

## **SECTION E – INTERACTIONS AND INTER-RELATIONSHIPS**

In line with requirements of EC Directive 85/337/EC (as amended) and the Planning and Development Regulations 2001, any interactions/inter-relationship between the various environmental factors was also taken into account as part of the EIAR scoping and assessment.

Where a potential exists for interaction between two or more environmental topics, the relevant specialists have taken the potential interactions into account when making their assessment and where possible complementary mitigation measures have been proposed. An overview of these potential interactions is provided in Table 17.1, with the main interactions or inter-relationships discussed in Sections 17.1 to 17.12 below.

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**17.0 INTERACTIONS AND INTER-RELATIONSHIPS**

**Table 17.1:** Summary of Potential Interactions / Inter-Relationships

<b>Receptor Source</b>	<b>Human Beings</b>	<b>Air</b>	<b>Climate</b>	<b>Noise</b>	<b>Landscape &amp; Visual</b>	<b>Traffic</b>	<b>Biodiversity</b>	<b>Water</b>	<b>Soils</b>	<b>Cultural Heritage</b>	<b>Material Assets</b>
<b>Human Beings</b>		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>Air</b>	✓		✓	x	x	x	✓	x	x	x	✓
<b>Climate</b>	✓	✓		x	x	x	✓	x	x	x	x
<b>Noise</b>	✓	x	x		x	x	✓	x	x	x	✓
<b>Landscape &amp; Visual</b>	✓	x	x	x		x	x	x	x	✓	x
<b>Traffic</b>	✓	✓	✓	✓	x		✓	x	x	x	✓
<b>Biodiversity</b>	✓	✓	✓	x	✓	x		✓	✓	x	x
<b>Water</b>	✓	x	x	x	x	x	✓		✓	x	x
<b>Soils</b>	✓	✓	x	x	✓	x	✓	✓		✓	✓
<b>Cultural Heritage</b>	✓	x	x	x	✓	x	x	x	x		x
<b>Material Assets</b>	✓	✓	✓	x	x	x	✓	✓	✓	x	

- ✓ - Anticipated Interaction  
X - No Anticipated Interaction

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### **17.1 AIR AND SOILS**

Excavations and earth moving operations during construction works may generate quantities of dust, which have the potential to impact upon air quality in the vicinity of the proposed development. Consequently, an impact upon air quality has the potential to impact upon human health, cause dust nuisance and cause disturbance to fauna (further discussed in Section 17.3).

The extent of dust generation depends on the nature of the construction dust (soils, sands, gravels, silts etc.) and the construction activity. The potential for dust dispersion depends on the local meteorological conditions such as rainfall, wind speed and wind direction.

Mitigation measures to control dust emissions would be implemented, which would include dust suppression where necessary.

### **17.2 AIR, CLIMATE AND TRAFFIC**

The proposed development has the potential to impact upon the air quality and climate of the area through air emissions, including potential greenhouse gases, arising from the proposed boilers, the wastewater treatment process and exhaust fumes from vehicles.

There would be a small increase in traffic during the construction phase, however, this would not be considered significant given the transient nature of works.

A comprehensive greenhouse gas assessment of the operational phase of the proposed development was undertaken by Katestone Environmental Pty Ltd., and is included as Attachment 5.1. The assessment of greenhouse gases generated from operations determined that the impact of the development on climate change would be very low in terms of national emissions.

The Odour, Air Quality and Greenhouse Gas Assessment report, included as Attachment 5.1, also assessed the potential impacts of traffic on air quality and climate. The report concluded that the proposed development's potential impact on roadside local air quality would be negligible. The potential impact of the development on regional air quality was found to be low compared to major regional roads in the vicinity of the proposed development.

### **17.3 AIR, HUMAN BEINGS AND BIODIVERSITY**

An adverse impact on air quality has the potential to impact upon human health, cause dust nuisance and cause disturbance to fauna. However, as discussed in Section 17.2, the risk to air quality as a result of the proposed development would not be considered significant.

During the construction phase of the development, there would be potential for dust emissions, which could impact upon the communities and residents on the roads to the site and fauna in the surrounding area. The potential impact of dust would be temporary, given the transient nature of construction works. Dust control would be an integral part of construction management practices, with mitigation measures implemented where required, including sweeping of roads and hardstand areas, appropriate storage and transport of

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material and dust suppression measures where required. Therefore emissions during construction are not likely to adversely affect air quality.

Odour is another aspect of air quality with the potential to impact upon human beings, in the context of nuisance. 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. 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 (included as 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. As discussed in Section 17.2 above, the assessment 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.

The air quality assessment also considered the potential effect of the development on Natura 2000 sites. This assessment found that predicted concentrations of ammonia would be well below the relevant criteria at the Natura 2000 sites located near the proposed development.

#### **17.4 NOISE, HUMAN BEINGS AND BIODIVERSITY**

Noise generated during the construction and operational phases of the proposed development has the potential to impact upon human beings and fauna within the vicinity of the site.

During the construction phase, noise may be generated due to increased vehicle movements and the operation of construction plant. It is not anticipated that there would be a significant impact on local residences and fauna within the vicinity of the 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 to noise, and have been included as part of an outline Construction Environmental Management Plan.

The operational phase of the proposed development would have no significant additional impact upon the existing noise environment of the area. The predicted noise levels for operational site equipment and 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. Therefore, it is not anticipated that significant noise impact would occur to human beings or bio-diversity.

#### **17.5 MATERIAL ASSETS AND HUMAN BEINGS**

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.

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It is considered that the proposed development would have a positive impact upon the local economy of the agri-food sector, by providing employment opportunities and by sourcing cattle from local farmers and suppliers.

The proposed development would not have any significant impacts upon utilities, such as disruption to local services, during either the construction or operational phase. During construction works, the demand on the local electricity and mains water systems would not be considered significant given the scale and transient nature of works.

During the operational phase, the annual anticipated electricity consumption (approximately 922 MWhrs) and LPG consumption (80m<sup>3</sup>) would not be considered significant in the overall context of the proposed development. With regards water demand for the site (estimated between 150-200 m<sup>3</sup>/day), no significant impact would be anticipated upon the Banagher regional water supply. Should conditions allow, the applicant intends to source the site's water requirement via water abstraction onsite. Water conservation measures have been included as part of the proposed development design, which include rainwater harvesting of all roof water for use in staff sanitary facilities and site landscaping, in addition to utilising "grey-water" from the proposed WWTP for use in lairage and lorry-wash out. Wastewater generated by the proposed development would not impact upon Banagher WWTP, as it is proposed to treat wastewater onsite at the new WWTP and ICW system prior to discharge to the Feeghroe Stream.

Should waste be incorrectly handled or stored at the development site, it has the potential to cause an adverse impact upon human beings through nuisance, including visual, odour, pests, and pollution to soils and water.

During the construction phase, wastes would be segregated and stored in suitably contained waste receptacles at the site compound. This would considerably reduce the potential risk of pollution to soils and water. Waste would be removed from the development on a regular basis, to avoid the accumulation of high waste volumes, which could cause nuisance. It should also be noted that given the inert nature of the majority of C&D waste types, it is unlikely that issues regarding odour or pests would arise.

During the operational phase, wastes would be appropriately stored within the waste receptacles provided by the appointed waste contractor(s), with animal by-products stored within designated trailers or tanks. The removal of waste from the site would be undertaken on a regular basis, to prevent large volumes of waste accumulating onsite and to prevent the potential for odour and pest nuisance. For example, Category 1 and Category 3 material would be removed off-site on a daily basis, while municipal waste may be collected once per week.

Any hazardous waste generated during the construction or operational phase would be managed in accordance with the Waste Management (Hazardous Waste) Regulations 1998 and 2000, and would be stored separately from non-hazardous waste, appropriately labelled and stored upon bunds where appropriate.

## **17.6 MATERIAL ASSETS, BIODIVERSITY, WATER QUALITY AND SOILS**

The proposed development would alter flora cover and the species of fauna supported due to land take and soil disturbance works. This impact would be minor, given the low ecological value of agricultural habitats at the site, and given that it is proposed to plant native flora species for the ICWs and site landscaping.

Waste has the potential to impact upon water quality and biodiversity during both the construction phase and operational phase, by causing pollution to soils and water through leaching of materials, and subsequently to aquatic biodiversity, and by potentially attracting pests / vermin to the site. However, as discussed in Section 16, wastes generated during the construction phase would be stored in suitably contained waste receptacles at the site compound, with the majority of the waste inert in nature, reducing the potential of pollution to soils and water.

It is not considered that there would be any significant impact upon soils and water, and thus biodiversity, due to waste management during the operational phase, given that waste would be collected by licenced waste contractors and recovered, recycled or disposed of at appropriately licenced waste facilities, which would have environmental controls in place as standard.

## **17.7 MATERIAL ASSETS AND NOISE**

The proposed development is located in a rural agricultural area, primarily dominated by pastureland. Increased noise emissions during the construction or operational phases would have the potential to impact upon livestock due to disturbance.

The potential for noise during construction works associated with the proposed development on livestock would not be considered significant, given the transient nature of construction activities and given that noise control measures would be implemented by the construction works contractor, as standard practice, and as outlined in the Construction Environmental Management Plan prepared for the development. The potential for operational noise associated with the proposed development to cause disturbance to livestock within the vicinity of the site would be considered low. Animals would quickly become acclimatised to the new noise environment adjacent to the development, as with similar projects such as new roads and motorways.

## **17.8 MATERIAL ASSETS AND AIR**

As noted above, the proposed development is located in a rural agricultural area. The proliferation of dust during construction has a nuisance value and livestock would be at risk to eye irritation from high levels of wind blowing dust particles. Given the proposed mitigation measures for dust control and dust suppression, in addition to the transient nature of construction works, the potential for dust to impact upon livestock would be considered low.

## **17.9 WATER QUALITY AND SOILS**

There would be a potential impact on water quality during the construction phase of the proposed development due to the release of suspended solids during soil disturbance works. Surface water run-off passing over exposed soils has the potential to entrain suspended solids and release them into receiving waters. An increase in suspended solids would reduce water clarity, which could affect light penetration and therefore productivity in the waters. Water quality may also be impacted upon by an increase in nutrients, which are bound to suspended solids. A significant increase in nutrients can result in excessive eutrophication, leading to deoxygenation of waters and subsequent asphyxia of aquatic species.

Appropriate mitigation measures would be implemented during the construction phase including the provision of silt control features and the appropriate storage of spoil.

## **17.10 WATER QUALITY, HUMAN BEINGS AND BIODIVERSITY**

The proposed development and future planned discharge of treated effluent to surface waters would have the potential to cause a deterioration in water quality. A deterioration in water quality would impact upon aquatic flora and fauna, would negatively affect the fishery industry and in severe cases, may impact upon any water-based leisure activities and amenities of the area.

It is unlikely that the proposed development would have the potential to impact upon drinking water quality. 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) abstraction point is located approximately 30 km downstream of the Rapemills-Shannon confluence in Lough Derg [E 185210, N 203730].

During construction works, there would be a potential risk to water quality from releases of suspended solids during earth works, uncured concrete and hydrocarbons from the operation of heavy construction plant and associated equipment. Uncured concrete has the potential to alter the pH of waters locally, while hydrocarbons can lead to potentially toxic and / or de-oxygenating conditions within waters.

Suspended solids potentially entrained in surface water run-off during construction works can impact upon aquatic habitats through deposition, reducing clarity and by potentially increasing nutrients which are bound to the suspended solids. An increase in sediments has the potential to impact upon fish by damaging gravel beds required for spawning, smothering fish eggs and in extreme cases, by interfering with the gills of fish. Consequently, an impact on fish would affect fauna, such as the otter (*Lutra lutra*), who prey on fish.

During the construction phase of the proposed development and future planned development, surface water quality would be protected through the implementation of mitigation measures, which include the use of appropriate silt control features, the regular maintenance and inspection of construction plant and the appropriate storage of potentially polluting



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substances. An outline Construction Environmental Management Plan (CEMP) has been prepared which included measures for the protection of water quality.

During the operational phase, water quality may be impacted upon due to an increase in nutrients, which may arise from surface water-run off containing nutrients bound to suspended solids or by the discharge of treated effluent emissions, in particular emissions of phosphates and nitrogenous compounds. A significant increase in nutrients can result in excessive eutrophication, leading to deoxygenation of waters and subsequent asphyxia of aquatic species.

Discharges of ammonia can have a direct toxic effect in its unionised form ( $\text{NH}_3$ ) to which fish species, and particularly salmonid species, are susceptible. Uncontrolled emissions of suspended solids and fats, oils and grease can also have a detrimental impact upon habitats and species.

It is not anticipated that the proposed development has the potential to adversely impact upon water quality during the operational phase. Proposed final effluent quality values for discharges to the Feeghroe Stream have been based upon the Feeghroe's assimilative capacity and current water quality. The assimilative capacity assessment concluded that the proposed discharge would not, in and of itself, cause the Feeghroe Stream to fail to achieve good status, or significantly impact the current water quality of the Feeghroe.

#### **17.11 LANDSCAPE AND VISUAL, SOILS AND HUMAN BEINGS**

The excavation, temporary storage and movement of soil within the site would affect the appearance of the landscape. This would be temporary as vegetation becomes established and would be necessary as part of the construction.

The proposed development would have the potential to adversely impact upon the visual landscape during the operational phase, thereby reducing the visual amenity for local residents.

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.

As discussed in Section 7, 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.

#### **17.12 CULTURAL HERITAGE, SOILS AND HUMAN BEINGS**

Archeologically important sites, buildings of historic, artistic or architectural interest and sites of cultural heritage form part of the landscape of County Offaly. A number of monuments are present within the wider vicinity of the site. These include an enclosure,



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located approximately 0.5km to the north-east, and a cluster of toghers, with the nearest togher located approximately 1.1km to the north-east. Furthermore, two townland boundaries are located within the site, the boundary between Boheradurrow and Clongawny, and the boundary between Boheradurrow and Meenwaun.

Potential impacts to archaeological, architectural and cultural sites may occur during topsoil stripping, excavation and soil movements during the construction phase of the development. These works may also impact upon the landscape of the area, particularly if existing archaeological and architectural features are physically affected.

The proposed development would not directly impact upon any known recorded monuments, national monuments, protected structures or NIAH heritage sites. However, the proposed development would likely have a direct impact upon two townland boundaries, that between Boheradurrow and Clongawny Beg, and that between Boheradurrow and Meenwaun.

The proposed development would have a potential indirect impact upon an enclosure located approximately 0.5km from the site. This monument has not been investigated, but there is potential for unknown sub-surface archaeological features or material within the vicinity of the proposed site, which would be negatively impacted by construction works.