

## 20 SUMMARY OF MITIGATION MEASURES

### 20.1 Introduction

This Chapter of the EIAR collates and summarises the mitigation measures recommended for each of the environmental topics examined in Chapters 5 – 19 of this EIAR.

These mitigation measures and any associated monitoring comprise what would be implemented during the Demolition, Construction and Operational Phase to reduce the potential for significant adverse impact of the proposed development on the environment.

This Chapter does not expand on the reasoning or expected effectiveness of the proposed mitigation or monitoring measures. For such descriptions, we refer to each of the individual chapters of the EIAR.

A number of the recommended mitigation measures would be expected to be required as a condition of any grant of permission by An Bord Pleanála.

### 20.2 Proposed Mitigation Measures

#### 20.2.1 Population and Human Health (Chapter 5)

There are no specific mitigation measures proposed for Human Health. Mitigation measures proposed to minimise the potential impacts on human health in terms of air quality, landscape & visual impact and noise & vibration are discussed in the relevant sections of Chapters 9: Climate (Air Quality and Climate Change), Chapter 12: Air (Noise & Vibration) and Chapter 13: Landscape & Visual Impact respectively.

Chapter 14: Material Assets (Transportation), addresses mitigation measures proposed to reduce the impact of additional traffic movements to and from the development.

#### 20.2.2 Biodiversity (Chapter 6)

##### Construction Stage

###### Designated sites

###### *European Sites*

As set out in the Appropriate Assessment Screening Report, in concluding that the proposed development is not likely to have a significant effect on any European sites, mitigation measures intended to avoid or reduce any harmful effects of the proposed development on European sites were not required or taken into account.

###### *National Sites*

As there is no risk of the proposed development to affect the integrity of any nationally designated site, mitigation measures intended to avoid or reduce any harmful effects of the proposed development on nationally designated sites were not required or taken into account.

###### Habitats

###### *Retention and Protection of Vegetation during Construction*

Any vegetation (including trees, hedgerows or scrub adjacent to, or within, the proposed development boundary) which is to be retained shall be afforded adequate protection during the construction phase in accordance with the Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes (National Roads Authority, 2006b), as follows:

- All trees along the proposed development boundary that are to be retained, both within and adjacent to the proposed development boundary (where the root protection area of the tree extends into the proposed development boundary), will be fenced off at the outset of works and for the duration of construction to avoid structural damage to the trunk, branches or root systems of the trees. Temporary fencing will be erected at a sufficient distance from the tree so as to enclose the Root Protection Area (RPA) of the tree. The RPA will be defined based upon the recommendation of a qualified arborist.
- Where fencing is not feasible due to insufficient space, protection for the tree/hedgerow will be afforded by wrapping hessian sacking (or suitable equivalent) around the trunk of the tree and strapping stout buffer timbers around it.
- The area within the RPA will not be used for vehicle parking or the storage of materials (including soils, oils and chemicals). The storage of hazardous materials (e.g. hydrocarbons) or concrete washout areas will not be undertaken within 10 m of any retained trees, hedgerows and treelines.
- A qualified arborist shall assess the condition of, and advise on any repair works necessary to, any trees which are to be retained or that lie outside of the proposed development boundary but whose RPA is impacted by the works. Any remedial works required will be carried out by a qualified arborist.
- A buffer zone of at least 5m will be maintained between construction works and retained hedgerows to ensure that the root protection areas are not damaged.

#### *Protection of Vegetation from Dust during Construction*

To control dust emissions during construction works standard mitigation measures shall include: spraying of exposed earthwork activities and site haul roads during dry and/or windy conditions; provision of wheel washes at exit points; control of vehicle speeds and speed restrictions (20 km/h on any un-surfaced site road); covering of haulage vehicles; and, sweeping of hard surface roads. These procedures will be strictly monitored and assessed on a daily basis.

Dust screens will be implemented at locations where there is the potential for air quality impacts on sensitive ecological receptors (i.e. within 100m of the works) such as the attenuation pond, during the construction phase.

#### *Measures to Protect Surface Water Quality During Construction*

Mitigation measures to protect surface water in the receiving environment during construction are detailed in EIAR Chapter 8 Water, and in the outline Outline Construction Management Plan (CMP), and include:

- Management and control of surface water run-off.
- On-site attenuation tanks.
- Fuel, chemical and hazardous material storage and handling.
- Emergency response to accidental spillages.
- Monitoring and maintenance of the wastewater treatment systems.
- Testing and inspection of onsite sewers and new sewer connections and procedures to isolate, contain and dispose of and leakage from the foul sewer.
- Foul sewers surveyed by CCTV and assessed to identify possible physical defects. Any defects will be remediated and re-CCTV'd to verify that the works have been completed in accordance with the specifications.

### Mammal species (excluding bats)

#### *Measures to Protect Badgers During Construction*

The mitigation measures described below follow the recommendations set out in the Guidelines for the Treatment of Badgers during the Construction of National Road Schemes (National Roads Authority, 2006). These guidelines set out the best practice approach in considering and mitigating impacts on Badgers during construction works.

As there are badger records from the local area, and badger could potentially establish new setts in the future within the Zol of the proposed development, a pre-construction check of all suitable habitat within the proposed development boundary will be required within 12 months of any constructions works commencing. Any new badger setts present will be afforded protection in line with the requirements set out in the TII/NRA guidance document as follows: -

- Badger setts will be clearly marked and the extent of bounds prohibited for vehicles clearly marked by fencing and signage.
- No heavy machinery shall be used within 30m of badger setts; lighter machinery (generally wheeled vehicles) shall not be used within 20m of a sett entrance; light work, such as digging by hand or scrub clearance shall not take place within 10m of sett entrances.
- During the breeding season (December to June inclusive), none of the above works shall be undertaken within 50m of active setts, nor blasting or pile driving within 150m of active setts.
- Works can be undertaken within these zones following consultation with, the approval of and, if required, under the supervision of a badger ecologist.

As the proposed development will not result in the permanent loss of any badger setts, there is no requirement to construct any artificial setts as part of the mitigation strategy.

### Bats

#### *Measures to Protect Bats during Vegetation Clearance*

The following mitigation measures are proposed in relation to those trees and trees groups identified as having high potential to support roosting bats (Figure 6.10). Bats could occupy suitable roosting features at any time prior to the commencement of works. Therefore, there is an inherent risk that bats could be affected by the proposed felling works. The following mitigation procedures will be followed: -

- Felling of confirmed and potential tree roosts will be undertaken during the periods April – May or September – October as during this period bats are capable of flight and may avoid the risks from tree felling if proper measures are undertaken, but also are neither breeding nor in hibernation
- Use of detectors alone may not be sufficient to record bat emergence and re-entry in darkness. Therefore, prior to felling of confirmed and potential tree roosts, an emergence survey using infra-red illumination and video camera(s) and bat detectors will be carried out on the night immediately preceding the felling operation to determine if bats are present
- Where it is safe and appropriate to do so for both bats and humans, such trees may be felled using heavy plant to push over the tree. In order to ensure the optimum warning for any roosting bats that may still be present, the tree will be pushed lightly two to three times, with a pause of approximately 30 seconds between each nudge to allow bats to become active. The tree should then be pushed to the ground slowly and should remain in place until it is inspected by a bat specialist
- Trees should only be felled “in section” where the sections can be rigged to avoid sudden movements or jarring of the sections
- Where remedial works (e.g. pruning of limbs) is to be undertaken to trees deemed to be suitable for bats, the affected sections of the tree will be checked by a bat specialist (using

endoscope under a separate derogation licence held by that individual) for potential roost features before removal. For limbs containing potential roost features high in the tree canopy, this will necessitate the rigging and lowering of the limb to the ground (with the potential roost feature intact) for inspection by the bat specialist before it is cut up or mulched. If bats are found to be present, they will be removed by a bat specialist licenced to handle bats and released in the area in the evening following capture

- If any bat tree roosts are confirmed, and will be removed by the proposed felling works, then a derogation licence will be required from the NPWS and appropriate alternative roosting sites will be provided in the form of bat boxes.

#### *Measures to Control and Reduce Light Spill During Construction and Operation*

Any light spill affecting bat use of habitats outside of the proposed development boundary will be avoided, where feasible. Light levels during construction and operation in these areas will be kept to a minimum where feasible.

This will be achieved through sensitive siting and design of the lighting elements. This will include careful consideration of light placement on buildings, column heights and luminaire design. Accessories such as baffles, hoods or louvres can be used to reduce light spill and direct light to where it is needed. Ideally luminaires should be selected which do not emit UV light (e.g. metal halide and fluorescent light sources should be avoided). LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.

Monitoring of light levels along the hedgerows and treelines areas will be undertaken pre-construction, during-construction and post-construction to identify any areas where light spill is affecting background levels during construction or operation.

Where monitoring detects light spill is affecting these habitat areas, remedial measures will be implemented to ensure that minimum light levels are maintained. Following a review of the lighting design, these measures may include modification of lighting locations and column heights, luminaire design and/or introducing additional screening to reduce light spill.

Reporting on the monitoring will be forwarded to the local authority for their review and any remediation required agreed between them and the applicant.

#### Birds

Where feasible, vegetation (e.g. hedgerows, trees, scrub and grassland) will not be removed, between the 1<sup>st</sup> March and the 31<sup>st</sup> August, to avoid direct impacts on nesting birds. Where the construction programme does not allow this seasonal restriction to be observed, then these areas will be inspected by a suitably qualified ecologist for the presence of breeding birds prior to clearance. Areas found not to contain nests will be cleared within 3 days of the nest survey, otherwise repeat surveys will be required.

#### Amphibians

If works to clear any of the habitat features suitable to support amphibian species are to begin during the season where frogspawn or tadpoles may be present (February – mid-summer), or where breeding adult newts, their eggs or larvae may be present (mid-March – September), a pre-construction survey will be undertaken to determine whether breeding amphibians are present.

In the case of common frog, any frog spawn, tadpoles, juvenile or adult frogs present will be captured and removed from affected habitat by hand net and translocated to the nearest area of available suitable habitat.

In the case of smooth newt, individuals will be captured and removed from affected habitat either by hand net or by trapping and translocated to the nearest area of available suitable habitat, beyond the ZoI of the proposed road development. If used, the type and design of traps shall be approved by the NPWS. This is a standard and proven method of catching and translocating smooth nest.

If the size or depth of the habitat feature is such that it cannot be determined whether all amphibians have been captured, it will be drained under the supervision of a suitably experienced ecologist to confirm that no amphibian species remain before it is destroyed or infilled. Any mechanical pumps used to drain the habitat feature will have a screen fitted, and be sited, such that no amphibian species can be sucked into the pump mechanism.

Any capture and translocation works shall be undertaken immediately in advance of site clearance/construction works commencing.

## Fish

### *Habitat Loss*

To minimise the effects of habitat loss on fish species, all sections of river/stream channel within the proposed development boundary, but not within the footprint of the proposed development and associated infrastructure, will be protected from site clearance and construction works. Rivers/streams will be fenced off at a minimum distance of 5m from the river bank where any works are taking place nearby and within this zone the natural riparian vegetation will be retained where possible.

### *Mortality Risk & Disturbance / Displacement*

To minimise the potential effects of construction works on fish species the following mitigation measures will be implemented: -

- No instream works will be carried out between the months of October and June (inclusive) to avoid the most sensitive time for fish species and fish species movements.
- Design of new sections of river channel shall be in accordance with the principles outlined in Channels & Challenges. Enhancing Salmonid Rivers (O'Grady, 2006).
- Immediately prior to rivers/streams being diverted into a newly constructed river channel or culvert, they will be electrofished (if required) to capture and transfer fish from the original channel to the new one. Once the watercourse has been diverted this will be followed by a manual search of the original watercourse to transfer any remaining fish to the new river/stream channel.
- Any water abstraction points required for dust suppression will be agreed with IFI and the suction head shall be screened to ensure that fish are not removed during the abstraction process.

### *Habitat Severance/Barrier Effect during Construction*

All temporary crossing structures used to cross watercourses during construction will be designed in accordance with the Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI, 2016) and Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes (National Roads Authority, 2005) to maintain fish and macroinvertebrate passage, and to prevent sedimentation and erosion.

## **Operational Stage**

### Habitats

#### *Measures to Protect Surface Water Quality during Operation*

Mitigation measures to protect surface water in the receiving local environment in the River Skane during operation are detailed in Chapter 8: Water, and in the Outline Construction Management Plan (CMP), and include: -

- Continued management, monitoring and maintenance of the wastewater treatment systems in accordance with the EPA licence requirements.
- Runoff from the site will be attenuated within the on-site attenuation tanks, and hydrobrakes and downstream defender will also be employed to control the rate of discharge. In combination these SuDS measures significantly reduce the volume and rate of surface water discharging from the site.
- The SuDS treatment train will pre-treat the surface water discharging to the River Skane, removing pollutants and hydrocarbons from the surface water runoff.

These mitigation measures are for the protection of the water quality within the River Skane watercourse only, and not for the protection of European Sites downstream as there are no significant effects likely to arise on European sites as a result of water quality impacts associated with the proposed development, as discussed above in Section 6.5.1.

### Bats

In order to provide additional roosting opportunities for bats, the installation of bat boxes will be erected on suitable retained trees in suitable locations across the site, the location of which to be decided by a suitably qualified and experienced bat ecologist.

### Mammal Species

Mitigation measures are not required as no operational phase impacts are predicted on badger or small mammal species as a result of the proposed development.

### Birds

Mitigation measures are not required as operational phase impacts predicted on bird species as a result of the proposed development will be short-term and not significant.

### Amphibians

Mitigation measures are not required as no operational phase impacts are predicted on amphibians as a result of the proposed development.

## **20.2.3 Land, Soils and Geology (Chapter 7)**

### **Construction Stage**

The excavations for the drainage pipes, water supply, utilities and foundations are anticipated as being relatively shallow and will have minimal impact on the ground water in the site.

Following completion of any required initial dewatering, it is expected that flows of water into the excavation will be relatively small. These flows will be managed by sump pumping on an as-required basis.

The quantity of excavated materials to be removed from or imported into the site has been reduced by establishing levels of the proposed buildings which optimise the volume of cut and fill as best as possible.

Unsuitable sub-soils generated by excavations on site will be reviewed for reuse as landscaping or non-engineering fills on adjoining or other construction sites within the region.

In the case of topsoil, careful planning and on-site storage can ensure that this resource is reused on-site as much as possible. Any surplus topsoil not reused on site can be sold. However, topsoil is quite easily damaged and can be rendered useless if not stored and cared for properly.

It is important that topsoil is kept completely separate from all other construction waste as any cross-contamination of the topsoil can render it useless for reuse as topsoil.

It is important to ensure that topsoil is protected from all kinds of vehicle damage and kept away from site-track, delivery vehicle turning areas and site plant and vehicle storage areas.

If topsoil is stored in piles of greater than two metres in height the soil matrix (internal structure) can be damaged beyond repair. It should be sealed and be kept as dry as possible and used as soon as possible to reduce any deterioration through lengthy storage and excess moving around the site.

Records of topsoil storage, movements and transfer from site will be kept by the Construction and Demolition Waste Manager.

Silt traps, silt fences and tailing ponds will also need to be provided by the contractor where necessary to prevent silts and soils being washed away by heavy rains during the course of the construction phase.

Surplus subsoil will be stockpiled on site, in such a manner as to avoid contamination with builders' waste materials, etc., and to preserve the materials for future use as clean fill.

The provision of wheel wash areas at the exit to the development will be required to minimise the amount of soils deposited on the surrounding road network. The adjoining road network will be cleaned on a regular basis. All trucks on the public roads will carry up to a maximum of ten cubic metres with suitable covering of the material to prevent spillage and damage to the surrounding road network.

Dampening down measures with water sprays will be implemented during periods of dry weather to reduce dust levels arising from the development works.

Appropriate storage and bunding measures will be implemented throughout the construction stage to prevent contamination of the soil and groundwater from oil and petrol leakage from site plant. Refuelling will be restricted to allocated re-fuelling areas. This area is to be an impermeable bunded area designed to contain 110% of the volume of fuel stored.

Soil samples taken from the site during the site investigations in March 2020 showed no evidence of contamination. However, due to the random sampling process and the sample size taken, this does not mean that the site has no contamination. In the unlikely event that any contaminated soil is uncovered on site during excavations, this will be identified and disposed of to an appropriate waste disposal facility.

On foot of Waterman Moylan's accompanying Preliminary Construction Management Plan, a Construction Management Plan, Traffic Management Plan and Waste Management Plan will be implemented by the contractor during the construction phase to control the above remedial measures.

### **Operational Stage**

On completion of the works, it is proposed to re-topsoil and replant open areas within the development. Following completion of these reinstatement works, no significant adverse impacts on the soils and geology are envisaged and therefore no mitigation measures will be required.

## 20.2.4 Water (Chapter 8)

### Construction Stage

#### Foul Water Drainage

##### *North & South Sites*

In order to reduce the risk of defective or leaking foul sewers, the following remedial measures will be implemented: -

- All new foul sewer connections will be tested by means of an approved air test during the construction phase in accordance with Irish Waters Code of Practice and Standard Details.
- All private drainage will be inspected and signed off by the design Engineer in accordance with the Building Regulations Part H and BCAR requirements.
- All foul sewers will be surveyed by CCTV and assessed to identify possible physical defects. Any defects will be remediated and re-CCTV'd to verify that the works have been completed in accordance with the specifications.
- The connection of the new foul sewers to the public sewer will be carried out under the supervision of Irish Water in the connections are approved under Self Lay Agreement and will be checked prior to commissioning. Alternatively, Irish Water will undertake the connections as part of the Connection Agreement for sewers in the public domain by their Network Contractors.
- Prior to commencement of excavations in public areas, all utilities and public services will be identified and checked, to ensure that adequate protection measures are implemented during the construction phase and in accordance with MCC road opening licence requirements.

#### Surface Water Drainage

##### *North & South Sites*

The contractor will prepare and implement a Construction Management Plan which will outline the requirements for the storage and handling of fuel, including the refuelling of vehicles in designated refuelling zones/bunded areas to minimise the risk of spillages, and the impact of spillages should they occur.

The Construction Management Plan will also utilise sedimentation controls, including silt traps, tailings ponds and silt fences during the construction period.

All private drainage will be inspected and signed off by the design Engineer in accordance with the Building Regulations Part H and BCAR requirements. This will reduce the possibility of any cross connections being constructed going forward in the proposed subject Blocks.

#### Water

##### *North & South Sites*

A method statement setting out in detail the procedures to be used when working in the vicinity of existing watermains will be produced by the contractor for any construction works within the vicinity of watermains and for roads and / or services crossing watermains.

All watermains will be cleaned and tested in accordance with Irish Water guidelines prior to connection to the public watermain.

All connections to the public watermain will be carried out by or under the supervision of Irish Water and MCC.



## **Operational Stage**

### Foul Drainage

#### *North & South Sites*

All foul drains will be tested and surveyed prior to connection to the public sewers to minimise the risk of uncontrolled ground water seepage or leakage of the foul water to ground water on the site.

Otherwise, no remedial or reductive measures are deemed to be necessary after completion of the development other than normal maintenance of the foul sewer system.

### Surface Water Drainage

#### *North & South Sites*

The increased runoff from the site will be attenuated within the on-site attenuation tanks, with the discharge rates limited to the greenfield runoff rate. In addition, the significant SuDS devices, outlined in Section 8.4.1.2, will significantly reduce and slow down the rate of surface water runoff. This will reduce the peak flows and flooding of storm water to the downstream system during major storm events. Gullies, downstream defenders and the hydrobrake manholes shall be regularly maintained to avoid blockages.

The SuDS treatment train will also pre-treat the surface water discharging to the River Skane, removing pollutants and hydrocarbons from the surface water runoff. Maintenance of these SuDS devices will be required to ensure that they continue to operate as designed.

### Water

#### *North & South Sites*

Water meters will be installed at key locations in agreement with Irish Water, and these meters will be linked to Irish Water's monitoring system by telemetry. These meters will facilitate the early detection of unusual water usage in the network and identify potential leaks in the system.

All plumbing fixtures and fittings and sanitary wear to be installed within the development should be to the current best practice for water consumption to minimise future water usage.

It is not envisaged that any further remedial or reductive measures will be necessary on completion.

## **Cumulative**

### **Construction Stage**

#### Foul Water Drainage

#### *North & South Sites*

In order to minimise the effect of the construction of the outfall sewer on the public road the following reductive measures are suggested: -

- Prior to commencement of excavations in public areas all utilities and public services will be identified and checked, to ensure that adequate protection measures are implemented during the construction phase.
- Traffic management for vehicular, cycle and pedestrian traffic will be implemented to minimise disruption to the public.
- All excavations within the public roads will be backfilled in a controlled manner and the public road will be reinstated to the satisfaction of the Local Authority.

- Method statements for all works will be prepared and assessed prior to commencement of the works. All construction methods used will be tailored to reduce, where possible, dust and noise and interference with residents in neighbouring development.
- All spoil and waste material will be removed to an approved storage or disposal facility.

#### Surface Water Drainage

##### *North & South Sites*

The mitigation measures of the cumulative development during the operational phase is as per the proposed development.

#### Water

##### *North & South Sites*

The mitigation measures of the cumulative development during the construction phase is as per the proposed development.

### **Operational Stage**

#### Foul Drainage

##### *North & South Sites*

The mitigation measures of the cumulative development during the operational phase is as per the proposed development.

#### Surface Water Drainage

##### *North & South Sites*

The mitigation measures of the cumulative development during the operational phase is as per the proposed development.

#### Water

##### *North & South Sites*

The mitigation measures of the cumulative development during the operational phase is as per the proposed development.

## **20.2.5 Climate (Air Quality and Climate Change) (Chapter 9)**

### **Construction Stage**

#### Air Quality

The pro-active control of fugitive dust will ensure the prevention of significant emissions, rather the pro-active control of fugitive dust will ensure the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released. The main contractor will be responsible for the coordination, implementation and ongoing monitoring of the Dust Management Plan. The key aspects of controlling dust are listed below. Full details of the Dust Management Plan can be found in Appendix 9.3. These measures will be incorporated into the Construction Management Plan (CMP) prepared for the site.

In summary the measures which will be implemented will include: -

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic.
- Any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions.
- Vehicles exiting the site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads.
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be 20 kph, and on hard surfaced roads as site management dictates.
- Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust would be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

### Climate

Construction stage traffic and embodied energy of construction materials are expected to be the dominant source of greenhouse gas emissions as a result of the construction phase of the development. Construction vehicles, generators etc., may give rise to some CO<sub>2</sub> and N<sub>2</sub>O emissions. However, due to short-term nature of these works, the impact on climate will not be significant.

Nevertheless, some site-specific mitigation measures can be implemented during the construction phase of the proposed development to ensure emissions are reduced further. In particular the prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.

### **Operational Stage**

The impact of the proposed development on air quality and climate is predicted to be imperceptible with respect to the operational phase in the long term. Therefore, no additional site specific mitigation measures are required.

A number of measures will be incorporated into the design of the proposed development in order to reduce the impact on climate once operational. The Energy Statement prepared by Waterman Moylan Consulting Engineers and submitted with this planning application outlines the proposed measures for the dwellings and creche. The buildings will meet the requirements of the Building Regulations Part L 2019 and 2017 and the buildings will also be Nearly Zero Energy Building (NZEB) compliant.

The exact systems to be installed will be determined during the detailed design stage however the Energy Statement outlines the most likely solutions for the proposed development, these include, installing air source heat pumps or exhaust air heat pumps, achieving an air tightness standard of 3 m<sup>3</sup>/m<sup>2</sup>/hr for the dwellings and 5 m<sup>3</sup>/m<sup>2</sup>/hr for the creche and achieving a U-Value that is 20% to 30% higher than the minimum required. These measures will ensure the impact of the proposed development on climate is minimised.

## Cumulative

### Construction Stage

As there are no developments within 350m of the site that have the potential to cause cumulative construction dust impact, mitigation measures are not required other than those listed in Section 9.6.1.1.

### Operational Stage

The traffic data used to assess the operational stage impacts to air quality and climate included the cumulative traffic associated with the Phase 1 development as well as other existing and permitted developments in the local area. Therefore, the cumulative impact is included within the operational stage impact for the proposed development. The impact is predicted to be imperceptible and therefore mitigation measures are not required.

## 20.2.6 Climate (Sunlight) (Chapter 10)

The subject application proposes the development of a greenfield site zoned as: “A2” which is “to provide for new residential communities with ancillary community facilities, neighbourhood facilitates and employment uses as considered appropriate.” under statutory planning policy (i.e. the Meath County Council Development Plan 2013 – 2019). In these circumstances, during the construction or operational phases scope for mitigation measures, which would preserve a sustainable level of density, is limited.

## 20.2.7 Climate (Daylight) (Chapter 11)

The subject application proposes the development of a greenfield site zoned as: “A2” which is “to provide for new residential communities with ancillary community facilities, neighbourhood facilitates and employment uses as considered appropriate.” under statutory planning policy (i.e. the Meath County Council Development Plan 2013 – 2019). In these circumstances, during the construction or operational phases scope for mitigation measures, which would preserve a sustainable level of density, is limited.

## 20.2.8 Air, Noise and Vibration (Chapter 12)

### **Construction Stage**

With regard to construction activities, best practice control measures from construction sites within *BS 5228 (2009 +A1 2014) Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2* will be used to control noise and vibration impacts. The contractor will ensure that all best practice noise and vibration control methods will be used as necessary in order to ensure impacts to the closest residential noise sensitive locations are not significant. This will be particularly important during demolition, foundation construction including piling works which are likely to be the activities to have the highest potential noise and vibration impact.

Noise-related mitigation methods are described below and will be implemented for the project in accordance with best practice. These methods include: -

- No plant used on site will be permitted to cause an ongoing public nuisance due to noise.
- The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations.
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract.

- Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use.
- During construction, the contractor will manage the works to comply with noise limits outlined in BS 5228-1:2009+A1:2014. Part 1 – Noise.
- All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.
- Limiting the hours during which site activities which are likely to create high levels of noise or vibration are permitted.
- Monitoring levels of noise and vibration during critical periods and at sensitive locations.

Furthermore, it is envisaged that a variety of practicable noise control measures will be employed. These may include: -

- Selection of plant with low inherent potential for generation of noise and/ or vibration;
- Erection of good quality site hoarding to the site perimeters which will act as a noise barrier to general construction activity at ground level.
- Erection of barriers as necessary around items such as generators or high duty compressors.
- Situate any noisy plant as far away from sensitive properties as permitted by site constraints.

Table 20.1 presents the predicted daytime noise levels from an indicative construction period on site at the nearest off-site receptors assuming standard mitigation measures. Note construction noise sources for the site are assumed to be running 66% of the time. The predictions have been prepared at a distance of 15m & 40m to consider the impact on the closest receptors and take account of the 5 dB screening effect of a 2.4m site hoarding.

Phase	Item of Plant (BS 5228-1:2009+A1:2014 Ref.)	Predicted at Nearest Receiver at 15 m distance dB L <sub>Aeq</sub>	Predicted at Nearest Receiver at 40 m distance dB L <sub>Aeq</sub>
Site Preparation	Wheeled Loader Lorry (D3 1)	65	56
	Track Excavator (C2 22)	62	53
	Dozer (C2.13)	68	59
	Dump Truck (C4.2)	68	59
<b>Total</b>		<b>72</b>	<b>64</b>
Foundations	Tracked Excavator (C3.24)	64	55
	Concrete Pump (C3.25)	68	59
	Compressor (D7 6)	67	58
	Poker Vibrator (C4 33)	68	59
<b>Total</b>		<b>73</b>	<b>64</b>
General Construction	Hand tools	71	62
	Tower Crane (C4.48)	66	57

	Pneumatic Circular Saw (D7.79)	65	56
	Internal fit – out	60	51
<b>Total</b>		<b>73</b>	<b>64</b>
Landscaping	Dozer (C2.13)	68	59
	Dump Truck (C4.2)	68	59
	Surfacing (D8.25)	58	49
<b>Total</b>		<b>71</b>	<b>62</b>

**Table 20.1:** Construction Noise Predictions.

It is predicted that construction activities may cause a negative, short-term, potentially significant impact at receptor R6 which is located on the boundary of the northern site.

At all other receptors the construction works are not predicted to cause a significant impact.

Note that the predicted noise levels referred to in this section are indicative only and are intended to demonstrate that it will be possible for the contractor to comply with current best practice guidance.

The noise impacts due to demolition and construction works with mitigation in place may be described as negative, significant and short-term at location R6. For R1 and R2 the impact is negative, significant and temporary during the foundations phase. All other phases and all other receptors are predicted to have a negative, moderate and short-term impact.

## Operational Stage

### Outward Noise

As part of the detailed design of the development, plant items and, where necessary, appropriately selected remedial measures will be specified in order that the adopted plant noise criteria is achieved at the façades of noise sensitive properties, including those within the development itself.

### Residential Inward Noise (Acoustic Design Statement Part 2)

As is the case in most buildings, the glazed elements and ventilation paths of the building envelope are typically the weakest element from a sound insulation perspective. In general, all wall constructions (i.e. block work or concrete and spandrel elements) offer a high degree of sound insulation, much greater than that offered by the glazing systems. Therefore, noise intrusion via the wall construction will be minimal.

In this instance the facades highlighted in **Error! Reference source not found.** and **Error! Reference source not found.** will be provided with glazing and ventilation that achieves the minimum sound insulation performance as set out in Table 20.2 and Table 20.3. Other facades in the development have no specific requirement for sound insulation. The calculations assume that one vent is required per room.

Facade	Octave Band Centre Frequency (Hz)						dB R <sub>w</sub>
	125	250	500	1k	2k	4k	
Orange	Standard Double Glazing						33
Red	26	27	34	40	38	46	38

**Table 20.2:** Sound Insulation Performance Requirements for Glazing, SRI (dB)

Facade	Octave Band Centre Frequency (Hz)						dB $D_{ne,w}$
	125	250	500	1k	2k	4k	
Orange	30	33	38	37	36	36	38
Red	31	33	42	43	39	39	42

**Table 20.3:** Sound Insulation Performance Requirements for Ventilation,  $D_{n,e}$  (dB)

The overall  $R_w$  and  $D_{ne,w}$  outlined above are provided for information purposes only. The over-riding requirement is the minimum octave-band sound insulation performance values which may also be achieved using alternative glazing and ventilation configurations. Any selected system will be required to provide the same level of sound insulation performance set out in Table 20.2 and Table 20.3 or greater.

It is important to note that the acoustic performance specifications detailed herein are minimum requirements which apply to the overall glazing and ventilation systems. In the context of the acoustic performance specification the 'glazing system' is understood to include any and all of the component parts that form part of the glazing element of the façade, i.e. glass, frames, seals, openable elements etc.

The assessment has demonstrated that the recommended internal noise criteria can be achieved through consideration of the proposed façade elements at the design stage. The calculated glazing and ventilation specifications are preliminary and are intended to form the basis for noise mitigation at the detailed design stage. Consequently, these may be subject to change as the project progresses.

Following the provision of these measures the impacts will be considered neutral, not significant and permanent.

#### Creche Inward Noise (Acoustic Design Statement Part 2)

Consideration of the sound insulation of the following building element has been considered in the calculations:

- External wall construction;
- Background ventilation; and,
- Glazed elements.

Typically, external wall constructions offer a high degree of sound insulation, much greater than that offered by the glazing systems and vents. Therefore, noise intrusion via the wall and roof constructions will be minimal. For the assessment of the building envelope sound insulation we have assumed the external wall as providing a minimum overall sound insulation performance of 50 dB  $R_w$ .

In order to meet the criterion for internal ambient noise levels the required performance specification for glazing and ventilation systems are provided below:

Building	Octave Band Centre Frequency (Hz)						dB $R_w$
	125	250	500	1k	2k	4k	
Creche	26	27	34	40	38	46	38

**Table 12.4:** Sound Insulation Performance Requirements for Glazing, SRI (dB)

Building	Octave Band Centre Frequency (Hz)						dB R <sub>w</sub>
	125	250	500	1k	2k	4k	
Creche	31	33	42	43	39	39	42

**Table 20.5:** Sound Insulation Performance Requirements for Ventilation, D<sub>n,e</sub> (dB)

### 20.2.9 Landscape and Visual Impact (Chapter 13)

The development lands form the southern parcel A which sit in a low elevation compared to the surrounding landscape and Section B northern parcel which is in a slightly more elevated position. The lands in Parcel A are partially visible from the elevated M3/ R125 roundabout (photomontage 3) and the intermittent existing roadside hedgerow / scrub provides a level of screening of the site lands. Significant additional screen planting is proposed for the boundary along the R125 which will screen views of the site from views from the west. The recently completed Dun Rioga development close to the northern part of the Section A lands will have views into the site (see Photomontage 6) and while the construction stage will be the most visually negative temporary hoarding will screen most of the negative construction related views. On completion the proposal for a significant open space area will enhance the space between the two sites.

The northern section B again is visible from the L2208 Drumree Road as it comes from the M3 overbridge to the west (Photomontage 04). A proposed separation strip at the entrance with tree planting will help screen views into the site from this direction and a strip of native species planting to the rear of the westernmost blocks of housing will screen views into the site from the west. View from the R125 to the east of Section B are screened by the road being in a cutting and dense roadside planting also screens views (Photomontage 10). The M3 roadway is in a cutting to the west of the southern and northern lands but it rises to pass over the R147 to the north of the Section B lands allowing glimpse views of the proposed development. The overall landscape design proposals include the Objectives as set out in the Local; Area Plan with respect to Open Space and 'Green Corridors' and the provision of easily accessible play areas, the provision of cycle links to existing residential areas, the retention of hedgerows and the provision of native species planting throughout the site areas.

#### Construction Stage

The construction stage is the most visually negative and has the greatest impact on the landscape of the site. Tree and hedgerow removal, soil stripping and stockpiling and the erection of site hoarding are the most visible aspects of the early construction phase. The visual impact of multi-storey apartment buildings also has a wider visual impact than standard house construction. Measures such as site hoarding and temporary screening reduce local visual impacts. A well-run site with timely full completion of phases will help mitigate any ongoing negative construction stage impacts.

#### Operational Stage

In the operational phase landscape maintenance has a big impact on how the development appears to residents or visitors. Timely grass and shrub maintenance operations along with weed control and litter collection will enhance the area and help integrate it into the surrounding landscape.



## 20.2.10 Material Assets (Transportation) (Chapter 14)

### Construction Stage

A Construction Traffic Management Plan (CTMP) will be developed by the Contractor and presented to MCC for approval prior to commencement of the construction works. The CTMP will contain details of temporary traffic management for each construction stage.

- Construction traffic will be limited to certain routes and times of day, with the aim of keeping disruption to existing traffic and residents to a minimum. To minimise disruption to the local areas, construction traffic volumes will be managed through the following measures:
- During peak hours, ancillary, maintenance and other site vehicles movements will be discouraged.
- Use of properly designed access and egress points to minimise impact on both external traffic and amenity of residents.
- Daily construction programmes will be planned to minimise the number of disruptions to surrounding streets by staggering HGV movements to avoid site queues.
- Check on each departing vehicle at the exit from site to public road.
- Use of a banksman and/or traffic lights to control exit of construction vehicles onto public road.
- Issue of instructions and maps on how to travel to site to each sub-contractor to avoid 'lost' HGV's disrupting traffic.
- Establishment and maintenance of HGV holding areas within the site.
- Ongoing assessment of the most appropriate routes for construction traffic to and from the site.

The designated and operational on-site control measures, which will be established and maintained at this site, will include: -

- Designated hard routes through site.
- Each departing vehicle to be checked by a banksman.
- Wheel wash facility at egress point.
- Provision and facilities to cover lorry contents as deemed necessary.
- Controlled loading of excavated material to minimise risk of spillage of contents and overfilling.
- Spraying/damping down of excavated material on site by dedicated crews.
- Facility to clean local roads if mud or spillage occurs.

### Operational Stage

During the operational phase, a number of measures will be adopted in order to minimise traffic impacts as follows: -

- Suitable levels of signage and pavement markings will be installed within the site in order to reduce any potential traffic hazards.
- Adequate lighting will be provided.
- Once operational, traffic signal timings will be re-examined based on observations made on site in order to ensure the most efficient operation of the junctions.

It is proposed that a Mobility Management Strategy for the proposed development will be implemented by the developers, in conjunction with Meath County Council. This Mobility Management Strategy will take account of the provision of future cycle and pedestrian facilities, public transport services and provisions for the creation of enterprise to facilitate opportunities for employment in Dunshaughlin.

#### 20.2.11 Material Assets (Waste) (Chapter 15)

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

##### Construction Stage

As previously stated, a project specific C&D WMP has been prepared in line with the requirements of the guidance document issued by the DoEHLG and is included as Appendix 15.1. Adherence to the high-level strategy presented in this C&D WMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material excavation and construction phases of the Proposed Development.

It has been estimated by the project engineer that 43,253m<sup>2</sup> of soil and stone from the excavations required for construction of new foundations, the installation of underground services and attenuation tank, will be re-used on site. It is envisaged that 24,807m<sup>2</sup> of soil and stone will be required to be moved off site, with the rest of the excavated material being reused on site. Material moved offsite will be taken for offsite reuse, recovery and/or disposal. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers or the environment.

In addition, the following mitigation measures will be implemented: -

- Building materials will be chosen with an aim to 'design out waste'.
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery – it is anticipated that the following waste types, at a minimum, will be segregated: -
  - Concrete rubble (including ceramics, tiles and bricks).
  - Plasterboard.
  - Metals.
  - Glass.
  - Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks/bricks) and any suitable construction materials shall be re-used on-site, where possible.
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site.
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required).
- A waste manager will be appointed by the main contractor(s) to ensure effective management of waste during the excavation and construction works.
- All construction staff will be provided with training regarding the waste management procedures.

- All waste leaving site will be reused, recycled or recovered where possible to avoid material designated for disposal.
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Article 27 of the *EC (Waste Directive) Regulations (2011)* as detailed in the C&D WMP (Appendix 15.1). EPA approval will be obtained prior to moving material as a by-product. However, it is not currently anticipated that article 27 will be used.

These mitigation measures will ensure that the waste arising from the construction phase of the development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations, the Litter Pollution Act 1997, the EMR Waste Management Plan (2015 – 2021) and the and the MCC Bye-Laws for the Storage, Presentation and Collection of Household and Commercial Waste and the MCC waste and draft waste bye-laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will encourage sustainable consumption of resources.

### Operational Stage

As previously stated, a project specific OWMP has been prepared and is included as Appendix 15.2. Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the EMR Waste Management Plan 2015 – 2021 and the MCC waste bye-laws.

In addition, the following mitigation measures will be implemented: -

- On-site segregation of all waste materials into appropriate categories including (but not limited to): -
  - Organic waste.
  - Dry Mixed Recyclables.
  - Mixed Non-Recyclable Waste.
  - Glass.
  - Waste electrical and electronic equipment (WEEE).
  - Batteries (non-hazardous and hazardous).
  - Cooking oil.
  - Light bulbs.
  - Cleaning chemicals (pesticides, paints, adhesives, resins, detergents, etc.).
  - Furniture (and from time to time other bulky waste).
  - Abandoned bicycles.
- All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly identified with the approved waste type to ensure there is no cross contamination of waste materials.
- All waste collected from the development will be reused, recycled or recovered where possible, with the exception of those waste streams where appropriate facilities are currently not available.

- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities.

These mitigation measures will ensure the waste arising from the development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, associated Regulations, the *Litter Pollution Act 1997*, the *EMR Waste Management Plan (2015 - 2021)* and the MCC waste bye-laws. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

### **Cumulative Development**

The implementation of the mitigation measures outlined in Section 16.6 will ensure that a high rate of reuse, recovery and recycling is achieved at the development during the demolition, excavation and construction phases as well as during the operational phase. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

#### Construction Stage

A carefully planned approach to waste management as set out in Section 16.6.1.1 and adherence to the C&D WMP during the construction phase will ensure that the effect on the environment will be *short-term, imperceptible and neutral*.

#### Operational Stage

During the operational phase, a structured approach to waste management as set out in Section 16.6.1.2 will promote resource efficiency and waste minimisation. Provided the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted effect of the operational phase on the environment will be *long-term, imperceptible and neutral*.

## **20.2.12 Material Assets (Utilities) (Chapter 16)**

### **Construction Stage**

Mitigation measures proposed in relation to the drainage and water infrastructure include the following: -

- A detailed “Construction Management Plan” will be developed and implemented during the construction phase. Site inductions will include reference to the procedures and best practice as outlined in the “Construction Management Plan”.
- Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate.
- In the event of groundwater being encountered during the construction phase, mitigation measures will include dewatering by pumping to an appropriate treatment facility prior to discharge. Other measures would include excluding contaminating materials such as fuels and hydrocarbons from sensitive parts of the site i.e. highly vulnerable groundwater areas.
- In order to reduce the risk of defective or leaking sewers, all new sewers should be laid in accordance with Irish Water standards, pressure tested and CCTV surveyed to ascertain any possible defects.

- The construction compound will include adequate staff welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the construction compound will be removed off site to a licensed facility until a connection to the public foul drainage network has been established.
- The construction compound's potable water supply shall be protected from contamination by any construction activities or materials.
- Where possible backup network supply to any services will be provided should the need for relocation or diversion or existing services be required otherwise relocation or diversion works will be planned to incur minimal impact, with users notified in advance of any works.
- Connections to the existing gas and telecommunications networks will be coordinated with the relevant utility provider and carried out by approved contractors.

### Operational Stage

Please refer to Chapter 8: Water of the EIAR for mitigation measures associated with the surface water treatment.

All new drainage lines (foul and surface water) will be pressure tested and will be subject to a CCTV survey to identify any possible defects prior to being made operational.

Water conservation methods such as the use of low flush toilets and low flow taps should be incorporated into dwellings to reduce water volumes and related treatment and abstraction costs of the development.

Similarly, water conservation methods would reduce the loading on the foul sewer network and the treatment works.

On completion of the construction phase no further mitigation measures are proposed in relation to the electrical, gas and telecommunications infrastructure.

### 20.2.13 Cultural Heritage (Archaeology) (Chapter 17)

Remedial and mitigation measures describe any corrective or mitigative measures that are either practicable or reasonable, having regard to the potential likely and significant environmental impacts. This includes avoidance, reduction and remedy measures as set out in Section 4.7 of the Development Management Guidelines for Planning Authorities (2007) to reduce or eliminate any significant adverse impacts identified.

The Archaeological Assessment has identified a number of areas and features of archaeological and cultural heritage interest, on and around the lands comprising the development site. This is based on the desktop assessment, field inspection, geophysical survey, test-trenching, and excavation. The impact of the proposed development has been considered above and the summary results are repeated here:

- |   |          |
|---|----------|
| • Impact on recorded monuments (RMP)      | None     |
| • Impact on known archaeology             | Profound |
| • Impact on potential/unknown archaeology | Profound |

### Construction Stage

Further archaeological testing was carried out within the Study Area following the initial EIAR assessment. Please refer to Appendix 17.1 for a report on the results of this testing.

The pre-development geophysical survey and archaeological testing informed the design of the Cumulative Development. This allowed for the positive profound long-term effect of preservation in situ of the large central enclosure and the inner burial enclosure and the very significant, permanent positive effect of preservation by record (excavation) for the remainder of the archaeological features and deposits.

The previous geophysical surveys, testing and excavation within the footprint of the attenuation trench have shown that while archaeological features are highly likely to be present within the Proposed Development, they are highly unlikely to be of the same density, size and magnitude as those already excavated/preserved in situ within the Cumulative Development.

Testing of the Proposed Development has identified the location and extent of potential features and informed the location of areas for archaeological monitoring and excavation works to be carried out in conjunction with groundworks. Please refer to Appendix 17.1 for a report on the results of this testing.

Archaeological monitoring of the removal of topsoil within areas of the Proposed Development to contain archaeological features identified during the pre-development testing would profoundly reduce the negative impact of the Construction Stage on previously unknown archaeological features.

Archaeological excavation of previously unknown archaeological features within the Proposed Development would allow for the very significant positive permanent effect of preservation by record.

### **Operational Stage**

It is envisaged that the Operational Stage would have a long-term neutral effect on any unexcavated archaeological features and/or deposits that may potentially be preserved in situ within the green areas of the Proposed Development and so further ameliorative, remedial or reductive measures will not be necessary.

### **Cumulative**

#### Construction Stage

The pre-development geophysical survey and test trenching allowed for the identification of previously unknown significant archaeological features, including a large central enclosure with an inner burial enclosure. As a result, the development was re-designed to allow for the best practice reductive measure of preservation in situ for the central enclosure and inner burial enclosure. This was a very significant long-term positive effect.

Excavation, or preservation by record, of substantial archaeological features external to the central enclosure had a permanent very significant positive effect on knowledge of metal-working and cereal-producing multi-phase sites associated with enclosures and burial grounds.

The Cumulative Development had zero impact on the archaeological resource of the wider Dunshaughlin area and so mitigation measures were not necessary.

#### Operational Stage

The Operational Stage of the Cumulative Development has a long-term very significant positive effect on the continuing *in situ* survival of the large central enclosure and the associated inner burial enclosure.

It has no impact on the archaeological features that were fully excavated as part of the Cumulative Development.

The Operational Stage has zero effect on the archaeology of the wider Dunshaughlin area and no mitigation measures are necessary.

Receiving environment	Impact without measures	Impact with measures
RMP	None	None
Known archaeology	Profound, negative	Very significant, positive
Potential archaeology	Profound, negative	Very significant, positive

**Table 17.6:** Summary of Impact and Ameliorative Measures.

#### 20.2.14 Cultural Heritage (Architectural Heritage) (Chapter 18)

There is no direct impact on the surrounding built heritage. Indirect impacts are anticipated to be imperceptible. As such, ameliorative, remedial or reductive measures are not proposed.

#### 20.2.15 Risk Management (Major Accidents & Disasters) (Chapter 19)

##### Construction Phase

The mitigation measures relevant to each environmental factor outlined in Chapters 5 – 18 of the EIAR, as well as in the CMP, will be implemented during the construction phase of the development and will collectively mitigate the risk of major accidents and disasters during this time.

The construction phase of the proposed development will be carried out in accordance with best practice site management measures relating to health and safety and emergency response. These measures are described in the CMP.

##### Operational Stage

No mitigation or monitoring measures are proposed specific to reducing the risk of major accident / disaster during operation.

