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11 Population and Human Health

11.1 Introduction

This chapter assesses the impacts of the proposed development on human beings and those impacts that are not already covered by other chapters of the EIAR, such as health and safety, social considerations, economic activity, local amenity and land-use.

Other environmental assessments have been undertaken as part of this EIAR on topics that have potential to have impact on Population and Human Health including Noise and Vibration (Chapter 13); Air Quality and Climate (Chapter 12); Traffic and Transportation (Chapter 15); Landscape and Visual (Chapter 9); Land and Soils (Chapter 8), Water Environment (Chapter 7).

The Population and Human Health Chapter has been prepared by the following;

The Planning Policy Chapter has been completed by Majella O' Callaghan and Orla O'Sullivan of McCutcheon Halley Planning Consultants.

Majella O'Callaghan (BA (Hons) Geography and Economics, MSc Urban and Regional Planning and Diploma in Project Management) is a Senior Planner with McCutcheon Halley Planning Consultancy with over 11 years' experience in Planning. She has worked with multi-disciplinary teams on a several projects and has provided input to a variety of development projects that require both environmental and ecological assessment of potential impacts. She has also contributed to and co-ordinated a number of EIAs.

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11.2 Assessment Methodology

This chapter has been prepared having regard to the following guidelines:

- Guidelines for Planning Authorities and An Bord Pleanála in carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, August 2018);
- Guidelines on the Information to be Contained in Environmental Impact assessment Reports (EIAR) (Environmental Protection Agency (EPA), 2022);
- Advice Notes for Preparing Environmental Impact Statements (EPA, draft September 2015); and

- The Planning System and Flood Risk Management – Guidelines for Planning Authorities (DoEHLG, 2009).

The Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022) state that:

‘.in an EIAR, the assessment of impacts on population and 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.’

Recital 22 to the EIA Directive provides that:

“In order to ensure a high level of protection of the environment and human health, screening procedures and environmental impact assessments should take account of the impact of the whole project in question, including, where relevant, its subsurface and underground, during the construction, operational and, where relevant, demolition phases”.

The EPA advice notes (EPA, 2015) recommend considering the following issues when assessing the potential impacts and effects of a proposed development on Population and Human Health;

- **Economic Activity** likely to lead to projects - will the development stimulate additional development and/or reduce economic activity, and if either, what type, how much and where?
- **Social Consideration** - will the development change the intensity of patterns and types of activity and land use?
- **Land-use** - will there be severance, loss of rights of way or amenities, conflicts, or other changes likely to ultimately alter the character and use of the surroundings?
- **Tourism** – will the development affect the tourism profile of the area?
- **Health** – have the vectors through which human health impacts could be caused been assessed, including adequate consideration of inter relationships between those assessments.

Ballyhale is not identified as having any significant intrinsic tourism value, and for the purposes of this assessment potential effects on tourism and tourism resources will be considered under Economic Activity.

The appraisal of the likely significant effects of the proposed flood relief works on population and human health was conducted by reviewing the current socio-economic environment in the area. This includes an analysis of aerial photography and Ordnance Survey (OS) mapping. Information on the proposed scheme was provided by DBFL Consulting Engineers, including a Constraints Report and the proposed scheme and associated drawings.

The EIAR study area incorporates the settlement of Ballyhale and the immediate surrounding areas that are likely to be affected. Information was gathered with respect to the demographic and employment characteristics of the resident population within the relevant catchment area, sourced from Census 2011 and 2016. The data included information on population, household type, travel trends, employment and health. A desktop survey of the following documents and websites also informed this:

- Kilkenny City and County Development Plan (KCiCDP) 2021 - 2026;
- Central Statistics Office (CSO) website www.cso.ie;
- Department of Education and Sciences (DES) website www.education.ie;
- The Nore Basin Flood Risk Management Plan 2018 – 2021.

Detailed consideration was given to the surrounding area and the potential receptors and receiving environment that might be affected by the proposed development. The EPA Guidelines (2022) and the EPA Advice Notes (2003) and (2015) identify sensitive receptors as neighbouring landowners, local communities and other parties likely to be impacted by the proposal.

These are discussed in detail in Section 4.3 and include;

- the surrounding residents/homes,
- benefitting lands
- the community facilities and services in the area,
- local businesses
- local schools and childcare facilities, and
- temporary receptors such as pedestrians or drivers passing through Ballyhale as flood relief works progress.

Consultations with both the local authority and statutory bodies were also used to ensure that environmental issues, including socio-economic, recreational and amenity issues relating to the proposed development were addressed (refer to Chapter 3 for details and responses). A response was received from the Irish Farmers Association which outlined their support in principle for the flood relief works. The comments are provided below, and potential issues affecting landowners as a result of the flood relief works are dealt with in this chapter of the EIAR and in other chapters where appropriate:

“Any landowner” affected needs to be consulted with in detail from the outset.

- Landowners affected by this project will have to be adequately compensated for any works carried out.

- A plan/procedure must be in place if the proposed works affects the landowners lands going forward. i.e. any new potential flooding of lands due to proposed works

The Nore Basin Flood Risk Management Plan 2018 – 2021 (the 'Plan') follows the CFRAM Programme which examined the flood risk and proposed possible measures to address the risk, in 300 communities throughout the country at potentially significant flood risk. These communities were identified through a Preliminary Flood Risk Assessment (PFRA) which was a national screening assessment of flood risk. The PRFA identified that Ballyhale was one of the communities at potentially significant flood risk from fluvial flooding.

The Plan identifies that the following public consultations were held with regard to flood risk and proposed protection measures for Ballyhale;

- Ballyhale/Mullinavat, held on 19th October 2015 at Mullinavat Community Centre. 10 attendees were recorded.
- Thomastown/Ballyhale, held on 29th February 2016 at Thomastown Community Centre. 35 attendees were recorded.

Consultations were also held at the draft Flood Risk Management Plan Stage;

- Ballyhale (and other areas), held on 18th October 2016 at the New Park Hotel in Castlecomer Road, Kilkenny. 63 attendees were recorded.

11.3 Baseline Environment

11.3.1 Site location and description

Ballyhale is a settlement in Co. Kilkenny, c. 7.5 km to the south-west of Thomastown and c. 2.2 km to the east of the M9 motorway. The R448 is the principle road through the town. The Dublin-Waterford railway line runs to the west of the village. The 2016 Census data for the settlement of Ballyhale indicates a population of 174. The town is within the catchment of the Little Arrigle River which is a tributary of the River Nore. The main channel of the Little Arrigle runs to the west of the village and the Ballyhale River, a tributary of the Little Arrigle runs through the village and discharges to the River Nore and River Barrow SAC to the north of Ballyhale Town. The features of conservation interest for the River Barrow and River Nore SAC include a number of freshwater species such as freshwater pearl mussel, salmon, lamprey and crayfish.

There are a number of structures and buildings listed in the Record of Monuments and Places (RMP) and National Inventory of Architectural Heritage (NIAH) in proximity to the proposed flood relief works;

- A number of sites of archaeological importance are present in the vicinity of Ballyhale church including the church, castle the graveyard and a font. All are listed within the Kilkenny County Development plan and most are listed in the Record of Monuments and Places (RMP);
- Additional sites of archaeological importance from the RMP are identified west of the watercourse upstream of the village and include a souterrain and a burnt mound;
- NIAH sites in the vicinity of the works include the Church tower, a number of buildings on main street, a water pump on main street;
- Two existing bridges on the Ballyhale River are also included on the NIAH.

11.3.2 Population and Settlement Patterns

Ballyhale is subject to the Kilkenny City and County Development Plan (KCiCDP) 2021. It is identified as one of 22 rural towns in the settlement hierarchy (Section 4.3 of the KCiCDP). To promote the vitality and viability of smaller settlements as rural service centres, the KCiCDP recognises that it is an objective of the National Planning Framework (NPO 18b) to “*develop a programme of new homes in small towns and small villages with local authorities and agencies such as Irish Water and local communities to provide serviced sites with the appropriate infrastructure to attract people to build their own homes and live in small towns and villages*”..

There are no landuse zoning objectives within the settlement boundary of the town. The settlement boundary for Ballyhale provided for in the KCiCDP is shown in Figure 11.1.

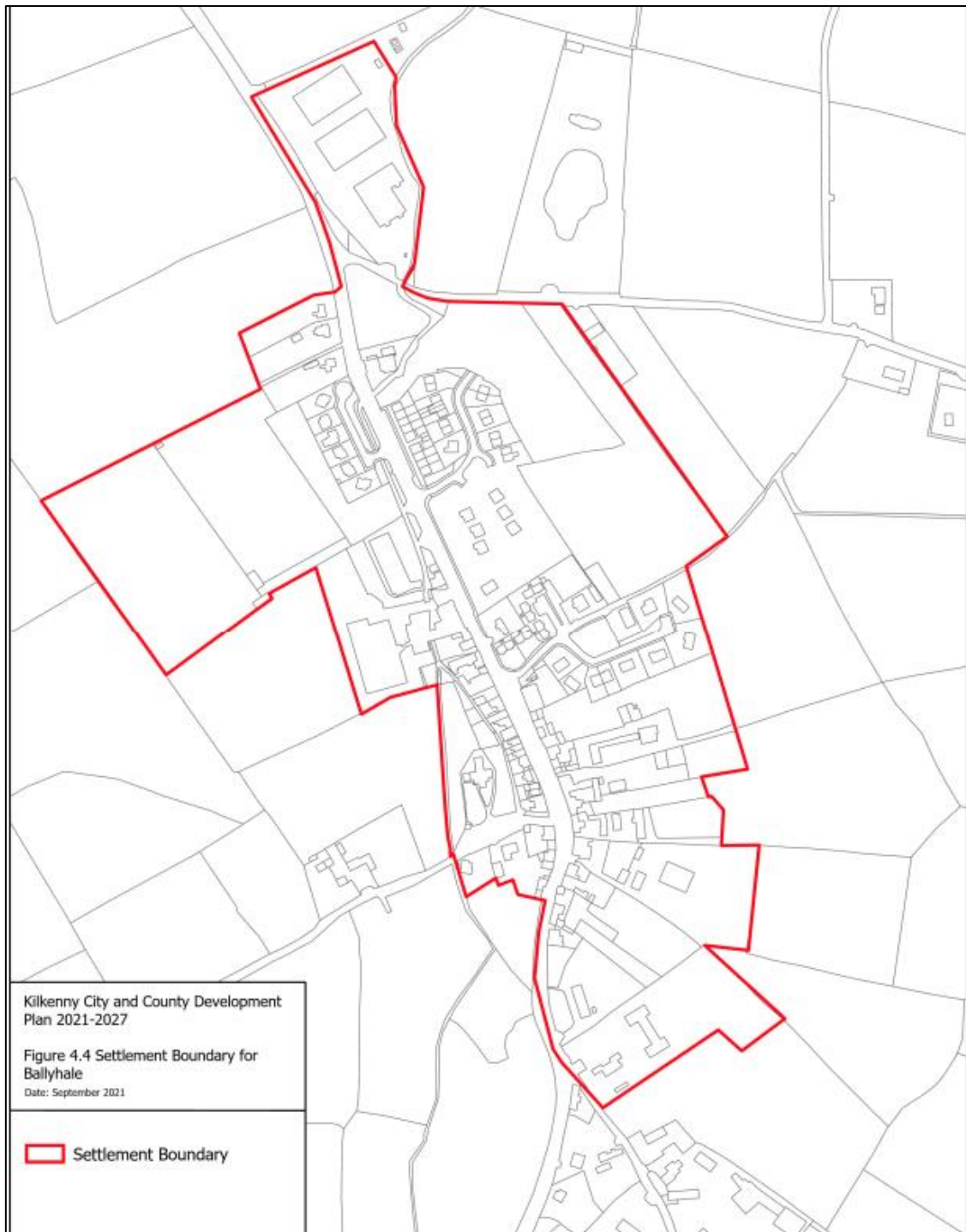


Fig 11.1 Settlement Boundary for Ballyhale (Fig 4.4 of KCiCDP 2021 – 2027)

Ballyhale Settlement is located within the Electoral District (ED) of Ballyhale. A 1km buffer was generated to identify an appropriate buffer to determine potential receptors that may experience significant impacts as a result of the flood relief works. This EIAR study area overlaps three Electoral Divisions: the Ballyhale ED, Knocktopher ED and Kiltorcan ED (refer to Fig 11.2).

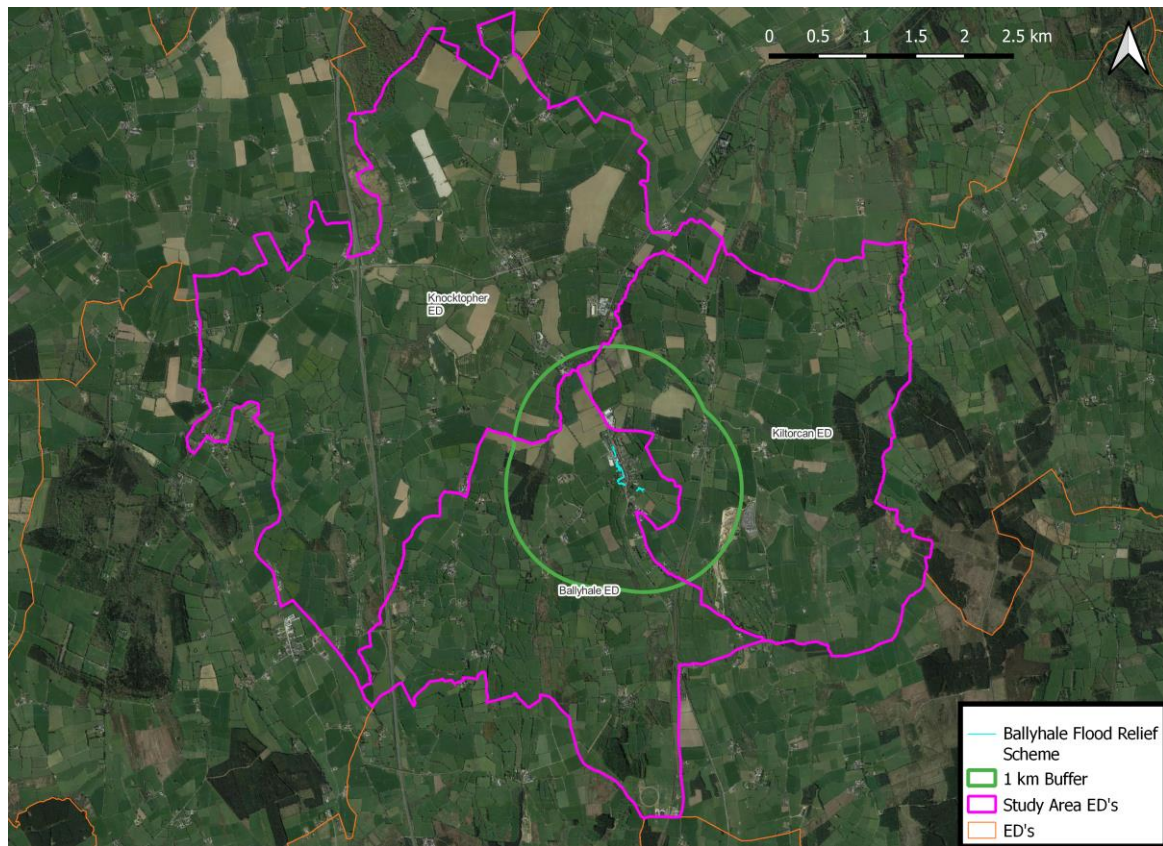


Fig 11.2 Electoral Districts in proximity to the settlement of Ballyhale.

The 2016 Census identified that Knocktopher had a population of 521, Ballyhale ED had a population of 424, and the Kiltorcan ED a population of 175. The percentage change between 2011 and 2016 is presented in Table 11.1 below. The figures show that all EDs increased in population above the average for the county and state. The settlement of Ballyhale was identified as having a population of 174 in 2016. This is included in the overall figure for the Ballyhale ED.

Table 11.1 Population Change for Ballyhale ED, Knocktopher ED and Kiltorcan ED between 2011 and 2016. Kilkenny County and State figures are included for comparison

Electoral District	2011	2016	Change	% Change
Kiltorcan ED	159	175	16	10%
Ballyhale ED	368	424	56	15.2%
Knocktopher	521	554	33	6.3%
Kilkenny County	95,419	99,232	3,813	4%
State	4,588,252	4,761,865	173,613	3.8%

Ballyhale is one of the smallest rural towns identified in the settlement hierarchy for Kilkenny County, accounting for 0.18% of the total population of the rural settlements (Table 2, Appendix B, Housing Strategy). The population of the settlement of Ballyhale is set to grow by 14 to 188 (0.08%) by 2027.

The CSO figures for average household size for the EDs are shown in Table 11.2. Ballyhale ED and Knocktopher ED are in line with the figures for Kilkenny County and the state (Table 11.2), however the Kiltorcan ED is higher at 3.7.

Table 11.2 Household size for Ballyhale ED, Knocktopher ED and Kiltorcan ED. Kilkenny County and State figures are included for comparison.

Area	Households	Persons	Average Household Size
Ballyhale ED	155	425	2.7
Kiltorcan ED	47	175	3.7
Knocktopher ED	197	554	2.8
Kilkenny County	34,855	97,536	2.8
State	1,702,289	4,676,648	2.7

In terms of demographic split (Table 11.3), the CSO 2016 identified that the figures for the age cohorts for the Ballyhale ED and Knocktopher ED are in line with the average figures for Kilkenny County and the State. The population in Kiltorcan shows some differences in that there is a higher percentage of children in the 12 – 18 year age cohort (15.4% compared to an average of 9.9% for Kilkenny County and 9.2% for the state). This generally corresponds to secondary school aged children. In comparison the figure for the Ballyhale ED is slightly less than average (6.1%).

The CSO data also identifies that Kiltorcan had a lower percentage of people in the 65+ age cohort.

Table 11.3 Demographic breakdown for age cohorts for Ballyhale ED, Knocktopher ED and Kiltorcan ED. Kilkenny County and State figures are included for comparison.

Area	Age 0-4	Age 5-11	Age 12-18	Age 19-34	Age 35-64	Aged 65+	Total Population
State	331,515	484,368	435,913	990,618	1,881,884	637,567	4,761,865
As percentage of total population	6.9%	10.2%	9.2%	20.8%	39.5%	13.4%	N/A
Kilkenny County	7,112	10,317	9,849	17,686	40,215	14,053	99,232
As percentage of total population	7.2%	10.4%	9.9%	17.8%	40.5%	14.2%	N/A
Ballyhale ED	38	54	26	78	166	62	424
As percentage of total population	9%	12.7%	6.1%	18.4%	39.2%	14.6%	N/A
Kiltorcan ED	16	24	27	23	71	14	175
As percentage of total population	9.1%	13.7%	15.4%	13.1%	40.6%	8%	N/A
Knocktopher ED	37	69	53	85	227	80	551
As percentage of total population	6.7%	12.5%	9.6%	15.4%	41.2%	14.5%	N/A

Travel Trends

Most people (over 80%) work or attend school within a driving radius of ¾ hour for the all of the EDs included in the assessment. The settlement of Ballyhale is located within a 10 minute drive of Thomastown, and a 40 minute drive of Kilkenny and Waterford City. People may travel into Ballyhale from the surrounding EDS for work, however given that this is a predominately rural area and that Ballyhale does not have any major centres of employment it is likely that people will seek work in larger towns such as Thomastown or in Kilkenny City. Students may also attend secondary schools or colleges in Kilkenny or Waterford.

Table 11.4 Travel trends and commuting time for residents of the Ballyhale ED, Knocktopher ED and Kiltorcan ED.

Time Taken to Travel to Work, School or College	Ballyhale: Total Population Aged 5 years and over		Knocktopher: Total Population Aged 5 years and over		Kiltorcan: Total Population Aged 5 years and over	
Under 15 mins	72	28.1%	94	27%	42	35.6 %
1/4 hour - under 1/2 hour	77	30.1%	117	33.6%	22	18.6 %
1/2 hour - under 3/4 hour	65	25.4%	78	22.4%	32	27.1 %
3/4 hour - under 1 hour	10	3.9%	15	4.3%	9	7.6%
1 hour - under 1 1/2 hours	10	3.9%	11	3.2%	4	3.4%
1 1/2 hours and over	11	4.3%	13	3.7	5	4.2%
Not stated	11	4.3%	20	5.7%	4	3.4%
Total	256		348		118	

Labour Force

The CSO releases quarterly publications on labour force (Labour Force Survey LFS)¹ estimates for the state.

The Labour Force Survey (LFS) replaced the Quarterly National Household Survey (QNHS) from Q3 2017. Similar to the QNHS, it is a large-scale, nationwide survey of households in Ireland. It is designed to produce quarterly labour force estimates that include the official measure of employment and unemployment in the state (International Labour Organisation classification). The most recent release published by the CSO is for Q2 2021. Table 11.3 provides summary results for the survey.

¹ <https://www.cso.ie/en/releasesandpublications/ep/p-lfs/labourforcesurveyquarter22021/>

Indicator	Standard LFS Methodology (ILO)	COVID-19 Adjusted Estimates June 2021
	Q2 2021	end of Q2 2021
Employed persons aged 15 - 89 years	2,349,100	2,120,778
<i>Employment rate for those aged 15-64 years</i>	<i>68.6%</i>	<i>61.7%</i>
Unemployed persons aged 15-74 years	184,100	413,687
<i>Unemployment rate for those aged 15-74 years</i>	<i>7.3%</i>	<i>16.2%</i>
In labour force	2,533,200	-
Not in labour force	1,482,700	-

Fig 11.3 CSO Labour Force Survey Quarter 2 2021 Summary Results

In general, there were 2,349,100 people aged 15-89 years in employment in Q2 2021, giving an employment rate of 68.6% for those aged 15-64, based on the International Labour Organisation (ILO) criteria². There were 184,100 unemployed persons aged 15-74 years in Q2 2021. The number of persons in employment was up 9.9% (211,000) from 2,138,100 over the year while the employment rate was up from 63.2% in Q2 2020.

The Population and Labour Force Projections 2017 – 2051 Report released by the CSO in 2018 identifies that Ireland's population is projected to grow substantially by 2051, from 4.74 million in April 2016 to 6.69 million by 2051. Population growth will be influenced by inward migration and fertility, but even with low inward migration and declining fertility, the report anticipates that Ireland's population should reach 5.58 million in 2051.

11.3.3 Economic Activity

There are a number of businesses currently operating in Ballyhale. Industrial premises are located at the Arrigale Business Park, located towards the north of the town, and include Airmax Inflatables Ltd and Mulberry Stoves. Further to the north along the Main Street at the outer edge of the town is a designated industrial area which includes BD Seafood, Boxer Logistics and Glen Fuels Truck Stop. Additionally, to the south-east of Ballyhale, Kiltorcan Quarries has operated since the 1980s and is responsible for the exportation of aggregates around Cork and Ireland.

The Nore Basin Flood Risk Management Plan 2018 – 2021 introduced in Section 11.2 of this report provides an assessment of the potential economic risk to Ballyhale as a result of future flood events. The numbers of properties at risk and the estimated

² <https://www.ilo.org/global/standards/lang--en/index.htm>

damage values are based on the market values as understood at the time of the assessment. These are set out in Appendix E to that report.

Chapter 5 of this EIAR provides a detailed description of the scheme, and includes a summary of the calculation of the cost of flood damage to property. The cost of flood damage is also included in the Options Report prepared by DBFL for the scheme.

The assessment identified that a number of properties, both residential and non-residential, are at risk of flooding in the Ballyhale affected area during the 1% AEP event (medium probability of occurrence). It is obvious from the analysis that the cost of a flood event would result in a significant cost and loss to this small community; for the design standard event 1% AEP the Capped Present Value of Damages (PVd) is calculated at €4,696,971.

The assessment identified that a number of properties, both residential and non-residential, are at risk of flooding in the Ballyhale affected area during the 1% AEP event (medium probability of occurrence). It is obvious from the analysis that the cost of a flood event would result in a significant cost and loss to this small community.

As identified in the analysis of travel trends above, both Waterford City and Kilkenny City are within a 40 minute drive of the settlement of Ballyhale. Thomastown is the nearest large settlement in proximity to Ballyhale, located within a 10 minute drive. Thomastown is identified as a District Town in the Settlement Hierarchy of the KCiCDP, with a population of at least 1,500. District Towns are identified as having “*well developed services and community facilities and have the capacity to accommodate additional population (subject to certain physical infrastructural investments)*”

The surrounding area is rural in nature, with much of the land in agricultural use. There are a number of recent permissions for solar farms in proximity to Ballyhale which indicates that some landowners are willing to diversify into alternative agricultural uses.

These are also considered in the assessment of potential cumulative impacts.

11.3.4 Land use and Amenity

Ballyhale is a rural settlement, located within a predominately agricultural area. Fig 11.5 presents an overview of the uses within and in proximity to Ballyhale, and along the route of the proposed flood works. In terms of recreational activity, the soccer pitch and the iconic Ballyhale Shamrocks GAA Club are located to the south and west of Ballyhale village centre respectively. Ballyhale Shamrocks is comprised of a mixture of both juvenile and senior teams for men and women, while the soccer pitch to the south

services the physical activity needs of the pupils in Scoil Airegil and Scoil Phadraig. This suggests that there is regular traffic through the village to use the sporting facilities.

Kissanes Pharmacy and Ballyhale Health Centre are situated within the settlement boundary. Scoil Phadraig which is located approximately 76 metres from the nearest point of the route of the flood relief scheme will be servicing 181 pupils during the 2021-2022 academic year. The Ballyhale Creche and Montessori is located on the main street and operates from Monday to Friday. Billy's Tearooms and Shop is a very important community asset, established in 2015 to help revitalise the community which had recently suffered a decline due to closure of shops, pubs and the local post office³.

The Church of St Martin's of Tours, which is located to the south east of Ballyhale, is included on the NIAH as a building of Regional Significance and is also identified in the Register of Protect Structures. The graveyard is also identified as an area of archaeological potential. The church is in regular use - the mass schedule for the Church identifies that masses are currently held on Saturday evenings at 07.30 pm and Sunday mornings at 11.00 am. It is likely that the church is in use at other times, for example to celebrate events such as funerals, weddings, etc.

The KCiCDP identifies that the tourism sector continues to be a crucial element of community and economic development for the County. With regard to Ballyhale, the KCiCDP identifies recent developments that "shall be encouraged and supported" such as Mountain View in Ballyhale, a restaurant and boutique hotel with golf course that offers accommodation for visitors to the area. It is also an objective to continue the development the Ballyhale Looped Walks (KCiCDP Trails and Walkways Objectives 8F).

³ <https://www.independent.ie/business/farming/rural-life/after-losing-five-shops-three-pubs-and-the-post-office-how-this-rural-community-is-revitalising-itself-37926624.html>

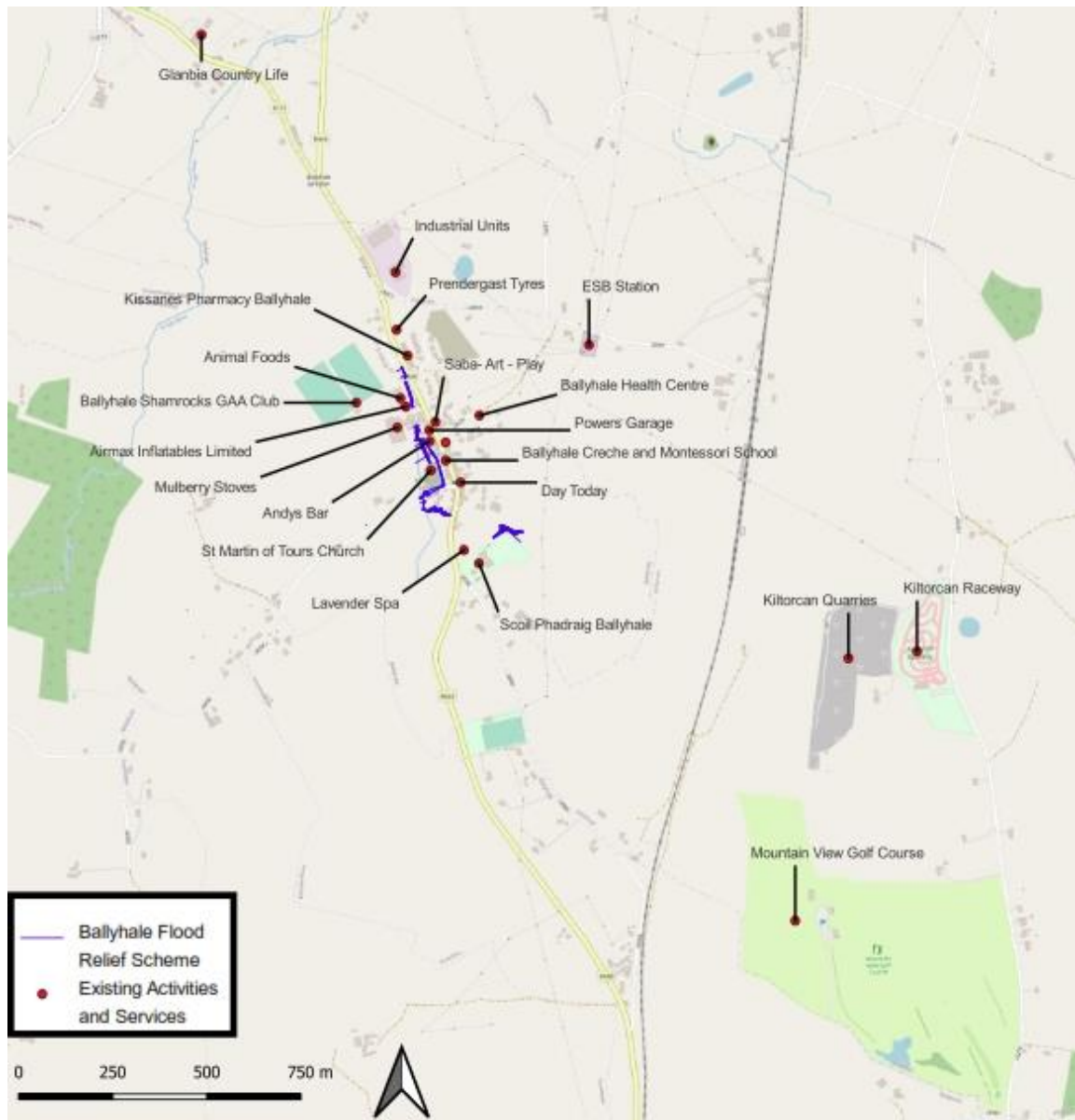


Figure 11.5 Community and Employment uses

The Landscape Character Assessment (LCA) for Kilkenny County is described in Chapter 9 of the EIA (Landscape and Visual Impact Assessment) The LCA divides the county into four landscape character types (LCTs). These are:

- Upland Areas,
- Lowland Areas,
- River Valleys, and
- Transitional Areas.

Ballyhale is located in an area outlined as a Transitional Area, which lies between the south western uplands (Landscape Character Type C) and the lower lying lands to the north(Landscape Character Area F, Kilkenny Western Basin).

The landscape character of this area is defined by a smooth terrain, allowing views over long distances, and vegetation is predominantly low. Land use comprises pasturelands and tree plantations, the area is described as a rural area with scattered, low density settlement patterns.

The LVIA did not identify any areas of sensitive landscape in proximity to Ballyhale. The KCiCDP notes that in general, areas of elevated topography, with low growing or sparse vegetation and little existing development are landscapes of high sensitivity and have a low potential to absorb new development. The LCA for Kilkenny notes that this landscape unit is perceived as having no special landscape or scenic value.

11.3.5 Health

The CSO provides information on the perceived health of participants, rating health from Very Good to Bad. Within the combined ED areas, over 85% identified their health as either 'Very Good' or 'Good'. Overall, approximately 2% of the population for each ED identified their health as 'Bad' or 'very Bad'.

Table 11.4 Perceived Health Status for residents of the Ballyhale ED, Knocktopher ED and Kiltorcan ED.

General Health	State	Kilkenny County	Ballyhale ED	Kiltorcan ED
Very Good	59.4%	61%	64.4%	79.4%
Good	27.6%	27.5%	27.8%	16%
Fair	8.0%	7.9%	5.4%	3.4%
Bad	1.3%	1.2%	1.4%	1.1%
Very Bad	0.3%	0.3%	0.7%	0%
Not stated	3.3%	2.1%	0.2%	0%

11.4 Identification of Principal Potential Receptors

As the proposed flood relief works are taking place in Ballyhale which is a rural settlement supporting an active community, there are a number of services, businesses and community facilities that experience temporary disruption. Local residents may also

be affected. An overview of the uses within and in proximity to the settlement is provided in Fig 11.5.

11.4.1 Local residents

The flood relief works will take place at discrete locations throughout the settlement of Ballyhale (refer to Chapter 5 for details). The settlement of Ballyhale was identified as having a population of 175 following the 2016 Census. It is likely that receptors immediately adjacent to the flood relief works will experience short term disturbance as the construction phase progresses, as a result of noise, or dust emissions or disruption due to construction traffic.

11.4.2 Community Facilities and Services

The settlement of Ballyhale comprises of a range of community facilities and services, many of which are identified in Section 11.3 of this report. Those that are located in closest proximity to the proposed flood relief works are likely to experience some levels of disruption during construction works, for example the Church of St Martin's of Tours is located at an important node in the flood relief scheme (refer to Figure 11.5).

11.4.3 Economic Activities

To the west and north of the Ballyhale settlement there are a number of businesses associated with industrial activity and manufacturing. The businesses such as BD Seafood, Prendergast Tyres, Mulberry Stoves and Boxer Logistics operate consistently on a day to day basis and service a wide customer base throughout the region.

11.4.4 Temporary Receptors

As the flood relief scheme is under construction, people travelling through Ballyhale for reasons including to access employment, education, medical treatment or access any other services in the surrounding area may be deemed to be temporary receptors and may experience brief disturbance and disruption due to traffic impacts, presence of machinery, noise, dust, etc.

11.4.5 Do Nothing Scenario

If the flood relief scheme does not proceed then there will be no construction related impacts on the receptors identified above. The settlement of Ballyhale would remain at risk of flooding. The risk is quantified in the Hydraulic Report prepared for the scheme

by McCloy Consulting Engineers, which modelled the baseline flood risk using recently commissioned ground based bathymetric and topographic survey data.

The results of the modelling indicated substantial flood risk within Ballyhale village originating from the Ballyhale River. The primary flood mechanism for flooding was attributed to structure / channel incapacity along the Ballyhale River particularly on the western church reach to the Arrigle Business Park. Two substantial overland flow routes upstream of the village emerge affecting lands on Chapel Lane and on Main Street.

The modelling identified the number of properties shown to be affected by fluvial flooding within Ballyhale village for the three key return periods for the present day hydrology and mid-range / high-end climate change future scenarios (Table 11.5). The extent of the flooding for the 1% AER is shown in Fig 11.6.

Table 11.5 Properties Subject to Internal Flooding for the present day hydrology, MRFS and HEFS

Return Period	No. of properties flooded		
	Present Day Hydrology Scenario	Mid-Range Climate Change Scenario	High End Climate Change Scenario
10% AEP	0	10	12
1%AEP	19	31	35
0.1%AEP	44	47	47



Fig 11.6 Extent of flooding through settlement of Ballyhale. Extract from Hydraulics Report prepared by McCloy Consulting Engineers.

The KCiCDP has undertaken a Strategic Flood Risk Assessment (SFRA) as part of the Strategic Environmental Assessment (SEA) which identified the areas at risk to flooding and appropriate policy response. The SFRA identifies that Ballyhale is located within a High Priority Watercourse (HPW) as per the CFRAMS. A flood risk map for Ballyhale, which does not take into account flood defences such as flood walls or embankments, is provided in the SFRA (reproduced here as Fig 11.7). Flood risk is indicated using Flood Zones, which indicate a high, moderate or low risk of flooding; .

- **Zone A High probability of flooding.** This zone defines areas with the highest risk of flooding from rivers (i.e. more than 1% probability or more than 1 in 100) and the coast (i.e. more than 0.5% probability or more than 1 in 200).
- **Zone B Moderate probability of flooding.** This zone defines areas with a moderate risk of flooding from rivers (i.e. 0.1% to 1% probability or between 1 in 100 and 1 in 1000) and the coast (i.e. 0.1% to 0.5% probability or between 1 in 200 and 1 in 1000).
- **Zone C Low probability of flooding.** This zone defines areas with a low risk of flooding from rivers and the coast (i.e. less than 0.1% probability or less than

1 in 1000). Flood Zone C covers all areas of the plan which are not in zones A or B.

The flood risk map for Ballyhale indicates the number of properties which are located within Flood Zone A.

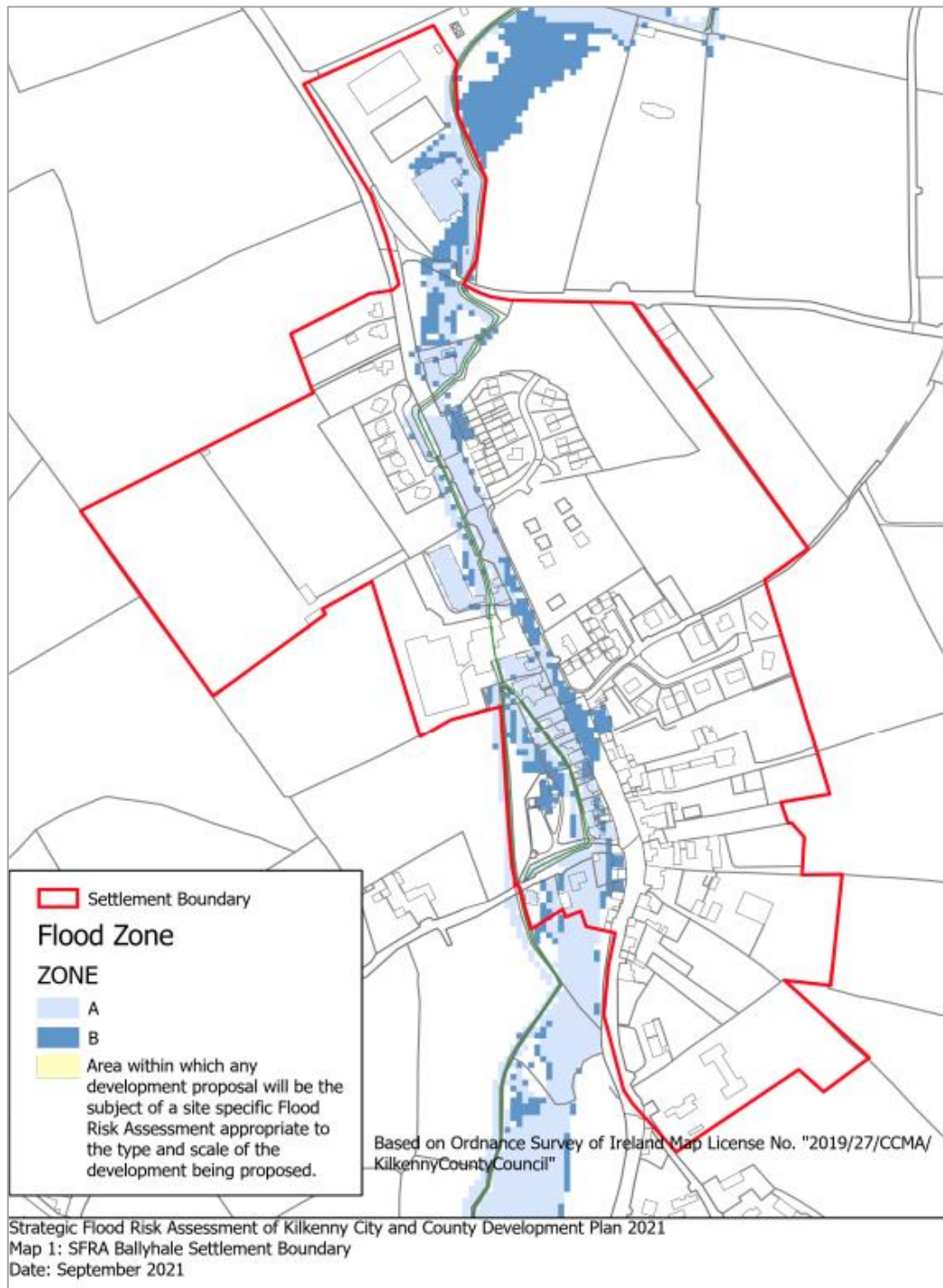


Figure 11.7 Copy of Map 1 Ballyhale from SFRA for Kilkenny City and County

Chapter 8 of the UoM15 Hydraulic Report referred to in the OPW Flood Risk Management Plan for Kilkenny identified the economic pressures of a 'Do Nothing

Scenario'. In the event that the flood relief scheme does not proceed, the Net Present Value Damages to the surrounding population will be significant for the current scenario, mid-range and high-end future scenarios. The data presented in Chapter 5 of this report demonstrates that even the mid-range future scenario (10% AEP) would result in significant economic loss.

The do-nothing scenario would therefore result in a long term adverse effect on the settlement of Ballyhale.

11.5 Characteristics of the Proposed Development

The project comprises a flood relief scheme for the town of Ballyhale, Co. Kilkenny. The general intent of the works are to enhance the flow capacity and level of defence through the town so that the design flows can be conveyed through the town without causing property flooding.

The project is currently at planning stage and subject to approval and detailed design. It is estimated that the works would be tendered in 2023 with commencement in 2024 and an estimated site programme of approximately 20 months depending on construction phasing. Chapter 5 (Description of the Proposed Scheme) identifies the primary works elements.

- Site setup,
- Advance Archaeology Surveys
- Site clearance and demolition,
- Earthworks,
- Installation of drainage,
- Construction of new structures
- Landscaping and demobilisation

Following completion of a range of baseline assessments to establish the existing environmental and flood risk conditions at the site, the proposed scheme will include a range of interventions along the watercourse. These are set out in the Flood Risk Management Option Report prepared by DBFL

To summarise, the proposal seeks to *“remove the existing flow split at the church and direct all flow to the open channel western branch. This removes flow from the heavily modified and under capacity eastern channel which is adjacent to a number of at-risk properties. It allows a continuous flood defence to be provided between all river flows and the at risk properties”*.

Flood defence works will include;

- Proposed embankment/berm (up to 1.2 m in height) to rear of Garda Station
- Removal of existing access bridge and wall to the rear of the garage/Andy's Pub and proposed flood wall of up to 1m
- Proposed piped channel from Church stream (north of Andy's Bar) along Main Street and connecting to the stream in channel at front of Ballyhale Business Park.
- Removal of weir (and possibly bridge) and re-grading of existing channel at entrance to Ballyhale Business Park on Main Street
- Proposed flood wall (0.3m in height) along river channel between Pairc na Seamróg entrance and Hazelbrook estate

A full description of the project is provided in Chapter 5.

11.6 Predicted Impacts of the Proposed Development

11.6.1 Construction Stage

Chapter 5 identifies the primary works elements. Given the nature of the proposed works there are a number of discrete works areas and it is likely that individual access will be required to each area, complete with temporary fencing around these works areas as required.

A temporary construction compound will be established at a location agreed with Kilkenny County Council. The area of the construction site compound will be defined and enclosed by protective hoarding and will accommodate contractor personnel and visitor parking, porta cabins for site offices, WC and welfare facilities, storage containers and material lay down areas. The compound will be removed upon completion of the works.

Construction activities such as excavation may give rise to emissions to air or surface water, as well as increased noise and vibration. The construction phase of the project will commence in 2024 and take place over an estimated 20 months, depending on construction phasing.

Given the nature of the works, which will be spread out to encompass a number of locations within Ballyhale, some disruption to local traffic can be anticipated. The potential impacts are assessed in Chapter 15 (Traffic and Transport). The assessment identified that construction of the proposed scheme will cause temporary short-term traffic impacts on the local road network, however these are expected to be minimised through enforcement of a Construction Traffic Management Plan (CTMP). The CTMP

shall take account of local usage patterns of existing residential and commercial developments in the area. The principal objective of the CTMP will be to ensure that the impacts of all building activities on both the public (off-site) and internal (on-site) workers are fully considered and proactively managed, and programmed to take into account key stakeholders and minimise disruptions.

The potential effects with regards to construction noise and vibration and air quality and climate are described in detail in Chapter 13 (Noise and Vibration); and Chapter 12 (Air Quality and Climate). Potential impacts on surface water and water courses are considered in Chapter 7 (Water Environment).

Population and Settlement Patterns

Generally, the potential impacts arising during the construction phase relate to quality of life including visual impact, amenity, noise, air quality and transport. Where relevant, these impacts have been considered in the relevant chapters of the EIAR and will be minimised or mitigated where appropriate. It is unlikely that these impacts will be of a scale to either encourage people to move from the area or discourage people from moving to the area. No significant impacts on population and settlement patterns as a result of the construction phase of the project are anticipated.

Economic Activities

The construction phase will last approximately 20 months in total, and will occur on a phased basis. It is anticipated that normal construction working hours will be 07:00 to 19:00 Monday to Friday and 08:00 to 17:00 on a Saturday. Working outside these hours will be subject to agreement with the Local Authority.

There may be a slight, short term positive benefit to the local economy, as construction workers may utilise local facilities such as shops, service stations or restaurants.

It is anticipated that local businesses, including those within the settlement of Ballyhale will continue to operate normally, however the proposed works will include a new relief drainage line down Ballyhale Main Street. This will involve construction within the existing road carriageway and may cause some disruption to local businesses. Temporary traffic management measures for this work shall be included within the contractors Traffic Management Plan/Construction Management Plan and the contractor shall apply for a road opening license from KCC for the works. It is anticipated that the works would involve temporary closure of one side of the carriageway and an alternating one way traffic management system on the other lane.

Temporary road closures may impact businesses due to loss of parking and disruptions to the regular flow of traffic. Construction vehicles will not be permitted to park on the public roads unless designated or permitted to do so.

Any impacts on local businesses and economic activity will be negative, but temporary and moderate for the duration of the particular phase of construction works.

Community Facilities and Services

The most significant community facilities within the settlement of Ballyhale are identified on Figure 11.4 and include the primary school (Scoil Phaidraig, located to the south of the settlement), the Church, Ballyhale creche and Montessori, the Parochial Hall and Ballyhale Health Centre. While these are expected to operate normally during the construction phase access may experience some disruption due to temporary road closures and presence of machinery and plant, and there may also be some disturbance as a result of noise, dust, etc.

Landuse and Amenity

In general, construction phase impacts on local amenity and receptors identified in proximity will be mainly related to disturbance to private property, noise, air quality and traffic. These are dealt with in the specific chapters of the EIA. Potential impacts relating to air quality are also considered under **Health**.

The CEMP identifies that foundations for the proposed flood walls and other structures will require foundations, involving reasonably shallow excavations. The requirement for any temporary support for surrounding lands will be established and detailed in the Construction Stage Construction Management Plan. The CEMP identifies that, given the nature of the works, there is a risk that private property may be damaged during the construction phase. To minimise this risk, preconstruction surveys will be carried out on adjacent buildings to ensure any damage can be identified, monitored and reinstated. These will be carried out in consultation with residents, or any stakeholders that may be affected.

An Air Quality Assessment was completed and is presented as Chapter 12 of this EIAR. The assessment identified that there are approx. 23 sensitive residential properties within 20m of the proposed construction activities on the site, including the church. There are approximately an additional 26 sensitive residential properties within 50m of the site. The sensitivity of the area to dust soiling effects on people and property is high, in terms of potential earthworks and construction dust impacts. Overall, the risk of dust soiling is considered Medium. Construction site dust control measures and good

construction site management are proposed to mitigate the potential for significant impact of fugitive dust emissions. Mitigation measures include implementation of a dust management plan; communication with stakeholders and local residents and appointing a designated person who will be responsible for project-related air quality and dust issues. Good practice site management will include managing use of machinery to reduce emissions, waste management and using water assisted sweepers to remove dust or materials tracked in and out of the site.

Monitoring is also proposed to monitor dust, record inspection results, and make the records available to the local authority if and when requested. The records shall include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary.

Once the mitigation measures are put in place the potential for fugitive dust emission effects at the nearest residential properties will be controlled to ensure any impacts are of negligible significance.

Traffic Disturbance

Potential impacts relating to traffic are assessed in Chapter 15. Haul routes have been identified to consider all traffic during the construction stage. Construction traffic will only be generated on weekdays (07:00-17:00, subject to conditions of a planning permission) and will consist of the following two categories:

- Private vehicles owned and driven by site construction staff and by full time supervisory staff, and;
- Construction vehicles.

On-site employees will generally arrive before 07:00, thus avoiding the morning peak hour traffic. These employees will generally depart after 17:00. Deliveries will be actively controlled and subsequently arrive at a dispersed rate during the course of the working day. A preliminary indication of material quantities associated with the proposed scheme is estimated in 1,800 m³ export and 2,100m³ import. It is noted that these volumes are based on design and will be further refined and optimized through a future detailed design process.

This will equate to c. 156-195 lorry movements during the course of the construction works. It is not expected that HGV vehicle movements will exceed 4 vehicles per hour during the busiest period of construction works.

It is not proposed to utilise any roads with weight/height restrictions as part of the routing of HGVs during the construction phase. HGVs will be directed to site via the

R448 and shall not be permitted to use local routes such as Chapel Lane except for essential deliveries on these routes.

The scheme shall be constructed in a manner to minimise disruption to road users, local residents and businesses. All construction works are to be undertaken in a clearly delineated site area which will have specific entry and exit points for construction traffic.

The assessment on potential impacts relating to traffic concluded that, considering the site's proximity to the strategic road network and following the mitigation measures outlined in this report, construction traffic will not give rise to any significant traffic concerns or impede the operational performance of the local road network and its surrounding junctions.

Overall it is considered that the traffic measures will result in temporary disturbance to residents, business owners and people passing through Ballyhale.

Noise and Vibration

A noise and vibration impact assessment has been prepared to assess the potential noise and vibration impact of the proposed flood relief scheme on the nearest residential properties (Chapter 13). The construction activities of the proposed flood relief scheme have been examined to identify those that have the potential to give rise to a short-term noise and vibration impact and a suitable construction impact assessment has been undertaken. As appropriate, construction phase mitigation measures have been outlined within Chapter 13 of the EIAR. The future operation of the proposed flood relief scheme is not anticipated to result in any significant noise impacts.

A daytime baseline noise monitoring survey was undertaken in proximity to the residential properties close to the alignment of the existing Ballyhale River on 7th September 2021. The baseline noise measurement data indicates that Ballyhale is a quiet village with passing traffic on the R448 the dominant noise source. Passing traffic is not continuous through the village during daytime.

There will be no significant vibration impact during the construction of the proposed Ballyhale Flood Relief Scheme as there is no proposal for piling to occur during construction.

The assessment found that based on the expected short-term duration of works at each location there will be a short-term noise impact at the nearest sensitive receivers to the proposed works. In some of the works areas, the predicted worst-case 1-hour construction noise levels may briefly be in excess of the recommended maximum noise

level of 70 dB L_{Aeq} / 80 dB L_{AMax} at 1m from the façade of the nearest residential properties as outlined by the TII Guidelines (March 2014).

Noise from construction works will fluctuate throughout the course of a typical working day as well as over the course of the construction works being undertaken in any one location. Therefore, the daytime construction noise threshold of 65 dB $L_{Aeq,12\text{ Hour}}$ should be achieved at the nearest residential properties. The construction noise impacts will be short-term and will not be significant.

Health

Human health may be impacted on in a variety of ways and by several environmental receptors including water, biodiversity, climate, flooding, air, and major accidents, etc. Exposure to contaminants or pollutants can have serious implications for human health.

Potential impacts on population and human health include excessive noise, localised flooding due to non-control of surface water or failure of temporary bunds/diversions, poor air quality in areas where there are high emissions of dust or fumes from machinery. These issues are addressed within the relevant disciplines of the EIAR.

Human health risks not addressed elsewhere in the EIAR relate to Construction Health and Safety.

The baseline data for the combined ED area indicates that the general population is in good health, both economically and physically. The proposal will not result in any significant negative impacts to the health and wellbeing of the existing population.

Construction activities such as offloading, earth moving and backfilling can generate dust, particularly in dry weather conditions. While construction dust tends to be deposited within 350 m of a construction site, the majority of the deposition occurs within the first 50 m.

The extent of dust generation is dependent on the nature of the material and the location of the construction activity. In addition, the potential for dust dispersion depends on the local meteorological factors such as rainfall, wind speed and wind direction.

The Air Quality Assessment identified that the potential for impacts on human health are negligible for demolition, earthworks and construction, and are low for trackout (movement of vehicles). Appropriate mitigation measures within the Air Quality Chapter are proposed such as ensuring bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems

to prevent escape of material and overfilling during delivery, and that bags (of fine powdered materials) are sealed after use and stored appropriately to prevent dust.

Water-assisted dust sweeper(s) should also be used on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.

Construction sites in general pose potential risk to the health and safety of the public. A CEMP has been prepared which will be further detailed by the appointed contractor in advance of works commencing. To reduce the potential for health and safety risks, the project developer will require that all contractors prepare a site-specific health and safety plan before initiating construction activities. The plan will inform those on site of the measures to take in the event of an emergency and will be maintained for the duration of the construction phase.

11.6.2 Operational Stage

Population and Settlement Patterns

Once completed, the flood relief works are likely to have a positive impact on settlement within and in proximity to Ballyhale. Based on the potential economic analysis of flood related damage, the elimination of this risk is likely to attract more development and increase the population of the settlement and surrounding area.

It is an objective of the KCDP to consider in principle proposals for developments with densities of up to 10 dwellings per hectare in smaller towns and villages where social services and facilities either available or can be provided within the lifetime of the plan. It is anticipated that the completion of the flood relief scheme will provide comfort to landowners who may wish to develop lands within the settlement or in close proximity to the Ballyhale River.

Economic Activities

The prevention of future flood events may result in an economic boost for the town and encourage new businesses to open. Section 11.3.3 of this report sets out the economic risks to Ballyhale and its supporting infrastructure as identified as part of the CFRAM Programme and also in The Nore Basin Flood Risk Management Plan 2018 – 2021. The cost of flood related damage to Ballyhale would be significant, not including possible loss of services and properties. The impact of the flood relief works is anticipated to be positive, significant and long term.

Landuse and Amenity

No operational impacts are anticipated as a result of traffic, noise and vibration, or air and climate. The impact of the flood relief works is anticipated to be positive, significant and long term. The potential impacts on landscape, as well as visual impacts are assessed in Chapter 9. A number of viewpoints were chosen to assist in the assessment of visual effects. These include views to the south of the town, in the vicinity of the Church of St Martin, and along the Main Street. In general, the LVIA found that there would be no significant impacts to landscape or visual effects as a result of the proposed flood relief works, with proposed landscaping anticipated to improve the visual amenity in some locations, such as the church and surrounds.

Health

The impact of the flood relief works is anticipated to be positive, significant and long term.

11.7 Mitigation Measures

Mitigation measures in relation to population, land-use and local amenity are set out in the relevant chapters of the EIAR. No further mitigation measures are proposed.

11.7.1 Construction Phase

The works include a number of elements as outlined in the PCEMP which will affect access or operations within residential and commercial properties. The contractor shall liaise with all property owners to ensure the works schedule is co-ordinated with landowner requirements to minimise disturbance and provide temporary access measures as appropriate. Particular landowner requirements or restrictions shall be included within tender documents for the project.

Measures to protect health and safety during the construction phase will be included in the Contractors Construction Stage Construction Management Plan.

11.7.2 Operational Phase

No impacts have been identified.

11.8 Cumulative Impacts

A search of the Kilkenny County Council planning database was carried out to determine if there are permitted projects in the vicinity of Ballyhale that could, when considered in combination with the FRS, result in a cumulative environmental effect.

These are included in Chapter 2. There may be a cumulative impact if the construction phases of projects commence at the same time as there may be an increase in local traffic, resulting in an increase in disruption, delays and emissions. However, given the nature of these projects, construction traffic is not likely to travel through Ballyhale, but would use alternative haulage routes for efficiency, and would operate under appropriate construction traffic management plans.

There will be no operational impacts as there is no traffic associated with the operational phase of the development.

No significant cumulative impacts are anticipated.

11.9 Residual Impacts

None identified, following implementation of proposed mitigation measures.

11.10 Significant Interactions

No significant interactions with population and human health have been identified. Potential interactions between other disciplines are assessed in the relevant chapters of this EIAR.

11.11 Difficulties Encountered in Compiling Information

No difficulties were encountered in compiling information for the Population and Human Health Chapter of this EIAR.

11.12 References

www.cso.ie

www.kilkennycoco.ie

www.epa.ie