

## Chapter 14:

# Summary of EIAR Mitigation and Monitoring Measures

## 14.0 SUMMARY OF EIAR MITIGATION & MONITORING MEASURES

### 14.1 INTRODUCTION

The central purpose of EIA is to identify potentially significant adverse impacts at the pre-consent stage and to propose measures to mitigate or ameliorate such impacts. This chapter of the EIAR document has been prepared by **John Spain Associates** and sets out a summary, for ease of reference, of the range of methods described within the individual chapters of this EIAR document which are proposed as mitigation and for monitoring during the construction and operational phases of the proposed development. It is intended that this chapter of the EIAR document will provide a useful and convenient summary to the competent/consent authority of the range of mitigation and monitoring measures proposed.

EIA related conditions are normally imposed by the competent/consent authority as part of conditions of planning consent and form a key part of the Impact Anticipation and Avoidance strategy. Conditions are principally used to ensure that undertakings to mitigate are secured by explicitly stating the location, quality, character, duration and timing of the measures to be implemented. A secondary role of EIA related conditions is to ensure that resources e.g. bonds / insurances will be available and properly directed for mitigation, monitoring or remedial action, in the event that the impacts exceed the predicted levels.

Monitoring of the effectiveness of mitigation measures put forward in the EIAR document, both by the competent authorities and the developer, is also an integral part of the process. Monitoring of environmental media and indicators arise either from undertakings or from conditions.

In the case of mitigation and monitoring measures it is important for all parties to be aware of the administrative, technical, legal and financial burdens that can accompany the measures proposed. It is also important to ensure that, where monitoring is provided for, it is clearly related to thresholds, which if exceeded cause a clearly defined set of actions to be implemented.

The 2018 EIA Guidelines published by the Department of Housing, Planning and Local Government state:

“While not a mandatory requirement an EIAR can very usefully include a summary table of features and/or measures envisaged to avoid, prevent or reduce and, if possible, offset likely significant adverse effects of the proposed development, and a timescale for the implementation of proposed mitigation measures.”

Given the complexity of the scheme in question, and the detail provided within this EIAR, this chapter seeks to provide a complete overview of mitigation and monitoring measures proposed, in the spirit of the above statement within the EIA Guidelines albeit not formatted as a table.

### 14.2 MITIGATION STRATEGIES

#### 14.2.1 Introduction

There are three established strategies for impact mitigation - avoidance, reduction and remedy. The efficacy of each is directly dependent on the stage in the design process at which environmental considerations are taken into account (i.e. impact avoidance can only be considered at the earliest stage, while remedy may be the only option available to fully designed projects).

### **14.2.2 Mitigation by Avoidance**

Avoidance is generally the fastest, cheapest and most effective form of impact mitigation. Environmental effects and consideration of alternatives have been taken into account at the earliest stage in the project design processes. The consideration of alternatives with respect to the development of the subject lands has been described in Chapter 2.

### **14.2.3 Mitigation by Reduction**

This is a common strategy for dealing with effects which cannot be avoided. It concentrates on the emissions and effects and seeks to limit the exposure of the receptor. It is generally regarded as the "*end of pipe*" approach because it does not seek to affect the source of the problems (as do avoidance strategies above). As such this is regarded as a less sustainable, though still effective, approach.

### **14.2.4 Reducing the Effect**

This strategy seeks to intercept emissions, effects and wastes before they enter the environment. It monitors and controls them so that acceptable standards are not exceeded. Examples include wastewater treatment, filtration of air emissions and noise attenuation measures.

### **14.2.5 Reducing Exposure to the Impact**

This strategy is used for impacts which occur over an extensive and undefined area. Such impacts may include noise, visual impacts or exposure to hazard. The mitigation is effected by installing barriers between the location(s) of likely receptors and source of the impact (e.g. sound barriers, tree screens or security fences).

### **14.2.6 Mitigation by Remedy**

This is a strategy used for dealing with residual impacts which cannot be prevented from entering the environment and causing adverse effects. Remedy serves to improve adverse conditions which exist by carrying out further works which seek to restore the environment to an approximation of its previous condition or a new equilibrium.

## **14.3 MITIGATION AND MONITORING MEASURES**

The following provides a list, for ease of reference, of the mitigation and monitoring measures recommended in each chapter of the EIAR.

### **14.3.1 Project Description & Alternatives Examined**

#### **Construction Phase**

**PD&AE CONST 1:** It will be necessary for the appointed contractor to prepare and implement a construction management plan (including traffic management) to reduce the impacts of the construction phase on local residents and ensure the local road network is not adversely affected during the course of the construction project.

**PD&AE CONST 2:** The appointed contractor should prepare a Construction and Operational Waste Management Plan for the proposed development as part of their contractual responsibilities. The Waste Management Plan

should meet the requirements of the Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects.

### **Operational Phase**

Not applicable.

Monitoring

Not applicable.

### **14.3.2 Population and Human Health**

#### **Construction Phase**

**POP & HH CONST 1:** In order to protect the amenities enjoyed by nearby residents, premises and employees a Construction and Environmental Management Plan (including traffic management) should be prepared by the contractor and implemented during the construction phase.

#### **Operational Phase**

Not applicable.

Monitoring

In relation to the impact of the development on population and human health it is considered that the monitoring measures outlined in regards to the other environmental topics such as water, air quality and climate and noise etc. sufficiently address monitoring requirements.

### **14.3.3 Archaeology and Cultural Heritage**

#### **Construction Phase**

**ARCH CONST1:** It is recommended that archaeological monitoring, under licence, should be undertaken during topsoil removal for the construction works of the access road, under Planning ref. Meath Co. Co. LB180620. This is currently being undertaken under licence number 18E0089ext.

**ARCH CONST 2:** A conservation strategy for the enclosure, ME021-011002-, and burials, ME021-011001 has been submitted to the Licensing Section and the Developments Applications Unit (DAU) of DCHG. This entails the establishment of a fenced exclusion zone around the site of the enclosure, ME021-011002-, and burials, ME021-011001 prior to, and continuing through, any construction phase of the development. This area within the exclusion zone will be appropriately landscaped and maintained as green area to preserve the buried archaeological material (see Appendix 1).

**ARCH CONST3:** A *fulacht fia* site (RMP ME021-016) is located at the north-eastern boundary of the development area. It is recommended that this site should be preserved *in-situ* and it is noted that it will be located under green space in the final development plan. An exclusion zone should be established around this site for the duration of construction works. It is further noted that all groundworks for the proposed access road and, in particular, the attenuation area, will be monitored under licence 18E0089ext. Should the *fulacht fia* extend into this area, an appropriate mitigation strategy will be agreed with the Department of Culture, Heritage and the Gaeltacht (DCHG)

in consultation with the National Museum of Ireland (NMI). This may involve either preservation *in situ* or preservation by record, *i.e.* full archaeological excavation.

**ARCH CONST4:** It is recommended that archaeological monitoring, under licence, should be undertaken during topsoil removal for the construction works of the residential area.

**ARCH CONST5:** It is recommended that the school site be further assessed using geophysical survey followed by test trenching under licence, should be undertaken prior to development of the area.

### **Operational Phase**

N/A

### **Monitoring**

All archaeological test-excavations, monitoring and excavations undertaken under licence from the DCHG in consultation with the NMI require the production of a report as per the licence conditions. These will be published after an appropriate period allowed to complete, amongst others, all the necessary specialist reports used to compile a full archaeological report. The production of a full archaeological report and deposition of copies to the DCHG and NMI ensures compliance with the licence condition as well as the mitigation measure of preservation by record.

### **14.3.4 Biodiversity**

#### **Construction Phase**

**BIOCONST1:** Mortality to animals during construction – mitigation by avoidance.

1a. The removal of hedgerow, treeline should not take place from March to August inclusive as per the Wildlife Act.

1b. The following mitigation is taken directly from the bat survey report:

*“All the mature trees within the site shall be examined for the presence of bats by a bat specialist prior to felling. Should bats be noted in any tree, it is a protected structure and a derogation must be sought as discussed above. A bat detector survey within the appropriate season and weather conditions would allow the ruling out of several trees at one time. Alternatively, trees may be surveyed by a bat specialist from height (hoist, tree climbing etc.)”*

**BIOCONST2:** Pollution during construction – mitigation by reduction

Best practice site management will be employed during works at all times. These should conform to guidance from Inland Fisheries Ireland (2016) and will be presented in a Pollution Prevention Plan. It will be the responsibility of the site manager to ensure that pollution does not occur. Fuels, oils and other dangerous substances should be stored in a bunded area. Sediment-laden water will not be discharged to water courses or surface ditches. Given the context of the site rainwater is likely to percolate to ground. However, there may be times when heavy rainfall exceeds the soil's absorption capacity. In this event, run-off will be directed to suitably-sized silt traps or attenuation ponds. Only clean, silt-free water will be discharged to ditches etc. Pollution prevention measures will be inspected at appropriate intervals and a record of these inspections will be maintained by the site manager.

**BIOCONST3:** Impacts to Badgers. The works will require a licence from the NPWS to disturb the Badger sett. The application for this licence has been made and the protective measures which will be adhered to during construction works. This will include protective fencing around the sett entrance to prevent encroachment of machinery. There will be no direct disturbance of the badger sett. Where excavation of soil will take place within 50m of the sett it will be done only under the supervision of a suitably qualified ecologist.

**BIOCONST4:** Damage to trees to be retained

Protective fencing will be erected in advance of any construction works commencing outside the drip-line of the canopy of retained trees within and along the site boundaries in order to prevent damage by machinery, compaction of soil, etc. in accordance with BS 5837:2012. This will be signed off on by a qualified arborist or ecologist to ensure it has been erected properly before any machinery is allowed on site. No ground clearance, earth moving, stock-piling or machinery movement will occur within these protected areas.

### **Operational Phase**

#### **BIOOPER1: Artificial lighting**

The following measures are taken from the bat report:

Lighting should be controlled to avoid light pollution of green areas and should be targeted to areas of human activity and for priority security areas. Motion-activated sensor lighting is preferable to reduce light pollution.

- None of the remaining mature trees or trees proposed for planting shall be illuminated.
- Dark corridor for movement of bats along the grounds of the site. Lighting should be directed downwards away from the treetops.
- All luminaires shall lack UV elements when manufactured and shall be LED
- A warm white spectrum (ideally <2700Kelvin but as low as the Council limitations allow) shall be adopted to reduce blue light component
- Luminaires shall feature peak wavelengths higher than 550nm
- Tree crowns shall remain unilluminated
- Planting shall provide areas of darkness suitable for bats to feed and commute through the site.

### **Monitoring**

There are no anticipated significant impacts associated with the construction phase of the proposed development, following the implementation of the recommended mitigation measures outlined in Section 4.7.1, which are considered sufficient in reducing the potential for adverse impacts. Monitoring is required where the success of mitigation measures is uncertain or where residual impacts may in themselves be significant.

#### **Construction phase**

Monitoring during the construction phase should be carried out to ensure that measures to prevent pollution prevention and protect the root zones of trees are fully implemented.

#### **Operation phase**

There are no anticipated significant impacts associated with the operation of the proposed development. Mitigation measures, where recommended in Section 4.8, are considered sufficient in reducing the potential for adverse impacts. Therefore, monitoring is not required as part of the development during the operational phase. No monitoring is required during the operation phase.

### **14.3.5 Landscape and Visual Impact**

#### ***Construction Phase***

**L&V CONST 1:** Existing vegetation was considered from the outset of the design process in order to minimise the impact of the development, particularly on existing trees. Site engineering, drainage, ducts and other infrastructure has been designed to minimise impact. Replacement planting is proposed as part of the landscape plans issued by Dermot Foley Landscape Architects and included separately as part of this planning submission. The following mitigation measures are proposed:

- To protect trees to be retained, fell adjacent trees to be removed and grind out stumps in accordance with BS5837:2012;

- Implement tree protection measures for trees to be retained in accordance with BS5837:2012 before any demolition or construction works proceed;
- Where required strip and store topsoil in accordance with BS4428:1989 and BS3882:2007;
- Install proposed replacement and additional proposed planting and seeded areas in accordance with the Typical Soft Landscape Details issued by Dermot Foley Landscape Architects and included separately as part of this planning submission.

**L&V CONST 2:** The following mitigation measures are proposed:

- Maintain the character of the site by installing proposed planting in accordance with the proposed landscape plans by Dermot Foley Landscape Architects, included separately as part of this planning submission.

**L&V CONST 3:** Substantial tree planting is proposed, as illustrated in the proposed landscape plans issued by Dermot Foley Landscape Architects included separately as part of this planning submission.

The following mitigation measures are proposed:

- Maintain restricted views of the site by installing proposed planting in accordance with the proposed landscape plans;

### ***Operational Phases***

**L&V OPER1:** The following mitigation measures are proposed:

- Maintain all vegetation in accordance with the Design Rationale by Dermot Foley Landscape Architects, included separately as part of this planning submission.
- Install replacement planting for any plants that fail during the 18-month maintenance and defects liability period;
- Site to be monitored regularly for signs of invasive species

**L&V OPER2:** The following mitigation measures are proposed:

- Maintain and manage proposed specimen tree planting to ensure that it matures to match existing trees on site.
- Site to be monitored regularly for signs of invasive species.

**L&V OPER3:** The following mitigation measures are proposed:

- Maintain all existing retained and proposed vegetation to ensure that restricted views are retained into the sit;
- Maintain and manage proposed specimen tree planting to ensure that it matures to match existing trees on site.

### ***Monitoring***

N/A

### **14.3.6 Land and Soils**

#### **Construction Phase**

##### **L&S CONST1: CONSTRUCTION MITIGATION**

- Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development.
- At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas.
- Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains.
- Topsoil stockpiles will also be located on site so as not to necessitate double handling.
- Topsoil will be re-used where possible in proposed development in gardens and open space areas.
- The design of road levels and finished floor levels has been carried out to minimize cut/fill type earthworks operations.
- Disturbed subsoil layers will be stabilized as soon as practicable. Therefore, backfilling of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping, will all be carried out promptly to minimise the duration that subsoil layers are exposed to the effects of weather.
- Stockpiles of excavated subsoil material will be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles.
- Measures will be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection and earth bunding adjacent to open drainage ditches).
- Where feasible, excavated material will be reused as part of the site development works (e.g. for landscaping works and for backfill in trenches under non trafficked areas).
- Earthworks plant and vehicles delivering construction materials to site will be confined to predetermined haul routes around the site.
- Vehicle wheel wash facilities will be installed in the vicinity of any site entrances and road sweeping implemented as necessary in order to maintain the road network in the immediate vicinity of the site.
- Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods.
- All oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand area.
- Refuelling and servicing of construction machinery will take place in a designated hardstanding area, remote from surface water inlets (when it is not possible to carry out such activities off-site).
- It is likely that bedrock will be exposed during construction works. Deep drainage works will be avoided where possible to reduce the possibility of impacting on bedrock. Should bedrock be encountered, the extent of exposed bedrock will be limited to the immediate vicinity of active work areas. Where bedrock is encountered it will be crushed, screened and tested for use within the designed works to reduce the volume of material required to leave site. This will also reduce the volume of material to be imported to the site.

#### **Operational**

##### **L&S OPER1:**

The only mitigating measures envisaged during the operational phase are to ensure regular maintenance of SUDS features and landscaped open space.

Ensuring appropriately designed, constructed and maintained site services will protect the soils and geology from future contamination arising from operation of the development.

## **Monitoring**

### **Construction**

Proposed monitoring during the construction phase in relation to the soil and geological environment are as follows:

- Adherence to the “*Construction Management Plan (CMP)*”. The developer will be responsible for ensuring adherence with the “*Construction Management Plan*”. If construction works are not in accordance with the plan, then the developer will ensure that this is remedied.
- Construction monitoring of the works (e.g. inspection of existing ground conditions on completion of cut to road sub-formation level in advance of placing capping material, stability of excavations etc.).
- Inspection of fuel / oil storage areas. If these are found to be sub-standard then the developer will ensure that they are made fit for purpose.
- Monitoring cleanliness of adjacent road network, implementation of dust suppression and provision of vehicle wheel wash facilities. If these measures are found to be inadequate and the adjacent road network is negatively impacted, the developer will ensure that this is remedied and will ensure that dust suppression measures are implemented more regularly and all vehicles exiting the site use vehicle wheel wash facilities provided.
- Monitoring of contractor’s stockpile management (e.g. protection of excavated material to be reused as fill; protection of soils from contamination for removal from site).
- Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.). The developer is responsible for ensuring that these measures are fit for purpose and operating correctly.
- Soil removed during the construction phase will be monitored to maximise potential for re-use on site.
- The quantities of topsoil, subsoil and rock removed off site will be recorded.

### **Operation**

Monitoring of the “taken in charge”, public open space areas by the Parks Department of Meath County Council will be on-going. They will ensure that the detention basins and other SuDS features such as swales are adequately maintained. If they are found to be not adequately maintained, then they will be responsible for increasing the maintenance schedule.

## **14.3.7 Water**

### **Construction Phase**

#### **W CONST1:**

To minimise the impact of the construction phase on the water environment, the following mitigation measures should be implemented.

- Implement best practice construction methods and practices complying with relevant legislation to avoid or reduce the risk of contamination of watercourses or groundwater.
- A Site-Specific “Construction and Environment 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 and Environment 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.
- Weather conditions and seasonal weather variations will also be taken account of when planning stripping of topsoil and excavations, with an objective of minimizing soil erosion.
- The extent of sub-soil and topsoil stripping to be minimised to reduce the rate and volume of the run-off during construction until the topsoil and vegetation are replaced.

- Concrete batching will take place off site or in a designated area with an impermeable surface.
- Concrete wash down and wash out of concrete trucks will take place off site or in an appropriate facility.
- Discharge from any vehicle wheel wash areas is to be directed to on-site settlement ponds.
- Oil and fuel stored on site for construction should be stored in designated areas. These areas shall be bunded and should be located away from surface water drainage and features.
- Refuelling of construction machinery shall be undertaken in designated areas away from surface water drainage in order to minimise potential contamination of the water environment. Spill kits shall be kept in these areas in the event of spillages.
- Hazardous construction materials shall be stored appropriately to prevent contamination of watercourses or groundwater.
- Spill kits should be kept in designated areas for re-fuelling of construction machinery.
- Dewatering measures should only be employed where necessary.
- Hydrobrake flow controls and petrol interceptors should be constructed on each surface water outfall before the outfalls are made operational.

### **Operational**

#### **W OPER1:**

- The design of proposed site levels (roads, FFL etc.) has been carried out to replicate existing surface contours, break lines etc. where possible and therefore not concentrating additional surface water flow in a particular location.
- Surface water runoff from the site will be attenuated to the greenfield runoff rate as recommended in the Greater Dublin Strategic Drainage Study (GDSDS). Surface water discharge rates will be controlled by a Hydrobrake flow control device, with attenuation tanks and detention basins provided to store runoff from a 1 in 100-year return period event (1%AEP). SUDs features are implemented in the surface water drainage network to reduce the rate of runoff from hard standing areas and to improve the quality of surface water runoff. For detailed information refer to the “Infrastructure Design Report” prepared by DBFL.
- Surface water runoff from the development to be collected by an appropriately designed system with contaminants removed prior to discharge i.e. petrol interceptor.
- A regular maintenance and inspection programme of the flow control devices, attenuation storage facilities, gullies and petrol interceptor will be required during the Operational Phase to ensure the proper working of the development’s networks and discharges.
- Waste generated by the everyday operation of the development should be securely stored within designated collection areas with positive drainage collection systems to collect potential runoff. Operational waste should be removed from site using licenced waste management contractors.
- Water conservation methods to be implemented such as the use of low flush toilets.

### **Monitoring**

#### **Construction**

Proposed monitoring during the construction phase in relation to the water and hydrogeological environment are as follows:

- Adherence to ‘Construction Management Plan’. If construction works are found to be not in accordance with the aforementioned plan, then the developer will ensure that measures are put in place to ensure compliance.
- Monitoring cleanliness of adjacent road network, implementation of dust suppression and vehicle wheel wash facilities. If these measures are found to be inadequate or inadequately implemented, then the developer will ensure that measures are put in place to remedy this.
- Monitoring of run-off from the site including pumping / dewatering. If these measures are found to be

inadequate or inadequately implemented, then the developer will ensure that measures are put in place to remedy this.

- Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.) If these measures are found to be inadequate or inadequately implemented, then the developer will ensure that measures are put in place to remedy this.
- Monitoring of discharge from sediment retention ponds (e.g. pH, sediment content). If these measures are found to be inadequate or inadequately implemented, then the developer will ensure that measures are put in place to remedy this.
- A dust management programme should be implemented during the construction phase of the development. If these measures are found to be inadequate or inadequately implemented, then the developer will ensure that measures are put in place to remedy this.

### Operation

Proposed monitoring during the operational phase in relation to the water and hydrogeological environment are as follows:

- The taking in charge of the water infrastructure will ensure the system is regularly inspected and maintained. If specific maintenance is required on the water network, then the Local Authority will be responsible for ensuring that these maintenance measures are implemented.
- The performance of all SuDS features will be monitored by the relevant authorities during the life of the development. If specific maintenance is required for SuDS features, then the Local Authority will be responsible for ensuring that these maintenance measures are implemented.
- Monitoring of the installed 'Hydrobrake' (flow control) and gullies will be required to prevent contamination and increased runoff from the site. If specific maintenance is required on the surface water 'Hydrobreak' and on gullies, then the Local Authority will be responsible for ensuring that these maintenance measures are implemented.
- Although no specific monitoring will be required as part of the proposed development, it is envisaged that EPA Monitoring will continue in the area through the life of the development.

### **14.3.8 Air Quality & Climate**

#### **Construction Phase**

**AIRCONST1:** 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.

- 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.
- Furthermore, 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.
- AIRCONST2: Construction 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

The results of the air dispersion modelling study indicate that 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.

### Monitoring

#### Construction Phase

Monitoring of construction dust deposition at nearby sensitive receptors during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2m above ground level. The TA Luft limit value is 350 mg/(m<sup>2</sup>\*day) during the monitoring period between 28 - 32 days.

#### Operational Stage

There is no monitoring recommended for the operational phase of the development as impacts to air quality and climate are predicted to be imperceptible.

### **14.3.9 Noise & Vibration**

#### **Construction Phase**

- **N&V CONST1:** The assessment has found that predicted levels of construction noise at the nearest noise sensitive locations are likely to be above the proposed threshold values, mitigation measures are recommended to minimise or reduce any potential impacts.
- Reference will be made to BS5228: 2009 + A1 2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites - Part 1 Noise for appropriate mitigation measures, which offers detailed guidance on the control of noise and vibration from construction activities. Various mitigation measures will be considered and applied during the construction of the proposed development to ensure noise and vibration limit values are complied with:
  - Limiting the hours during which site activities likely to create high levels of noise are permitted;
  - Establishing channels of communication between the contractor/developer, Local Authority and residents;

- Appointing a site representative responsible for matters relating to noise and vibration;
- Monitoring levels of noise during critical periods and at sensitive locations;
- All site access roads will be kept even to mitigate the potential for noise and vibration from lorries.
- Furthermore, a practicable noise control measures will be employed where necessary. These will include:
- Selection of plant with low inherent potential for generation of noise and/ or vibration;
- Erection of barriers as necessary around items such as generators or high duty compressors;
- Siting of noisy plant as far away from sensitive properties as permitted by site constraints and the use of vibration isolated support structures where necessary.
- Erection of construction site hoarding along noise sensitive boundaries where works are taking place in proximity to existing residential properties where no substantial screening exists.

### **Operational**

#### **N&V OPER1: Additional Vehicular Traffic on Public Roads**

- During the operational phase of the development, noise mitigation measures with respect to the outward impact of traffic from the development are not deemed necessary. Furthermore, the site design includes a cycling and pedestrian infrastructure and a pedestrian bridge over the railway line.

#### **N&V OPER2: Building Services Plant**

- With consideration at the at the detailed design stage the selection and location of plant items will ensure that noise emissions to sensitive receivers both external and within the development itself will be within the relevant criteria, therefore no further mitigation required.
- Considering that sensitive receivers within the development are closer than off-site sensitive receivers, once the relevant noise criteria is achieved within the development it is expected that there will be no negative impact at sensitive receivers off site.

### **Monitoring**

During the construction phase, noise and vibration monitoring shall be carried out by the contractor to ensure that the recommended threshold levels set out in the EIAR Chapter or any conditioned noise and vibration limits are not exceeded.

#### **14.3.10 Material Assets**

##### **Construction Phase**

**MA CONST1:** Mitigation measures proposed in relation to material assets include the following:

- A detailed “Construction Management Plan” will be prepared by the Contractor and implemented during the construction phase. Site inductions will include reference to the procedures and best practice as outlined in the “Construction Management Plan”.
- In order to reduce the risk of defective or leaking sewers, all new sewers should be laid in accordance with the relevant 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.
- 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 network will be coordinated with the relevant utility provider and carried out by approved contractors.
- All works in the vicinity of the existing gas main and in particular within the wayleave area will be agreed and co-ordinated with Gas Networks Ireland (GNI) prior to commencement.

### **Operational Phase**

**MA OPER1:** Please refer to Chapter 8.0 Water 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.
- Chapter 8.0 includes the mitigation measures associated with the surface water system for the development.
- It is envisaged that the development would take place and be occupied over a reasonable time period, and therefore the downstream foul sewerage system (foul sewer network and wastewater treatment facility) would be gradually loaded.
- Similarly, water conservation methods would reduce the loading on the foul sewer network and the treatment works at Drogheda WWTP.
- Regular maintenance of the drainage network including the petrol interceptor, flow control and surface water storage system would ensure that they are operating correctly.
- On completion of the construction phase no further mitigation measures are proposed in relation to the electrical and gas infrastructure.

### **Monitoring**

#### **Construction**

Please refer to Chapter 8.0 – Water for the proposed monitoring in relation to the surface water. There is no specific monitoring is proposed in relation to the remaining material assets infrastructure.

- All drainage works will be approved by Meath County Council and will be carried out in accordance with the GDR COP (Greater Dublin Regional Code of Practice for Drainage Works).
- All foul and surface water sewers will be CCTV surveyed prior to being 'taken in charge' by Meath County Council.
- Watermains, foul sewers and surface water sewers will be pressure tested prior to connection to the public system.

#### **Operation**

Proposed monitoring during the operational phase in relation to the water infrastructure are as follows:

- The surface water and foul drainage systems will be monitored by way of observation of hydraulic issues with the system and the establishment of a proper maintenance programme for all sewers / Suds features etc.
- Regular cleaning of pipe networks within the development taken in charge will ensure no blockage will obstruct any flow from surface and foul networks.
- On-going water usage within the proposed development will be monitored by bulk water meters. Water usage will be monitored by the relevant authority to avoid waste and leaks etc.

### **14.3.11 Transporation**

#### **Construction Phase**

**TRANS CONST1:** All construction related parking will be provided on site. Construction traffic will consist of the following two principal categories:

- Private vehicles owned and driven by site construction staff and by full time supervisory staff;
- Excavation plant and dumper trucks involved in site development works and material delivery vehicles for the following: granular fill materials, concrete pipes, manholes, reinforcement steel, ready mix concrete and mortar, concrete blocks, miscellaneous building materials, etc.

It is anticipated that the generation of HGV's during the construction period will be evenly spread throughout the day and as such will not impact significantly during the peak traffic periods.

### **Operational Phase**

**TRANS OPER1:** A number of walking and cycling connection points are proposed within the development. These connection points will provide access for pedestrians and cyclists onto the approved Link Road, further leading onto Colpe Road as well as R132 Dublin Road, via a proposed pedestrian/bridge over the Dublin-Belfast Railway Line leading towards Drogheda Town Centre. These facilities will provide attractive, convenient and safe routes for residents. Therefore, there are good links proposed for residents to travel by more sustainable modes.

**TRANS OPER2:** A Mobility Management Plan (MMP) will be prepared for residents within the apartment units in order to guide the delivery and management of coordinated initiatives post construction. The MMP ultimately seeks to encourage sustainable travel practices for all journeys to and from the proposed development.

### **Monitoring**

During the construction stage the following monitoring exercises are likely to be required. The specific compliance exercises to be undertaken in regard to the range of measures detailed in the final construction management plan will be agreed with the planning authority.

- compliance with construction vehicle routing practices,
- compliance with construction vehicle parking practices,
- Internal and external road conditions and
- Timings of construction activities.