However, there are more disparities in the magnitude and sign for the precipitation changes projected for the island. Table 3.2-2 summarises climate impact projections for Ireland, estimates of projections confidence are derived from published projection data from the Local Authority Adaptation Strategy Development Guidelines.

**Table 3.2-2: Climate Impacts Projections: 30-year overview<sup>15</sup>**

Variable	Summary	Confidence	Projected Changes
<b>Sea Levels Rise</b>	Strong increase	High	Projections of sea level rise to 2100 suggest a global increase in the range of 0.09 - 0.88m with a mean value of 0.48m. For 2050, it is reasonable to assume a sea level rise in the region of 25cm above present levels. It should be noted that due to a limited understanding of some important effects that contribute to rates of increase, these estimates of sea level rise may prove optimistic, and estimates of up to 4-6 m have been projected by some models.
<b>Storm surge</b>	Strong increase	Medium	An increase in the number of intense cyclones and associated strong winds are expected over the north - east Atlantic. By the 2050s, storm surge heights in the range of 50-100cm are expected to increase in frequency for all coastal areas with exception of the southern coast.

<sup>15</sup> Local Authority Adaptation Strategy Development Guideline, EPA 2016



<b>Costal Erosion</b>	Moderate increase	Low	Currently approximately 20% of Ireland's coastline is at risk of costal erosion, particularly areas of the south and east coast and also in isolated areas on the west coast. Rates of increase will be determined by local circumstances; however, it is expected that areas of the south-west are likely to experience the largest increase.
<b>Cold Snaps/ Frost (winter/night)</b>	Moderate decrease	High	By mid-century, minimum temperatures during winter are projected to increase by ~2°C in the southeast and ~2.9°C in the north. This change will result in fewer frost days and milder night-time temperatures.
<b>Heatwaves</b>	Strong increase (summer)	High	Seven significant heatwaves (defined as 5+ days@>25°C) have been recorded in Ireland over the past 30 years, resulting in approximately 300 excess deaths. By mid-century, a projected increase in summer maximum daily temperature of approximately 20°C will likely intensify heatwaves, with maximum temperatures increasing and heatwave duration lengthening.
<b>Dry Spells</b>	Strong increase (summer)	Medium	There have been seven periods of insignificant rainfall in Ireland in the past 40 years. Of these, the events of 1976 and 1995 were the most severe, averaging 52 and 40 days in duration respectively across Irish rainfall stations. An approximate 20% decrease in summer precipitation in many areas is strongly indicated under a high emissions scenario. This decrease is likely to result in progressively longer periods without significant rainfall, posing potentially severe challenges to water sensitive sectors and regions.
<b>Extreme Rainfall</b>	Strong increase (winter)	Low	Heavy precipitation days (in which more than 20mm of rainfalls) are likely to increase in frequency in winter. By the 2050s an increase in the number of heavy precipitation days of around 20% above the level of 1981-2000 is projected under both low- medium and high emissions scenarios. This may have serious consequences for flood risk in sensitive catchments.

<b>Flooding</b>	Moderate increase (winter)	Low	An Irish Reference Network of hydrometric stations has been established to assess signals of climate change in Irish hydrology. This network has detected an increasing trend in high river flows since 2000. Projections of future flows are beset by uncertainty at the catchment scale, but a broad signal of wetter winters and drier summers is evident across a number of independent studies.
<b>Wind Speed</b>	Minor increase (winter)	Medium	Observed wind speed over Ireland has not changed significantly in recent times, but it is anticipated that the distribution of wind will alter slightly in future, with winters marginally windier and summers marginally less so. Though the average wind speed is anticipated to change in only a minor way over the coming decades, the frequency of extreme windstorms is expected to increase due to alternations in the origin and track of tropical cyclones.

### 3.2.6 Local Context

The closest weather station to the application site and are considered representative of conditions experienced at the application site is that at Mullingar, which is located approximately 24km to north-east of the Proposed Development application site.

The moderating influence of the Atlantic Ocean is felt throughout Ireland. The annual mean temperature for different areas in Ireland varies between mountainous regions, lowlands and the coast. Mean daily maximum temperatures are typically between 7.4°C to 19.2°C and mean daily minimum temperatures are typically between 2.2°C to 11.1°C for the area surrounding Mullingar.

**Table 3.2-3: Mullingar 1979–2008 averages**

Temperature (°C)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
mean daily max	7.4	7.9	9.8	12.1	14.9	17.3	19.2	18.9	16.7	13.2	9.9	7.9
mean daily min	1.5	1.5	2.8	4.1	6.3	9.2	11.1	10.8	8.9	6.2	3.5	2.2
mean temperature	4.5	4.7	6.3	8.1	10.6	13.2	15.2	14.8	12.8	9.7	6.7	5.0

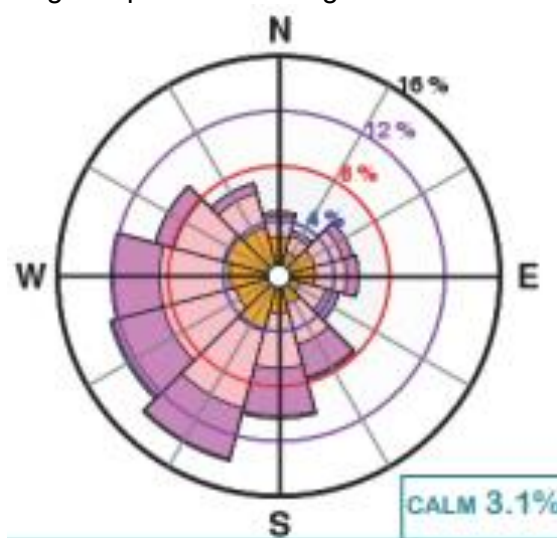
The east of Ireland, which is sheltered from Atlantic frontal systems, is sunnier than the west. The sunniest months are May and June. The mean daily duration recording of sunshine for the area is 3.6 hours. December is the dullest month, with 1.6 hours of mean daily duration. May is the sunniest month, with 5.8 hours of mean daily duration, explained largely by its long days and finer weather.

For the period 1979-2008, mean monthly total for year rate of precipitation was 941.3 mm / year at Mullingar, with winter months receiving the heaviest amounts, refer to Table 3.2-4.

**Table 3.2-4: Average Precipitation Mullingar 1979–2008 averages**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
mean monthly total	91.7	72.0	78.3	62.1	68.7	70.5	61.8	80.8	73.8	102.1	82.4	97.1	941.3
greatest daily total	30.3	24.7	29.5	27.6	26.1	52.9	26.6	58.2	42.1	48.8	43.7	38.8	58.2

Results from the synoptic meteorological station at Mullingar over a ten-year period indicate that the predominant wind direction is from the south-western quadrant. A windrose for the wind data recorded at Mullingar is presented in Figure 3.1.



**Figure 3.1: Windrose for Mullingar** <https://www.met.ie/climate-ireland/SummaryClimAvgs.pdf>

### 3.2.7 Potential Impact of the Proposed Project

The building sector has high energy demand which includes the energy used during construction, embodied energy of materials used and in addition there is energy demand of the buildings once occupied. During the construction process waste is generated and efforts to reduce and recycle waste need to be incorporated. Changes in climate are being observed and these impacts are expected to continue and intensify into the future. DBFL's Flood Risk Assessment includes attenuation measures for no flooding for 1 in 100 years (plus 10% climate change) event.. Energy demand of the occupied buildings can contribute to the climate change as at present majority of generated energy comes from carbon-based fuels. Carbon footprint of the occupiers can be based on the commuting and consumption patterns. Extreme weather patterns can pose higher risk of flooding which can cause high economical damage and disruption to the community. The flood risk deems the site to be outside the 1,000 year flood events (Zone C).

### 3.2.8 Impact Statement - Adaptation Options

The Proposed Development design includes measures to reduce carbon footprint of the building. High level of insulation and high performance glazing will reduce the heating demand on the plant and on site produced renewable energy will further decrease the energy demand. Section 3.1 provides description of Energy Efficiency, CO<sub>2</sub> emissions and resilience to climate change which serve actions to reduce the energy requirements of the building. The OPW website [www.floodinfo.ie/](http://www.floodinfo.ie/) indicates that the Lissywollen site was within the area assessed as part of the Flood Risk Management Plan for the Shannon Upper and Lower River basin. In addition as part of the EU Floods Directive, the OPW is undertaking a Catchment Flood Risk

Assessment and Management (CFRAM) Study countrywide. Many of these maps are available" on the CFRAM and OPW websites. In reviewing the mapping, it can be noted that the Proposed Development site falls entirely outside the 0.1% Annual Exceedance Probability (AEP) event (1 in 1,000 year). It can be concluded that the Proposed Development is located within flood zone C.

Site levels will be designed such that overland flow caused by any flooding from the site drainage system, or from surface water that fails to enter the site drainage system in extreme events, will not flood buildings, driveways or footpaths. Surface water is designed to remain within the bounds of roadway reservations.

The site drainage network has been modelled so no flooding occurs throughout the site for the design return period of 1 in 100 years (plus 10% climate change), and is considered to exceed the requirements of the GDSDS for a 1 in 30-year return period surcharge check.

In addition the attenuation system has been sized for a 1 in 100 year return period and it is designed using the current rainfall depth values available from Met Eireann including 10% increase for the effects of climate change.

Mitigation measures at areas at risk of flooding in a 1 in 100 year event will consist of designing overland flows to direct any floodwater away from buildings, either keeping it within the carriageway or directing the surface water to designated green areas within the site. The finished floor levels for all buildings in the vicinity are designed to be above the surcharged level for any manhole in danger of flooding. Furthermore, finished floor levels for all buildings will be a minimum of 500mm above the maximum flood levels in nearby surface water attenuation systems.

If petrol interceptors are not adequately cleaned and maintained, there is a risk that they would become a throttle and cause flooding upstream.

During flood events, access and egress would need to be maintained and overland flow routes and extents would need to be carefully planned. All habitable spaces are located more than 500mm above the top water levels for attenuation systems for the 1 in 100 year event and are at no perceivable risks of flooding.

Proposed mitigation measures to address residual flood risks are summarised below:

1. The proposed drainage system including the detention basins to be maintained on a regular basis to reduce the risk of a blockage. A maintenance contract for the petrol interceptor will be entered into with a specialist maintenance company.
2. The drainage network is designed in accordance with the recommendations of the GDSDS and provides attenuated outlets and associated storage up to the 100 year event. The drainage network for the site has been designed to ensure that it can accommodate the 1 in 100 year rainfall event in surcharged conditions.
3. Overland flow routes for pluvial events should not be built on or become blocked off. Overland flow routes should be designed to direct water to compatible development areas and to other open space areas away from dwellings.
4. At detailed design stage, the location of all dropped kerbs and side inlet gullies to be fully reviewed to ensure all overland flow paths are not impeded.
5. Sustainable Urban Infrastructure: the development will include SUDS features e.g. permeable paving, swales, filter drains etc. incorporating interception and storage.

### 3.2.9 Behavioural Measures – Soft Actions for the Occupied Building

The way people use energy in the home, at work and in commuting between the two places, has the potential to save up to 20% of total energy consumption.

While public knowledge and awareness is rapidly improving in recent years many households are still unaware of the large ecological footprint that they have on the environment and how to easily save resources and prevent waste. Soft actions will aim to inform the building occupants on effective strategies to use less resources, efficient appliances, efficient use of their heating/hot water controls and efficient transport/ commuting.

### 3.2.10 Construction Phase

Details of the construction period and what measures will be adopted and used is covered by the document 'Construction And Demolition Waste Management Plan' which is included in this planning application by Alanna Homes. This document is intended to set a clear path and philosophy for the future nominated contractor in drawing up their own final strategy for Construction and Demolition Waste Management Plan.

The site is inland and deemed to be within Flood Zone C, i.e. outside the 1,000 year flood events. The sequential approach recommended by "The Planning System and Flood Risk Management Guidelines for Planning Authorities" has been complied with for the subject site as it is within Flood Zone C.

The adaptation options outlined in the flood risk assessment should be implemented by the main contractor and after building handover by future management company. The management company will be responsible to develop a final implementation plan, a monitoring routine and a schedule of evaluation and review.

### 3.2.11 Development Vulnerability

The aim of the vulnerability assessment is to identify the relevant climate hazards for the project at the foreseen location.

#### Construction Phase

The likelihood analysis of the proposed development during construction phase to climate hazards is presented in Table 3.2-5. The climate change impact on the Proposed Development has been assessed to be moderate affected by extreme rainfall, flash (pluvial) flood, storms, and winds. Based on the predicted climate change impacts for this location the Proposed Development during construction phase would be unlikely affected to cold spells, landslides and snow. The Proposed Development during construction phase would not be affected by flood, heat, drought, wildlife fires and freeze–thaw damage. The Proposed Development would not be affected by rising sea level during construction phase.

**Table 3.2-5: Analysis of Likelihood of Climate Hazards during Construction Phase**

	Extreme rainfall, flash flood	Flood	Heat	Drought	Wildlife Fires	Storms and winds	Landslides	Cold Spells and snow	Freeze –thaw damage	Rising sea levels
Rare		✓	✓	✓	✓				✓	✓
Unlikely							✓	✓		
Moderate	✓					✓				
Likely										
Almost certain										

Table 3.2-6 shows the climate hazard impact analysis of the proposed development construction phase. Major impacts on health and safety, the environment and financial areas, moderate impacts on asset damage and engineering, operational, social and reputation areas are identified based on the projected change climate impacts.

**Table 3.2-6: Climate Hazard Impact Analysis**

Risk areas	Insignificant	Minor	Moderate	Major	Catastrophic
Asset damage, engineering, operational			✓		
Safety and Health				✓	
Environment				✓	
Social			✓		
Financial				✓	
Add based on design					

Table 3.2-7 below assesses the sensitivity of the project construction phase to climate hazard. It was assessed that site assets, energy inputs and transport links are of high sensitivity to extreme rainfall, flood, flash floods, storms and winds; water inputs will be highly sensitive to droughts. On site assets will be medium sensitive to cold spells and snow and freeze – thaw damage. Transport links will be medium sensitive to cold spells and snow.

**Table 3.2-7: Sensitivity of Project during construction phase to Climate Hazards**

	Extrem e rainfall, flash flood	Flood	Heat h	Drough t	Wildlif e Fires	Storm s and winds	Landslide s	Cold Spells and snow	Freeze –thaw damag e	Risin g sea levels
On site assets	High	Low	Low	Low	Low	High	Low	Medium	Medium	Low
Inputs - Water	Low	Low	Low	High	Low	Low	Low	Low	Low	Low
Inputs - Energy	High	Low	Low	Low	Low	High	Low	Low	Low	Low
Transport Links	High	Low	Low	Low	Low	High	Low	Medium	Low	Low
Add based on design										

In Table 3.2-8, the exposure of the project construction phase to current climate hazards was assessed. In the current climate as the construction activities will be carried out short term. The exposure of the project extreme rainfall, flood, flash flood, storms and winds has been assessed to be medium.



**Table 3.2-8: Exposure of the Project during construction phase to Climate Hazards without Mitigation**

	Extreme rainfall, flash flood	Flood	Heat	Drought	Wildlife Fires	Storms and Winds	Landslides	Cold Spells and Snow	Freeze –thaw damage	Rising sea levels
<b>Current Climate</b>	Medium	Low	Low	Low	Low	Medium	Low	Low	Low	Low

Table 3.2-9 shows the vulnerability analysis of the project during construction phase to climate hazards; it combines the sensitivity and the exposure analysis. The Proposed Development was assessed to be most sensitive to extreme rainfall, flash flood, storms, and winds.

**Table 3.2-9: Vulnerability Analysis of Project to Climate Hazards**

Sensitivity	Exposure (current & future climate)		
	Low	Medium	High
Low	Rising sea levels, Flood, Landslides, Freeze –thaw damage, Drought, Heat, Wildlife Fires		
Medium		Cold Spells and Snow	
High			Extreme Rainfall, Flash Flood, Storms and Winds

Based on the development vulnerability assessment, measures to improve the resilience of the project during construction phase to extreme rainfall, flash (pluvial) flood, storms, and winds are required.

### Operational Phase

Detailed development vulnerability assessment for the proposed project is presented below. The likelihood analysis of the proposed development to climate hazards is presented in Table 3.2-10.

The Proposed Development has been assessed to be almost certain affected by extreme rainfall, flash (pluvial) flood, storms, and winds and heat. The Proposed Development would be likely affected by drought. The Proposed Development would be unlikely affected to cold spells, landslides and snow. The Proposed Development would not be affected by flood, wildlife fires and freeze –thaw damage. The Proposed Development will not be affected by rising sea level.

**Table 3.2-10: Analysis of Likelihood of Climate Hazards**

	Extreme rainfall, flash flood	Flood	Heat	Drought	Wildlife Fires	Storms and winds	Landslides	Cold Spells and snow	Freeze –thaw damage	Rising sea levels
Inputs - Water	Low	Low	Low	High	Low	Low	Low	Low	Low	Low
Inputs - Energy	High	Low	Low	Low	Low	High	Low	Low	Low	Low
Transport Links	High	Low	Low	Low	Low	High	Low	Medium	Low	Low
Add based on design										

Table 3.2-11 shows the climate hazard impact analysis of the proposed development. It was assessed that climate hazards will have major impacts on health and safety, the environment, moderate impact social areas.

**Table 3.2-11: Climate Hazard Impact Analysis**

Risk areas	Insignificant	Minor	Moderate	Major	Catastrophic
Safety and Health				✓	
Environment				✓	
Social			✓		
Add based on design					

Table 3.2-12 below assesses the sensitivity of the project to climate hazard. It was assessed that the project energy inputs and transport links are of high sensitivity to extreme rainfall, flood, flash floods, storms and winds; water inputs will be highly sensitive to droughts. Transport links will be medium sensitive to cold spells and snow.

**Table 3.2-12: Sensitivity of Project to Climate Hazards**

	Extreme rainfall, flash flood	Flood	Heath	Drought	Wildlife Fires	Storms and winds	Landslides	Cold Spells and snow	Freeze –thaw damage	Rising sea levels
Inputs - Water	Low	Low	Low	High	Low	Low	Low	Low	Low	Low
Inputs - Energy	High	Low	Low	Low	Low	High	Low	Low	Low	Low
Transport Links	High	Low	Low	Low	Low	High	Low	Medium	Low	Low
Add based on design										

In Table 3.2-13, the exposure of the project to climate hazards was assessed. In the current climate, the exposure of the project extreme rainfall, flood, flash flood, storms and winds has been assessed to be medium. The project was assessed to have high exposure to rainfall, flash flood, storms, winds and heat in future.

**Table 3.2-13: Name of Table Exposure of the Development to Climate Hazards without Mitigation**

	Extreme rainfall, flash flood	Flood	Heat	Drought	Wildlife Fires	Storms and Winds	Landslides	Cold Spells and Snow	Freeze –thaw damage	Rising sea levels
Current Climate	Medium	Low	Low	Low	Low	Medium	Low	Low	Low	Low
Future Climate	High	Low	High	Low	Low	High	Low	Low	Low	Low

Table 3.2-14 Shows the vulnerability analysis of the project to climate hazards; it combines the sensitivity and the exposure analysis. The project was assessed to be most sensitive to extreme rainfall, flash flood, storms, winds and heat.

**Table 3.2-14: Vulnerability Analysis of Project to Climate Hazards**

Sensitivity	Exposure (current & future climate)		
	Low	Medium	High
Low	Rising sea levels, Flood, Landslides, Freeze –thaw damage, Wildlife Fires		
Medium		Cold Spells and Snow Drought	
High			Extreme Rainfall, Flash Flood, Storms and Winds Heat

Based on the development vulnerability assessment, measures to improve the resilience of the Proposed Development to extreme rainfall, flash (pluvial) flood, storms, and winds heat are required.

Mitigation is designed to increase the resilience of the development, or wider environmental receptors, to climate change and focuses on increasing capacity to absorb climate related shocks.

In the context of climate change, measures to increase the adaptive capacity of the proposed development and disaster risk reduction strategies can be developed with a view to reducing vulnerability and increasing the resilience of the Proposed Development. Significant incidents related to the climate change that affect operation of the proposed strategic housing development should be recorded for future analysis.

Based on a development vulnerability assessment measures to improve the resilience of the project to extreme rainfall, flash flood, storms, and winds are required. Table 3-15 details specific mitigation measures for the proposed development relating to climate change adaptation.

**Table 3.15: Mitigation Measures Related to Climate Change Adaptation**

Main concerns related to:	Proposed alternatives or mitigation measures
<b>Construction phase</b>	
<b>Extreme Rainfall, Flash Flood</b>	Mitigation measure will consider changes / flexibility in construction / operations that allow for rising water levels and groundwater levels based on the masterplan design.
	Mitigation measure will consider design of provide adequate surface water drainage during construction phase based on the masterplan design.
<b>Risk Reduction Mechanism</b>	Mitigation measure will consider secure insurance for damage of assets / site incidents based on the masterplan design.
<b>Storms and Winds</b>	Mitigation measure will ensure construction activities can withstand increases in high winds and storms based on the masterplan design.

	Mitigation measure will ensure the choice of equipment is weather efficient based on the masterplan design.
<b>Other concerns based on the design</b>	In this section the mitigation measures will be considered on the design in the masterplan layout.
<b>Operational phase</b>	
<b>Extreme Rainfall, Flash Flood</b>	Mitigation measure will consider changes / flexibility in construction / operations that allow for rising water levels and groundwater levels based on the masterplan design.
	Mitigation measure will consider design of provide adequate surface water drainage during construction phase based on the masterplan design.
<b>Storms and Winds</b>	Mitigation measure will ensure design can withstand increases in high winds and storms based on the masterplan design.
<b>Heat</b>	Mitigation measure will ensure building design for ventilation and cooling based on the masterplan design.
	Mitigation measure will ensure design of outdoor spaces to reduce urban heat island effect based on the masterplan design.
<b>Drought</b>	Mitigation measure will ensure design for droughts emergency based on the masterplan design.
<b>Other concerns based on the design</b>	In this section the mitigation measures will be considered on the design in the masterplan layout.

### 3.2.12 Future Reduction of GHG Emissions

A set of indicators shall be developed to assess project preparedness for adaptation against climate change. Provision shall be made for a periodic review of plans and the allocation of reporting responsibilities for a regime to measure and evaluate progress on adaptation. This can be carried out by the property management company or resident association. This process shall include regular feedback and/or updates from the implementation efforts.



## 4 Sustainability Appraisal

This section appraises the sustainability of the Proposed Development against a range of criterion. The sub-section headings below are typical but may be modified if an alternative structure is required by local policy.

### 4.1 Management

This section describes the adoption of sustainable management practices in connection with design, construction, commissioning, handover and aftercare activities to ensure that robust sustainability objectives are set and followed through into the occupation of the dwellings. Issues under this section focus on embedding sustainability actions through the key stages of design, procurement and initial occupation from the initial project brief stage to the appropriate provision of aftercare.

Whilst management of a project may not immediately appear to have significant impacts on a development's sustainability, ensuring the development delivers a product that is what the occupants require, that will not cause disruption to third parties, and ensuring the occupants know how to operate the facilities effectively, minimises the potential for the development to require amendment post-completion and consequently minimises the risk of wastage and unnecessary expenditure. Furthermore, it is of no benefit to design even the most environmentally sustainable building if management failures result in the sustainability enhancements not being implemented.

Items in this section typically include:

- Evidence that design team members roles have been clearly defined;
- Evidence that the aims of the design and design strategy have been clearly defined;
- Evidence of consultation with stakeholders/end users;
- Responsible construction practices will be employed (such as the Considerate Constructors Scheme); and
- Encuring commissioning and after care has been accounted for.

### 4.2 Health and Well-being

Whilst the contribution of health and well-being issues to sustainability may not immediately be obvious, the provision of pleasant and safe environments that enhance the occupants' quality of life from the outset contribute to sustainability by minimising the likelihood that elements of the building will be replaced, minimise energy use, and help to ensure viable long-term occupation of the properties.

Items considered in this section include:

- Daylighting, high-frequency lighting and lighting standards;
- Indoor air quality;
- Indoor acoustic performance/sound insulation standards;
- Safety and security through design;
- Access to nature; and

- Access to recreation facilities.

The remainder of the quality of life issues are typically addressed through design standards and specifications.

## 4.3 Transport

DBFL Consulting Engineers Traffic and Transport Assessment provides further details on the site location and pre-development conditions.

The subject development land is bisected by the existing Brawney residential estate and is generally bounded to the north by the N6, Athlone Relief Road, to the south by the Old Rail Trail Greenway, to the west by Scoil na gCeithre Máistrí and to the east by undeveloped lands, further east of which are the ESB Regional Headquarters. The subject site is located within the lands designated for the Lissywollen South Framework Plan 2018-2024.

Access to the subject site will be from Ballymahon roundabout (on the R915) to the west and Garrycastle roundabout (on the R916) to the east. The development proposal includes for road development works from Ballymahon roundabout (on the R915) to the west via and Garrycastle roundabout (on the R916) to the east, and the development of an east-west access route through the subject site as envisaged by the Lissywollen South Framework Plan 2018-2024. The Proposed Development also provides for pedestrian and cyclist connectivity to Old Rail Trail Greenway to the south.

The planning application also includes for the provision of new bicycle infrastructure off-site along Brawney Road and Blackberry Lane corridors linking the subject masterplan lands with the existing bicycle infrastructure at the R915/east. This new bicycle infrastructure will benefit new residents of the Proposed Development to access work, leisure and education facilities to the northwest and northeast in addition to providing new sustainable routing opportunities for both existing residents of the area and visitors / patrons of the leisure facilities currently located along Brawney Road.

The development would appear to have very good public transport links, with the presence of the adjacent station. This section would appraise the measures taken to minimise reliance on private transport during occupation of the dwellings, and to minimise impacts from construction traffic during construction.

Proposal include for the provision of public open spaces, planting, boundary treatments & all ancillary landscape works, public lighting, drainage and attenuation, car & bicycle parking, bin storage, ESB sub-stations and all associated site development works.

The subject site will be highly accessible to pedestrians and cyclists. Pedestrians and cyclists will be given priority within the internal site layout to ensure travel desire lines within the site are accommodated providing a good level of service and ensures the risk of vehicle/pedestrian conflict is minimised.

Dedicated pedestrian / cycle paths are proposed throughout the site layout providing a traffic free route between the different sections of the development site. Furthermore, pedestrian facilities are proposed on two sides and two-way cycle facilities on one side of the extended Brawney Road corridor.

The design has assigned higher priority to the movement of pedestrians and cyclists within the development, implementing self-regulating streets which actively manage vehicle movements within a low speed, high-quality residential environment.

#### 4.3.1 Site Access Arrangements

With the Brawney Road corridor exhibiting LINK street functions, the proposed internal network incorporates a structured hierarchy of integrated residential streets responding to their context and function attributes:

- Meandering east-west through the subject site, 'The Avenue' LINK Street (Brawney Rd extension) connects to the east with R916 Wash House Road and to the west with R915 Ballymahon Road. This 6m wide LINK street has been purposively designed (30kph design speed) through the masterplan development lands to actively manage vehicle speeds and discourage through traffic. Segregated cycle tracks and footpaths are proposed to the north and/or south of this LINK street.
- The narrower 5.5m wide Primary and Secondary LOCAL streets (20kph) branching off the afore mentioned LINK street have been designed to have relatively short lengths of straight sections with tight corner and junction geometry further contributing to managing vehicle speeds. The main function of these LOCAL streets are to provide access within/across the immediate development quarter. The 'Homezone' (20kph) will be closed lightly trafficked squares with onwads permeability provided for only pedestrians and cyclists. Within the courtyards higher quality material specifications will be applied to influence its place function.
- The adopted design philosophy has sought to achieve a quality 'sense of place' by incorporating several green open space areas to encourage social activity. Furthermore, the type of surface materials, landscaping and street furniture have been chosen with consideration of both their aesthetic qualities and context of the existing surrounding environment. The design has also sought to minimise the impact of highway features by avoiding excessive signing, road markings and street furniture. Significant levels of enclosure along each street type as achieved by the building orientation and tree planting contribute to providing a more intimate and supervised street environment.

The proposed street layout has been influenced by several factors including the Athlone Development plan 2014-2020, boundary conditions, future and existing development, watercourses and hedgerows. The resulting street pattern is largely a grid pattern with some minor curvilinear sections, creating attractive legible street scapes. The street layout was derived from several factors which include, the distinct shape of the site, boundary conditions and travel desire lines. This has led to the creation of a street network that comprises elements of an orthogonal and organic layout in specific areas but with through access maintained for walking and cycling throughout, thereby maximising connections within the site.

The development strategy adopts an open network model with elements of a filtered permeability network, maximising connectivity between key local destinations through the provision of a high degree of permeability and legibility for sustainable forms of travel.

On-street activity is promoted within the internal layout of all internal Local Streets and Pedestrian/Cycle Only Urban Streets through the adoption of 'own-door' dwellings and corner plots have been designed with dual aspect units.

In recognition of the low speed nature and higher place function of Local Streets, the proposed design has sought to specify minimal signage and line markings along the internal local streets with such treatments used sensitively throughout.

Different surface material treatments for pedestrian crossing/traffic calming table treatments, are proposed to alert and subsequently influence driver behaviour and vehicle speeds. Courtyard areas will be distinguished through the application of high-quality material specification in addition to different coloured surfacing materials. Clear, unobstructed

footpaths of no less than 2.0m wide are provided through out the scheme, with connections and tie-ins to existing external pedestrian networks. Greenways (shared ped/cycle connections) have been designed to incorporate 3.0m wide facilities as per the guidance outlined in the National Cycle Manual. Well-designed pedestrian crossing facilities are provided at frequent intervals along key travel desire lines throughout the scheme in addition to those located at street nodes. All courtesy crossings are provided with either dropped kerbs or a raised flat top treatment thereby allowing pedestrians to informally assert a degree of priority

Parking is provided through a mix of in curtilage perpendicular spaces measuring 5m x 2.5m, off street car park areas and parallel spaces measuring 6m x 2.2m. The provision of on-street car parking includes both parallel and perpendicular parking bays along either one or both sides of the internal local streets. The potential dominance of both on and off street car park areas are minimised through the provision of landscaped buffers and street trees.

The development proposes 5 no. new formal cycle / pedestrian access points between the masterplan lands and the Old Rail Trail Greenway to the south of the development site subsequently ensuring excellent cycle / pedestrian accessibility.



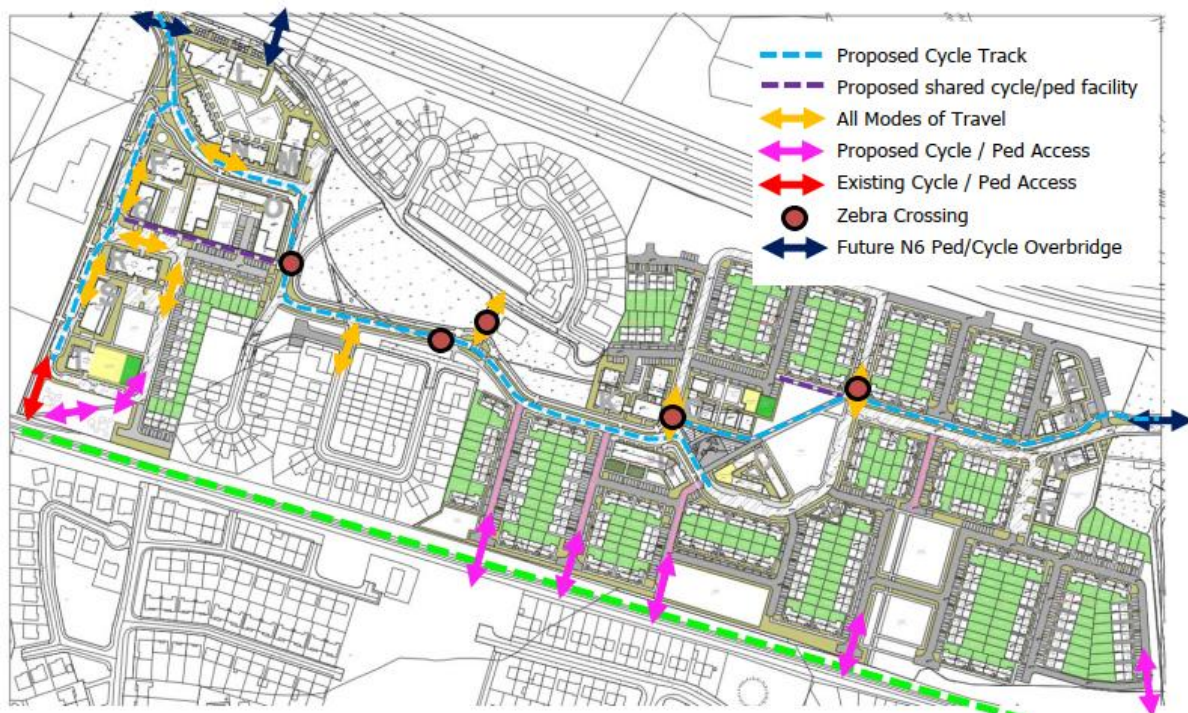
**Figure 4-3.1: Old Rail Trail Greenway (DFBL Mobility Management Plan)**

As introduced above, the subject site will be highly accessible to pedestrians and cyclists. Pedestrians and cyclists will be given priority within the internal site layout to ensure travel desire lines within the site are accommodated providing a good level of service and ensures the risk of vehicle/pedestrian conflict is minimised.

Dedicated pedestrian / cycle paths are proposed throughout the site layout providing a traffic free route between the different sections of the development site. Furthermore, pedestrian facilities are proposed on two sides and two-way cycle facilities on one side of the extended Brawney Road corridor.

A total of six TOUCAN controlled crossing facilities (Zebra) are proposed along the new east-west spine road each located on key pedestrian / cycle travel desire routes. These formal facilities, supplemented by courtesy crossings, will provide a high degree of permeability with safe crossing points integrating the residential areas located to the north and south of the new 'spine' road.





**Figure 4.3.2: Site Layout and Pedestrian/Cycle Accessibility (DFBL Mobility Management Plan)**

The proposals incorporate a hierarchy of internal streets which are firmly set within the context of the local Athlone receiving environment. The existing road network in Athlone includes arterial links such as the N6 to the north, the N55 to the northwest and the N62 and N61 corridor as located to southeast and west of the subject site respectively. Link streets bordering the site, such as R915 Ballymahon Road, and R916 Wash House Road provide the connections between the proposed development, the above Arterial links, and town centre. In contrast, the internal road network within the site has been designed to deliver a hierarchy of link and local streets that provide appropriate access within / across the proposed new residential communities and the road network external to the site. The movement function and design of each internal street network has sought to respect the different levels of motorised traffic whilst optimising access to/from public transport and prioritising the movement of higher number of pedestrians and cyclists. In parallel the adopted DMURS design philosophy has sought to consider the context / place status of each residential local street in terms of level of connectivity provided, quality of the proposed design, level of pedestrian / cyclists activity and vulnerable users requirements whilst identifying appropriate 'transition' solutions between different street types.

The planning application also includes for the provision of new bicycle infrastructure off-site along Brawney Road and Blackberry Lane corridors linking the subject masterplan lands with the existing bicycle infrastructure at the R915/east. This new bicycle infrastructure will benefit new residents of the proposed development to access work, leisure and education facilities to the northwest and northeast in addition to providing new sustainable routing opportunities for both existing residents of the area and visitors / patrons of the leisure facilities currently located along Brawney Road.

The proposed residential scheme incorporates a hierarchy of streets as noted below:

- A 6m wide Link street is proposed (30kph design speed) through the masterplan development lands. Segregated cycle tracks and footpaths are proposed to the north and / or south of this Link street.

- Narrower 5.5m wide Local streets (20kph design speed) branching off the aforementioned Link street provide access to the new residential areas.

The street layout was derived from several factors which include, the distinct shape of the site, boundary conditions and travel desire lines. This has led to the creation of a street network that comprises elements of an orthogonal and organic layout in specific areas. As part of the design and development of the street network, cycle and pedestrian linkages were prioritised around the development to link existing developments. Further details are outlined in the applications Design Manual for Urban Roads and Streets (DMURS) Compatibility Statement.

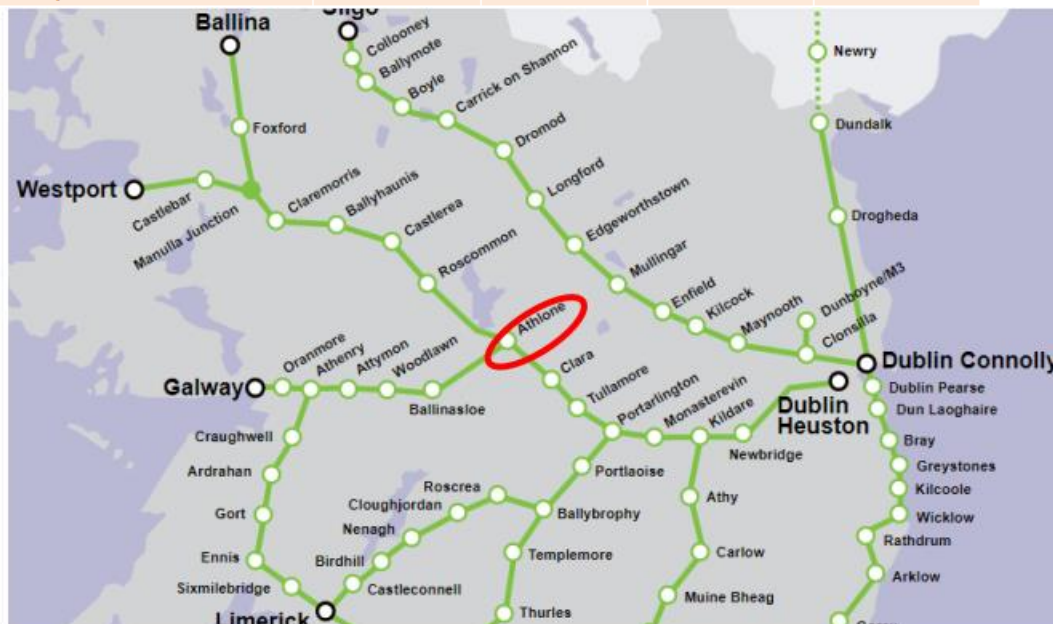
#### 4.3.2 Public Transport

Athlone train station is located approximately 2km from the subject site via the R915 (by all modes) and 1.4km away via the Old rail Trail Greenway (pedestrian / cyclists). This station is serviced by 2 no. rail services including;

- Dublin Heuston to / from Galway, and
- Dublin Heuston to / from Westport and Ballina.

**Table 4.3-1: Athlone Train Station Services (DFBL Mobility Management Plan)**

Destination	Mon – Thur	Fri	Sat	Sun
Dublin to Galway	10	10	10	6
Galway to Dublin	11	11	9	6
Dublin to Westport and Ballina	4	5	4	4
Westport and Ballina to Dublin	5	5	5	4



**Figure 4.3.3.4: Rail Network (DFBL Mobility Management Plan)**

The subject site benefits from good public transport accessibility levels. Bus Eireann operates 2 number town services (A1 and A2) both of which operate between Monksland and Greggans but along different interchange routes.

Interchange opportunities for both the A1 and A2 services are located within walking distance of the subject site with the nearest interchanges currently located approximately 600m (A2) and 750m (A1) walking distance to the east from the subject site. Furthermore a second bus



interchange for the local A2 bus service is currently available at the Regional Sports Centre and is only 500m from the subject development site.

Furthermore, 3 no. 'local link' services are accessible at Athlone Institute of Technology (AIT) as located approximately 1.6km from the subject site. These 'local link' services provide access to destinations including Moate, Roscrea, Shannonbridge, Pollagh and Kilcormac.

Three no. regional bus services serve Athlone including Bus Eireann services 70 and 73 which is accessible at Athlone Bus Station (14km from subject site) and Citylink service 763 as accessible at AIT (1.6km from subject site). Bus Eireann route 70 operates between Galway and Dundalk whilst route 73 operates between Waterford / Carlow and Longford. The Citylink 763 service operates between Galway and Dublin Airport.

The subject scheme layout has been designed to facilitate the existing local bus route A2 to extend eastwards into the subject development lands beyond its existing extents at Athlone Regional Sports Centre.

A significant number of bicycle parking spaces are proposed within the development to accommodate residents, visitors and staff to the site.

The on-site cycle facilities will be linked to the existing and proposed off-site cycle routes. Also, improved cycle infrastructure is proposed under the NTA and local authority green route which runs in close proximity to this site.

Additionally, the site developers will equip all residences with broadband compatible connection points, to enable residents to access to broadband services, which will help facilitate access to MMP information. Information on the website will include details of local public transport routes, local amenities and facilities, walking and cycle maps and a link to online car sharing opportunities. The website will also provide links to other websites (such as Dublin Bus) to encourage residents to plan their journeys using sustainable transport.

The development masterplan incorporates the extension of Brawney Road eastwards (LIHAF scheme) through the subject development lands and ultimately connects with Blackberry Lane (to the east) and onwards to the R916 corridor. The implementation of this 'link' street will provide a new vehicle through route (Lissywollen Avenue) between the existing Brawney Road / R915 / N55 / One Mile Round roundabout (to the west) and the R916 / Moydrum Road roundabout junction (to the east). This new 'link' street incorporates a number of minor junctions which provide access for all modes of travel to the different residential areas of the proposed masterplan and the existing residential developments. Based upon the information and analysis detailed within this Traffic and Transport Assessment it has been demonstrated that:

- The subject site is highly accessible to pedestrians and cyclists from the surrounding area.
- Future proposals as stated within the Athlone Town Development Plan include "To provide a walking/cycling route from the Athlone Mullingar railway line in Athlone, to the River Shannon, via a new bridge over the Shannon to the west bank and onwards to the Roscommon County boundary, with the potential to connect to Athlone Castle and southwards around the town". Support by the NTA this new pedestrian / cycle infrastructure is predicted to be delivered over the next 2-3 years further enhancing the site accessibility levels.
- The subject site benefits from good public transport accessibility levels with bus-based services already calling close to the masterplan lands and providing connections to additional public transport services at Athlone Rail Station and Bus Station located approximately 2km to the southwest.

- The proposed residential scheme's internal road layout has been designed to be consistent with both the principles and guidance outlined within the Design Manual for Urban Roads and Streets (DMURS) 2013 (updated May 2019). The scheme proposals are the outcome of an integrated design approach that seeks to implement a sustainable community connected by well-designed streets which deliver safe, convenient and attractive networks.
- The proposed masterplan has been designed to facilitate the existing local bus route A2 to be extend eastwards into the subject development lands beyond its existing extents at Athlone Regional Sports Centre. A total of 2 no. new bus stops are proposed along the new east-west 'link' street. The extension of the local bus route eastwards into the masterplan lands will benefit both existing local residents and residents of the masterplans proposed new dwellings. The strategic positioning of the two new bus stops will ensure that all new and existing residents will have to walk no more than 250m in order to access the bus service. This walking distance is below best practice recommended maximum walking distance of 300m thereby enhancing public transport accessibility levels.
- A total of 1 no. third party committed development has been identified and included into the network assessment.
- A junction impact analysis was undertaken and has demonstrated that, with the exception of the R916 / Moydrum Road Roundabout, the proposals will generate a subthreshold impact upon all the junctions during the AM and PM peak hours during all adopted design years.
- Furthermore, due to the redistribution effect of the proposed new 'link' road through the subject masterplan site, a reduced quantum of baseline vehicle movements compared to existing conditions are observed at a number of junctions. Such observations are recorded during all or some of the design years including Junction 1 (N55 / N6 Eastbound On-ramp / N6 off-ramp junction), Junction 2 (N55 / N6 Westbound off-ramp junction), Junction 3 (Brawney Road / R915 / N55 / One Mile Round) and Junction 8 (R915 / The Crescent / Grace Park Road / Gleeson Street junction).
- The AM and PM peak hour impact recorded at the R916 / Moydrum Road Roundabout are over the 5% threshold for congested networks with 8.59% and 8.81% respectfully in the 2036 Future Design Year. Accordingly, this junction has been subject to further analysis as discussed within Chapter 7 of this report. Junction 3 (N55 / Brawney Road / R915 / One Mile Road) has also been subject to further assessment due to its close proximity to the subject development even though the impact of the subject development has been established as being subthreshold.
- The junction analysis undertaken at the two key off-site junctions reveals that with the introduction of the proposed alterations to both the N55 / Brawney Road / R915 / One Mile Road junction, and the R916 / Moyburn Road / Blackberry Lane junction; the operational performance of the two existing roundabout junctions improves slightly. These enhancements proposed as part of an integrated package of mitigation measures; provides the capacity required to accommodate the proposed masterplans residential development. Even with the introduction of the subject developments additional traffic volumes, maximum RFC values and queue lengths are predicted to reduce slightly when compared to the corresponding Do-Nothing scenario results in each of the three adopted 2021, 2026 and 2036 design year scenarios.

### 4.3.3 Car Parking

The proposed development layout design provides a total of 752 no. car parking spaces comprising 455 no. housing car parking spaces and 297 no. apartment car parking spaces. The provision of 455 no. residential housing unit car parking spaces are slightly higher than the local development plans 'minimum' car parking requirements (380). The proposed apartment / duplex car parking provision (280) is lower than the development plan requirement (388).

This provision of 295 apartment car parking spaces equates to a ratio of 1.01 per apartment unit. In order to determine if this level of car parking provision is adequate to cater for the potential car parking demand, an assessment of the Census 2016 car ownership data has been undertaken at existing residential areas within Athlone Town. The assessment of Census car ownership data at 6 no. residential areas with similar site characteristics to the subject development site reveals an average car ownership ratio of 0.81 cars per household. In comparison, the subject proposals propose a provision of 1.01 cars per apartment unit and therefore is considered an appropriate quantum to accommodate the predicted demand.

Furthermore it is noted that on evenings and weekends, both the on street car parking adjoining the school and creche facilities could be made available for use as additional visitor car parking spaces.

The Traffic and Transport Assessment recommends disabled parking is provided "Minimum one space of appropriate dimensions in every 25 standard spaces, up to the first 100 spaces; thereafter, one space per every 100 standard spaces or part thereof".

The development proposals includes for the provision of one on-street coach parking space and 11 no. car parking spaces immediately adjoining Scoil na gCeithre Máistrí. These 11 on street spaces could be assigned for school use Monday to Friday from 8am to 4pm. Outside of these hours, these parking spaces can be used for visitor parking by the residential development.

### 4.3.4 Mobility Impaired Parking Electric Vehicle (EV) Parking & Car Sharing

The subject proposals include for 7 no. spaces. The scheme proposals also include 30 no. EV car parking spaces and should the demand for EV parking spaces increase beyond supply, additional EV charging facilities can be easily retrofitted with the appropriate ducting provided to enable easy retro fit of the charged units.

### 4.3.5 Cycle Parking

A total of 1,613 no. bicycle parking opportunities are proposed as part of the residential development scheme comprising 1,585 residential and 28 creche cycle parking spaces. The 1,585 no. residential cycle parking spaces comprise 1285 no. long term secured / sheltered spaces and 328 short term parking spaces. The 28 no. cycle parking spaces proposed for the creche facilities include 12 no. at the 321m<sup>2</sup> creche located in Sector 1A West of the site (adjacent to Block C) and 16 no. at the 448m<sup>2</sup> creche located on the ground floor apartment Block T.

**Table 5.5: Proposed Cycle Parking Provision/ Opportunities**

Land Use		Unit No.	Short Term	Long Term
<b>Apartments</b>		491	160	631
Homes	Residents (rear parking via side access)	220	-	510 <sup>1</sup>
	Residents (no rear parking via side access)	65	-	130
	Visitors (off-site centralised facility)	285	154	-

<b>Crèche</b>	-	14	14
<b>Subtotal</b> (per parking duration classification)		328	1,285
<b>Subtotal</b> (proposed bicycle parking stands)		328	7752
<b>Total Bicycle Parking Opportunities</b> (minimum)			1,613

1) It is not proposed to provide dedicated bicycle stands in the rear garden of the housing units

2) Excludes the parking opportunities in the rear garden of houses with a side access route.

The proposed cycle parking spaces are conveniently located in close proximity to Block access locations and are well within the recommended distances of 25m for short stay cycle parking spaces and 50m for long stay cycle parking spaces as stated in DLRCC's 'Standards for Cycle Parking and associated Cycling Facilities for New Development (January 2018)'.

In conclusion, it is considered that the impact on the surrounding road network, as a result of the proposed masterplan development on the surrounding road network will be negligible. This is based on the anticipated levels of traffic generated by the proposed development, the level of mitigation achieved following the implementation of the proposed road infrastructure upgrades at the two offsite roundabouts and the information and analysis summarised in the above report.

It is concluded that the proposals represent a sustainable and practical approach to development on the subject Lissywollen South lands and there are no traffic or transportation related reasons that should prevent the granting of planning permission for the proposed residential development.

## 4.4 Water

The primary hydrological feature in the vicinity of the site is the Shannon River (approx. 2km south-west of the site). There is also a small watercourse, River AI, located approximately 1km to the south of the site.

The water supply for Athlone is sourced from the River Shannon. Currently the water treatment plant in Athlone abstracts approximately 500m<sup>3</sup>/hr, or 3 million gallons per day (MGD) which is distributed to the four main reservoirs at Annagh, Ardnaglug, Battery Heights and Coosan. Current demand is approximately 2 MGD (million gallons / day). Permission has been sought for a new water treatment plant at Killinure, which would abstract up to 15 MGD to serve the South Westmeath Water Supply Scheme, which includes the town of Athlone, including Lissywollen South and a large area of South Westmeath. It is anticipated that this new water treatment plant will be operational by 2021. In terms of wastewater, the Athlone Wastewater Treatment Plant has been recently upgraded to provide for a capacity of 40,000 population equivalent (pe) and therefore will adequately supply the Lissywollen South area. The Council shall continue to collaborate closely with Irish Water to ensure development is closely aligned with the provision of adequate and appropriate critical service infrastructure.

### 4.4.1 Flood Risk

DBFL Consulting Engineers Site Specific Flood Risk Assessment September 2020 for the proposed residential development was undertaken in accordance with the requirements of the Planning System and Flood Risk Management Guidelines for Planning Authorities", November 2009. Following the flood risk assessment stages, it was determined that the site is within Flood Zone C as defined by the Guidelines and based on the ECFRAMS mapping. Therefore, the development of housing on the subject site is appropriate for the site's flood zone category and a justification test as outlined in the Guidelines is not required. The Guidelines sequential approach is met with the 'Justify' & 'Mitigate' principals being achieved.

The proposed flood mitigation measure(s) outlined above should be implemented. It is considered that the flood risk mitigation measures once fully implemented are sufficient to provide a suitable level of protection to the proposed development and will not cause an increased risk of flooding to external properties.

A regularly maintained drainage system would ensure that the network remains effective and in good working order should a large pluvial storm occur. In the event of extreme pluvial flooding then over land flood routes would direct water towards the open space areas.

Should extreme pluvial flooding occur in excess of the development's drainage capacity i.e. exceeding 1% AEP, then over land flood routes towards the on-site open spaces would protect the development and houses with lowest proposed floor levels.

While the development constitutes 'highly vulnerable' development. It is appropriate for this flood zone and the scheme will be designed to ensure that the risk of flooding of the development is reduced as far as is reasonably practicable. The development does not increase the risk of flooding to adjacent area and roads once mitigation measures are implemented.

The western catchment generally slopes south west towards the proposed outfall point while the eastern catchment generally falls in a north easterly direction. It is therefore proposed localised raising of the existing ground levels may be required in some locations in order to achieve a gravity discharge solution and provide sufficient cover over proposed foul sewers.

On the assumption of infiltration not being feasible surface water flows from the proposed development are to be attenuated to greenfield runoff rates in conjunction with implementation of SUDS strategies such as permeable paving, detention basins and installation of a Class 1 by-pass fuel / oil separator prior to discharging to the public surface water network. Refer to DBFL's Engineering Services Report (180176-DBFL-XX-XX-RP-C-0002) for full details of the proposed drainage & SUDS methodologies employed in the proposed surface water design.

Based on the above, it is not currently envisaged that the proposed development works will have any direct impact on the existing underlying hydrogeology & geology.

#### 4.4.2 Surface Water Drainage

Diversion of this existing sewer will be required in order to accommodate the proposed site layout. Surface water runoff from the site's road network will be directed to a proposed surface water pipe network via road gullies while surface water from roofs will be routed to the proposed surface water pipe network via the porous aggregates beneath permeable paved driveways (providing an additional element of attenuation).

Surface water will pass through silt trap manholes prior to entering the attenuation system. Discharge rates from the proposed surface water drainage network will be controlled by a vortex flow control device (Hydrobrake or equivalent), associated underground attenuation tanks (Pluvial Cube or equivalent) and detention basins. Surface water discharge will also pass via a by-pass fuel / oil separator (sized in accordance with permitted discharge from the site).

Surface water calculations are based on an allowable greenfield runoff rate of 78.5l/s (20.7l/s western catchment, 57.8l/s eastern catchment) in accordance with the Greater Dublin Strategic Drainage Strategy (GDSDS). This results in a total attenuation volume for the 2 no. Surface Water Drainage Catchments of approx. 2,770m<sup>3</sup> (810m<sup>3</sup> western catchment, 1960m<sup>3</sup> eastern catchment).

The surface water drainage network, attenuation storage and site levels are designed to accommodate a 100-year storm event (provision for climate change included). Floor levels of the residential units are set above the 100-year flood levels by a minimum of 0.5m. For storms in excess of a 100 year event, the development has been designed to provide overland flood routes towards the surface water drainage outfall and landscaping features. These overland flood routes also reduce the development's vulnerability to climate change.

The Proposed surface water drainage network has been designed in accordance with Greater Dublin Strategic Drainage Strategy (GDSDS), the Department of the Environment's Recommendations for Site Development Works for Housing Areas, the Department of the Environment's Building Regulations "Technical Guidance Document Part H Drainage and Waste Water Disposal" and BS EN 752: 2008 Drain and Sewer Systems Outside Buildings.

## 4.5 Materials

This category encourages steps to be taken to reduce the impact of construction materials through design, construction, maintenance and repair. Materials issues focus on the procurement of materials that are sourced in a responsible way and have a low embodied impact over their life including extraction, processing and manufacture and recycling.

Choice of materials has a significant impact on the environment. Material choice needs to be integrated into the initial design of the building and the following needs to be considered:

- embodied energy - the amount of energy required to produce the material;
- durability - its ability for a long life;
- potential for material reuse if the building is taken down;
- sourcing - materials available locally should be chosen over those imported over long distances; and
- renewable materials should be sought from sustainable sources wherever possible.

During construction, the methods and measures outlined below would be adhered to in order to mitigate impacts on material use:

- Excavation of subsoil layers would be required in order to allow road construction, foundation excavation, drainage and utility installation and provision of underground attenuation of surface water. Underlying subsoil layers are also expected to be suitable for reuse as non-structural fill (e.g. build-up of back gardens areas or build-up of open spaces).
- Excavation of existing subsoil layers would be required in order to allow for basement excavation, drainage and utility installation and provision of underground attenuation of surface water.
- Underlying subsoil layers are sandy gravelly clay with occasional cobbles and are expected to be generally suitable for reuse as non-structural fill (e.g. build-up of back gardens areas or build-up of open spaces).
- In the context of materials imported to site, these would be natural stones sourced from locally available quarries in accordance with the appropriate statutory guidelines, greenfield / inert soil imported under a Waste Permit issued by the local authority; or materials that have been approved as by-products by the EPA in accordance with the EPA's criteria for determining a material is a by-product, per the provisions of article 27(1) of the European Communities (Waste Directive) Regulations, 2011.



- Imported materials would be granular in nature and used in the construction of road pavement foundations, drainage and utility bedding and surrounds. Imported fill would be required to raise the development to the required level for drainage.
- Materials would be brought to site and placed in their final position in the shortest possible time. Any imported material would be kept separate from the indigenous arisings from the site. All excavation to accommodate imported material would be precisely co-ordinated to ensure no surplus material is brought to site beyond the engineering requirement.
- Stripping of topsoil would be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development. At any given time, the extent of topsoil strip (and consequent exposure of subsoil) would be limited to the immediate vicinity of active work areas.
- Topsoil stockpiles would be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains.
- Topsoil stockpiles would also be located so as not to necessitate double handling.

## 4.6 Waste

This section will comprise two parts: the first addresses the minimisation of demolition and construction waste; and the minimisation and treatment of waste post-occupation. This section considers the Construction & Demolition Waste Management Plan (CDWMP) prepared by Alanna Roadbridge Developments Ltd. to support a planning application for a Strategic Housing Development on site measuring circa 17.64 hectares at Lissywollen, Athlone, County Westmeath. Waste management in Ireland is subject to EU, national and regional waste legislation which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended). In addition, the Irish government issues regular policy documents which outline measures aimed to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The most recent policy document A Resource Opportunity – Waste Management Policy in Ireland was published in 2012 and stresses the environmental and economic benefits of better waste management, particularly in relation to waste prevention.

The document sets out a number of actions, including the following:

- A move away from landfill and replacement through prevention, reuse, recycling and recovery.
- A Brown Bin roll-out diverting 'organic waste' towards more productive uses.
- Introducing a new regulatory regime for the existing side-by-side competition model within the household waste collection market.
- New Service Standards to ensure that consumers receive higher customer service standards from their operator.
- Placing responsibility on householders to prove they use an authorised waste collection service.
- The establishment of a team of Waste Enforcement Officers for cases relating to serious criminal activity will be prioritised.

- Reducing red tape for industry to identify and reduce any unnecessary administrative burdens on the waste management industry.
- A review of the producer responsibility model will be initiated to assess and evaluate the operation of the model in Ireland.

#### 4.6.1 Significant reduction of Waste Management Planning.

Following the above, the Eastern-Midlands Region (EMR) Waste Management Plan 2015 – 2021 was published and provides a framework for the prevention and management of wastes in a safe and sustainable manner. The EMR Waste Management Plan 2015 – 2021 is the regional waste management plan for the Lissywollen area published in May 2015.

The Construction & Demolition Waste Management Plan (CDWMP) comprises an agreed set of measures designed to be easily implemented by all site contractors to effectively manage the construction phase of the development and traffic generated by the construction phase. The ultimate goal of a CDWMP is designed to minimise against any and all possible effects of the construction phase, including those on the surrounding roads and infrastructure.

The CDWMP will:

- be a dynamic document which will evolve to suit the ongoing construction of the development and any changes which may occur.
- be integrated into and implemented throughout the construction phase of the project to ensure the following:
- ensure all site activities are effectively managed to minimise the generation of waste and to maximise the opportunities for on-site reuse and recycling of waste materials;
- ensure that all waste materials generated by site activities, that cannot be reused on site, are removed from site by appropriately permitted waste haulage contractors and that all wastes are disposed of at approved waste licensed / permitted facilities in compliance with the Waste Management Act 1996, the Waste Management (Amendment) Act 2001 and the Protection of the Environment Act 2003;
- to manage and control any environmental impacts (noise, vibration, dust, water) that project construction work activities may have on receptors and properties that are located adjacent to project work areas and on the local receiving environment; and
- to comply with any planning conditions and requirements relating to waste management as required by An Bord Pleanála and Westmeath County Council.
- Ensure supply chain management: including waste minimisation, management systems and site stewardship.



**Figure 4.1: The waste hierarchy**

The waste produced on this project will be surplus soil and timber demolition waste, unsuitable for placement in the works due to either the location of its source or the material not meeting specified requirements. There will also be packaging material and small amounts off-cuts from plastic pipes/ducts and some small amounts of timber waste from shuttering activities. Site management with responsibility for ordering of material shall ensure that materials are ordered so that the quantity delivered the timing of the delivery and the storage is not conducive to the creation of unnecessary waste. No hazardous material has been identified on site at the time of drafting this document however encapsulant waste; cans, lids, primer bottles and lids, brushes, cardboard boxes and other contaminated materials will be bagged and collected separately for correct disposal. Where possible, packaging will be segregated for recycling or returned to the supplier. Any waste stored on site or any other activity carried out on-site must not cause a litter nuisance in a public place. Plastic wastes are highly visible and account for many reports of poor waste management on construction jobs. Some packaging materials are easily carried by the wind and represent a slip hazard, especially when wet. Ensure that all plastic packaging wastes are collected and covered/weighed down as work continues.

Other potential waste would be managed by the following methods:

- Other Wastes Printer cartridges: These cartridges will be stored in a marked container and brought for re-filling rather than being disposed of.
- Domestic Batteries: All used batteries should be kept in a marked container and sent for proper disposal or recycling at the end of the project.
- Waste Electrical Equipment: This type of waste must be brought to a licensed disposal site, if required.
- Fluorescent Bulbs: All fluorescent tubes and bulbs will be set aside in a designated area and disposed of periodically.

Waste skips will be located in the construction compound. All waste must be segregated and placed in the relevant skip. Skips will be collected by an appointed waste collector and disposed of at the relevant licensed facility. Excavated soil and other C&D waste-derived aggregates are considered suitable for certain on-site construction applications including road construction and backfill of drainage lines etc. Where possible and when material is suitable it is intended to reuse as much material within the site boundary as possible.

All waste will be documented prior to leaving the site. Waste will be weighed by the contractor, either by weighing mechanism on the truck or at the receiving facility. These waste records will be maintained on site by the nominated Project Manager.

All movement of waste and the use of waste contractors will be undertaken in accordance with the Waste Management Acts 1996 - 2011, Waste Management (Collection Permit) Regulations 2007 and Amendments and Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments. This includes the requirement for all waste contractors to have a waste collection permit issued by the NWCPO. The nominated project manager will maintain a copy of all waste collection permits on-site.

If the waste is being transported to another site, a copy of the Local Authority waste COR/permit or EPA Waste/IED Licence for that site will be provided to the nominated project manager. If the waste is being shipped abroad, a copy of the Transfrontier Shipping (TFS) notification document will be obtained from South Dublin County Council (as the relevant authority on behalf of all local authorities in Ireland) and kept on-site along with details of the final destination (COR, permits, licences etc.). A receipt from the final destination of the material will be kept as part of the on-site waste management records.

The Project Manager/C&D Waste Manager shall arrange for full details of all arisings, movements and treatment of construction and demolition waste discards to be recorded in our "Project Waste Traceability Register" during the construction stage of the Project. Each consignment of C&D waste taken from the site will be subject to documentation, which will conform with the table below and ensure full traceability of the material to its destination.

## 4.7 Land-use and Ecology

This section assesses the ecological impact of the proposed development and also addresses the efficiency of land-use and site selection. The site sits to the northeast of Athlone town, on the edge of the urban sprawl area. It is bordered by the N6, a residential development, agricultural land and the Old Rail Trail Greenway. The surrounding area north of the site is dominated by agricultural lands with some bog, industrial estates and residential areas. There are no water courses within the boundary of the proposed site. The closest waterways are the Kippinstown Stream (26K74) located approximately 1.1km to the north, which flows north and joins the Garrnafela River (26G51) before entering Lough Ree. Approximately 740m to the south of the site an unidentified stream flows east and joins the Upper Shannon River (26S02) at the River Shannon Callows.

Consultation was undertaken with Alanna Homes/Westmeath County Council with regard to the scope of works within the proposed project. The consultation with the NPWS identified concerns in relation to Molinia meadows which were highlighted to be present within 10km. They identified a 'species rich wetland area' and 'green area with meadow species excellent for pollinators' and suggested specific effort be made in relation to frog and newt investigations. The NPWS suggested that 'part of the wildflower area should be retained as a biodiversity area as a mitigation measure'. Similarly, they suggested retaining all boundary hedgerows and supplementing where there are gaps be as a matter of priority to mitigate for the loss of a significant area of internal hedgerows and as a matter of adopting priority actions 17 and 18 of the Westmeath Biodiversity Action Plan 2014-2020. Additionally, it is noted that the consultation response indicated the requirement for suitably qualified ecologists to conduct various surveys. All of the other consultation resulted in an expression of no concern in relation to biodiversity related impacts due to the low ecological value of the receiving environment and the distance from protected sites.

All habitats present on site were of low ecological importance at both landscape and local scales. There were no species identified on site which are invasive and subject to restrictions

(Third Schedule) under Regulation 49 of the European Communities (Birds and Natural Habitats) Regulations, 2011. The central hedgerow provides a linear feature of moderate local importance with potential for breeding birds to use it.

There was evidence of fox and rabbit activity on site. There were no signs of any badger activity and no badger setts were identified. The site has moderate potential for bat activity. The breeding bird surveys identified common farmland/garden bird passerine species to be present on site. The habitats on site are grassland and disturbed ground fields and the treelines on site are of low local ecological importance due to the proximity to the N6 and availability of similar habitat.

The fields to the west have a notable wet flush area as indicated by the reeds (*Juncus* spp.) present (also identified by the NWPS consultation response), however this area was dry during all field visits and there is no bankside vegetation, shade or refugia for amphibians or reptiles; therefore, the site has no potential for any protected fish, amphibians or reptiles.

The central segment of the hedgerow will be maintained as it has a full canopy and complex understory. Connectivity to the wider landscape will be maintained to the north of the site and augmented supplementary planting of native trees will increase the condition of the existing hedgerow to the north. Overall, 36% of the available hedgerows will be lost due to the implementation of the project.

Where hedgerow removal is required all works in that regard will be constrained to outside 1st March and the 31st August. Should hedgerow removal be required within this time then a relevant derogation licence must be sought. In addition to this an Ecological Clerk of Works (EcOW) will be appointed to monitor all hedgerow removal for disturbance to potential badger setts, bat roosts and/or bird nests. The ECoW will ensure that none of the hedgerows to be maintained, identified above, are interfered with in any way that impacts their ecological integrity throughout the implementation of the construction works.

The project is not expected to contribute significant cumulative impacts. The characteristics of the development detailed above indicate any potential impacts will be localised due to the magnitude of works being undertaken. There will be a short-term reduction of habitat connectivity and the availability of local breeding bird habitat during the implementation of the landscape management plan as the supplementary planting is undertaken and the trees establish and mature.

There will be a permanent loss of around 990m of semi mature hedgerows of varying quality. Given the urban context of the site, the low abundance of species identified on site and the availability of similar habitat in the area, this is not identified as a significant impact to the flora and fauna of the receiving environment.

Landscape Rationale (Ronan Mac Diarmada & Associates) confirms natural playgrounds help children to develop other beneficial behaviours in addition to physical skills. These behaviours include social skills, cooperation, and the ability to solve problems. In addition, natural playgrounds stimulate a child's imagination and creativity more than a traditional playground, more sustainable and blend in with natural environment—slopes etc.

The design incorporates mitigation measures as described in relevant sections of this EIAR. A Construction Environmental Management Plan (CEMP) accompanies this application and provides additional management measures which will be implemented during construction.

The design incorporates mitigation measures as described in relevant sections of this EIAR. A Construction Environmental Management Plan (CEMP) accompanies this application and provides additional management measures which will be implemented during construction.

The operational phase works are not anticipated to have any impacts beyond the site boundary due to the proposed characteristics of the development. A specific noise pollution and surface water assessments were undertaken (detailed in EIAR sections 10 and 8 of the respectively). In light of these assessments, following the source-pathway-receptor model, the Zone of Influence (ZOI) was identified to be localised/within the immediate vicinity and no significant impact were identified; given the nature of the proposed works.

Taking the baseline ecological data, the extent, the scale and the characteristics of the proposed development into account the following potential impacts have been identified:

- Hedgerow removal
- Impacts on Surface Water
- Earthworks – causing the mobilisation of particles
- Noise and vibration.

Potential impacts to biodiversity are predominantly associated with construction phase works which are temporary. The operational phase elements of the project are thought to have negligible impacts given the low ecological value of the existing habitats therefore the development will have no significant adverse effects. Localised impacts related to hedgerow removal will be minimised through the Landscape management plan. This plan identifies that some of the central hedgerow will be maintained and augmented planting will occur to the north of the site using native tree and plant species.

The operational phase works are not anticipated to have any impacts beyond the site boundary due to the proposed characteristics of the development. A specific noise pollution and surface water assessments were undertaken (detailed in EIAR sections 10 and 8 of the respectively). In light of these assessments, following the source-pathway-receptor model, the Zone of Influence (ZOI) was identified to be localised/within the immediate vicinity and no significant impact were identified; given the nature of the proposed works.

Taking the baseline ecological data, the extent, the scale and the characteristics of the proposed development into account the following potential impacts have been identified:

- Hedgerow removal
- Impacts on Surface Water
- Earthworks – causing the mobilisation of particles
- Noise and vibration.

Potential impacts to biodiversity are predominantly associated with construction phase works which are temporary. The operational phase elements of the project are thought to have negligible impacts given the low ecological value of the existing habitats therefore the development will have no significant adverse effects. Localised impacts related to hedgerow removal will be minimised through the Landscape management plan. This plan identifies that some of the central hedgerow will be maintained and augmented planting will occur to the north of the site using native tree and plant species.

There are no other long-term residual impacts identified as the majority of the site is currently heavily manage med agricultural grassland or disturbed ground.



The proposal is consistent with the objectives of the Westmeath County Development Plan 2014-2020, the Athlone Town Development Plan 2014-2020 and the Lissywollen South Framework Plan 2018-2024.

## Proposed play



- We are proposing a natural playground.
- Natural playgrounds help children to develop other beneficial behaviors in addition to physical skills. These behaviors include social skills, cooperation, and the ability to solve problems. In addition, natural playgrounds stimulate a child's imagination and creativity more than a traditional playground
- More sustainable
- Blend in with natural environment – slopes etc.

### Movement

- Tree planting and gentle grass mounding are ideal places to hide. These changes in levels are suitable for jumping and running down gentle hills.
- Some Wooden seating areas could be suitable for climbing.
- Proposed playground located in open space will accommodate climbing.

### Stimulation of the five senses

- Natural elements throughout open space provide quiet play areas and bright areas that appeal to a child's senses.
- Sensory and textured plants planted throughout the space appeal to the senses.

### Experiencing change in the natural and built environment. Experiencing the seasons

- The contrast between open space and paving provides opportunities to learn and play.
- Natural elements in open space such as trees will allow children to experience changes in seasons.

### Social interactions

- Meeting points and a number of seating areas will encourage social interaction.
- Kick about spaces also encourage interaction

### Playing with identity

- Role play. Places to hide in the natural elements of open space.

### Experiencing a range of emotions

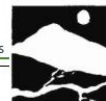
- This bespoke designed open space will appeal and evoke children's emotions.

### Capabilities of play such as tumble, chase game.

- Extensive grass areas throughout the open space are ideal for kickabout and chasing games.

### Varied and interesting physical environment.

- A bespoke designed space that has gentle grass mounding thus providing a change in levels. This provides a varied and interesting physical play environment.



Central open space is grassy, defined by paths and semimature trees, allowing visibility through the park. The open spaces allow for active recreation and passive uses, creating a green focal point for the development. A park has more active elements to the east, including a natural play area and a multi-use games area with low observation mounds to the north and south.

There are smaller open spaces throughout the development, including several pocket parks. These smaller parks are green areas designed for as a visual amenity with trees and seating for neighbourhood use.

Some areas to incorporate lines of Yeats poems along side of bench Resin-bound surfacing for high impact areas across the development

Several outdoor gym equipment and kick about areas scattered around the development in the open space areas.

Natural playgrounds help children to develop other beneficial behaviours in addition to physical skills. These behaviours include social skills, cooperation, and the ability to solve problems. Natural playgrounds stimulate a child's imagination and creativity, and integrate into level changes and the natural environment.

Tree planting and gentle grass mounding are ideal places to hide. The changes in levels are suitable for jumping and running down gentle hills. Some wooden seating areas could be suitable for climbing.



Natural elements throughout open space provide quiet places, dark and bright are as that appeals to a child's senses. Sensory and textured plants planted throughout the space will appeal to the senses providing a varied and interesting physical environment.

Where detention basins are required and located within the central open space areas, the south facing aspects will be terraced while the north facing aspects will be sloped with a 1:3 gradient. Side slopes will receive a Parkland grass mix, requiring a less intensive maintenance regime.

The creation of habitat spaces along the retained hedgerows for birds, insects, badgers & bats is a vital element to the Green Infrastructure in this development. These areas will not be mown or sprayed so that wildlife can thrive uninterrupted by humans and create a stronger biodiversity within the development.

**Figure 4.7.8.1: RMDA Landscape Masterplan**

## Landscape Masterplan



**Figure 4.7.8.2: RMDA Landscape Masterplan**

Where possible, existing natural and landscape heritage elements to be protected retained and augmented with new native tree planting creating a significant buffer zone, habitat renewal, and visual screening.

This proposed planting will strive to create a sense of identity through public space, improve the experience of the users, and blending the edges into the surrounding neighbourhood. The design is composed of several multi-use community areas, where chance meetings, markets, relaxation, and play can occur. Reflecting the urban nature of this development, the public realm design focuses on creating a strong sense of urban character, through materials and scale, using high-quality space and durable materials to improve public realm environments, while also maintaining distinctive landscape features. Within the scheme: there are distinctive public and communal spaces.

The increased permeability of the development to the its context is important to connect residents to surrounding opportunities.

A key objective of the scheme is the enhancement and provision of green infrastructure which is fully integrated with the new development, linking into the existing greenway which runs along the southern site boundary.

Streetscape character is defined by specific tree species, creating a sense of identity within the primary open space area around which pedestrian linkages, passive and active open space areas are arranged

Where detention basins are required and located within the central open space areas, the south facing aspects will be terraced while the north facing aspects will be sloped with a 1:3 gradient. Side slopes will receive a Parkland grass mix, requiring a less intensive maintenance regime.

The Village centre incorporates mixed use buildings around a formal plaza area, which acts as a focal point for the development. A palette of high quality landscape materials has been suggested in order to enhance the pedestrian area. Changes of landform add interest and help delineate the different congregation spaces. A variety of seating and gathering points are an integral part of the proposal. These attractive surface treatments are accompanied with natural and formal tree and shrub planting to soften the appearance of the areas, with proposed pollinator species used to bring biodiversity into this space.

A range of high quality public Open Spaces have been proposed to cater for the recreational and amenity requirements of future residents and users. Extensive path systems that are organic in style. We have proposed native woodland tree planting, native transplants & a wild flower meadow mix to help create a natural habitat area.

The central space is open and grassy, defined by paths and semimature trees, allowing visibility through the park. The open spaces allow for active recreation and passive uses, creating a green focal point for the development. The park has more active elements to the east, including a natural play area and a multi-use games area with low observation mounds to the north and south.

The northern boundary separates the site from the adjacent N6 motorway. The existing hedgerow is retained and supplemented with planting of wildflower meadows and trees, creating a significant buffer zone, habitat renewal, and visual screening.

Communal courtyards and open spaces create a sense of place between the proposed residential blocks, providing small play spaces, seating areas, and congregation points for other community activities. Defensive planting buffer the building edge, ensuring privacy and planting that is unique to these spaces.

Retention and enhancement of biodiversity ensures that the natural, cultural, and health requirements of communities are integrated into, and not compromised by, the new development. This green infrastructure strategy follows an overarching strategy of protecting, creating, enhancing, and connecting the natural heritage and biodiversity value of the lands. The provision of 1,746 no. trees, along with shrub, wildflower, and bulb planting, thread through and surround the built environment and connect to one another, maximising the environmental benefits and habitat creation.

The creation of Habitat spaces along the retained hedgerows for birds, insects, badgers & bats is a vital element to the Green Infrastructure in Lissywollen. These areas will not be mown or sprayed so that wildlife can thrive uninterrupted by humans and create a stronger biodiversity within the development.

Trees Planting species and sizes were selected for their visual interest, robust and hardiness, habitat, and quality they will bring to spaces.

Delphi Design Architecture + Planning's Planning Report & Statement Of Consistency confirms the development proposal complies with the policies and objectives of the NPF; 'Compact Growth' that will aid the delivery of much needed housing on residentially zoned lands. In particular, the development proposal will strengthen the overall urban structure and support the town's growth as a key regional centre which will be a driver of regional growth, investment and prosperity for the Midlands by catering for increased residential density at an appropriate location. Creating a modern new urban quarter, in the compliance with the vision set out in the Athlone Town Development Plan 2014-2020 and the Lissywollen South Framework Plan 2018-2024. The development proposal provides for new homes at a sustainable location, with strategic access to existing services and facilities, and offers an appropriate mix of housing typologies which support the trends for smaller households and the need for lifetime adaptable homes. The development proposal also prioritises sustainable transport modes and caters for community facilities to support the future population.

The development proposal caters for an appropriate density in compliance with the Sustainable Residential Development in Urban Areas that include a mix of building heights ranging from 2 storey houses and 3, 4 & 5 storey duplex and apartment buildings. In addition, the proposal provides for a mix of building typologies, and includes a range of dwelling types, comprising circa 10% 1-bedroom units, 37% 2-bedroom units, 44% 3- bedroom units and 9% 4-bedroom units (49% houses, 43% apartments & 8% duplexes).

The development proposal complies with:

- the minimum apartment floor area requirements.
- a minimum of 50% dual aspect apartments in a single scheme in suburban or intermediate locations
- the minimum floor to ceiling height of apartments shall be 2.7m
- a maximum of 12 apartments per core may be provided within apartment schemes.

The design, layout and built form ensure the proposed development provides a variety of residential dwellings that are connected and accessible to existing services. The proposal provides for 2 no. childcare facilities; circa 83 and 62 no. children respectively, based on 516 no. dwellings (excluding 1 bed apartments) this would equate to a provision of circa 138 no. childcare spaces therefore exceeding this requirement and therefore complies with the 'Childcare Facilities – Guidelines for Planning Authority' (2001).

The Development Proposal has been designed with the needs of pedestrians, cyclists, public transport users and enhancement of the public realm considered creating an urban edge to the proposed new east-west access route traversing, prioritising connectivity for pedestrian and cyclists throughout, particularly to the Old Rail Trail Greenway to the south.

The proposed development provides an appropriate mix of housing typologies which will see the land develop to as a high quality new residential urban quarter which will integrate with the existing environs and services. The proposed development will assist in achieving the population and housing targets set for the county through the provision of 576 no. residential units to be built within the existing footprint of Athlone and in proximity to existing services in an appropriate location which is sensitive to the physical character of the built and natural environment. A mix of 1, 2, 3 & 4 bed houses, apartments and duplex units will meet the needs of a variety of households and support the provision of lifetime adaptable homes that can accommodate the changing needs of a household over time. The proposed development

provides for 60 no. 1 bed apartments and 212 no. two bed houses and apartments representing 10% and 37% of the proposed dwellings which will cater for 'start up units' and the growing trend for smaller household sizes.

The development proposal will deliver new housing on existing zoned and serviced lands and will facilitate significant population growth and achieve sustainable compact growth targets of 30% of all new homes to be built within the existing built up urban area. The development proposal caters for community infrastructure which will provide employment opportunities within the scheme and will aid the promotion of Athlone as a key tourist destination in the region through its design, layout and connections to the Old Rail Trail to the south.

All of the proposed dwellings have been designed to a high standard and are of a size capable of facilitating future alterations thereby supporting lifelong housing and independent living. The development agreement between the applicant and Westmeath County Council provides for 174 no. dwellings (30% of the total proposed) offered for social and affordable dwellings.

A housing mix comprised of 285 no. houses, 246 no. apartments and 45 no. duplex units ensure that a variety dwelling types and sizes are provided throughout the proposed scheme which can meet both the needs of a diverse population and the changing needs of same over the course of its lifecycle. All of the dwellings will be of a size which meets with and/or exceeds the required standards for new dwellings which allows for future alterations and supporting housing for life. The development proposal also caters for a large quantum of ground floor own door dwellings which can be easily accessed but people with disabilities and the elderly.

Public open space has been provided 15% of the site area and provides for a hierarchy of spaces which is detailed in the landscaping documents accompanying the planning application. The development proposal caters for a new east-west access route through the site. All of the proposed roads within the scheme are overlooked by proposed dwellings. All of the proposed dwellings have been designed to a high standard and are of a size capable of facilitating future alterations thereby supporting lifelong housing and independent living. The development proposal caters for housing which can be offered to both home purchasers and renters.

All areas of public open space have been located so as to be central to the development and overlooked by proposed dwellings for enhance security and passive surveillance delivering new residential accommodation on an undeveloped and underutilised site zoned for residential use. Providing housing to support the projected population growth of the area providing much needed housing typologies.

The proposed layout has been designed to prioritise public transport and other sustainable modes of transport catering for a new community hub facility and 2 no. childcare facilities to support future social infrastructure demands generated by the development as well as an ample provision of public open space which will offer recreational space for future residents. Ensuring the development is self-sustaining and, together within existing facilities in the vicinity, is of an appropriate scale for the subject site. The proposed layout has given consideration to the existing residential amenity in the vicinity and is designed to reduce any negative effects on same and provides for an overall net density of 42 dwellings per hectare, however density is varied across the site in consideration of the surrounding environs. Creating a modern, vibrant, new urban quarter as envisaged by the Lissywollen South Framework Plan (LSFP) which will be differentiated by 5 character areas throughout the site. This approach also for a diverse mix of housing and household types, while also ensuring that the sense of community in Brawney reinforced and protected providing a wide variety of residential dwellings including for terraced, semi-detached & detached housing, duplex and apartment units which can cater for residents in all stages of the life cycle. All of the proposed dwellings are provided with private amenity space.

The development proposed caters for a new east-west access route through the subject lands in compliance with the objectives of the Lissywollen South Framework Plan 2018-2024. The route of this proposed road formed an integral part of the design process and will allow for the lands to 'open up' and connect to existing amenities in the vicinity of the site. All areas of public open space have been located so as to be central to the development and overlooked by proposed dwellings for enhance security and passive surveillance.

The Proposed Development has been designed with cognisance to the need to promote the Old Rail Trail Greenway to the south as an important amenity feature in the town and the proposed development will offer several pedestrian / cycle links to the Old Rail Trail increasing access for both residents and visitors. The proposed development will be built out on a phased basis with a phasing plan accompanying the planning application. The proposed phasing of the development will ensure that there is a timely provision of social infrastructure in tandem with the delivery of residential dwellings.

The development proposal has considered the existing environmental amenity of the site. Where possible existing hedgerows and trees are maintained throughout the development and have been incorporated into the landscape features. New native trees and hedgerows will also be planted as part of the development scheme in order to support biodiversity initiatives. The environmental quality will be ensured throughout the development process implemented through construction management plans and on-site inspection.

The enclosed landscaping plans cater for active and passive recreation areas, children's play areas and street furniture. All of the proposed areas of public open space and roads are overlooked by proposed dwellings to ensure safety and security of these areas. 5 no. character areas will avoid the monotony of 'volume building' type schemes and create distinct urban forms. All of the materials used will be of a high quality and the proposed dwellings will be built to the most up to date energy efficient standards. The northwest of the site will cater of a more modern urban area, largely consisting of apartment units while the rest of the site will consist of more traditional 2 storey detached, semi-detached and terraced houses that will be distinguished by different material finishes. An Architectural Design Rationale document containing more details accompanies the planning application. The development proposal has encouraged higher buildings which also remain sensitive to the existing environs and the contextual sitting of the subject site. The proposed buildings of height are largely located to the northwest of the development site to create a welcoming urban form and a positive identity for the area which is compatible with the vision of the Framework Plan.

The Proposed Development caters for a new urban boulevard from Brawney Road to the northwest of the site to Garrycastle roundabout to the southeast of the site which will link all of the Area 1 & 2 lands within the Framework plan lands. The development also caters for an integrated network of secondary street which offer a mix of street typology and are compliant with DMURS. The proposed development also caters ample provision of footpaths, cycling routes and soft landscaping areas which will encourage walking/running within Lissywollen and promote healthy communities. These routes will be overlooked by proposed dwellings for passive surveillance and will ensure permeability throughout the subject lands. The proposed will cater for links to the Old Rail Trail to the south of the development site. All of the proposed areas of public open spaces & streets will be fronted onto by the proposed dwellings. The development proposal has been designed to prohibit the siting of rear elevations/gardens onto public open spaces, streets and the N6 national route.

The development proposal cater for a new east-west distributor road which will be tree lined, landscaped and finished with high quality design as per the enclosed landscaping and boundary treatment details. The development proposal caters for pocket parks as informal recreational spaces as desired by the objectives of the Framework Plan. These green space areas form a hierarchy of interconnecting green spaces which link existing and proposed public open spaces.

## 4.8 Pollution

This section addresses the prevention and control of pollution and surface water run-off associated with the building's location and use. Issues in this section aim to reduce the buildings impact on surrounding communities and environments arising from light-pollution, noise, flooding and emissions to air, land and water.

### 4.8.1 Light

Sunlight, Daylight & Shadow Assessment (impact Neighbours and Development Performance) (Chris Shackleton Consulting) confirms the application generally complies with the recommendations and guidelines of Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice (BRE 2011) and BS 8206 Lighting for Buildings and Part 2: Code of Practice for Daylighting.

This development has been successfully designed to maximise the occupant's access to light and reduce the impact on "existing" buildings. As such the design has used the guidelines in the spirit they have been written and balanced the requirements of this report with other constraints to arrive at this design.

### 4.8.2 Water

Following the Site Specific Flood Risk Assessment, it has been determined that the entire site / zoned developable area is located in Flood Zone C as defined by the Guidelines (i.e. proposed development is considered to have the required level of flood protection up to and including the 1% AEP flood event.)

Surface water runoff from the site will be attenuated to the greenfield runoff rate as outlined in the Greater Dublin Strategic Drainage Study (GDSDS). Surface water discharge rates will be controlled by Hydrobrake type vortex control devices in conjunction with attenuation storage.

### 4.8.3 Land

Due to the lack of significant residual impacts from the development that would affect the wider geological environment, there will be no significant cumulative impacts to land, soil and geology resulting from this project, and other local existing developments, projects and plans. All impacts on soils and geology relating to the proposed project will be localised and within the development footprint.

With appropriate mitigation measures implemented during the construction phase, the potential impact on land, soils and geology during construction is considered to have a short term, imperceptible significance.

There are no known areas of soil contamination on the site of the proposed development. According to the EPA online mapping (<http://gis.epa.ie/Envision>), there are no licenced waste facilities on or within the immediate environs of the site of the proposed development.

There are no historic mines at or in the immediate vicinity of the site of the proposed development that could potentially have contaminated tailings.

GSI have classified the site's groundwater vulnerability as "high" across the entire site.

GSI also classified underlying bedrock aquifers as "locally important".



There are no likely significant impacts on the land, soil or geological environment associated with the proposed operational development of the site. As such, the impact is considered to have a long term, imperceptible significance with a neutral impact on quality.

On completion of the construction phase, there will be no further unplanned events anticipated on soils and the geological environment.

#### 4.8.4 Air

The main impacts during the construction phase are related to the airborne dust generated by construction activities.

Although the Proposed Residential Development would result in a change to the existing road network, traffic flows' The predicted pollutant concentrations indicate that there would be no exceedances of pollutant limit values. All airborne contaminants screened fall well below the Air Quality Standard Limit Values for the protection of human health. They also fall below the lower assessment thresholds for all pollutants of concern.

On this basis, any changes in emissions associated with the existing and additional vehicular traffic on public roads would be negligible in terms of both increases and decreases in exposure to airborne pollutants. As the predicted total concentration is predicted to be well below the Air Quality Standard Limit Values for the protection of human health, and are predicted to experience a negligible change in pollutant concentration due to the proposed development.

No mitigation or monitoring is proposed as part of the Operational Phase of the Proposed Development due to negligible impacts.

#### Construction Phase Impacts

There are a small number of existing commercial and residential properties adjacent to and in the vicinity of the proposed residential development site, which have the potential to be affected by construction activities.

The construction phasing for the proposed development has been developed to ensure that the sensitive receptors (that is residents around Brawney Road; the single dwelling to the west of ESB Networks; users of Athlone Town Football Club; Old Rail Trail Greenway users and residents to the south of the greenway) would not be immediately proximal to the vast majority of the initial proposed works.

The predicted total concentration is predicted to be well below the Air Quality Standard Limit Values for the protection of human health (less than 75% of the AQAL), and predicted to experience a negligible change in pollutant concentration due to the proposed development. Considering the sensitivity of surrounding land uses, proximity to the works and the ameliorative, remedial or reductive mitigation measures, the construction related impacts of the residential development are likely to be Not Significant.

The timely implementation of sectoral emission reduction policies will be key to achieving this target.

The deposition of dust on surrounding lands, or spillage onto public roads shall be prevented at all times.

The following measures are proposed during the construction phase to mitigate against risks to the surrounding hydrological environment:



- A site-specific Construction Environmental Management Plan (CEMP) has been developed and will be implemented during the construction phase. Site inductions would include reference to the procedures and best practice as outlined in the CEMP.
- Construction works are carried out in such a manner that emissions of dust and other pollutants are limited, and that best practicable means are employed to minimise disruption, risks to human health, and to avoid unnecessary impacts on sensitive ecological habitats.
- The Contractor will be required to implement measures to minimise the amount of dust and emissions (including odour) produced during the Works. There will be a Duty of Care on the Contractor to ensure that dust-raising activities are located away from sensitive receptors (i.e. residents around Brawney Road) as much as feasibly possible and duration kept to a minimum.
- The Contractor shall prepare an Air Quality Management Plan (AQMP) and incorporate the relevant mitigation measures outlined below within; reflecting the requirements of best practicable means and level of risk to be included as part of the CEMP.
- Regular site inspections shall be undertaken to monitor compliance with the AQMP; record inspection results, and make an inspection log available to the relevant authorities/environmental bodies and the Employer's Project Manager when requested.
- Any water from excavations, etc. will be pumped into a designated settlement pond where it will be allowed to soak back into the water table. If there is not room in any area of the site for settlement ponds, the water will be pumped into a filtration bag or use of traps which separates any silt or use a Mechanical system such as the Silt Buster system which also separates the silt. Any areas of the site where there could be a risk of surface water runoff from the site into a watercourse or drain, we will set up protective silt fencing to protect the watercourse.
- Rain water or groundwater pumped from excavations is to be directed to on-site settlement ponds.
- Surface water runoff from areas stripped of hardstanding and surface water collected in excavations would be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.
- Weather conditions and seasonal weather variations would also be taken account of when planning stripping the site and excavations, with an objective of minimising soil erosion.
- In order to mitigate against spillages contaminating the surrounding surface water and hydrogeological environments, all oils, fuels, paints and other chemicals shall be stored in a secure bunded hardstand area. Refuelling and servicing of construction machinery would take place in a designated hardstand area which is also remote from any surface water inlets (where not possible to carry out such activities off site).
- Concrete batching would take place off site and wash out of concrete trucks will take place off site (at authorised concrete batching plant in full compliance with relevant planning and environmental consents).
- Discharge from any vehicle wheel wash areas is to be directed to on-site settlement ponds.
- It is proposed to implement a programme for monitoring water quality at the outfall as part of the construction of this development, in agreement with the Planning Authority.

- The construction compound would include adequate staff welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the construction compound will be tankered off site to a licensed facility until a connection to the public foul drainage network has been established.
- The construction compound's potable water supply shall be protected from contamination by any construction activities or materials.
- The predicted residual impacts on the water and hydrogeological environment arising from the operational phase will be negligible.
- The proposed development will typically require alteration of ground levels to ensure it is at an adequate level for the proposed surface water drainage, foul water drainage and to mitigate flood risk.
- Site development works would include stripping the 100mm thick topsoil layer. It is expected that all stripped topsoil will be reused on site (incorporated into landscaping of back gardens and public open spaces).
- Stripping of topsoil would result in exposure of the underlying subsoil layers to the effects of weather and construction traffic and may result in subsoil erosion and generation of sediment laden runoff.
- Earthworks plant (e.g. dump trucks) and vehicles delivering construction materials to site (e.g. road aggregates, concrete deliveries etc.) have potential to cause rutting and deterioration of the topsoil layer and any exposed subsoil layers, resulting in erosion and generation of sediment laden runoff. This issue can be particularly noticeable at site access points (resulting in deposition of mud and soil on the surrounding road network). Dust generation can also occur during extended dry weather periods as a result of construction traffic.
- There would be no direct discharges to soil or groundwater during the operational phase of the proposed development. Foul effluent and surface water will be discharged to the Irish Water sewer and surface water drainage network following the required treatment measures.
- There would be no significant storage or use of hazardous materials during the operational phase that could adversely impact subsoil, groundwater or surface water in the vicinity of the site. Accidental losses of oil, petrol or diesel on roadways or in car parks could cause contamination if these elements entered the underlying soil and groundwater. However, the presence of surface hardstanding throughout these areas would render this unlikely. In addition, all surface water would be routed through a suitably sized petrol interceptor before entering the public surface water network.
- Surface water runoff from areas stripped of topsoil would be directed to temporary on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.
- On-site settlement ponds are to include geotextile liners and riprapped inlets and outlets to prevent scour and erosion.
- Excavation of existing subsoil layers has been minimised as far as reasonably practicable. Cut type earthworks operations would not be required to achieve designed site levels, however some cut type earthworks will be required to construct block basements and

attenuation features. Cut material is considered likely to be suitable to be reused as non-structural fill elsewhere on site.

- Disturbed subsoil layers would be stabilised as soon as practicable (e.g. backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping). The duration that subsoil layers are exposed is to be minimised in order to mitigate against weather effects.
- Similar to comments regarding stripped topsoil, stockpiles of excavated subsoil material would be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles.
- Measures would be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection and earth bunding adjacent to open drainage ditches).
- The source of aggregate, fill material and topsoil imported to site would be carefully selected and vetted in order to ensure that it is of a reputable origin and that it is “clean” (i.e. will not contaminate the environment). Project contract and procurement procedures will be developed to ensure that aggregate, fill material and topsoil are acquired from reputable sources with suitable environmental management systems as well as regulatory and legal compliance.
- No large or long-term stockpiles of fill material would be held on the site. At any time, the extent of fill material held on site will be limited to that needed in the immediate vicinity of the active work area.
- Smaller stockpiles of fill, where required, would be suitably protected to ensure no sediment laden runoff enters existing surface water drains. Such stockpiles are to be located in order to avoid double handling.
- No mitigation measures are proposed in relation to the geological environment. There are no predicted impacts arising from the operational phase.
- Development of the site will result in a level of noise and vibration related effects on the environment during the construction phase. The interaction between Soils, Land & Geology and Noise and Vibration is considered to be moderate and temporary in nature. A construction traffic management plan will be implemented in order to minimise the disturbance caused by traffic.
- There is a potential for soil excavation activity to impact on air quality in terms of dust generated. Dust generation can also occur during extended dry weather periods as a result of construction traffic.
- Removal of the existing topsoil layer will be required across the site as well as removal of some trees, hedgerows etc.
- The Contractor should take all necessary measures to minimise disturbance caused by dust. Excavation and earthworks can be a potential source of dust if they are not properly controlled, especially in dry and windy weather and thus should be avoided at these times if practicable.
- Activities which have the potential to generate dust should be subject to a risk assessment, taking into account proximity to sensitive receptors, sensitive core activities

associated with the operation of the airport and duration. This will allow appropriate mitigation and management techniques to be implemented.

- Visual inspections should be undertaken regularly when dust-raising activities are occurring. Inspections should take into account prevailing meteorological conditions, and results shall be recorded and maintained. These inspections should take place at least daily, and should determine the effectiveness of the applied mitigation and management techniques.
- Appropriate measures should reflect the nature of the construction activity (type, dust source points, construction operation periods and time of year) as well as ameliorating conditions (such as prevailing wind directions and speeds, typical precipitation and the dampening effect of retained soil moisture).

## 4.9 Cultural Heritage

Archaeological Impact Assessment (John Purcell) confirms the proposed development is within an area of archaeological potential to the northeast of Athlone town. The development will have no impact on the recorded archaeological monuments in the area. The development will not be visible from the recorded monuments in the area and will have no impact physically. Test trenches were excavated across the site. No archaeological finds, features or architectural fragments were uncovered. As a result of this no further archaeological input is required. All recommendations are subject to agreement with the Department of Culture, Heritage and the Gaeltacht.

## 4.10 Noise and Vibration

The construction noise assessment also shows that construction noise threshold values would be exceeded, and adverse impacts identified at a number of the existing residential properties located around the development Site, therefore mitigation measures are considered necessary. Refer to the Noise and Vibration Assessment for further details.

The external amenity space noise assessment has shown that in a number of the areas of the site moderate and high impacts have been predicted in operation, therefore mitigation measures are considered necessary. The installation of acoustic barriers around the relevant amenity areas would reduce the noise levels within the outdoor amenity spaces. Noise levels incident upon the façade will require mitigation to meet the internal noise limits stipulated in BS8233:2014.

From an analysis of the available daytime and night-time ambient noise level predictions the highest glazing specification is required to meet the night-time maximum noise limit of 45dB(A) in a habitable room.

## 5 Conclusions

This Climate and Sustainability Appraisal has been prepared to accompany this Strategic Housing Development (SHD) Application to An Bord Pleanála for the Strategic Housing development at Lissywollen, Athlone, County Westmeath, for Alanna Roadbridge Developments Ltd.

The range of mitigation measures included in the design and the CEMP which include good practice methods would be employed to mitigate any risk of noise, dust or pollution. No identified impact in this assessment, cumulatively or individually is considered to likely cause significant effects on the environment.

In conclusion, it is considered that the Proposed Development would not have any significant impacts on the environment. All recommended mitigation measures and standard practices would be employed throughout the construction and operation phase of the development to ensure that the Proposed Development would not create any significant impacts on the quality of the surrounding environment.

### 5.1.1 Energy

Careful consideration has been given to the efficiency of the built environment in terms of the overall site layout and the design of individual dwellings and other building through:

Layout provides for orientation of east-west orientated blocks optimum orientation for maximisation of solar gain, sunlight, shelter and delivery of Nearly Zero Energy Buildings (NZEB);

Recognition of the importance of the retention, preservation and protection of trees, hedgerows, and associated watercourses and their utilisation for sustainable management of surface water; and

Careful consideration of pedestrian and cyclist permeability.

Passive house principles will be adopted to reduce the energy demand with features including:

- superior levels of insulation;
- increased levels of air tightness;
- improved Low E windows;

To deliver the most energy efficient dwellings the majority of the principals are embodied in the design and construction of the envelope and the mechanical systems therein.

With consideration to the future, provisions will be made on site for the installation of e-car charging points in accordance with the Athlone Town Development Plan. For the houses / duplex units ducting will be installed to the assigned parking space. The Part L renewable contribution shall be covered by the Roof Mounted PV Panels.

### 5.1.2 Climate Change

These are significant considerations for building and construction activities which should incorporate climate change contingencies into design specifications. In particular winter wind driven rain is likely to become a more important issue due to expected increases in wind speeds and rain. Rainfall will become more seasonal with wetter winters and dryer, more

overcast, summers. More extreme rainfall or precipitation events will occur, changing the current pattern of 'low duration, low intensity'. The likelihood of inland flooding will increase as a result.

Minimum temperatures during winter are projected to increase by ~2°C in the southeast and ~2.9°C in the north. This change will result in fewer frost days and milder night-time temperatures.

Projected increase in summer maximum daily temperature of approximately 20°C will likely intensify heatwaves, with maximum temperatures increasing and heatwave duration lengthening.

### 5.1.3 Transport

The development would appear to have very good public transport links, with the presence of the adjacent station.

The subject site will be highly accessible to pedestrians and cyclists. Pedestrians and cyclists will be given priority within the internal site layout to ensure travel desire lines within the site are accommodated providing a good level of service and ensures the risk of vehicle/pedestrian conflict is minimised.

Dedicated pedestrian / cycle paths are proposed throughout the site layout providing a traffic free route between the different sections of the development site. Furthermore, pedestrian facilities are proposed on two sides and two-way cycle facilities on one side of the extended Brawney Road corridor.

The design has assigned higher priority to the movement of pedestrians and cyclists within the development, implementing self-regulating streets which actively manage vehicle movements within a low speed, high-quality residential environment.

Parking is provided through a mix of in curtilage perpendicular spaces measuring 5m x 2.5m, off street car park areas and parallel spaces measuring 6m x 2.2m. The provision of on-street car parking includes both parallel and perpendicular parking bays along either one or both sides of the internal local streets. The potential dominance of both on and off street car park areas are minimised through the provision of landscaped buffers and street trees.

The proposals incorporate a hierarchy of internal streets which are firmly set within the context of the local Athlone receiving environment. In parallel the adopted DMURS design philosophy has sought to consider the context / place status of each residential local street in terms of level of connectivity provided, quality of the proposed design, level of pedestrian / cyclists activity and vulnerable users requirements whilst identifying appropriate 'transition' solutions between different street types.

A significant number of bicycle parking spaces are proposed within the development to accommodate residents, visitors and staff to the site.

The on-site cycle facilities will be linked to the existing and proposed off-site cycle routes. Also, improved cycle infrastructure is proposed under the NTA and local authority green route which runs in close proximity to this site.

Additionally, the site developers will equip all residences with broadband compatible connection points, to enable residents to access to broadband services, which will help facilitate access to MMP information. Information on the website will include details of local public transport routes, local amenities and facilities, walking and cycle maps and a link to



online car sharing opportunities. The website will also provide links to other websites (such as Dublin Bus) to encourage residents to plan their journeys using sustainable transport.

The subject site benefits from good public transport accessibility levels with bus-based services already calling close to the masterplan lands and providing connections to additional public transport services at Athlone Rail Station and Bus Station located approximately 2km to the southwest.

The proposed residential scheme's internal road layout has been designed to be consistent with both the principles and guidance outlined within the Design Manual for Urban Roads and Streets (DMURS) 2013 (updated May 2019).

The proposed development layout design provides a total of 752 no. car parking spaces and includes for the provision of one on-street coach parking space and 11 no. car parking spaces immediately adjoining Scoil na gCeithre Máistrí. These 11 on street spaces could be assigned for school use Monday to Friday from 8am to 4pm. Outside of these hours, these parking spaces can be used for visitor parking by the residential development.

The subject proposals include for 7 no. mobility impaired spaces. The scheme proposals also include 30 no. EV car parking spaces and should the demand for EV parking spaces increase beyond supply, additional EV charging facilities can be easily retrofitted with the appropriate ducting provided to enable easy retro fit of the charged units. A total of 1,613 no. bicycle parking opportunities are proposed.

In conclusion, it is considered that the impact on the surrounding road network, as a result of the proposed masterplan development on the surrounding road network will be negligible. This is based on the anticipated levels of traffic generated by the proposed development, the level of mitigation achieved following the implementation of the proposed road infrastructure upgrades at the two offsite roundabouts and the information and analysis summarised in the above report.

It is concluded that the proposals represent a sustainable and practical approach to development on the subject Lissywollen South lands and there are no traffic or transportation related reasons that should prevent the granting of planning permission for the proposed residential development.

#### 5.1.4 Flood Risk

The Proposed Development site falls entirely outside the 0.1% Annual Exceedance Probability (AEP) event (1 in 1,000 year). It can be concluded that the Proposed Development is located within flood zone C.

Site levels will be designed such that overland flow caused by any flooding from the site drainage system, or from surface water that fails to enter the site drainage system in extreme events, will not flood buildings, driveways or footpaths. Surface water is designed to remain within the bounds of roadway reservations.

The site drainage network has been modelled so no flooding occurs throughout the site for the design return period of 1 in 100 years (plus 10% climate change), and is considered to exceed the requirements of the GDSDS for a 1 in 30-year return period surcharge check. Overland flood routes also reduce the development's vulnerability to climate change.

#### 5.1.5 Drainage

The western catchment generally slopes south west towards the proposed outfall point while the eastern catchment generally falls in a north easterly direction. It is therefore proposed

localised raising of the existing ground levels may be required in some locations in order to achieve a gravity discharge solution and provide sufficient cover over proposed foul sewers.

On the assumption of infiltration not being feasible surface water flows from the proposed development are to be attenuated to greenfield runoff rates in conjunction with implementation of SUDS strategies such as permeable paving, detention basins and installation of a Class 1 by-pass fuel / oil separator prior to discharging to the public surface water network.

Based on the above, it is not currently envisaged that the proposed development works will have any direct impact on the existing underlying hydrogeology & geology.

Diversion of this existing sewer will be required in order to accommodate the proposed site layout. Surface water runoff from the site's road network will be directed to a proposed surface water pipe network via road gullies while surface water from roofs will be routed to the proposed surface water pipe network via the porous aggregates beneath permeable paved driveways (providing an additional element of attenuation).

Surface water will pass through silt trap manholes prior to entering the attenuation system. Discharge rates from the proposed surface water drainage network will be controlled by a vortex flow control device (Hydrobrake or equivalent), associated underground attenuation tanks (Pluvial Cube or equivalent) and detention basins. Surface water discharge will also pass via a by-pass fuel / oil separator (sized in accordance with permitted discharge from the site).

Surface water calculations are based on an allowable greenfield runoff rate of 78.5l/s (20.7l/s western catchment, 57.8l/s eastern catchment) in accordance with the Greater Dublin Strategic Drainage Strategy (GDSDS). This results in a total attenuation volume for the 2 no. Surface Water Drainage Catchments of approx. 2,770m<sup>3</sup> (810m<sup>3</sup> western catchment, 1,960m<sup>3</sup> eastern catchment).

The surface water drainage network, attenuation storage and site levels are designed to accommodate a 100-year storm event (provision for climate change included). Floor levels of the residential units are set above the 100-year flood levels by a minimum of 0.5m.

### 5.1.6 Biodiversity

All habitats present on site were of low ecological importance at both landscape and local scales. There were no species identified on site which are invasive and subject to restrictions (Third Schedule) under Regulation 49 of the European Communities (Birds and Natural Habitats) Regulations, 2011. The central hedgerow provides a linear feature of moderate local importance with potential for breeding birds to use it. The hedgerow will be maintained as it has a full canopy and complex understory.

Connectivity to the wider landscape will be maintained to the north of the site and augmented supplementary planting of native trees will increase the condition of the existing hedgerow to the north.

The project is not expected to contribute significant cumulative impacts. There will be a short-term reduction of habitat connectivity and the availability of local breeding bird habitat during the implementation of the landscape management plan as the supplementary planting is undertaken and the trees establish and mature.

There will be a permanent loss of around 990m of semi mature hedgerows of varying quality. Given the urban context of the site, the low abundance of species identified on site and the availability of similar habitat in the area, this is not identified as a significant impact to the flora and fauna of the receiving environment.

The operational phase works are not anticipated to have any impacts beyond the site boundary due to the proposed characteristics of the development.

There are no other long-term residual impacts identified as the majority of the site is currently heavily managed agricultural grassland or disturbed ground.

The creation of habitat spaces along the retained hedgerows for birds, insects, badgers & bats is a vital element to the Green Infrastructure in this development. These areas will not be mown or sprayed so that wildlife can thrive uninterrupted by humans and create a stronger biodiversity within the development.

Retention and enhancement of biodiversity ensures that the natural, cultural, and health requirements of communities are integrated into, and not compromised by, the new development. This green infrastructure strategy follows an overarching strategy of protecting, creating, enhancing, and connecting the natural heritage and biodiversity value of the lands. The provision of 1,746 no. trees, along with shrub, wildflower, and bulb planting, thread through and surround the built environment and connect to one another, maximising the environmental benefits and habitat creation.

#### 5.1.7 Statement of Consistency

The Planning Report & Statement Of Consistency confirms the developments 'Compact Growth' will aid the delivery of much needed housing on residentially zoned lands, strengthening the overall urban structure supporting the town's growth driving regional growth, investment and prosperity for the Midlands by catering for increased residential density at an appropriate location. The Development Proposal provides for new homes at a sustainable location, with strategic access to existing services and facilities, and offers an appropriate mix of housing typologies which support the trends for smaller households and the need for lifetime adaptable homes. Sustainable transport modes are prioritised and caters for community facilities to support the future population.

The Development is of an appropriate density that include a mix of building typologies, and includes a range of dwelling types, comprising circa 10% 1-bedroom units, 37% 2-bedroom units, 44% 3-bedroom units and 9% 4-bedroom units (49% houses, 43% apartments & 8% duplexes).

The development proposal complies with:

- the minimum apartment floor area requirements.
- a minimum of 50% dual aspect apartments in a single scheme in suburban or intermediate locations
- the minimum floor to ceiling height of apartments shall be 2.7m
- a maximum of 12 apartments per core may be provided within apartment schemes.

The design, layout and built form ensure the proposed development provides a variety of residential dwellings that are connected and accessible to existing services. The proposal provides for 2 no. childcare facilities; circa 83 and 62 no. children respectively, based on 516 no. dwellings (excluding 1 bed apartments) this would equate to a provision of circa 138 no. childcare spaces therefore exceeding this requirement and therefore complies with the 'Childcare Facilities – Guidelines for Planning Authority' (2001).

The proposed development will see the land develop to as a high quality new residential urban quarter which will integrate with the existing environs and services, assisting with the population and housing targets set for the county through the provision of 576 no. residential units in an appropriate location which is sensitive to the physical character of the built and natural environment. The housing mix will meet the needs of a variety of households and

support the provision of lifetime adaptable homes that can accommodate the changing needs of a household over time; 60 no. 1 bed apartments and 212 no. two bed houses and apartments. The apartments represent 10% and 37% of the proposed dwellings and will cater for 'start up units' and the growing trend for smaller household sizes.

The development will achieve sustainable compact growth targets of 30% of all new homes to be built within the existing built up urban area catering for community infrastructure providing employment opportunities within the scheme that will aid the promotion of Athlone as a key tourist destination in the region through its design, layout and connections to the Old Rail Trail to the south.

The development agreement between the applicant and Westmeath County Council provides for 174 no. dwellings (30% of the total proposed) offered for social and affordable dwellings. The housing mix comprised of 285 no. houses, 246 no. apartments and 45 no. duplex units ensures that a variety dwelling types and sizes are provided throughout the proposed scheme which can meet both the needs of a diverse population and the changing needs of same over the course its lifecycle. All of the dwellings will be of a size which meets with and/or exceeds the required standards for new dwellings in addition a large quantum of ground floor own door dwellings which can be easily accessed but people with disabilities and the elderly.

Public open space has been provided 15% of the site area and provides for a hierarchy of spaces which is detailed in the landscaping documents accompanying the planning application. The Development Proposal caters for housing which can be offered to both home purchasers and renters.

All areas of public open space have been located so as to be central to the development and overlooked by proposed dwellings for enhance security and passive surveillance delivering new residential accommodation on an undeveloped and underutilised site zoned for residential use. Providing housing to support the projected population growth of the area providing much needed housing typologies.

Ensuring the development is self-sustaining and, together within existing facilities in the vicinity, is of an appropriate scale for the subject site. Providing an overall net density of 42 dwellings per hectare, however density is varied across the site in consideration of the surrounding environs. Creating a modern, vibrant, new urban quarter as envisaged by the Lissywollen South Framework Plan (LSFP) which will be differentiated by 5 character areas throughout the site. This approach also for a diverse mix of housing and household types, while also ensuring that the sense of community in Brawney is reinforced and protected providing a wide variety of residential dwellings including for terraced, semi-detached & detached housing, duplex and apartment units which can cater for residents in all stages of the life cycle. All of the proposed dwellings are provided with private amenity space.

The Proposed Development will be built out on a phased basis with a phasing plan accompanying the planning application. The proposed phasing of the development will ensure that there is a timely provision of social infrastructure in tandem with the delivery of residential dwellings.

The development proposal has considered the existing environmental amenity of the site. Where possible existing hedgerows and trees are maintained throughout the development and have been incorporated into the landscape features. New native trees and hedgerows will also be planted as part of the development scheme in order to support biodiversity initiatives. The environmental quality will be ensured throughout the development process implemented through construction management plans and on-site inspection.

The enclosed landscaping plans cater for active and passive recreation areas, children's play areas and street furniture. 5 no. character areas will avoid the monotony of 'volume building'

type schemes and create distinct urban forms. The development proposal has encouraged higher buildings which also remain sensitive to the existing environs and the contextual sitting of the subject site. The proposed buildings of height are largely located to the northwest of the development site to create a welcoming urban form and a positive identity for the area which is compatible with the vision of the Framework Plan.

#### 5.1.8 Pollution

This development has been successfully designed to maximise the occupant's access to light and reduce the impact on "existing" buildings.

Due to the lack of significant residual impacts from the development that would affect the wider geological environment, there will be no significant cumulative impacts to land, soil and geology resulting from this project, and other local existing developments, projects and plans. All impacts on soils and geology relating to the proposed project will be localised and within the development footprint.

With appropriate mitigation measures implemented during the construction phase, the potential impact on land, soils and geology during construction is considered to have a short term, imperceptible significance.

There are no known areas of soil contamination on the site of the proposed development. There are no historic mines at or in the immediate vicinity of the site of the proposed development that could potentially have contaminated tailings.

There are no likely significant impacts on the land, soil or geological environment associated with the proposed operational development of the site. As such, the impact is considered to have a long term, imperceptible significance with a neutral impact on quality.

On completion of the construction phase, there will be no further unplanned events anticipated on soils and the geological environment.

No air mitigation or monitoring is proposed as part of the Operational Phase of the Proposed Development due to negligible impacts.

The predicted total concentration is predicted to be well below the Air Quality Standard Limit Values for the protection of human health (less than 75% of the AQAL), and predicted to experience a negligible change in pollutant concentration due to the proposed development.

Considering the sensitivity of surrounding land uses, proximity to the works and the ameliorative, remedial or reductive mitigation measures, the construction related impacts of the residential development are likely to be Not Significant.

The timely implementation of sectoral emission reduction policies will be key to achieving this target.

The external amenity space noise assessment has shown that in a number of the areas of the site moderate and high impacts have been predicted in operation, therefore mitigation measures are considered necessary. The installation of acoustic barriers around the relevant amenity areas would reduce the noise levels within the outdoor amenity spaces. Noise levels incident upon the façade will require mitigation to meet the internal noise limits stipulated in BS8233:2014.

From an analysis of the available daytime and night-time ambient noise level predictions the highest glazing specification is required to meet the night-time maximum noise limit of 45dB(A) in a habitable room.

#### 5.1.9 Conclusion

In conclusion, it is considered that the Proposed Development would not have any significant impacts on the environment. All recommended mitigation measures and standard practices would be employed throughout the construction and operation phase of the development to ensure that the Proposed Development would not create any significant impacts on the quality of the surrounding environment.



# Appendix A Document copies

Document Title	Prepared by
EIAR Chapter 5 - Biodiversity	FGE Consulting
Sunlight / Daylight Analysis & overshadowing	Chris Shackleton Consulting
Site Specific Floor Risk Assessment	DBFL Consulting Engineers
Mobility Management Plans	DBFL Consulting Engineers
Design Manual for Urban Road and Streets (DMURS) Statement	DBFL Consulting Engineers
Archaeological Survey Retreat testing report	John Purcell Archaeological Consultancy
Construction Demolition Waste Management Plan	Alanna Homes
Statement of Consistency	Delphi Design Architecture + Planning
Noise Impact Assessment	SLR Consulting
Sustainability	Alanna Homes
Landscape Rationale	RMDA
EIAR Chapter 7 - Water	
EIAR Chapter 6 - Land, Soil & Geology	DBFL Consulting Engineers
Traffic and Transport Assessment	DBFL Consulting Engineers
Waste Management	
EAIR Chapter 10 - Air	AECOM

## List of Acronyms

Annual Exceedance Probability (AEP)  
Athlone Institute of Technology (AIT)  
Appropriate Assessment (AA)  
Athlone Town Development Plan (ATP)  
Catchment Flood Risk Assessment and Management (CFRAM)  
Climate Action Regional Offices (CAROs)  
climate models (GCMs)  
Combined Heat & Power (CHP)  
Council for Forest Research and Development (CoFoRD)  
Department of Agriculture, Forestry and Marine (DAFM)  
Department of Housing, Local Government and Heritage (DEHLG)  
Department of the Environment, Climate and Communications (DCCAE)  
Department of Housing, Planning and Local Government (DHPLG)  
Department of Transport, Tourism and Sport (DTTAS)  
Design and Access Statement (DAS)  
Design Manual for Urban Roads and Streets (DMURS)  
Emissions Trading Scheme (ETS)  
Environmental Impact Assessment (EIA)  
Environmental Impact Assessment Report (EIAR)  
Environmental Protection Agency (EPA)  
European Regional Development Fund (ERDF)  
European Union (EU)  
Greater Dublin Strategic Drainage Strategy (GDSDS)  
greenhouse gas (GHG) National Planning Framework (NPF)  
heat recovery ventilation (HRV)  
Institute of Environmental Management and Assessment (IEMA)  
IPCC Special Reports on Emissions Scenarios (SRESs)  
Local Action (LAP)  
million gallons per day (MGD)  
National Adaptation Framework (NAF)  
National Climate Change Adaptation Network (NCCAF)  
National Cycle Network (NCN)  
National Transport Authority (NTA)  
Nationally Determined Contributions (NDCs)  
Natura Impact Statement (NIS)  
Nearly Zero Energy Buildings (NZEB)  
Office of Climate Licensing and Resource Use (OCLR)  
Office of Public Works (OPW)  
Regional Planning Guidelines (RPGs)  
Special Area of Conservation (SAC)  
Special Protection Area (SPA)  
Strategic Environmental Assessment (SEA)  
Strategic Flood Risk Assessment (SFRA)  
Strategic Housing Development (SHD)  
Sustainable Drainage Systems (SUDS)  
United Nations Framework Convention on Climate Change (UNFCCC)  
urban area adaptation Urb-ADAPT



