

6 Population and Human Health

6.1 Introduction

The 2014 EIA Directive (2014/52/EU)¹, as transposed into Irish legislation, amended the topics to be addressed in an EIAR and has replaced 'Human Beings' with 'Population and Human Health'.

In preparing this chapter, consideration has been given to the other inputs to this EIAR including, in particular, the chapters addressing Air Quality and Climate, Noise and Vibration, and the separate reports addressing Construction and Environmental Management Plan.

Population and Human Health comprise an important aspect of the environmental impact assessment to be undertaken by the competent authority. Any significant impact on the status of human health, which may be potentially caused by a development proposal, must therefore be comprehensively addressed.

The 'Guidelines on the information to be contained in Environmental Impact Assessment Reports'², published by the EPA states that *"In an EIAR, the assessment of impacts on population & human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in the EIAR e.g. under the environmental factors of air, water, soil etc."*

This chapter of the Environmental Impact Assessment Report (EIAR) focuses primarily on the potential likely and significant effects on Population, which includes Human Beings, and Human Health in relation to health effects/issues and environmental hazards arising from the other environmental factors. The potential effects and mitigation measures are considered in the following broad areas of investigation:

- Population
- Employment
- Community
- Human Health

6.2 Consultation

ORS/JSA have been commissioned to assess the potential effects of the Proposed Development in terms of Population and Human Health during the construction and operational phases.

The principal members of the EIA team involved in this assessment include the following persons:

- **Lead Author:** Luke Wymer – B.A., MRUP, Dip. Environmental and Planning Law, Dip PM, Adv. Cert. Environmental Management. Current Role: Executive Director of John Spain Associates. Experience c. 8 years.
- **Co-Author:** Mark Fitzgibbon – BSc, MRUP. Current Role: Planner. Experience c. 2 years.

¹ European Union, *EIA Directive 2014/52/EU*: [Directive - 2014/52 - EN - EIA - EUR-Lex \(europa.eu\)](https://eur-lex.europa.eu/eli/dir/2014/52/oj)

² EPA, *Guidelines on the information to be contained in environmental Impact Assessment Reports*: [Error: 404 Whoops! Page does not exist. | Environmental Protection Agency \(epa.ie\)](#)

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- **Project Coordinator & Co Author:** Luke Martin - B.A. (MOD) (Natural Sciences), M.Sc. (Sustainable Energy and Green Technology), CEnv, MIEEnvSc. Current Role: Senior Environmental Consultant. Experience c. 12 years.
- **Project Coordinator & Reviewer:** Oisín Doherty – B.Sc. (Geography with Environmental Science), MSc. (Environmental Management), CEnv, MIEEnvSc. Current Role: Associate Director. Experience c. 14 years.

Consultation was undertaken between the Applicant, ORS/JSA and other members of the planning/design team in order to obtain information required to assess the potential construction and operational phase effects on Population and Human Health.

6.3 Assessment Methodology & Significance Criteria

6.3.1 Desktop Study

The European Commission's Guidance on the preparation of the Environmental Impact Assessment Report (2017) does reference the requirement to describe and, where appropriate, quantify the primary and secondary effects on human health and welfare. Moreover, the European Commission guidance states the following in relation to the assessment of Human Health:

“Human health is a very broad factor that would be highly Project dependent. The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation, and decommissioning of a Project in relation to workers on the Project and surrounding population.”

In accordance with this approach to Human Health espoused in the Commission Guidance, this chapter addresses Human Health in the context of other factors addressed elsewhere in further detail within the EIAR. Relevant factors identified include inter alia water, air quality, noise, and the risk of major accidents and disasters.

In addition, this chapter of the EIAR has been prepared with reference to recent national publications which provide guidance on the 2014 EIA Directive including the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018) and the Guidelines on the information to be contained in environmental impact assessment reports, published by the EPA in 2022.

Moreover, the following guidance published by the Institute of Sustainability and Environmental Professionals (ISEP), formerly known as the Institute of Environmental Management and Assessment [IEMA], in November 2022 has been utilised in the preparation of this chapter:

- The IEMA Guide to Effective Scoping of Human Health in Environmental Impact Assessment.
- The IEMA Guide to Determining Significance for Human Health In Environmental Impact Assessment.

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The IEMA Guide on Scoping of Human Health states the following *inter alia*:

“EIA is a legal requirement for certain types of public and private projects and follows a structured process. EIA informs an application for consent to proceed with a project and is a key public health and environmental sustainability activity.

It aims to ensure potential positive health impacts and prevent potential negative health impacts of a project. Improving population health and reducing inequalities in health has an intrinsic value that is of huge importance to all communities, and it is a highly cost-effective policy objective.”

With regard to the selection of a study area for assessing human health impact, the IEMA (2022) guide on scoping for human health assessment states the following:

“Using a single geographically defined neighbouring community (site-specific population) to cover a range of effects across different wider determinants of health can provide appropriate flexibility and is proportionate. If there are clearly distinct localities from which a project’s activities occur (e.g. communities along a linear development) it would be appropriate to present multiple separate site-specific geographic populations.

Reporting should have regard to the geographic audiences most relevant to the health effects of the project. The populations of relevant geographic areas should be defined to aid understanding of the individual and combined health effects due to the project. For projects of a linear nature (e.g. cable, pipeline, road or rail infrastructure), reporting structure should allow the localised conclusions for relevant geographic areas to be understood separately. This does not require that every community has a separate reporting section, but that relevant localised effects should be discussed as appropriate.”

The 2018 EIA Guidelines published by the Department of Housing, Planning and Local Government (DHPLG) state that there is a close interrelationship between the SEA Directive and the 2014 EIA Directive. The Guidelines state that the term ‘Human Health’ is contained within both of these directives, and that a common interpretation of this term should therefore be applied. A comprehensive desk study was undertaken to assess the potential effects of the Proposed Development on Population and Human Health. This study involved the collation and assessment of data from the following sources:

- Central Statistics Office (CSO) Census Data 2016 - 2022³.
- Galway County Council Website.
- Galway County Development Plan 2022 - 2028⁴.
- Regional Spatial and Economic Strategy for the Northern & Western Regional Assembly⁵ (RSES).
- Environmental Protection Agency (EPA).
- Pobal HP Deprivation Index⁶.
- OSI Mapping and Aerial Photography to classify land use and identify amenity sites.
- Composting & Anaerobic Digestion Association of Ireland (CRÉ).
- Code of Practice for Chemical Agents, HSA 2016.

³ Central Statistics Office: [Employment, Occupation, Industry and Commuting - CSO - Central Statistics Office](#)

⁴ GCC (2022) CDP: <https://consult.galway.ie/en/consultation/adopted-galway-county-development-plan-2022-2028>

⁵ Southern Regional Assembly: RSES: [RSES | Southern Regional Assembly](#)

⁶ Pobal (Nd) Pobal HP Deprivation Index: [Pobal HP Deprivation Index Launched - Pobal](#)

- Chemical Agents and Carcinogens Code of Practice 2021, HSA⁷.
- Section 20 of the Safety, Health, and Welfare at Work Act 2005.
- Quarterly Economic Commentary, Autumn 2025, ESRI, September 2025.
- Labour Force Survey Quarter 2 2025.

6.3.2 Field Work

A site walk-over was conducted by ORS consultants in June 2025 to gain an understanding of the site and the surrounding environment.

Representatives of the applicant also conducted an online information event with stakeholders from the area of the Proposed Development, with an information event held on the 29th of July 2025. The applicant engaged with local residents individually to discuss the Proposed Development. The applicant also responded to all messages received by email, telephone and social media.

6.3.3 Impact Assessment Methodology

Once the identification of the baseline environs was conducted, the available data was then utilised to identify and assess the potential effects posed by the development on the Population and Human Health receptors withing the area.

6.3.3.1 Population Sensitivity

The assessment of significance of an impact is a professional appraisal based on the sensitivity of the receptor and the magnitude of effect. Within any area, the sensitivity of individuals in a population will vary.

The Health Impact Assessment Guidance provided by the Institute of Public Health (IPH, 2021) provides a conceptual model of the different components of sensitivity in the public health context (refer to **Figure 6.1**). The conceptual model utilises criteria (segments) and indicative classifications (levels) to underpin a finding on the sensitivity of a receptor.

The resulting outcome may be summarised as high, medium, low or negligible sensitivity to change resulting from a Proposed Development.

The existing sensitivity of the receiving environment (in terms of Population and Human Health) has been appraised for the study area with a desk-based assessment of routine demographic and health indicators, rather than the use of surveys or collection of primary data.

This includes analysis of existing data (as available) from the Central Statistics Office (CSO) and Pobal to gain a profile of the baseline population information and the sensitivity to change within the study area.

Topographical maps and Google maps, along with the information contained within the Planning Report and other application documents have also been used to inform the baseline description of the area in terms of existing economic activity, employment, community infrastructure, emergency services, tourism and recreation amenities.

⁷ HAS (2021) *Chemical Agents and Carcinogens Code of Practice 2021*: [Chemical Agents and Carcinogens Code of Practice 2021 - Health and Safety Authority \(hsa.ie\)](https://www.hsa.ie/en-gb/chemical-agents-and-carcinogens-code-of-practice-2021)

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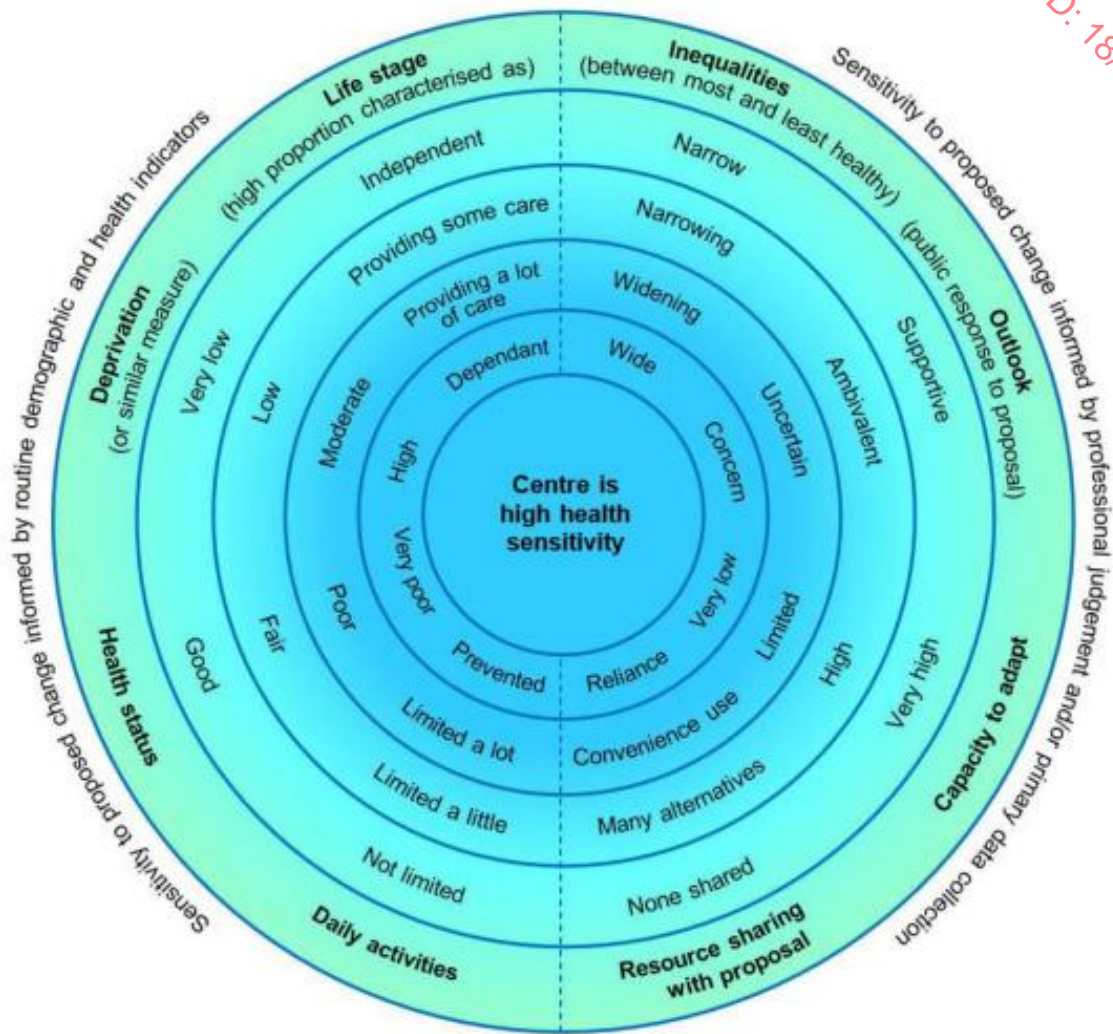


Figure 6.1: Extract from Figure T09 – Health Sensitivity Conceptual Model [IPH 2021]

6.3.3.2 Impact Magnitude

Magnitude considers the characteristics of the change which would affect the receptor as a result of the proposal.

The IPH 2021 Health Impact Assessment Guidance provides a conceptual model of the different components of sensitivity (Figure 6.2 below refers). In a similar framework to the conceptual model for sensitivity, this model provides different components of magnitude. It uses criteria (segments) and indicative classifications (levels) underpin a finding on impact magnitude. The conclusion from this model can be summarised as a high, medium, low or negligible magnitude of change.

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diversity of professional perspectives, e.g. academics, public health practitioners, regulators and policy makers.

The model below, includes the factors of magnitude of impact and the sensitivity of receptors as determined by the conceptual models discussed above. This assessment typically relies on regulatory thresholds, where there would be formal monitoring by regulators, to set out the acceptability or desirability of change to population health. The determination of significance also has regard to health priorities, the relevant scientific literature, health policy context, and responses to consultation.

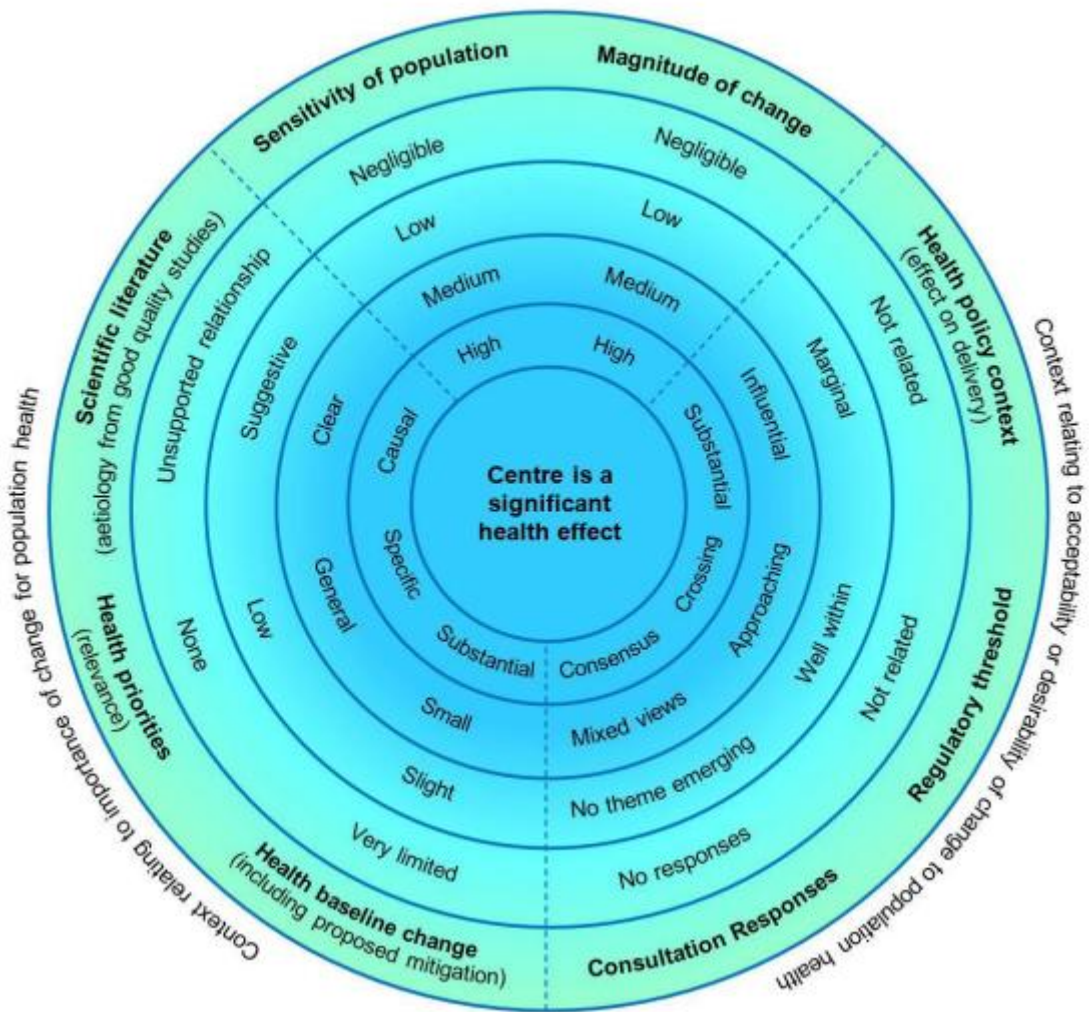


Figure 6.3: Extract from Figure T12 – Health Significance Conceptual Model [IPH 2021]

This chapter also has regard to the guidance on determining impact significance for human health in Environmental Impact Assessment, as provided within the 2022 IEMA Guide. The guidance highlights the importance of aggregating accurate and representative baseline data to help determine the sensitivity of a population, with Table 7.1 of the Guide providing a methodology for rating health sensitivity, Table 7.2 providing a methodology for health magnitude rating, and Table 7.4 providing a categorisation of significance depending on indicative criteria.

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The generic indicative EIA Significance Matrix provided within the 2022 EPA Guidelines was also taken account of in the prediction of significance and the categorisation of effects carried out within this EIAR Chapter.

This chapter of the EIAR document focuses primarily on the potential likely and significant effect on Population, which includes Human Beings, and Human Health in relation to health effects/issues and environmental hazards arising from the other environmental factors. Where there are identified associated and inter-related potential likely and significant effects which are more comprehensively addressed elsewhere in this EIAR document, these are referred to. The reader is directed to the relevant environmental chapter of this EIAR document for a more detailed assessment.

6.3.3.4 Human Health Risk Assessment (On-Site)

The assessment of significance of an impact is a professional appraisal based on the sensitivity of the receptor and the magnitude of effect. Within any area, the sensitivity of individuals in a population will vary.

Once the identification of the baseline environs was conducted, the available data was then utilised to identify and assess the potential effects posed by the Proposed Development on the Population and Human Health receptors within the area.

Appraisal of Impact

- Direct Impact: where the existing baseline in the immediate vicinity of the Proposed Development is altered by activities associated with the construction or operational phases of said development.
- Indirect Impact: where the baseline beyond the Proposed Development is altered by activities associated with the construction or operational phases of said development.
- No Significant Impact: The Proposed Development has neither a positive or negative impact upon the local population or human health.

Human Health

The methodology used in the assessment of Human Health in this Chapter was guided by the US Environmental Protection Agency (US EPA) in their Human Health Risk Assessment process. This assessment methodology follows a 4-step process:

- Hazard Identification
- Dose-Response Assessment
- Exposure Assessment
- Risk Characterisation

Hazard Identification

Examines whether a stressor (impact) has the potential to cause harm to humans and/or ecological systems, and if so, under what circumstances.

Dose-Response Assessment

Examines the numerical relationship between exposure and effects.

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Exposure Assessment

Examines what is known about the frequency, timing, and levels of contact with a stressor.

Risk Characterisation

Examines how well the data support conclusions about the nature and extent of the risk from exposure to environmental stressors.

6.4 Description of the Receiving Environment

6.4.1 Background

A description of the relevant aspects of the current state of the environment (baseline scenario) in relation to Population and Human Health is provided below. Specific environmental chapters in this EIAR provide a baseline scenario relevant to the environmental topic being discussed. Therefore, the baseline scenario for separate environmental topics is not duplicated in this section; however, in line with guidance provided by the European Commission, the EPA and the DHPLG, the assessment of effects on Population and Human Health refers to those environmental topics under which human health effects might occur, e.g. noise, water, air quality etc.

This section of the chapter provides the baseline information in relation to population and human health that exists in the vicinity of the Proposed Development. The Proposed Development site ('the Site' hereafter) occupies a total area of approximately 4.0 hectares and is situated in the townland of Glenloughaun, near Ballinasloe, Co. Galway. The operational area of Ballinasloe town Local Area Plan (2022-2028) is located c. 2.3km north of the Site (at the M6 Motorway) and the centre of Ballinasloe town is located c. 3.9km to the north. The R335 regional road provides access north to the M6 and the R446 which runs through Ballinasloe town. The Site itself is located along a local road called Glenloughaun Road (L8412). The Site is primarily greenfield and partially brownfield in nature, comprising existing hardstanding and buildings, and is primarily in agricultural use. The Site is surrounded primarily by agricultural farmland with the exception of an existing business unit adjacent to the site and fronting onto the local road north of the site.

The Site is bound to the north by Glenloughaun Road (L-8412) and partially by a site consisting of a meat-processing facility to the northeast of the main site area. To the west, south and east, the Site is bound by agricultural lands.

The receiving environment is described below under the following headings:

- Population and Settlement Patterns.
- Employment.
- Community.
- Human Health (Off-Site Receptors).
- Human Health (On-Site Receptors).

6.4.2 Population and Settlement Patterns

The Site is located in a sparsely settled rural townland known as Glenloughaun, in the Electoral Division of Kellysgrove (ED hereafter), this is a rural area beyond the outskirts of Ballinasloe town. Surrounding land use and settlement patterns are summarised in **Table 6.1**.

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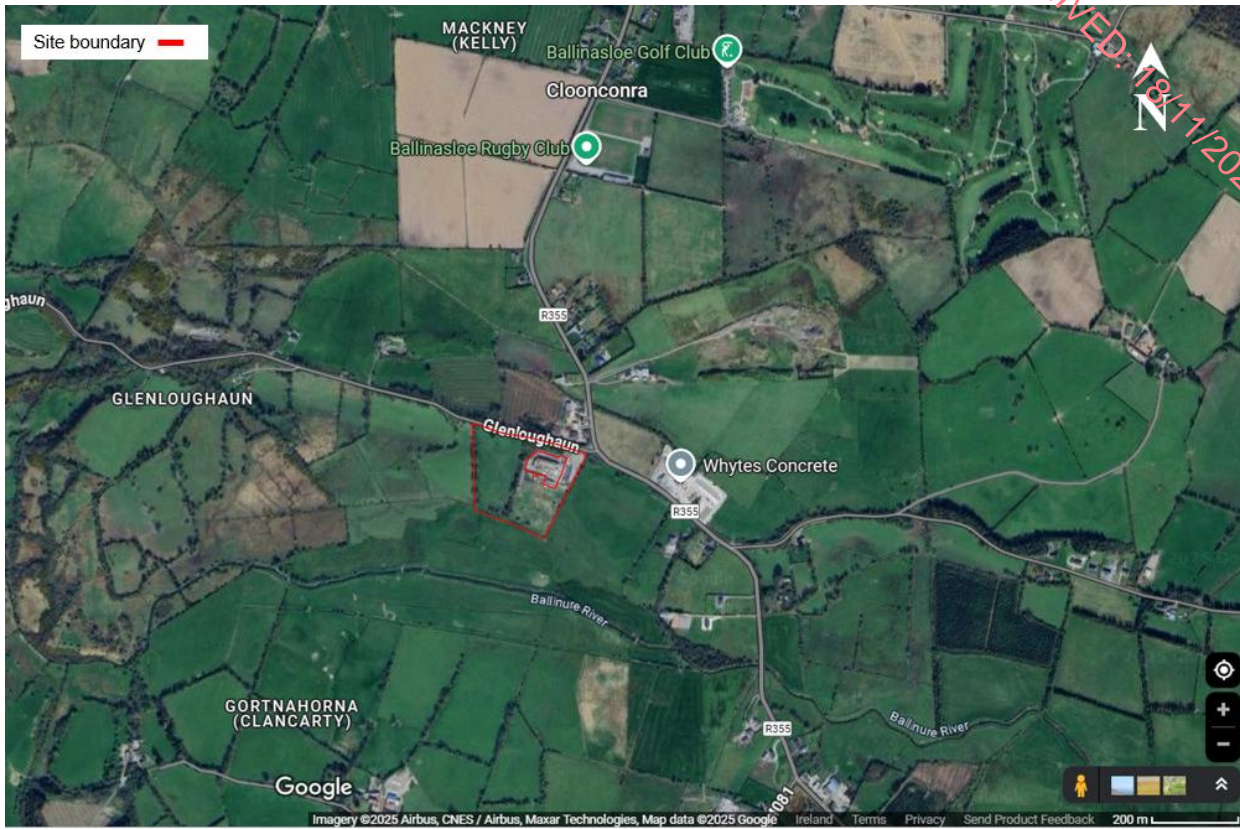


Figure 6.4: Proposed Development Location (Approximate Site Boundary in Red). Note: Adjacent meat-processing site has been excluded[Googe Earth]

Table 6.1: Land Use & Settlement Patterns	
Location in relation to site	Land Use
North	Glenloughaun Road (L-8412). To the northeast of the main site area is a site consisting of a meat-processing facility. Further north comprises agricultural lands and the R335 leading north towards the M6 and Ballinasloe. Ballinasloe Rugby Club is located c. 660m north and Ballinasloe Golf Club is located c. 815m northeast.
East	Agricultural lands. The R335 leads southeast from the northeastern boundary of the Site. A concrete supplier (Whytes Concrete) is located c. 315m east, along the R335. A residential dwelling is located c. 340m east.
South	Agricultural land. The Ballinure River is located c. 125m south.
West	Agricultural land.

6.4.2.1 Population Trends

The Proposed Development is situated centrally in the Kellysgrove ED which sits within the administrative boundary of Galway County Council (County hereafter).

Table 6.2 displays the 2016 and 2022 census population data for the local area (Small Area and ED) all the way to the national population. In the years between the 2016 and 2022 census, the population of Ireland (Country hereafter) has increased by 387,274 people (8.13%) and the population of the Galway County Council area (County hereafter) increased by 13,933 people (7.77%).

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Table 6.2: Population Trends for the Site’s Surrounding Areas 2016-2022 [CSO]

Area	2016	2022	% Change 2016-2022
Ireland	4,761,865	5,149,139	+8.13%
Galway County Council	179,390	193,323	+7.77%
Ballinasloe (town)	6,662	6,597	-0.98%
Kellysgrove (ED)	361	386	+6.93%

The population of the ED increased by 6.93% between 2016 and 2022, similar to that of the County as a whole. In contrast, the population of the town of Ballinasloe decreased by 0.98%.

6.4.2.2 Age Profile

The age profile of the population in the area is an important parameter as it provides a good insight into the potential labour force and assists in defining the sensitivity of the local population.

Table 6.3 shows the age profiles at County and local level of the study area for 2022.

Table 6.3: Age Profile from County to Local Level 2022 [CSO]

Area	0-14	15-24	25-44	45-64	65+	Total Persons
Galway County Council	40,570 (20.99%)	22,376 (11.57%)	46,558 (24.08%)	51,657 (26.72%)	32,162 (16.64%)	193,323
Ballinasloe (town)	1,420 (21.52%)	699 (10.60%)	1,809 (27.42%)	1,412 (21.40%)	1,247 (18.90%)	6,597
Kellysgrove (ED)	60 (15.54%)	52 (13.47%)	80 (20.73%)	115 (29.79%)	79 (20.47%)	386

This table indicates that the dominant age grouping for the ED is 45-64, followed by 25-44, consistent with that of the County level. The dominant age grouping in Ballinasloe town was 25-44, followed by 0-14. As seen by the table, the ED has a notably older population than the County and Ballinasloe. We note that the ED has a larger proportion of the population aged 15-64 (63.99%) in comparison with Ballinasloe town (59.42%) and the County (62.37%). The ED has a larger percentage aged 65+ (20.47%) in comparison with Ballinasloe town (18.90%) and the County (16.64%).

6.4.2.3 Life Stage (Age Dependency)

The Health Impact Assessment Guidance⁸ (IPH, 2021) outlines that life-course analysis is often used in public health and reflects differing health sensitivities and needs at different ages. Typically, children and older people are particularly sensitive to change, due to being dependents. Dependents are defined for statistical purposes as people outside the normal working age of 15-64. Dependency ratios are used to give a useful indication of the age structure of a population with young (0-14) and old (65+) shown as a percentage of the population of working age (15-64).

A low dependency ratio indicates that there is a larger proportion of working population age (15-64) years as compared to young (0-14) and old (65+). Conversely, a high dependency ratio indicates that there is a larger proportion of young (0-14) and old (65+) as compared to working

⁸ IPH (2021) *Health Impact Assessment Guidance*: [Health Impact Assessment Guidance: A Manual and Case Study | Institute of Public Health](#)

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population age. High dependency ratio can also indicate if some groups are more likely to be at home during the day (for example, due to childcare, or in the case of retired persons) and would therefore be more likely to be impacted by a development within the area.

Age dependency ratios are available through the Pobal Online Geo-Profiling tools⁹ which are based on the national Census.

The age dependency ratio for the study area is shown in **Table 6.4** below. From these dependency ratios, we can tell that the ED is less dependent than the Country as a whole, relatively consistent with the County level. This indicates a relatively ‘independent’ population within the study area as compared to that of Country which can be defined as per the conceptual model as ‘providing some care’ to ‘providing a lot of care’.

Area	Age Dependency Ratio for Census Year	
	2016	2022
Ireland	52.70	53.20
Galway County Council	34.22	34.74
Ballinasloe (town)	-	-
Kellysgrove (ED)	36.01	36.01

6.4.3 Socioeconomics

6.4.3.1 Education

Census data presenting the highest level of education completed by people living in the study area community is presented in **Table 6.5**. The data shows that the ED’s level of education completed is consistent with that of the Country as a whole. The ED has a higher percentage of the population with an ‘Honours Bachelor’s Degree, Professional Qualification or both’ and a ‘Postgraduate Diploma or Degree’ (13.82% and 9.09% respectively) when compared to Ballinasloe town (10.63% and 7.02% respectively).

Area	No Formal Education	Primary Education	Upper Secondary	Honours Bachelor’s Degree, Professional Qualification or both	Postgraduate Diploma or Degree	Total Persons Aged 15 Years and Over
Galway County Council	3,136 (2.46%)	10,581 (8.31%)	23,519 (18.46%)	16,705 (13.11%)	14,340 (11.26%)	127,388
Ballinasloe (town)	160 (3.81%)	457 (10.87%)	753 (17.91%)	447 (10.63%)	295 (7.02%)	4,204
Kellysgrove (ED)	8 (2.91%)	27 (9.82%)	49 (17.82%)	38 (13.82%)	25 (9.09%)	275

6.4.3.2 Deprivation

The Health Impact Assessment Guidance referred to previously in this chapter (IPH, 2021) outlines that impact assessments should consider whether the population is already stressed

⁹ Gov of Ireland / EU, *Pobal Maps*: [Pobal Maps](#)

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by limited resources or unusually significant burdens as well as whether groups could be affected that have reduced access to financial, social, and political resources.

Deprivation differences between areas are indicative of social gradients, which are central to the consideration of health inequalities and resulting effects.

Deprivation statistics for Ireland are available from the Pobal HP Deprivation Index that shows the overall affluence and deprivation. This index draws on data from the national Census and combines three dimensions of relative affluence and deprivation: Demographic Profile, Social Class Composition and Labour Market Situation that are measured by ten key socio-economic indicators from the Census of Population.

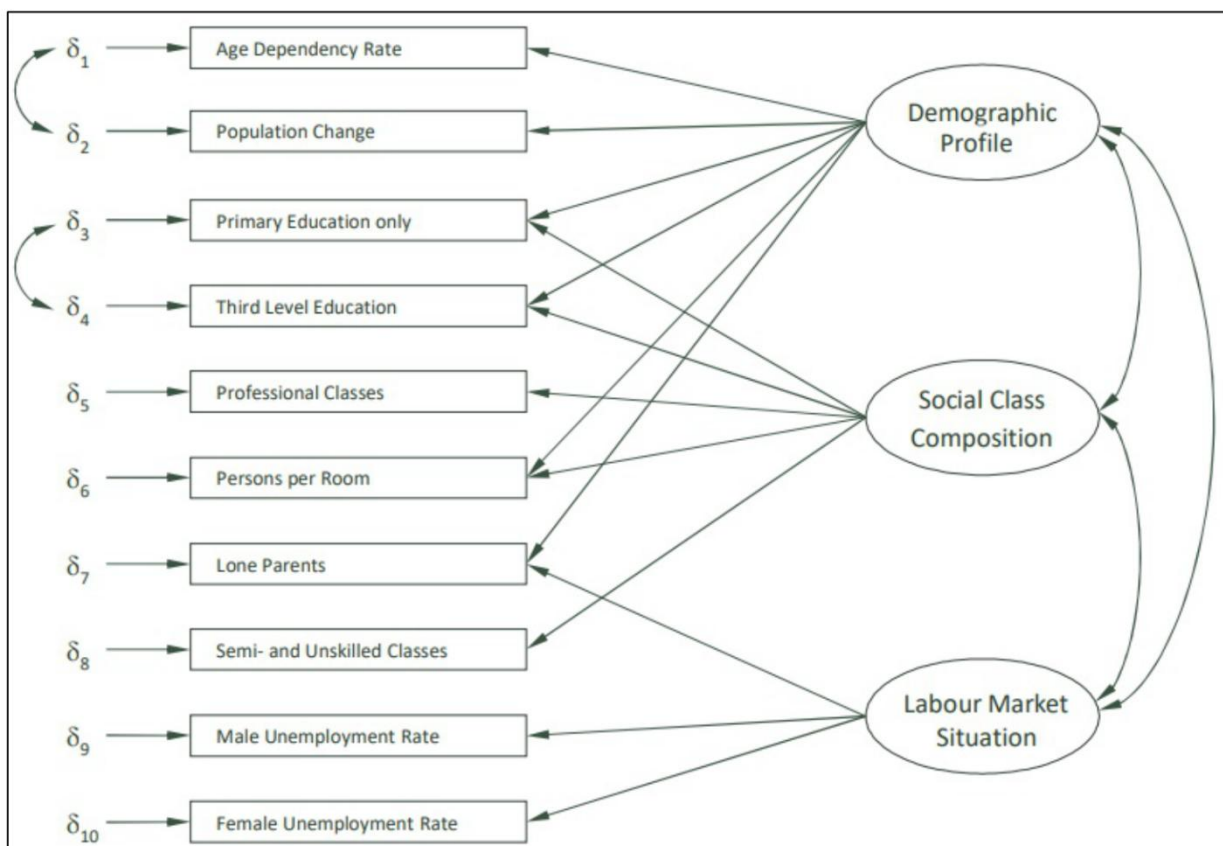


Figure 6.5: Basic Model of the Pobal HP Deprivation Index

The Pobal HP Deprivation Index Relative Index Score allows for the provision of descriptive labels with the scores, which are grouped by standard deviation as seen in Table 6.6 below.

In order to make a uniform assessment using the conceptual model as set out in Figure 6.1 above a relative Population Sensitivity the Deprivation Score of 'Very disadvantaged', or 'Extremely disadvantaged' would represent a high sensitivity. Conversely, an 'Extremely affluent' or 'Very affluent' would represent a very low sensitivity.

Table 6.6: Pobal HP Index Relevant Index Score Labels [Pobal HP Deprivation Index]		
Deprivation Score	Pobal HP Description	Sensitivity of Population
>30	Extremely affluent	Very low
20 to 30	Very affluent	Very low

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10 to 20	Affluent	Low
0 to 10	Marginally above average	Low
0 to -10	Marginally below average	Moderate
-10 to -20	Disadvantaged	Moderate
-20 to -30	Very disadvantaged	High
< -30	Extremely disadvantaged	High

The data in **Table 6.7** shows the Pobal HP Deprivation Index Relevant Index Scores¹⁰ for the Study Area based on the 2022 Census. These figures show for the year of 2022 that the ED is ‘marginally above average’, which is consistent with the County level. This indicates a relatively low population sensitivity (deprivation) within the ED. Pobal have not released deprivation scores for the State for 2022, so comparison to the national average is not possible, however it is noted that, for comparison purposes, the area of Dublin County displays a deprivation level of 2.69 (marginally above average).

Table 6.7: Deprivation Score within the Study Area [Pobal HP Deprivation Score, 2022 Census]		
Area	Deprivation Score	Pobal HP Description
Ireland	-	-
Galway County Council	2.34	Marginally above average
Ballinasloe (town)	-	-
Kellysgrove (ED)	0.88	Marginally above average

6.4.4 Employment

6.4.4.1 Economic and Employment Activity

The CSO’s Quarterly Labour Force Survey¹¹ (which has now replaced the Quarterly Household Survey) for Q2 2025, indicated that there was an annual increase in employment within the State by 63,900 or 2.3% to 2,818,100 people in the 12 months to Q2 2025. There were 140,800 unemployed people aged 15-74 years in Q2 2025 using International Labour Organisation (ILO) criteria, with an associated unemployment rate for those aged 15-74 years of 4.8%, up from 4.6% in Q2 2024.

The unemployment rate for those aged 15-24 years, known as the Youth Unemployment Rate, stood at 13.2% in Q2 2025 up from 12.0% in Q2 2024.

The estimated Labour Force (i.e. the sum of all people aged 15-89 years who were either employed or unemployed) stood at 2,958,900 in Q2 2025, up 2.5% (+73,500) from Q2 2024. The estimated labour market participation rate in Q2 2025 was 66.4%, up from 66.0% in Q2 2024.

An estimated 582,000 or 20.7% of those in employment worked part-time, and 153,600 or 26.4% of those in part-time employment were classified as underemployed (i.e. they would like to work more hours for more pay).

In the 12 months to Q2 2025 the age group with the highest employment rate was the 35-44 years age group (+85.6%), which was up 0.9 percentage points from the 84.7% recorded a year previously. The lowest employment rate by age was observed in the 15-19 year old cohort at 25.9%.

¹⁰ Pobal, *Pobal HP Deprivation Index*: [Pobal HP Deprivation Index Launched - Pobal](#)

¹¹ CSO (2025) *Labour Force Survey Q2 2025*: <https://www.cso.ie/en/releasesandpublications/ep/p-ifs/labourforcesurveyquarter2025/keyfindings/>

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The largest increase in employment by economic sector was in the Construction sector, which rose by 29,600 people (+18.4%). The largest decrease in employment was in the Information & Communication sector, down by 7,700 people (-4.1%).

The ESRI Quarterly Economic Commentary for Autumn 2025¹² (ESRI Autumn Commentary hereafter) notes that *“The economy continues to perform robustly. The most recent data show strong growth in consumption expenditure (+3% in Q2), in employment (+2.3% in Q2) and in tax receipts (+4.4% to end August). We expect this positive situation to continue over the forecast horizon and see modified domestic demand (MDD) growing by 3.8% in 2025 and by 3.2% in 2026.”* It further states that, *“Since our last Commentary, the US and the EU reached an agreement on tariffs, which has removed a considerable amount of uncertainty from the economic landscape. While this agreement reduces uncertainty in the short term, the new situation of a 15% tariff represents a deterioration in our trading environment and will likely be impactful for many firms and sectors. It is also important to be mindful of continuing uncertainties. Geopolitics continue to be volatile. The US is making threatening noises about the EU’s regulation of the digital space, with ongoing suggestions of retaliatory actions. While the most immediate threat of punitive US tariffs has been removed for now, the longer-term trend against continued trade liberalisation remains a threat to Ireland’s economic model. Finally, the odds on a recession in the US are now 50/50 according to Moody’s forecast model, with potential consequences for Ireland.”*

In relation to the Irish labour market, the ESRI Autumn Commentary states, *“Across a number of metrics, there has been a modest softening in the labour market since the last quarter. Unemployment has increased slightly while the rate of earnings and employment growth has slowed.”*

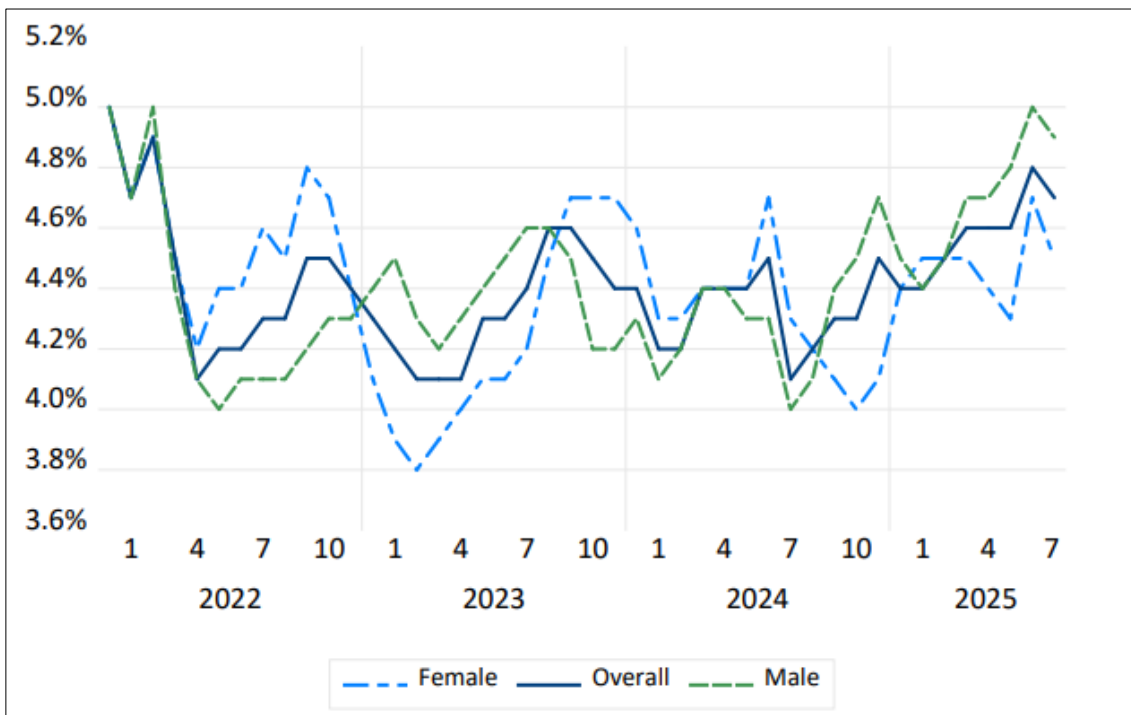


Figure 6.6: Unemployment Rate within the State (Source: ESRI Autumn Commentary Monthly, Figure 3.2)

¹² ESRI (2025) Quarterly Economic Commentary, Autumn 2025: <https://www.esri.ie/publications/quarterly-economic-commentary-autumn-2025>

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Figure 6.6 above highlights that *“Since the summer Commentary the unemployment figures for the year to date have been revised up. The rate now stands at 4.7%, and our current understanding is that it has been between 4.5% and 5% throughout 2025.”*

The ESRI Autumn Commentary states, *“Ireland’s labour market has been operating at (or close to) capacity for a considerable period. This is evidenced by low unemployment and high job vacancy rates. However, there are some early signs of a change, both in the detailed job vacancy data and in employment permit data.”*

The ESRI Autumn Commentary concludes that *“depending on the nature of additional US policy changes, yet to be announced, future years could see a big impact on corporation tax paid by the sector.”*

6.4.4.2 Galway County Development Plan

The County Development Plan (CDP hereafter) is a statutory document prepared by the Planning Authority in accordance with the requirements of the Planning & Development Act 2000 (as amended) and the Planning & Development Regulations 2001 (as amended).

The purpose of the CDP is to provide a strategic framework, setting out key policies and objectives for a new integrated land use strategy, and the proper planning and sustainable development of the County. The CDP is designed to set out the key policy context for the development of the County and is set within a hierarchy of national and regional spatial plans and guidelines. The Galway County Development Plan 2022 to 2028 took effect in June 2022.

The Galway County Development Plan states the following objectives relating to employment and economic activity:

Within Chapter 5 (Economic Development, Enterprise and Retail Development), Section 5.8 (Sectors, Clusters and Employment Opportunities) states that renewable energy and a low carbon future and agri-tech and agri-food are some of the emerging sectors most important to the County.

This Section states that *“The development of this circular bioeconomy industry where bio products are used for a range of purposes reduce waste levels and enable rural Ireland to contribute to a low carbon, climate resilient society as set out in the NPF. This approach makes use of new technologies and requires a new way of thinking. Given the contribution that the circular and bioeconomy can make to Ireland’s carbon reduction, it is considered that this sector should be supported where appropriate a sentiment that is supported by the NWRA.”*

According to Map 5.1 of the CDP, the Site is located within the ‘Economic Engine’.

We note Policy Objective SCO 3 (Agri-food Industry and Rural Diversification), which states, *“Support the development of the agri-food industry and rural diversification in a sustainable manner across County Galway facilitating research and development where appropriate.”*

The Goal for ‘Rural Living and Development’ within the County, according to Chapter 4 of the CDP, is to *“Support the role of rural areas in maintaining a stable population base through a strong network of villages and small towns and strengthening rural communities by supporting a resilient rural economy and the sustainable management of land and resources.”*

We note Policy Objective RD1 (Rural Enterprise Potential) which states, *“To facilitate the*

development of the rural economy through supporting a sustainable and economically efficient agriculture and food industry, together with forestry, fishing and aquaculture, energy and extractive industries, the bio-economy and diversification into alternative on-farm and off-farm activities, while at the same time noting the importance of maintaining and protecting the natural landscape and built heritage which are vital to rural tourism. Development of Cafes, Art Galleries, Hot Desk Facilities etc. which are important to the rural economy.”

Section 4.9 (Agri-Diversification) states, “It is Council policy to facilitate the development of the rural economy through supporting sustainability and economic efficiency in agriculture and diversification into alternative on-farm and off-farm activities such as... **renewable energy and the bio-economy**”. [Emphasis added].

Galway County Local Economic and Community Plan 2024-2030¹³

According to Section 1 of the LECP, “The purpose of the Galway County Local Economic and Community Plan (LECP), established under the Local Government Reform Act 2014, is to set a framework, objectives and actions needed to promote and support the economic development and the local and community development of Galway County. The LECP acts as the primary mechanism at the local level to bring forward relevant actions arising from national and regional strategies and policies that have a local remit.”

The Vision of the LECP is: “An inclusive County, with a clear sense of identity, where we work together to achieve the full economic, social, community, linguistic and cultural potential of Galway County and its people, through citizen engagement at a local level.”

Goal 5 of the LECP is “A sustainable and climate resilient County.” Section 7 further states that this goal is to achieve “A County that protects its environment and supports the transformation to a climate-neutral society”.

At Page 72, a strength of the County in relation to Goal 5 is: “The Public Sector Climate Action Mandate 2024 requires Irish public bodies to reduce energy-related greenhouse gas emissions by 51% and improve energy efficiency by 50% by 2030, highlighting the need to prioritise climate action targets. (Public Sector Climate Action Mandate 2024).”

We note the following challenge identified in relation to Goal 5:

“46.3% of the public survey respondents stated the County had poor waste management. Many pointed to issues such as insufficient public bins, lack of free recycling centres, and the imposition of recycling charges, which hinder the adoption of sustainable waste practices. (GLECP Public Survey).”

Objective SCO 5.1: “Increase community and business involvement in environmental action and the reduction of Galway County’s carbon footprint.” We note **Action 5.1.4** to achieve this objective: “Implement Galway County Council Climate Action Plan 2024-2029 and increase sustainable practices across the County to contribute to the achievement of regional and national targets.”

Objective SEDO 5.2: “Ensuring a Just Transition in Galway County.” **Action 5.2.1** to achieve this objective is to “Ensure Just-Transition support for those working in traditional sectors (farming, agriculture, extractive industries) and engage with the EU Just Transition Fund for

¹³ GCC (2024) LECP: <https://www.galway.ie/en/media/Galway%20County%20LECP%202024-2030.pdf>

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economy diversification, peatland restoration and sustainable mobility initiatives in qualifying areas of Galway County.”

Objective SEDO 5.4: “Develop Galway’s green economy, circular economy and sustainable energy future.” We note the following actions included in the LECP to achieve this objective:

- **5.4.1:** “Support the development and use of low-carbon technologies such as electric vehicles and low-carbon fuels.”
- **5.4.4:** “Implement effective energy management and projects across community and state agencies aligned with 2030 targets and net zero trajectory.”
- **5.4.5:** “Facilitate climate action throughout the County, by engaging and collaborating with stakeholders and citizens in the development, implementation and review of the Local Authority Climate Action Plan and provide them with information and support.”

Goal 6 of the LECP is “A County that prioritises economic development and education.”

Objective SEDO 6.2 is to “Attract new and expand existing key sectors and enterprise with significant employment, income and growth potential”. We note the following actions included in the LECP to achieve this objective:

- **6.2.1:** “To ensure the attractiveness of Galway is retained and developed further as a location for domestic and foreign direct investment and regional development through existing strategic networks including the Strategic Economic Corridor, AEC projects, promotion of key employment locations identified in the GCDP.”
- **6.2.2:** “Provide targeted support to emerging sectors and clusters including Tourism; Renewable energy and low carbon future; Marine and Blue Economy; ICT and Digital Enterprise; Life Science (Medtech, Pharma, Biotech, Healthcare); Advanced Manufacturing and Engineering; Argi-tech and Agri-food; and Retail.”

6.4.4.3 Central Statistics Office – Census 2022

The percentage of people aged 15 and over who participate in the labour force, as opposed to having another status such as student, retired or homemaker – is known as the labour force participation rate. It is measured as the number in the labour force (at work or unemployed) expressed as a percentage of the total population ages 15 and over.

According to the 2022 census there was a 5.58% unemployment rate (11 as a % of 197 - ‘short/long term unemployed’ as a % of ‘at work’ and ‘short/long term unemployed’) within the ED. The County had a similar unemployment rate of 6.23% and the national employment rate was 8% in 2022. In contrast, the town of Ballinasloe had an unemployment rate of 13.14%.

‘Managerial and technical’ and ‘Non-manual’ occupies the largest socio-economic groups within the ED (40.67% and 18.91%). For Ballinasloe town, the largest socio-economic groups were ‘All others gainfully occupied and unknown’ and ‘Managerial and technical’ (26.25% and 24.53%).

The smallest socio-economic group within both the ED and Ballinasloe was categorised as ‘unskilled’, occupying 4.40% and 4.40% of the population respectively.

6.4.5 Community

The two principal aspects of the community surrounding the Site can be defined as follows:

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- The residential community
- The working community

6.4.5.1 Residential Community

The site of the Proposed Development is located on the southern side of a local road called Glenloughaun Road, and south/southwest of the R335 Regional Road. Within the local area, residential dwellings are one-off and sparsely located; the closest established residential area is at Ballinasloe town (c. 2.3km north). Residential units are sparsely located within the surrounding area. As such, the wider residential community will become aware of any impact as a result of the Proposed Development.

6.4.5.2 Working Community

The working community in the vicinity of the Site comprise primarily agricultural-based employment. A meat processing factory is located immediately north of the Site. Other employment within the wider vicinity includes a concrete supplier (c. 315m east), a rugby club (c. 660m north), a restaurant (c. 920m north), a B&B (c. 1.02km north), a golf club (c. 815m north), a warehouse (c. 740m southeast), and timber supplier (c. 2.1km north).

6.4.6 Human Health (Off-Site Receptors)

6.4.6.1 Health Status (General Health)

The CSO as part of the census records conducted an overall self-reported measure of population health within the State. Areas with a poor health status are typically considered to be of a higher sensitivity and more susceptible to change in environmental conditions.

Table 6.8 below shows the self-reported measure of population health within the study area compared to the Country. The table shows that 86.53% of the ED self-reported their health as ‘very good’ or ‘good’, consistent with national and Country trends, while the town of Ballinasloe recorded 77.70%.

Table 6.8: Self-Reported Measure of Population Health [CSO, 2022 Census].						
Area	% Population Describing their General Health					
	Not Stated	Very Bad	Bad	Fair	Good	Very Good
Ireland	346,824 (6.7%)	16,843 (0.3%)	72,556 (1.4%)	444,895 (8.6%)	1,527,027 (29.7%)	2,740,994 (53.2%)
Galway County Council	9,452 (4.89%)	592 (0.31%)	2,342 (1.21%)	16,819 (8.70%)	58,198 (30.10%)	105,920 (54.79%)
Ballinasloe (town)	560 (8.49%)	42 (0.64%)	123 (1.86%)	746 (11.31%)	2,059 (31.21%)	3,067 (46.49%)
Kellysgrove (ED)	10 (2.59%)	1 (0.26%)	3 (0.78%)	38 (9.84%)	115 (29.79%)	219 (56.74%)

Ability to Perform Daily Activities

People’s ability to perform day-to-day activities is relevant to population sensitivity, particularly where there are changes in access to services or community amenities. Persons with disabilities can also be more susceptible to the changes in environmental conditions. The CSO as part of the census records an overall self-reported measure of persons with disabilities within Ireland.

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Table 6.9 details the number of persons with a disability compared to the population as a whole. The data shows that the ED has a consistent percentage of persons with a disability as that of the County and national level. Ballinasloe town displayed a slightly higher percentage.

Table 6.9: Persons with a Disability [CSO, 2022 Census]			
Area	Persons with a Disability	Population	% Persons with a Disability
Ireland	1,109,557	5,149,139	21.5%
Galway County Council	38,740	193,323	20.04%
Ballinasloe (town)	1,682	6,597	25.50%
Kellysgrove (ED)	84	386	21.76%

6.4.6.2 Summary of Population Health Sensitivity

The sensitivity of the surrounding area had been considered on the details of the published data available from CSO and Pobal. The ED has seen population growth between 2016 and 2022. The Pobal HP Deprivation Index shows the ED to be marginal above average, indicating a good to moderate population sensitivity (deprivation) within the study area (consistent with the Country as a whole).

There is a low age dependency ration within the ED therefore a large proportion of the population is within working age, thus considered as largely independent and judged to be not sensitive to change. The information presented above for the study area shows that a high proportion (86.53% for the ED) described their health status as ‘very good’ or ‘good’, while a low proportion as ‘bad’ or ‘very bad’. The data shows that the ED has a consistent percentage of persons with a disability than that of the national and County average: indicating that for persons within the area, there are relatively few restrictions on daily activities. We note that Ballinasloe town has a slightly higher percentage of persons with a disability.

The population within the study area is therefore not particularly sensitive to change, with a ranking of low sensitivity.

6.4.7 Human Health (On-Site Receptors)

An anaerobic digestion plant is considered to be a biological treatment facility, the operation of which can have the potential for a variety of exposure scenarios including:

- fire/ explosion and risk of release of harmful gas,
- spillage/ leak of chemicals or pollutants into groundwater/ surface water,
- extreme weather (e.g. flooding, lightning) impacting operation
- impacts from neighbouring facilities and/or critical civil infrastructure
- exposure to toxic chemical substances due to abnormal operating condition e.g. equipment failure
- exposure to biological substances from feedstocks, disease carrying pests.

In the absence of appropriate mitigation, the primary hazards to human health at a biogas facility is mainly associated with uncontrolled air and water discharges.

Exposure to chemical substances

Given the nature of the process, it is unavoidable that chemical substances will be generated

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e.g. biogas generation requires biological decomposition of organic materials, which necessarily generates methane (CH₄), carbon dioxide (CO₂), and traces of other gases, including nitrogen, hydrogen, hydrogen sulphide and ammonia.

As per health and safety legislation, occupational exposure limit values have been set for a variety of substances and provide a basis for ensuring that exposure to airborne contaminants in the workplace are controlled in such a way as to prevent adverse health effects. The exposure limits, derived from scientific assessment of dose response relationship, outline the concentration of the substance below which an employee, working a 40hr week, 8hr day would expect no adverse response. **Table 6.10** contains a summary from the Health and Safety Authority on Gas Exposure Limits relevant to AD plants.

Gas	Properties	Hazardous Atmosphere	Workplace Exposure Limit (8hr Reference Period)
CO ₂	Colourless and odourless gas. Heavier than air.	4 % vol, danger of asphyxiation	5000ppm
NH ₃	Colourless and pungent-smelling gas. Lighter than air. Hydrophilic so affects eyes, nose, throat as first indicator	Above 30 – 40 ppm mucous membranes, respiratory tract and eyes become irritated. Above 400-500 ppm immediate breathing difficulties, increased respiratory rate, potentially inducing loss of consciousness.	20ppm
CH ₄	Colourless, odourless gas. Lighter than air.	4.4–16.5% vol (explosive range)	Not specified
H ₂ S	Highly toxic, colourless gas. Heavier than air. Smells of rotten eggs.	2ppm, bronchial constriction in asthmatic individuals. Olfactory paralysis above 100 ppm (gas is no longer perceived). 320-530ppm, Pulmonary oedema, >500ppm rapid respiratory failure (fatal).	5ppm

Exposure to disease due to Pests onsite

Rodents can be harmful since they may transfer viruses, micro-organisms, parasites etc. and may, therefore, represent an important factor for the spreading of various diseases. Control of rodents is a mandatory prerequisite for any waste management facility. Flies and birds can also pose a problem, where they are attracted to raw waste.

Due to the nature of wastes being accepted at the site, feral animals, flies and other vermin may be attracted to the site. Vermin maybe attracted to the facility in search of food sources. Pests such as rodents and flies can not only be a nuisance to users and neighbours, but they can also transfer germs and disease and affect the ecological balance of an area.

Sources of potential public health risks associated with vermin and other pest animals include:

- Transmission of disease.
- Threat to native flora and fauna.
- Threat to livestock.

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There is no reason that waste being handled in the reception buildings will give rise to litter. The proposed treatment facility will process biodegradable waste in a controlled environment.

Due to the nature and rural location of the proposed plant and the probable populous of vermin already present which may be displaced by the construction works, it is intended to employ a specialist pest control firm for the duration of the project to ensure the regular monitoring and control of any vermin present on site or disturbed within the works area as a result of construction work.

6.5 Description of the Proposed Development

6.5.1 Introduction

Consideration of the characteristics of the Proposed Development allows for a projection of the level of impact on any particular aspect of the environment that could arise. In this chapter the potential impact on Population and Human Health is assessed.

The proposed development comprises the construction of an anaerobic digestion facility to produce renewable biomethane, CO₂ (which will be captured), and a bio-based fertiliser from organic material. The total gross floor area of the proposed development (including internal plant areas and ancillary structures) will be c. 2908.49 sq.m.

6.6 Likely Significant Effects

6.6.1 Do-Nothing Scenario

Under the 'Do Nothing' scenario there would be no change to the current land use of the Site. If the Proposed Development does not proceed as planned there will be no additional impact on the following receptors:

- **Local Population & Employment** - The failure of the Proposed Development to proceed will not lead to any profound or irreversible consequences. However, the opportunity to deliver additional employment opportunities into the rural economy will be lost as will the opportunity to contribute to specific objectives in the County Development Plan and the 2024 and 2025 Climate Action Plans, which promote renewable energy generation.
- **Community** - It is likely that the perceptions of the community would remain unchanged. However, the immediate economic and social benefits that would be forthcoming and experienced if the development were to progress would be foregone.
- **Land Use** - The failure of the Proposed Development to proceed will most likely see the land remaining as agricultural land, adjacent to an existing commercial unit.
- **Human Health (Off-Site)** - If the Proposed Development were not to proceed this primarily greenfield site would remain in its existing form and there would be no impact on Human Health. However, the unique opportunity of providing renewable energy to the gas grid will be missed, given the current economic climate and rising energy costs this Proposed Development provides a safeguard for the area and the country's energy needs.
- **Human Health (On-Site)** – Under the do-nothing scenario, it is likely that the risks associated with uncontrolled pests and vermin on the surrounding area, livestock and ecological receptors will be significantly reduced, in the absence of the Proposed Development, particularly in uncontrolled conditions (i.e. in the absence of mitigation),

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however, the production of a biobased fertiliser presents an opportunity to introduce a high-quality fertiliser with reduced pathogens compared to slurries and manures.

The Do-Nothing scenario would also be considered sub-optimal in the context of the national and county targets for the adoption of renewable energy sources, and in the context of anthropogenic climate change. Furthermore, an opportunity to introduce a bio-based fertiliser, with reduced pathogen content into the local bioeconomy would be missed.

6.6.2 Receptor Sensitivity

The sensitivity of the receptors identified are summarised in **Table 6.11**.

Receptor	Receptor Importance	Receptor Sensitivity	Rationale
Local Population & Employment	Low to moderate	High	The Proposed Development provides employment opportunities to the local area and surrounds, also with the potential to provide renewable energy.
Community	Low to moderate	Low	The overall economic and social benefits that the development would bring to the area would not be experienced by the community in the event of the development not occurring.
Human Health (Off-Site)	Low to moderate	Low to moderate	If the Proposed Development were not to proceed this greenfield site would remain in its existing form and the unique opportunity of providing renewable energy will be missed.
Human Health (On-Site)	High	High	The development will result in a situation where human health will be put at risk due to typical hazards associated with the construction and operation of the proposed facility.

6.6.3 Sources - Construction Phase

Potential construction phase effects are considered in detail below and summarised in **Table 6.12**.

6.6.3.1 Population

The construction phase is not considered to have any significant impact on the population of the surrounding area, as it is expected that the work force will primarily travel from their existing place of residence to the construction site, rather than reside in the area during the construction phase of the development.

The construction phase may result in a marginally increased population in the wider area due to increased construction employment in the area, however, this would be temporary in nature and the effect would be imperceptible.

Activities associated with the construction phase are anticipated to have **positive, slight, temporary** effects on the local population.

6.6.3.2 Employment

The Proposed Development will provide important construction / engineering and related employment. The construction phase will also have secondary and indirect 'spin-off' effects on ancillary support services in the area of the Proposed Development, such as retail services, together with wider benefits in the aggregate extraction (quarry) sector, building supply services, professional and technical professions etc. These beneficial effects on economic activity will be largely temporary but will contribute to the overall future viability of the construction sector and related services and professions over the construction period.

Activities associated with the construction phase are anticipated to have **positive, slight, temporary** effects on employment within the area.

6.6.3.3 Community

It is acknowledged that the construction phase of the project may have some short-term negative effects on local residents. Such effects are likely to be associated with construction traffic and possible nuisances associated with construction access requirements. These effects are dealt with separately and assessed in **Chapter 9: Air, Odour and Climate, Chapter 10: Noise and Vibration** and **Chapter 12: Traffic and Transportation** of the EIAR.

Given the overall scale of the Proposed Development, some potential effects may occur locally during the construction phase. It is expected that these short term temporary localised effects may be experienced by those residing, working, and visiting the area. Such effects would include an increase in daytime noise levels in the area as a result of the machinery being used for construction purposes and also by construction traffic accessing the Proposed Development.

Activities associated with the construction phase are anticipated to have **negative, slight, temporary** effects on the local community.

6.6.3.4 Installation of Gas Injection Unit

Biomethane will be supplied to the existing gas network via the onsite Grid Injection Unit (GIU) connecting the Site to the existing medium pressure distribution gas pipeline located c. 2.7km north of the Site at Brackernagh, Ballinasloe. The GIU will be owned and operated by Gas Networks Ireland. The GUI will be designed and delivered in accordance with the following standard: *I.S. 328 2021 Gas transmission — Pipelines and pipeline installations*.

The Grid Injection Unit (GIU) is shown as **item 25** on Site Layout Drawing Ref. **231960-ORS-ZZ-00-DR-AR-200**.

Activities associated with the construction phase as summarised in **Table 6.12** are anticipated to have **negative, slight and temporary effects** on health and safety in the area.

6.6.3.5 Human Health (On & Off Site)

All new developments will give rise to some associated short-term effects and disturbances to the surrounding areas. The construction methods employed, and the hours of work proposed will be designed to minimise potential effects. The Proposed Development will comply with all Health & Safety Regulations during the construction of the project. Where possible, potential risks will be omitted from the design so that the impact during the construction phase will be

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reduced.

The Health and Safety policy, procedures and work practices of the Proposed Development will conform to all relevant health and safety legislation both during the construction and operational stages of the Proposed Development. The Proposed Development will be designed and constructed to best industry standards, with an emphasis being placed on the health and safety of employees, local residents and the community at large.

Activities associated with the construction phase as summarised in **Table 6.12** are anticipated to have **negative, slight, and temporary** effects on health and safety in the area.

Receptor	Sensitivity Rating	Potential Environmental Effects	Quality	Significance	Duration
Local Population	Low to moderate	Potential minor increase in population during construction.	Positive	Imperceptible	Temporary
Employment	Low to moderate	Will provide jobs during the construction phase. May attract other sources of employment to the area.	Positive	Slight	Temporary
Community	Low to moderate	Wear and tear on the infrastructure. Construction traffic. Risk to air/noise.	Negative	Slight	Temporary
Installation of Gas Pipeline	Low to moderate	Materials that can pose a risk to Human Health due to the presence of Polycyclic Aromatic Hydrocarbons (PAHs).	Negative	Slight	Temporary
Human Health (Off-Site)	Low to moderate	Risk to health from construction methods. Impact of disturbance, air and noise impacts during construction.	Negative	Slight	Temporary

6.6.4 Sources - Operational Phase

Potential operational phase effects are considered in detail below and summarised in **Table 6.13**.

6.6.4.1 Population

The Proposed Development will have no likely significant effect on the existing population. No residential element is proposed as part of the development hence no impact will occur on the local population in this regard.

Given the scale of the Proposed Development, it will not increase the potential working population of the area. There will not be any significant increase in traffic levels to the local road network as outlined within the Traffic and Transport Assessment submitted as part of the application.

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There will be no notable increase in demand for community/recreational facilities arising from the completion of the Proposed Development as it will not introduce any resident population to the area. Any demand for additional shopping facilities and services will be met by the existing retailing facilities at Ballinalsoe town and other nearby settlements. There is no increased visitor population anticipated to the area as a result of the Proposed Development being completed.

Overall, the Proposed Development is likely to have a positive impact on the population in terms of employment and economic benefit in the long term.

Activities associated with the operational phase are anticipated to have **positive, moderate, long-term** effects on the local population, via the creation of long-term, sustainable employment to support the local population.

6.6.4.2 Employment

The Proposed Development will offer direct employment in the Anaerobic Digestion Facility, while also supporting existing employment opportunities on surrounding farms. Further indirect employment will be created as a result of the added benefits of the development, such as surrounding businesses catering for employee subsistence and hauliers transporting feedstock/waste materials to the plant. The Proposed Development, if undertaken, will be of considerable benefit to the area in terms of employment provision and economic gain leading to a positive, medium-term effect which is significant in the context of its rural location.

The Proposed Development can support between 30-45 jobs (consisting of c. 5-8 no. full time jobs in the plant, 14 no. jobs supported in the applicant's operational team, and c. 25 no. local contractors), specifically across rural locations, and protect existing farming employment.

Activities associated with the operational phase are anticipated to have **positive, significant, long-term** effects on employment within the area.

6.6.4.3 Community

The Proposed Development may have the following potential effects:

- Increased traffic levels, both vehicular and pedestrian in the surrounding area (**Chapter 12: Traffic and Transport**).
- Effects on local services and commercial facilities.

The adjoining residential communities may experience the above effects in a number of ways. The community may experience a slight change in mobility as a result of increased traffic on the road network. An alteration to the actual physical environment of the area may affect the spatial perceptions of the community living in the area. These aspects are dealt with in further detail within the Chapter 12: Traffic and Transportation and Chapter 11: Landscape and Visual Impact chapters of this EIAR.

Activities associated with the operational phase are anticipated to have **neutral, slight, long-term** effects on the community within the area.

6.6.4.4 Human Health

According to the CRÉ 'Guidelines for Anaerobic Digestion in Ireland',

“Generally incidents and accidents occur during the operation of the plant and are either caused by equipment failure, improper equipment utilization, or plain human errors. Death causing accidents are generally related to gas poisoning (Hydrogen Sulphide and Ammonia) in open and confined spaces. Proper confined space training and portable gas detection should be mandatory for all biogas plant operators”.

The main potential health hazards associated with a typical biogas facility are as follows:

- Prolonged low-level exposure to gases (asphyxiation, nausea).
- Exposure to hazardous substances (methane, waste, chemicals).
- Electrical hazards (Electrocution arising from plant equipment or CHP).
- Mechanical Hazards (falling, crushing, severing).
- Biological agents (infection, allergic/toxic reaction, exposure to endoparasites).

Fugitive Emissions

The main hazards to the environment from an AD plant are fugitive emissions of biogas, and feedstocks escaping from production facilities. Such emissions generally occur from structural faults or process failures within the plant pipework, CHP unit or the primary digestate tank.

Hazardous Substances

At an AD plant there is the potential presence of substances that could be toxic, corrosive, sensitising, or carcinogenic such as processing aids, oils, effluent, wastes and gases. Potential hazards include:

- Risk of asphyxiation/poisoning from fermentation gases/biogas.
- Release of toxic gases such as hydrogen sulphide during mixing.
- The use of additives and auxiliary materials with hazardous properties (e.g. carcinogenic properties).

Biological Agents

A biological agent is any micro-organism, cell culture or human endoparasite which may cause an infection, allergy, toxicity or otherwise create a hazard to human health. An AD plant utilises biological material to synthesise biomethane hence a variety of biological agents may be present in feedstock, digestates and biogas condensates. Biological agents have the potential to enter and harm humans via the following pathways:

- Inhalation of aerosols containing mould, bacteria or endotoxins which may be present in silage or dry poultry manure.
- Inhalation of mycotoxins and other microbiological metabolic products from visibly mouldy wastes which may cause acute toxic effects.
- Biological hazards from rodent birds and other animals and their excrement. (Weil's disease).

Pest Control

The presence of vermin or insect pests in or around any waste management facility is a health hazard. Management must have a pest and vermin control standard operating procedure in place, which effectively controls any such presence and prevents possible contamination risk.

Activities associated with the operational phase are anticipated to have negative, moderate, long-term effects on the local pest control in the absence of mitigation.

Electrical Hazards

Regardless of plant type there will be electrical infrastructure on site that has the potential to be hazardous such as CHP units, pumps, agitators, measuring devices. Electrical hazards mainly occur when any such equipment becomes faulty. Hazards include:

- Electric shock through an individual's body. (working too close to overhead powerlines/faulty electric cables on site).
- Electrical or magnetic fields (circulation of induction currents) posing a danger to people with pacemakers installed.
- Static electrical shock.

Mechanical Hazards

Moving mechanical parts may pose hazards such as falling, impact, crushing, cutting. Such hazards are most prevalent in close proximity to rotating parts, around moving vehicles, or from working at height. Repair and maintenance activities in particular have the potential for accidents when inadequate protection measures are applied.

Gas Hazards

Biogas is composed of different gases, and this mixture can vary depending on the feedstock mixture used to produce the gas. Common gases contained in biogas include carbon dioxide, methane, ammonia, and hydrogen sulphide.

Explosion and Fire Hazards

One of the main hazards at an AD plant is the risk of explosion. The mixture of gases can form an explosive atmosphere under certain conditions. Such explosive atmospheres can ignite and cause extensive damage and serious or fatal injuries.

Malpractice - Operative Health and Safety

Hazards due to bad work practice from those involved in the plant or other unauthorised persons.

Activities associated with the operational phase could have **negative, moderate to significant, long-term** effects on human health in the absence of mitigation.

Major Accidents

As AD plants generate and utilise what would be classed as dangerous substances under the Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations"), an inventory of the proposed quantities of dangerous substances was carried out in order to ascertain whether the proposed development would be subject to this set of regulation.

The purpose of the COMAH Regulations is to lay down rules for the prevention of major accidents involving dangerous substances, and to seek to limit as far as possible the

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consequences for human health and the environment of such accidents, with the overall objective of providing a high level of protection in a consistent and effective manner.

Methane, the primary combustible component of biogas (untreated biomethane), is classified as a P2 flammable gas under Regulation (EC) No. 1272/2008, which governs the classification, labelling, and packaging of substances and mixtures. The other substances on site—biomethane, propane, and diesel— are all classified as "named dangerous substances" under Part 2 of the Seveso Directive/COMAH.

Applying the aggregate calculation method outlined in the Seveso III/COMAH Directive, the proposed facility, when operating at full capacity i.e. assuming biogas in the digester headspaces, LPG gas and diesel for fuelling machinery, remains below the lower-tier threshold for COMAH. Thus, this regulation does not apply. Nevertheless, engineering designs and implemented process safety also consider and mitigate for potential for major accidents, as outlined in section 6.7 below.

Potential operational phase effects in the absence of mitigation are summarised in **Table 6.13**.

Table 6.13 – Operation Phase Effects Summary					
Receptor	Sensitivity Rating	Potential Environmental Effects	Quality	Significance	Duration
Local Population	Low to moderate	No material impact on the existing local population. Likely to have a positive impact on the population in terms of employment and economic benefit in the long term.	Positive	Moderate	Long-term
Employment	Low to moderate	Creation of significant employment benefit for the local study area. Further indirect employment will be created as a result of the induced benefits of the development.	Positive	Significant	Long-term
Community	Low to moderate	The community may experience a slight change in mobility as a result of increased traffic on the road network.	Neutral	Slight	Long-term
Human Health (Off-Site)	Low to moderate	Air emissions from CHP, Biomethane Boiler and Odour Treatment System. Projected ambient concentrations including background levels fall within all National and EU ambient air quality limit values and, thus, will not cause any effect on human health.	Neutral	Imperceptible	Long-term
Human Health (On-Site)	Moderate	Pests The presence of vermin and insect pests in or around any waste management facility is a health hazard. Management must have a pest and vermin	Negative	Moderate	Long-term

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		control standard operating procedure in place, which effectively controls any such presence and prevents possible contamination risk.			
Human Health (On-Site)	High	Fugitive Emissions	Negative	Moderate to significant	Long-term
		Hazardous Substances			
		Biological Agents			
		Electrical Hazards			
		Mechanical Hazards			
		Gas Hazards			
		Explosion and Fire Hazards			
		Malpractice - Operative Health and Safety			
		Major Accidents			

6.7 Mitigation Measures

6.7.1 Construction Phase

Potential effects during the construction phase will be minimised through the implementation of the Construction Environmental Management Plan which will be submitted to the council prior to construction.

6.7.1.1 Population

It is considered that the Proposed Development is unlikely to generate any significant adverse impact on the demography of the area, either during the construction phase or the operational phase, and will have positive economic effects. Therefore, no mitigation measures are required during the operational phase.

6.7.1.2 Employment

The Proposed Development will have a positive effect on employment levels in the area and as such no mitigation measure are required.

6.7.1.3 Community

It is considered that the Proposed Development is unlikely to generate any adverse effect on the community of the area either during the construction phase or the operational phase and would actually have positive economic effects. Therefore, no further mitigation measures are required.

6.7.1.4 Grid Injection Unit

Biomethane will be supplied to the existing gas network via the onsite Grid Injection Unit (GIU) connecting the Site to the existing medium pressure distribution gas pipeline located c. 2.7km north of the Site at Brackernagh, Ballinasloe. The GIU will be owned and operated by Gas Networks Ireland.

The GIU comprises equipment which will ensure that the biomethane is compliant with all

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necessary standards and regulations before it enters the local gas network. The unit performs the following key tasks:

- Gas pressure reduction and control: so that the gas pressure is always correct to match the medium pressure gas network.
- Gas analysis for compliance monitoring: the gas is tested for contaminants
- Metering: the volume of gas needs to be measured and recorded
- Flow Weighted Average Calorific Value: the energy content of the gas being injected into the grid needs to be measured and recorded. The calorific value must match the value stipulated by the local gas distributor.
- Odourisation for safety: prior to injection into the grid.
- Propanation: Where there are any shortfalls in the calorific value of biomethane, propane can be added from the on-site propane storage to match the calorific value required.

The Grid Injection Unit (GIU) is shown as **item 25** on Site Layout Drawing Ref. **231960-ORS-ZZ-00-DR-AR-200**.

6.7.1.5 Human Health

Adverse health and safety effects during the construction phase will be minimised through the implementation of the Construction Management Plan on site.

6.7.2 Operational Phase

In accordance with planning and legislative requirements the Proposed Development has been designed in line with best available technology (BAT) and industry best practice. Mitigation against the risk of accidents/injuries is embedded through the design process e.g. appropriately sized equipment selection, automated safety features such as fail-close valves, gas and pressure monitoring with feedback systems.

Potential effects to the local population, employment and community are neutral to positive hence no mitigation measures are recommended for these receptors. The following measures are recommended for human health.

6.7.2.1 Human Health

Fugitive Emissions

The following design specifications can help minimise the risks associated with the hazard of biogas escaping:

- Make all civil and process works as gas tight as possible.
- Automatic flare system (burn biogas during CHP downtime).
- Over-pressure release device.
- All digestate storage tanks gas-tight.
- Appropriate, calibrated measuring devices.

Hazardous Substances

The OSH Framework Directive (89/391/EEC) lays down the obligation of the employers to

evaluate the risks to the safety and health of workers which includes the following:

- General principles of prevention.
- Elimination of risks and accidents.
- Informing, consultation and balanced participation and training of site operatives.
- Permit-to-work system verifying operatives aware of SOP's.
- Material Safety Data Sheet recorded and maintained.

Biological Agents

Injury to humans as a result of exposure to biological agents is minimised through design measures such as enclosed pipework and tankers, mechanised pumping systems, regular air changes in enclosed buildings with filtration, pasteurisation of digestate to achieve pathogen kill.

Rigorous cleaning and controls at each step in the biogas supply chain will avoid careless contamination and the spread of disease at all stages.

Pest control will be regularly carried out and results of bait station checks recorded. The management of the facility will be responsible for the pest program including the chemicals used or actions carried out by independent pest control companies.

Electrical Hazards

Injury to humans as a result of electrical shock are minimised through design measures such as earthed and bonded structures, ATEX rated equipment and certified electrical installations and ongoing inspections.

All workers coming into contact with electrical networks should have up to date electrical safety training including use of lock-out tag out procedures. Training should be considered if the electrical network is being altered or upgraded. Refresher courses ensure experienced electrical operatives and professionals are familiar with the latest health and safety guidelines and best practices.

Mechanical Hazards

Injury to humans as a result of mechanical hazards are minimised through design measures such as automated pumping systems, use of lifting aids, appropriate equipment for working at heights, well designed plant layout ensuring adequate vehicle turning and good sightlines.

All workers coming into contact with mechanical equipment should have up to date safety training including use of lock-out tag out procedures, permit to work systems where risks are assessed, use of correct tools and regular inspection of equipment.

Gas Hazards

Actions to prevent gas related illness and injuries include:

- Gas confined to closed systems e.g. enclosed feedstock trailers and tankers, closed gas pipework.
- Odour abatement system to treat any off-gassing from feedstocks/digestate.

- Adequate signage demarcating potentially gaseous atmospheres, prohibiting mobile phones and naked flames i.e. ATEX zoning.
- Permit-to-work system e.g. ventilation of areas prior to work commencement.
- Calibrated and functioning detection devices.
- Adequate employee education and refresher courses.
- Limited work scheduled in confined spaces.

Explosion and Fire Hazards

Explosive atmospheres are mitigated by the following forms of protection:

- Primary Explosive Protection: Prevention of formation of explosive atmosphere through use of gas tight components, fail-close valves, automatic shut off systems, ventilation.
- Secondary Explosive Protection: Prevention of ignition (i.e. zones of prohibited mobile phone use/ignition), ATEX rated equipment in zoned areas.
- Tertiary Explosive Protection: Reduction of explosion consequences (i.e. PPE including gas monitors, explosion suppression, evacuation procedure).

A Fire and Explosion Risk Assessment will be conducted for all aspects of the site activities, from installation to operation. Once operational, the biogas facility operates as per recommendations from the Explosion Protection document, EPD, (A legal requirement as part of Safety, Health and Welfare at Work (General Application) Regulations 2007 Part 8) and the site fire risk assessment

Malpractice – Operative Health and Safety

Prior to the commissioning of the facility detailed standard operating procedures (SOPs) will be drafted which will be implemented during operation of the facility. In accordance with the 'Safety Health and Welfare at Work Act', 2005; 'the Safety, Health and Welfare at Work (Construction) Regulations, 2001' and associated Regulations, a site-specific Safety Statement will be produced which will incorporate all operating procedures at the facility. The site will operate under ISO 45001 management system.

The following measures will be implemented at the facility to minimise the potential for emergency situations:

- All on-site personnel will be adequately trained in relevant areas of employment.
- The facility design will be regularly reviewed for potential safety hazards.
- The facility will be designed to incorporate standby/backup plant in emergency situations.
- Adequate fire detection and fire-fighting infrastructure will be incorporated into the site design.
- All staff will be supplied with appropriate personal protective equipment (PPE).

6.8 Cumulative Effects

The potential cumulative effects of the Proposed Development on Population and Human Health have been considered in conjunction with the ongoing changes in the surrounding area. Visits to the Proposed Development and surrounding area and desk-based review of online planning files have been undertaken to identify the existing pattern of development, nearby uses, and any permitted / ongoing developments of relevance to the current proposals in the context of Population and Human Health.

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The cumulative effects of the proposed construction and operation of a biogas facility near Glenloughaun with other developments in the area are reviewed in this section with specific regard to the local population.

Air Odour and Climate

The assessment of the effects on Air, Odour and Climate (Chapter 9) has established that the emissions to atmosphere during the construction and operational stages will not affect human health.

Air dispersion modelling was completed to evaluate the potential effects of the planned development regarding EU ambient air quality standards which were established with the objective of protecting human health. As shown by the model results, projected ambient concentrations including background levels fall within all National and EU ambient air quality limit values and, thus, will have no effect on human health.

The predicted levels show that additional mitigation, other than the proposed Odour Treatment System, is not required.

Construction and operation phase mitigation measures are outlined in **Chapter 9: Air, Odour & Climate**.

Noise and Vibration

The assessment of the effects on Noise and Vibration (Chapter 10) has established that the noise emissions during the construction and operational stages will not affect human health.

Construction and operation phase mitigation measures are outlined in **Chapter 10: Noise and Vibration**.

6.8.1 Construction Phase

The mitigation measures outlined in the CEMP and above should be applied throughout the construction phase of the Proposed Development. This will ensure any significant cumulative effects on the local population and the greater environment are prevented.

6.8.2 Operational Phase

The cumulative effects on the local Population and on Human Health for the operational phase of the Proposed Development arise primarily from a slight increase in demand for services in the area, and due to increased employment in the area in combination with wider trends of increasing employment. By taking the mitigation factors into account and promoting sustainable use of all material assets this will help with the anticipated increase in the demand for local services and resources. Given the nature and scale of this development any potential cumulative effects of this Proposed Development will be minor.

6.9 Residual Effects

According to Environmental Protection Agency guidelines, Residual Impact is described as *'the degree of environmental change that will occur after the proposed mitigation measures have taken place.'* The mitigation strategy above recommends actions which can be taken to reduce or offset the scale, significance and duration of the effects on the surrounding populations.

6.9.1 Population

The Proposed Development will have no likely significant adverse effects, whether direct or indirect, on the population of the surrounding areas during the construction or operational phases.

Both direct and indirect employment will be created during the construction and operational phases of the development and as such the proposal will provide a significant economic benefit to the population of the surrounding area.

Following implementation of the mitigation measures proposed in **Section 6.7**, the residual impacts are anticipated to be **positive, slight to moderate, long-term** effects on the local population.

6.9.2 Employment

The Proposed Development will give rise to new employment opportunities in terms of the direct employment during the construction phase. There would also be indirect employment opportunities arising from the construction work taking place as a result of this proposal. These opportunities would include an increase in business for local services such as builders' suppliers as well as shops and other such tertiary industries.

The Proposed Development will provide for a significant gain to the area in terms of employment provision.

Following implementation of the mitigation measures proposed in **Section 6.7**, the residual effects are anticipated to be **positive, moderate, long-term** effects on local employment.

6.9.3 Community

It is considered that the Proposed Development is unlikely to generate any adverse effect on the demography of the area either during the construction phase or the operational phase and would actually have positive economic effects.

Following implementation of the mitigation measures proposed in **Section 6.7**, the residual effects are anticipated to be **neutral, slight, long-term** effects on the local community.

6.9.4 Human Health

The various human health parameters discussed in this chapter also interact with many other aspects of the environment. The residual effects in relation to these aspects are detailed in the individual chapters as follows:

- Chapter 9 – Air, Odour and Climate.
- Chapter 10 - Noise and Vibration.

Following implementation of the mitigation measures proposed in **Section 6.7** and the measures outlined in the chapters above, the residual effects are anticipated to be, **neutral, slight, long-term** effects on Human Health.

6.9.5 Residual Impact Summary

The overall impact anticipated during the construction phase of the project following the implementation of suitable mitigation measures is considered to be **neutral to positive, imperceptible to slight, and long-term.**

6.9.6 Monitoring

6.9.6.1 Population

No post development monitoring measures concerning population will be necessary.

6.9.6.2 Employment

No post development monitoring measures concerning population will be necessary.

6.9.6.3 Community

No post development monitoring measures concerning population will be necessary.

6.9.6.4 Human Health

The Proposed Development will operate under an Industrial Emissions Licence (IEL) issued by the Environmental Protection Agency (EPA) as well as adhering to Health and Safety Regulation. The licence will contain several conditions which the operator must remain in compliance with for the entire duration of the facility's lifespan, including ongoing monitoring of emission points, noise sources, pathogen control and facility management. These regulatory controls will stipulate a number of requirements that must be demonstrated to prevent or minimise the effects of operations on humans and the environment

The monitoring requirements in relation to Human Health aspects are detailed in the individual chapters as follows:

- Chapter 9 – Air, Odour and Climate
- Chapter 10 – Noise and Vibration

Following implementation of the mitigation measures as outlined in those chapters, the residual effects to human health as a result of air, odour and climate, and noise and vibration, are anticipated to be, **neutral to negative, imperceptible to slight, and temporary to long term.**

6.10 Summary of Significant Effects

The aspects of the environment considered for this assessment are Population, Employment, Community, and Human Health. Whilst the development proposals have the potential to cause detriment to the sensitive receptors identified, the recommended mitigation measures will ensure that the risk of potential effects are reduced to negligible.

6.11 Statement of Significance

The significance of impact upon the Population, Employment, Community, and Human Health have been assessed for during both the construction and operational phases.

Where a potential impact has been identified, the significance of impact upon these receptors

ranges from minor to moderate.

Where a potential effect has been identified, mitigation measures have been provided which once implemented reduce the impact of significance to **'slight or negligible'**. The mitigation steps are presented in **Section 6.7**.

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