

ENVIRONMENTAL IMPACT ASSESSMENT REPORT
BANAGHER CHILLING LIMITED, BANAGHER, CO. OFFALY

PART II - ENVIRONMENTAL IMPACTS

This section of the EIAR describes the likely significant environmental impacts arising from the proposed upgrade and extension of an existing abattoir facility within the townlands of Meenwaun and Boheradurrow, at Banagher, Co. Offaly, which includes the construction of stormwater and effluent drainage systems, water treatment plant, electrical sub-station, truck wash, security hut, waste and by-product area and gas compound, site access roads and all ancillary development including internal road surfacing, the provision of outdoor artificial lighting, an extension to the existing lairage facility and site landscaping.

Where possible, design measures have been included to reduce or eliminate possible impacts. Where this has not been possible, mitigation measures have been suggested to reduce or eliminate the identified impacts of the proposed development.

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SECTION A - HUMAN ENVIRONMENT

This section of the Environmental Impact Assessment Report deals with the potential effects of the proposed scheme on human beings.

These effects have been grouped into:

Air Quality, Climate and Odour Impacts

The impact of emissions to air generated by the proposed development. The impact of potential odours generated by the proposed development on nuisance odour in the general vicinity has been assessed.

Noise and Vibration Impacts

The impact of noise and vibration generated by the proposed development on noise and vibration levels in the general vicinity has been assessed.

Landscape and Visual Impacts

The impact of the proposed development on the visual amenity of the landscape has been assessed.

Traffic and Transport

The traffic and transportation impact associated with the construction of an extension to the existing abattoir development has been assessed. The assessment has addressed the adequacy of the existing road network to safely and appropriately accommodate the additional traffic associated with the proposed development, in particular the safety and capacity of the proposed vehicular access junction onto the local road along with an assessment of the impact on the Boheradurrow crossroads.

While human beings interact in some way with every aspect of the environment, the above interactions are considered the most significant in this case. The impacts of the proposed development on human beings in relation to effects on the natural environment are further considered in **Section B**, while the impacts of effects on material assets and archaeology, architecture, and cultural heritage are considered in **Sections C and D** respectively.

4.0 POPULATION AND HUMAN HEALTH

4.1 INTRODUCTION

Any development that alters the existing environment has the potential to impact upon human beings at a local and/or regional scale, through impacts upon socio-economic factors including demographics, land use, economic development and employment.

This section of the EIAR provides an overview of the receiving social-economic environment of the area. This section briefly outlines the main potential impacts of the proposed development, comprising of an upgrade and extension to the site's existing abattoir facilities at both the construction and operational phases on human beings.

The following sections of this EIAR provide detailed assessments of potential impacts to human beings and detail proposed mitigation measures to address the identified impacts.

4.2 METHODOLOGY

A study was undertaken to assess the potential impact of the proposed development on the receiving socio-economic environment. This study comprised a review of available information with regards population and dynamics, economic activity, employment, land use and residential amenity. Information was obtained from the Central Statistics Office (CSO) and the Offaly County Development Plan 2014 – 2020.

4.3 DESCRIPTION OF EXISTING ENVIRONMENT

4.3.1 POPULATION AND DYNAMICS

According to the 2016 Census, County Offaly had a population of 78,003, comprising 38,896 males and 39,107 females, growing from 76,687 in 2011. This represents a population increase of approximately 1.7% since the previous Census in 2011.

The settlement of Banagher Town had a population of 1,760 in April 2016, compared to 1,653 in April 2011, a change of 107 persons or 6.5%.

The Electoral Division of Banagher (12004), which includes the townland of Boheradurrow, had a total age dependency ratio of 57.9 in 2016 compared with 57.3 in 2011, while the Electoral Division of Mounterin (12028) which includes the townland of Meenwaun, had a total age dependency ratio of 50.9 in 2016 compared with 58.5 in 2011.

Table 5.1 below shows the changes in the population of Banagher Town by age group between the 2011 Census and 2016 Census. Considerable increases are noted for the older age groups, with an increase of 21.6% for the 65+ age group. Decreases were only noted in the younger age groups, with decreases of 2.1% and 1.4% for the 0-14 and 15-24 age groups respectively.

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Table 4.1: Banagher Population Change between 2011 and 2016 per Age Group

AGE GROUP (YEARS)	2011 CENSUS	2016 CENSUS	% CHANGE
0 – 14	337	330	–2.1
15 – 24	218	215	–1.4
25 – 44	475	508	+6.9
45 – 64	391	425	+8.7
65+	232	282	+21.6
Total	1,653	1,760	+6.5

The nearest urban areas to the facility include Shannonbridge, Eyrecourt, Cloghan, Belmont and Birr. Table 5.2 details the population change within these areas between the 2011 Census and 2016 Census. The majority of the urban areas within the vicinity of the facility experienced population increases since the previous 2011 Census.

Table 4.2: Population Changes in Towns within the vicinity of Banagher 2011 – 2016

AREA	2011 POPULATION	2016 POPULATION	% CHANGE
Shannonbridge	206	175	–15
Eyrecourt	252	264	+4.5
Cloghan	601	612	+1.8
Belmont	200	209	+4.3
Birr	5,822	4,370	–25

4.3.2 ECONOMIC ACTIVITY

The Department of Agriculture, Food and the Marine (DAFM) reports that the agri-food sector is Ireland’s largest indigenous industry, contributing €26 billion to the national economy in 2015, employing 8.4% of the working population and accounting for 10.7% of Ireland’s exports. The DAFM’s report, “Food Wise 2025”, identifies further growth opportunities for the sector, with the aim to position Ireland as a world leader in sustainable agri-food production.

The proposed Banagher facility would be a long-term employer for the area. Staff employed would make contributions to the local economy in the Banagher area and surrounds by direct spending of goods and services. In addition to providing employment, the facility would strengthen the local economy of the agri-food sector by sourcing cattle from farmers and suppliers within the catchment area.

A number of small-scale commercial enterprises are located within the vicinity of proposed development. These include Eliza Lodge - Nursing Home and Meenwaun Wind Farm. Several facilities licenced by the EPA are located within 15km of the Banagher Chilling Limited site, including two facilities with an “Intensive Agriculture” class of activity. Further details are provided in Section 4.3.5.

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4.3.3 EMPLOYMENT

The total labour force for 2016 in County Offaly was 35,478 individuals, which represents 45.5% of the total population of 77,961.

Table 4.3: Persons at Work by Occupation 2016

OCCUPATION	TOTAL	% OF WORKFORCE	% OF POPULATION
Managers, Directors and Senior Officials	2,213	6.2	2.8
Professional Occupations	4,383	12.4	5.6
Associate Professional and Technical Occupations	3,014	8.5	3.9
Administrative and Secretarial Occupations	3,210	9.0	4.1
Skilled Trades Occupations	6,559	18.5	8.4
Caring, Leisure and Other Service Occupations	2,836	8.0	3.6
Sales and Customer Service Occupations	2,234	6.3	2.9
Process, Plant and Machine Operatives	3,478	9.8	4.5
Elementary Occupations	3,300	9.3	4.2
Not stated	4,251	12.0	5.5
Total	35,478	100.0	45.5

The labour force participation rate was calculated by expressing the labour force, aged 15 years and over whom are at work, looking for their first regular job or unemployed, as a percentage of the total population aged 15 years and over. The labour force participation rate for 2016 was 59%, with 35,478 employed out of a potential 60,234. Table 4.4 below provides a summary of the working population for County Offaly. The agriculture, forestry and fishing sector accounted for 6.2% employment of the labour force in 2016.

Table 4.4: Population aged 15 years and over by principal economic status 2016

AREA	NO. OF PEOPLE	% OF POP 15-YEARS +
At work	30,287	50.3
Looking for first regular job	553	0.9
Unemployed having lost or given up previous job	5,191	8.6
Student	6,449	10.7
Looking after home/family	5,931	9.8
Retired	8,596	14.3
Unable to work due to permanent sickness or disability	3,033	5.0
Other	194	0.3
Total	60,234	100.0

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4.3.4 LAND USE AND SETTLEMENT PATTERNS

The existing slaughtering facility is located in the townland of Meenwaun, while the proposed development would be located within the townlands of Boheradurrow and Meenwaun, approximately 2.4km south-east of Banagher Town.

The proposed development is located within a rural agricultural landscape, sparsely populated, with residential development primarily linearly aligned along the existing road network. A number of large farmsteads and agricultural facilities involved in cattle rearing and beef production are located in the surrounding area of the site. The area also supports a number of commercial developments.

The nearest settlement to the existing and proposed facility is the town of Banagher, located approximately 2.4km north-west of the site. The towns of Birr and Portumna are located approximately 8km and 20km respectively from the facility. Tullamore is the largest closest town and is located approximately 31.5km to the north-east of the site.

Figure 4.1 below shows the address points of properties within the vicinity of the existing facility and proposed development. Points in yellow represent residential properties, points in purple represent commercial only properties, points in aqua represent properties accommodating both residential and commercial uses. It can be seen that the majority of buildings within the surrounding area of the proposed development are residential properties. Residential properties are primarily dispersed along the existing road network.

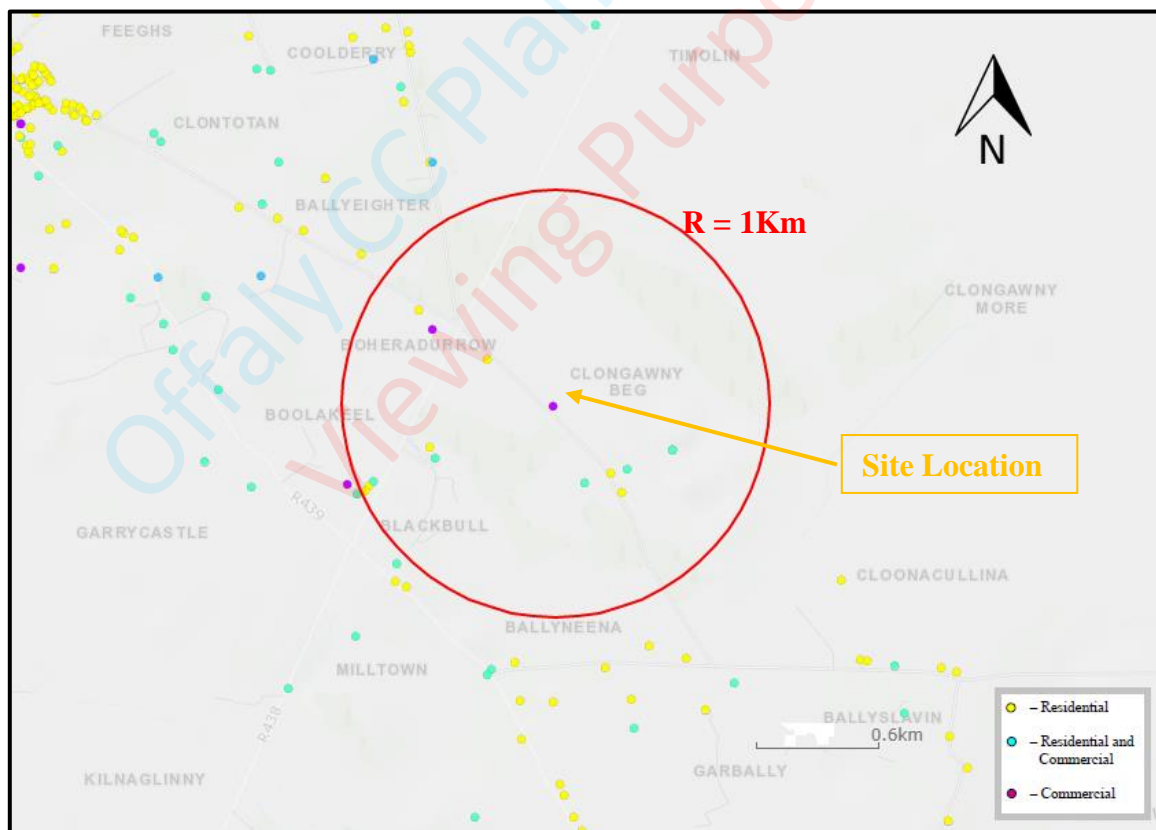


Figure 4.1: Address Points by Buildings for Properties within the vicinity of the Proposed Development (Source: myplan.ie)

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4.3.5 COMMERCIAL AND INDUSTRIAL ACTIVITIES

A number of small-scale commercial enterprises are located within the vicinity of the proposed development, with those situated within approximately 1km of the development shown in Figure 4.2. Figure 4.2 below shows commercial properties categorised per NACE Code, a pan-European classification system, in the surrounding area of the proposed development.

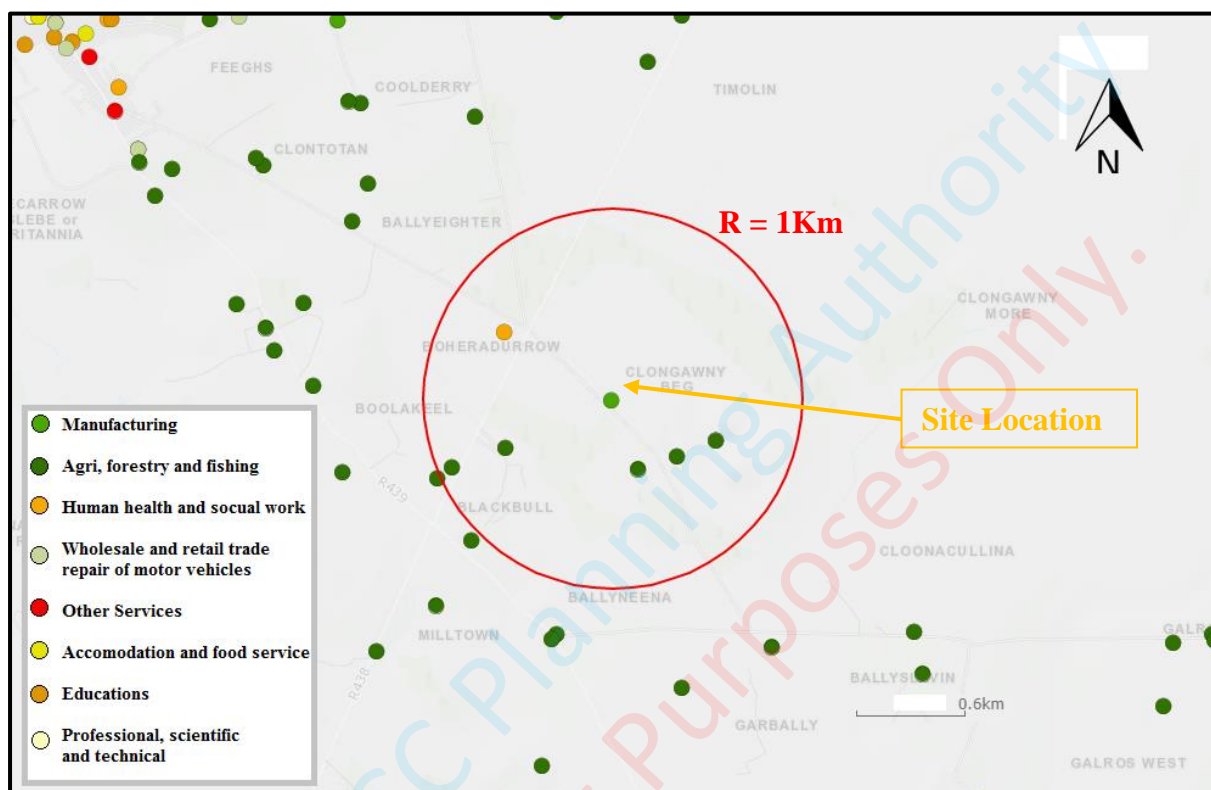


Figure 4.2: Commercial Activities per NACE Code within the vicinity of the Proposed Development (Source: myplan.ie)

In addition to the above, a number of facilities licenced by the EPA are located within 15km of the proposed development, as outlined in the table below.

Table 4.5: EPA Licenced Facilities within 15km of the Proposed Development

NO.	LICENCE NO.	LICENSEE NAME	LICENCE TYPE (FIRST SCHEDULE OF EPA ACT, 1992, AS AMENDED)	APPROXIMATE DISTANCE FROM PROPOSED DEVELOPMENT
1	P0294-01	Grant Engineering	3.9: Metals	10.6km South-South-East
2	P0932-01	Lumcloon Energy Ltd	2.1: Energy	11.5km North-East
3	P0412-01	Harvest Lodge Pigs Ltd	6.2 (b): Intensive Agriculture	12.8km East
4	P0502-01	Bord na Móna Energy Limited (Blackwater)	1.4: Minerals and Other Materials	12.5km North-North-West
5	P0437-02	Mr Michael Monagle (Sharragh Pig farms)	6.2 (a): Intensive Agriculture	12.9km South-East

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NO.	LICENCE NO.	LICENSEE NAME	LICENCE TYPE (FIRST SCHEDULE OF EPA ACT, 1992, AS AMENDED)	APPROXIMATE DISTANCE FROM PROPOSED DEVELOPMENT
6	P0611-02	Electricity Supply Board (West Offaly Power)	2.1: Energy	13.5km North-West

Figure 4.3 below shows the location of all EPA Licenced Facilities in the surrounding area of the proposed development, which are listed in Table 4.5 above.

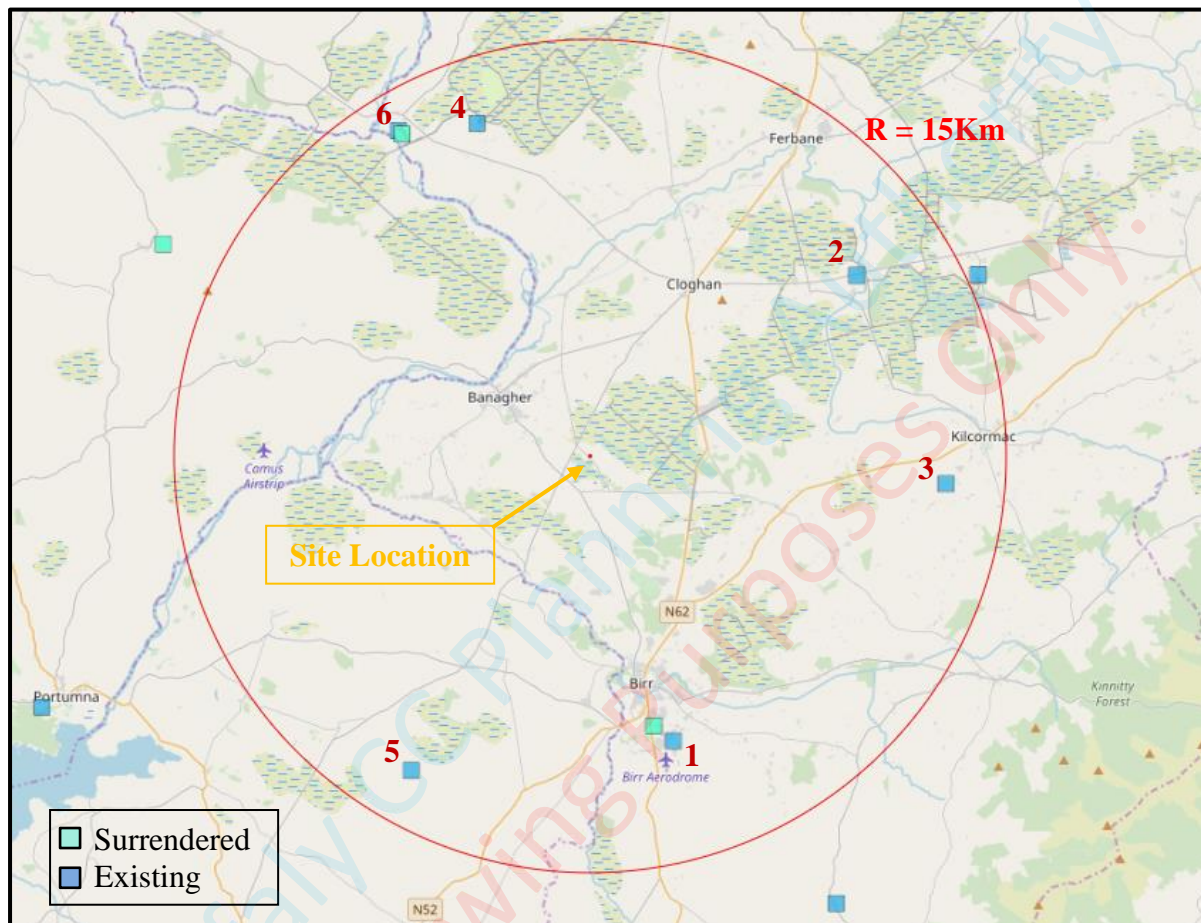


Figure 4.3: EPA Licenced Facilities within 15km of the Proposed Development

4.3.6 COMMUNITY AND SOCIAL INFRASTRUCTURE

Community infrastructure within the vicinity of the proposed development is primarily located within Banagher Town, located approximately 2.4km north-west of the existing site. Community and social infrastructure within Banagher town and the surrounds includes the following:

Educational: St. Ryanagh's College of Further Education (Laois Offaly ETB); Banagher College; Coláiste Na Sionna; St. Ryanagh's National School; Scoil Naomh Raghnach.

Financial: Bank of Ireland; Banagher Credit Union.

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Health: Medical Centre, Primary Care Services that includes GPs, Practice Nurses, Public Health Nurses, Physiotherapist, Phycologist.

Public Services: Library; Post Office; An Garda Síochána.

Community services: Community Employment Scheme, Offaly Local Development Company; West & South Offaly Homefix; Youthreach; West Offaly Training; SVP; Community Centre; GAA facilities; Soccer facilities.

4.3.7 AMENITIES AND TOURISM

According to Fáilte Ireland (2018), in 2016 approximately 226,000 overseas tourists visited the Midlands region, contributing approximately €72 million to the local economy. County Offaly received approximately 52,000 overseas visitors in 2016, contributing approximately €14 million in revenue to the county.

Locally, a range of amenities exist within Banagher Town, which are a valuable resource. Banagher has in the region of 72 businesses currently operating locally. These business range across manufacturing, service, retail, construction and tourism sectors. Examples of the town's primary amenities are detailed in Section 4.3.6 above, with other amenities including watersports activities, sub-aqua clubs, pitch and putt, playground and local parks.

Banagher town has a strong tourism sector. Being situated on the banks of the River Shannon and having its own marina, Banagher town is a popular tourist hub for Shannon river boats and cruisers. The area is well-known for its angling, and is particularly favoured by pike anglers.

The area is also known for its cultural heritage tourism, with its Napoleonic fortifications, Banagher Bridge, Fort Eliza, Cuba Court, Georgian architecture buildings, Martello tower and nearby castles. In particular, Banagher town is a stopping point for Clonmacnoise Monastic Site, which is located 15km to the north of the town.

Banagher town and surrounds is also an important area for ecotourism. The Shannon Callows, grassy meadows which flood in wintertime, support a vast range of waterbirds, including endangered and rare species such as Corncrake (*Crex crex*). Lough Boora Discovery Park, a popular tourist attraction, is located approximately 17km from Banagher town and approximately 15km from the proposed development site.

4.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development would comprise of the proposed upgrade and extension of an existing abattoir facility within the townlands of Meenwaun and Boheradurrow, at Banagher, Co. Offaly. The proposed development would also include the construction of stormwater and effluent drainage systems, water treatment plant, electrical sub-station, truck wash, security hut, waste and by-product area and gas compound, site access roads and all ancillary development including internal road surfacing, the provision of outdoor artificial lighting, an extension to the existing lairage facility and site landscaping.

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The proposed development would facilitate a maximum slaughter rate of 140 cattle per day. Slaughtering activities at the proposed facility would typically operate Monday to Friday. However, slaughtering may be undertaken at weekends for reasons such as casualty animals and demand. Upon completion of construction works, it is estimated the proposed development would provide employment for 110 personnel, with working hours varying from 7am to 10pm.

Two steam boilers, to be located within the plant room, are proposed as part of the development, each with a capacity of approximately 900kgs per hour.

Artificial outdoor lighting would be installed along the internal access network and within the main site yard. The lighting design for the development would be determined at a detailed design stage.

Should conditions allow, it is proposed that the site's water requirement would be sourced via water abstraction onsite. It is estimated that water consumption at the site would be 150 – 200 m³/day. Water conservation measures have been included as part of the proposed development design. Rainwater harvesting would be implemented, with all roof water collected for use in staff sanitary facilities and site landscaping. The final WWTP design includes for the capture of treated effluent water in a holding tank (grey water tank) to be used in lairage and lorry wash-out.

New stormwater and effluent drainage systems would be constructed. Stormwater from clean-yard areas and car parking areas would pass through a silt trap and Class 1 By-Pass Separator before being directed to a modular underground attenuation system. From here, stormwater would be pumped to a manhole prior to discharge to the Feeghroe Stream.

All process drains, domestic drains and dirty yard surface water drains would be directed to the site's new WWTP, which would comprise of an inlet sump, meva screen, drum screen, balancing tank, dissolved air flotation (DAF) unit, sludge tank, anoxic tank, two aeration tanks, clarifier, sand filters and an outlet sump. From here, the treated final effluent would be directed to the proposed integrated constructed wetlands (ICWs), comprising of a five-treatment cell system, prior to discharge to the Feeghroe Stream.

The proposed upgrade and extension of the existing abattoir facility would result in a loss of agricultural grassland, disturbed ground (including a section of previously tilled land), sections of hedgerows and drainage ditches and a limited area of bog woodland.

A landscaping plan has been prepared for the proposed development, which includes the replacement planting of approximately 400m of hedgerow along the southern site boundary, set-back from the site boundary, the replanting of approximately 115m along the eastern boundary of the ICW system, the bolstering of existing hedgerows / treelines with native species, and the proposed planting of new woodland adjacent the internal site access to the rear yard area.

The expected construction timeframe would be approximately 18 months, with hours of operation from 7am to 7pm Monday to Friday, and 8am to 2pm on Saturdays. The construction phase would provide temporary employment for an estimated 250 people for the duration of construction works. A temporary site compound would be established and would house the temporary offices, equipment and materials storage and construction staff welfare

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facilities. The temporary site compound would also be used for the storage of fuels and oils required for the various construction plant, in addition to housing waste receptacles.

4.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

A brief overview of the potential impacts upon human beings during the construction and operational phases is provided below. More detailed assessments are discussed in the following sections of this EIAR.

4.5.1 ECONOMY AND EMPLOYMENT

The proposed development would have a positive impact upon the local economy by providing temporary employment for an estimated 250 people for the duration of the construction phase (approximately 18 months), and by providing new employment opportunities, estimated at 110 new jobs, during the operational phase. The creation of jobs during the construction and operational phases would further contribute to the economy of the area through direct spending of goods and services in the Banagher area and surrounds.

The proposed development would also provide indirect employment during the operational phase, for example, via haulier contractors, gardening and landscaping contractors and pest control contractors. In addition to providing employment, the development would strengthen the local economy of the agri-food sector by sourcing cattle from farmers and suppliers within the catchment area.

In October 2018, the Department of Rural and Community Development announced that Banagher town had been chosen as one of six rural towns to take part in a pilot initiative to encourage people to live in town centres in rural Ireland. The pilot initiative is described as complementing the Rural Regeneration Fund and the Town and Village Renewal Scheme. The press release notes that the factors which attract people to live in a particular area can be many and varied, and include the availability of schools, transport, shops and retail, recreational areas and other services. The proposed development, by providing direct and indirect employment and by contributing to the local economy through direct spending of goods and services, may influence people to live in Banagher town and the immediate area.

4.5.2 AMENITIES AND TOURISM

There may be greater use of local amenities and tourism facilities during the construction phase by contractors, but the construction of the proposed development would not affect the tourism profile of the area.

There are no predicted negative impacts on local amenities and tourism arising from the operational phase. Approximately 110 people would be directly employed during the operational phase. Their potential use, both personal and business-related, of local amenities and tourism facilities may positively benefit the business community in the area, including amenity providers.

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4.5.3 AIR, DUST AND ODOUR

While it is not considered that the proposed development would adversely impact upon air quality, there would be a potential nuisance impact upon human beings with regards the generation of dust during the construction phase and odour during the operational phase. An assessment of the potential air quality impacts and odour impacts arising from the proposed development are discussed in detail in Section 5 of this EIAR and in Attachment 5.1 “*Odour, Air Quality and Greenhouse Gas Assessment*”.

The potential for dust generation during construction works may impact upon the community and residents on the local roads within the vicinity of the site. However, the potential impact of dust would be temporary, given the transient nature of construction works. Dust control measures would be implemented throughout the construction phase to reduce the potential impact. Mitigation measures for dust control are outlined in Attachment 5.1 and within the Outline Construction Environmental Management Plan which accompanies this planning application (Document Ref. PES_Outline CEMP_19_9201).

During the operational phase of the proposed development, there would be potential for odour generation, particularly from the wastewater treatment process. As detailed in Attachment 5.1, the air quality assessment undertaken for the proposed development predicted that concentrations of odour would be well below the relevant odour criterion at sensitive receptors. Odour controls would be implemented at the proposed development to minimise potential emissions, which are detailed within Attachment 5.1. Such measures would include the capture and abatement of emissions from the balance tank and sludge holding tank at the onsite WWTP.

The air quality assessment (Attachment 5.1) found that predicted concentrations of nitrogen dioxide, sulphur dioxide, carbon monoxide, particulate matter (as PM10 and PM2.5) and benzene would be well below the relevant criteria at sensitive receptors. The report also assessed the potential impacts of the development upon traffic in the region, and concluded that the development’s potential impact on roadside local air quality would be negligible.

4.5.4 NOISE

Noise generated during the construction and operational phases of the proposed development has the potential to impact upon human beings within the vicinity of the site. An assessment of potential impacts upon human beings due to noise associated with the proposed development is discussed in Section 6, based upon a Noise and Vibration Impact Assessment Report prepared by Enfonic Ltd which in support of this EIAR.

During the construction phase, it is not anticipated that there would be any significant impact, on local residences within close proximity to the proposed development. Applicable noise limits have been recommended in order to comply with standards for construction noise. Additional noise impact mitigation measures have been recommended in order to promote good practice in relation not noise, and have been included as part of an outline Construction Environmental Management Plan.

No significant additional noise impact would be anticipated during the operational phase of the proposed development. The predicted noise levels for operational site equipment and

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traffic are likely to be below the existing background levels at all survey locations. These would therefore fall into the **No Observed Effect Level (NOEL)** criteria.

4.5.5 TRAFFIC

The proposed development has the potential to impact upon traffic volumes in the area, which may subsequently impact upon the generation of noise and dust emissions. While there would be increased vehicle movements during the construction phase of the development, this would be for a limited period of time only (approximately 18 months), owing to the transient nature of construction activities.

The transportation assessment report, undertaken by NRB Consulting Engineers Ltd., notes that during the operational phase of the proposed development, the total traffic generated by the development comprises an Annual Average Daily Traffic (AADT) of 283 Passenger Car Units (PCUs, or car equivalents) within a 24 hour period. The report notes that while the local roads within the vicinity of the development are lightly trafficked, the increase in traffic movements due to the development can be considered small. The traffic assessment notes that the local road network can easily accommodate the traffic generated, and notes that the access junction and adjacent established road junctions would operate without any issues arising during the selected year of opening and the design year 15 years after opening. The report concludes that there would be no traffic/transportation capacity, traffic safety or operational issues associated with the proposed development.

4.5.6 LAND-USE

The proposed development would not be anticipated to have any significant impact upon the land use of the area, given that the proposed development would be an extension to the existing abattoir facility, and given that the development would be located mainly within agricultural lands, primarily pasture, belonging to the applicant.

4.5.7 VISUAL AMENITY

A 2km radius study was used for the landscape and visual assessment of the proposed development, with a particular focus on receptors contained within 1km of the site. The most notable centre of population in relation to the site is that of Banagher town, which is situated outside of the study area, approximately 3km northwest of the site. The immediate context of the proposal site is somewhat sparsely populated containing only a small number of isolated farmsteads and small linear clusters of dwellings. Similarly, the outer portions of the study area are also relatively sparsely populated.

In terms of landscape impacts, it is not considered that the site is located within a particularly sensitive setting. The wider context is that of a working rural landscape without particular landscape or visual designations in the Offaly County Development Plan.

There would be physical impacts on the land cover of the site, as well as temporary construction related impacts from the movement of heavy machinery and stockpiling of materials. However, the main impacts considered are those relating to post-construction effects on the prevailing landscape character. In this respect, the proposal represents a substantial intensification of a rural/industrial land use that already exists within the site in the form of the much smaller meat processing facility.

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While there is a thematic relationship between the proposed facility and the previous use of the land, this would primarily be a transition from an area of pastoral farmlands to that of a sizable industrial facility and would represent a marked increase in the intensity of development of the immediate vicinity of the site.

A detailed assessment of the potential impacts upon visual amenity arising from the proposed development is discussed in detail in Section 7 of this EIAR. This section notes that overall, it is considered that the proposed extension, though substantial in scale, is appropriately sited; visually well contained; and, where visible, the design helps it to assimilate with the existing landscape and visual context. The proposed development would result in visual impacts that are very localised and in the lower order of magnitude. Overall, it is considered that such effects are not significant in EIA terms, especially once landscape mitigation proposals, outlined in Section 7.3, have become established.

4.5.8 WATER

A deterioration in water quality may have the potential to adversely impact upon the quality of drinking water, particularly with regards microbial loading. A detailed assessment of potential impacts to water quality is included in Section 10 of this EIAR.

Discharges from slaughtering facilities have the potential to cause a microbial impact upon receiving waters due to the presence of total coliform, faecal coliform (including *Escherichia coli*) and streptococci groups of bacteria, in addition to parasites such as *Cryptosporidium parvum*. Sources of micro-organisms present within wastewaters at the Banagher Chilling facility include sanitary facilities for staff, blood and cleaning waters from the slaughter hall and dirty yard areas. The treatment of human waste arising from staff welfare facilities at the Banagher Chilling facility would also contribute to populations of enteric bacteria. While these groups of bacteria are not generally considered as pathogenic, they can be used to indicate the possible presence of pathogenic enteric organisms, such as *Salmonella* ssp., *Campylobacter jejuni* and *Listeria monocytogenes*, gastrointestinal parasites including *Ascaris* sp., *Giardia lamblia*, and *Cryptosporidium parvum*, and enteric viruses.

As enteric micro-organisms leave their optimal environmental conditions (intestinal tract of animals), their survivability would be impacted upon during the wastewater treatment process and discharge to surface water. While viruses can survive adverse conditions, they can only multiply within their hosts and are therefore limited in population once they enter the wastewater process.

The Banagher Water Treatment Works river water abstraction (2500PUB1001) [E 200864, N 216181] is located upstream of the Rapemills-Shannon confluence, and would not be affected by the proposed discharge. Due to the nature of the area hydrology, streams are generally gaining and there is a low risk of impact from the proposed discharge to the Banagher WTW groundwater abstraction, located <0.5km from the boundary of the proposed site. The Portumna Water Treatment Works (1200PUB1042) is located downstream of the Rapemills-Shannon confluence in Lough Derg [E 185210, N 203730]. The abstraction point is located approximately 30km downstream of the proposed discharge location.

As part of the proposed development, clarified effluent would be directed to a sand filtration system. While the sand filter serves to reduce the suspended solids in the final effluent, this

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would also reduce the microbial content of the wastewaters by filtering and retaining micro-organisms from the treated effluent. Sand filtration is estimated to remove enteric bacteria by over 90% with the World Health Organisation estimating that 99% of larger parasites and between 50-90% of enteric viruses are removed.

The effluent would then be passed through an integrated constructed wetland system, which removes solids due to filtration and sedimentation, and reduces pathogens through predation and natural die-off.

A Drinking Water Risk Assessment has been prepared as part of this planning application (Reference: PES_DWRA_19_9201). The Drinking Water Risk Assessment report concluded that the overall risk from the proposed discharge to the Banagher and Portumna water abstraction plants would be considered low. This conclusion was based upon the nature of generated wastewaters, proposed discharge limits, the wastewater treatment process, the level of dilution, nature of the area hydrology, the quality of receiving water and the anticipated impact of discharges during normal and abnormal operations.

It is anticipated that there would be no significant impact upon the quality of drinking water at the Banagher and Portumna supply schemes as a result of the proposed development.

4.6 MAJOR ACCIDENTS AND NATURAL DISASTERS

As noted in Directive 2014/52/EU, precautionary actions need to be put in place for certain projects which, *‘due to their vulnerability to major accidents and/or natural disasters (such as flooding, sea level rise or earthquakes) are likely to have significant adverse effects on the environment’*.

The proposed development would not fall within the Seveso III Regulations or European Communities (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015, as no dangerous substances / significant volumes of chemicals would be used at the site.

The site does not propose to store significant volumes of any chemicals or materials which could pose a significant spill risk to the aquatic environment. The fuel for the proposed onsite boilers would be liquefied petroleum gas (LPG), which would be stored within designated tanks, strategically placed within the rear yard area, surrounded by protective barriers to reduce the risk of collision.

Banagher Chilling Limited would ensure that all potentially polluting substances, including chemicals and fuels, would be stored in accordance with the EPA guidance on the storage of materials, in designated, bunded areas, with adequate bund provision to contain 110% of the largest drum volume or 25% of the total volume of containers. Outdoor bunded chemical storage areas would be located upon hardstanding. Bunds and bunded areas would undergo integrity testing every three years, as is best practice. Spill kits would be located throughout the site, and would be easily accessible and regularly inspected to ensure kits contain adequate stock.

As part of the proposed Environmental Management System, Banagher Chilling Limited would put in place an “Emergency Response and Accident Prevention” procedure. This

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procedure would outline the actions to be taken to deal with all potential site emergencies, including fire and chemical / process spills. This procedure would be communicated to all staff, and the relevant personnel would be trained to a basic level in fire-fighting procedures, in addition to receiving training in spill response.

During the construction phase of the proposed development, the risk of spills to the environment would be minimised through the implementation of measures, such as the appropriate storage of potentially polluting substances (e.g. oils, fuels), the regular maintenance and inspection of construction plant, the implementation of good housekeeping practices and the provision of spill kits. Further details are provided in Sections 10.7 and 11.10.

It is considered that the most likely natural disaster to which the proposed development may be vulnerable to and could have significant adverse effects on the environment, is fluvial or pluvial flooding. A site specific Flood Risk Assessment was undertaken for the development by IE Consulting (Ref. IE 1796-3149), to accompany the planning application, which included a detailed hydrological analysis of the Feeghroe Stream and the drainage ditches at the development site. The report noted that the fluvial and pluvial flood risk to the proposed development site is considered to be low. The report noted that secondary flood risk can be attributed to a potential surcharge due to a blockage of the culverts located on the Feeghroe Stream and drainage channels, which may result in localised areas of flooding within the site. However, given the proposed works as part of the development (such as diverting sections of drainage channels and installing new culverts) and with the implementation of a maintenance regime, as recommended in the report, the potential residual risk of culvert blockage to the site is considered to be low. Further details are provided in Section 11 of this EIAR.

4.7 MITIGATION MEASURES

The following sections of this EIAR provide further information on the potential impacts to human beings as a result of the proposed development. Mitigation measures have been proposed to address the potential impacts and are detailed under the following sections:

- Air Quality, Climate and Odour;
- Noise and Vibration
- Landscape and Visual
- Biodiversity – Aquatic Environment;
- Soils, Geology and Hydrology;
- Architectural, Archaeological and Cultural Heritage;
- Material Assets.

4.8 DIFFICULTIES ENCOUNTERED IN COMPILING INFORMATION

No difficulties were encountered during the assessment of potential impacts of the proposed development on population and human health.

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4.9 REFERENCES

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