

16. SUMMARY OF MITIGATION MEASURES

16.1 Introduction

This Chapter of the EIAR collates and summarise the mitigation measures recommended for each of the environmental topics examined in Chapters 5 – 14 of this EIAR.

These mitigation measures and any associated monitoring comprise implementation measures during the Construction and Operational phases of the proposed development to reduce the potential for significant adverse impacts occurring on the receiving environment as a result of the proposed development.

This Chapter does not expand on the reasoning or expected effectiveness of the proposed mitigation or monitoring measures. Such justification and descriptions can be found in the individual chapters of the EIAR relating to each of the specific environmental topics listed under separate heading below.

It is anticipated that a number of the proposed mitigation measures could be conditioned by way of individual / specific condition(s) or by way of an all-encompassing condition of any grant of permission by An Bord Pleanála requiring all mitigation measures to be observed / implemented / complied with.

16.2 Proposed Mitigation Measures

For ease of reference and clarity, all mitigation measures contained in this EIAR have been compiled below. All measures included below form part of the proposed development and will be implemented in full.

16.2.1 Population and Human Health

Mitigation Measure
Construction Phase
Advance notice will be given to the residents of Crodaun Forest Park estate before construction starts and in advance of any major planned disruptions.
A detailed Construction Management Plan will be prepared by the appointed Contractor to minimise impacts on adjacent residents.
Construction traffic will be managed to mitigate against potential traffic delays and to facilitate the existing pattern of vehicular movement.
The mitigation measures in relation to construction, traffic, noise, air quality and landscaping as set out in this EIAR will be carried out in full to minimise impacts on adjacent residents and the population of Celbridge as a whole.
Operational Phase
No mitigation measures are required in addition to, or beyond the scope of those measures identified in Chapters 7, 8, 9, 10, 11, 12 and 14 of this EIAR. Please refer to Sections 16.2.3 – 16.2.10 for a summary of mitigation measures proposed.

16.2.2 Biodiversity

Mitigation Measure
Construction Phase
<p>To offset the loss of higher significance hedgerow and treelines it is proposed to create new, biodiversity planting within areas of public open space and along both margins of the R405 and R449 roads. A total of 2,030m of new mixed-species hedgerow will be planted on peripheral and common areas of open space within the development. Peripheral hedgerows come to a length of 870m in total and comprise of native species, eight species of which are listed in the proposed planting schedule accompanying the submitted Landscape Masterplan. Soil from the existing hedgerows will be stockpiled and used in these new areas to retain a seed bank for other species. These new hedgerows will retain connectivity through the site for biodiversity, as well as joining up with other hedgerows and green spaces beyond the development site boundary. In addition, six bat boxes will be erected at appropriate locations throughout the site to provide artificial nesting sites for these mammals.</p>
<p>The removal of hedgerows should not take place from March to August inclusive as per the Wildlife Act. If this is unavoidable then vegetation subject to removal will first be inspected for signs of breeding birds. It is an offence to destroy or interfere with a bird’s nest or eggs (regardless of the time of year). If no nesting is occurring, then vegetation can be removed within 48 hours. It is recommended that hedgerows are not to be removed during the period March to August and that in all instances hedgerows and trees be surveyed and inspected for nesting breeding birds prior to removal. If nesting is found, then vegetation can only be destroyed under licence from the NPWS.</p>
<p>A dedicated bat survey will be carried out by a suitably qualified bat ecologist prior to the commencement of development and during the appropriate season. This should determine if bats are roosting in any of the features on the site and if the development of this project requires a derogation licence from the NPWS.</p>
<p>Although significant effects to freshwater courses are not predicted it is nevertheless appropriate that best site management practices should be in place to minimise pollution to the greatest degree feasible. As such, guidelines from Inland Fisheries Ireland (IFI, 2016) will be followed. This includes designating storage areas for dangerous substances (oils, fuels etc.) and ensuring that only silt-free run-off enters water courses. To this end, appropriately sized silt traps will be employed. These measures will be included in the detailed Construction Management Plan that will be prepared and submitted to the Planning Authority prior to commencement of development with input from the appointed main contractor.</p>
Operational Phase
<p>The lighting plan has been reviewed and no lighting is directed towards external boundary hedgerows. Lighting is to be limited by the use of directional cowels while LED bulbs are to be used through (these have lower impact on bats than traditional mercury-halide lamps).</p>

16.2.3 Land, Soil and Geology

Mitigation Measure
Construction Phase
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 be located so as not to necessitate double handling.
Surface water runoff from areas stripped of topsoil 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.
On-site settlement ponds will include geotextile liners and rapped inlets and outlets to prevent scour and erosion.
Excavation of existing subsoil layers has been minimised. Cut type earthworks operations will not be required to achieve designed site levels.
Disturbed subsoil layers will be stabilised as soon as practicable (e.g. backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping). The duration that subsoil layers are exposed is to be minimised in order to mitigate against weather effects.
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).
No large or long-term stockpiles of fill material will be held on the site. At any time, the extent of fill material held on site will be limited to that needed in the immediate vicinity of the active work area.
Smaller stockpiles of fill, where required, will be suitably protected to ensure no sediment laden runoff enters existing surface water drains. Such stockpiles are to be located in order to avoid double handling.
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.

In order to mitigate against spillages contaminating underlying soils, 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 hardstand area which is also remote from any surface water inlets (when not possible to carry out such activities off site).

Oil, fuel etc. storage areas will be decommissioned on completion of the construction phase. Any remaining liquids will be removed from site and disposed of at an appropriate licenced facility.

Operational Phase

On completion of the construction phase no further mitigation measures are proposed as there will be no further impact on soils and the geological environment.

16.2.4 Water: Hydrogeology and Hydrology

Mitigation Measure

Construction Phase

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 typical seasonal weather variations will be taken account of when planning stripping of topsoil and excavations with an objective of minimising soil erosion.

In order to mitigate against spillages contaminating the surrounding surface water and hydrogeological environments, all oils, fuels, paints and other chemicals should be stored in a secure bunded hardstand area. Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets (where not possible to carry out such activities off site).

Concrete batching will take place off site and wash down and wash out of concrete trucks will take place off site (at authorised concrete batching plant in full compliance with relevant planning and environmental consents).

Discharge from any vehicle wheel wash areas will be directed to on-site settlement ponds.

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 tankered 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 will be protected from contamination by any construction activities or materials.

Operational Phase

The design of proposed site levels (roads, FFL etc.) has been carried out to ensure the proposed development is elevated and set in such a way as to avoid concentrating additional surface water flow in a particular location.

Surface water runoff from the site will be attenuated to the greenfield runoff rate as outlined in the Greater Dublin Strategic Drainage Study (GDSDS). Surface water discharge rates will be controlled by a Hydrobrake type vortex control device in conjunction with below ground attenuation storage.

The following methodologies will be implemented as part of a SuDS surface water treatment train approach:

- Permeable paving in driveway areas
- Surface water runoff from roofs will be routed to the proposed surface water pipe network via the porous aggregates beneath permeable paved driveways
- Attenuation of the 30 and 100 year return period storms
- Installation of a Hydrobrake (limiting surface water discharge from the site to 2 l/sec/ha)
- Surface water discharge will also pass via a fuel / oil separator (sized in accordance with permitted discharge from the site)

A contract will be entered into with a suitably qualified contractor from maintenance of the attenuation system, Hydrobrake and full retention fuel / oil separator.

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

Water conservation measures such as dual flush water cisterns and low flow taps will be included in the design.

The potential impact of climate change has been allowed for as follows;

- Pluvial flood risk - attenuation storage design allows for a 20% increase in rainfall intensities, as directed by Kildare County Council's Water Services Engineer.
- Pluvial flood risk - drainage system design allows for a 20% increase in flows, as recommended by the GDSDS.

- Provision of min. freeboard (500mm) from 1% AEP as required by GDSDS (mitigation against impact of climate change).

16.2.5 Air, Dust & Climatic Factors

Mitigation Measure
Construction Phase
<p>A Dust Management Plan will be formulated for the construction phase of the project, as construction activities are likely to generate some dust emissions. The principal objective of the Plan is to ensure that dust emissions do not cause significant nuisance at receptors in the vicinity of the site. The most important features of the Dust Management Plan are summarised as follows:</p> <ul style="list-style-type: none"> • A designated Site Agent will be assigned overall responsibility for Dust Management; • The design of the site and Construction programme considers dust impact management and chooses design approaches to minimise dust emissions; • An effective training programme for site personnel will be implemented for the duration of the Construction Programme; • A strategy for ensuring effective communication with the local community will be developed and implemented; • A programme of dust minimisation and control measures will be implemented and regularly reviewed; • A monitoring programme will be implemented.
<p>The design of the construction programme and the location and layout of the construction compound and the storage of materials will be carefully planned to ensure that air quality impacts are minimised.</p>
<p>Activities with potential for significant emissions will, wherever possible, be located at a position as far as possible removed from the nearest residential and commercial receptors</p>
<p>The areas on site which vehicles will be travelling on will generally be hard-surfaced or compressed ground thus significantly reducing the potential for dust emissions from the vehicles</p>
<p>The construction compound area will have hard standing areas to minimise windblown dust generation.</p>
<p>In order to minimise the potential for wind-generated emissions from material storage bays, these bays will be oriented away from the dominant wind direction to minimise the effects of wind on release of dust and particulate.</p>
<p>The relatively coarse particle size (10 – 75µm) associated with the activity means that the particles will generally be deposited close to the emission source and will not travel significant distances away from the site.</p>

Fixed and mobile water sprays will be used to control dust emissions from material stockpiles and road and yard surfaces as necessary in dry and/or windy weather.

A daily inspection programme will be formulated and implemented in order to ensure that dust control measures are inspected to verify effective operation and management.

A dust deposition monitoring programme will be implemented at the site boundaries for the duration of the construction phase in order to verify the continued compliance with relevant standards and limits.

Operational Phase

No additional mitigation measures are required as the operational phase of the proposed residential development are predicted to have an imperceptible impact on ambient air quality and climate.

16.2.6 Noise and Vibration

Mitigation Measure

Construction Phase

The guidance on the control of noise and vibration from demolition and construction activities presented in BS 5228 will be followed. These measures include the following:

- Avoid unnecessary revving of engines and switch off equipment when not required;
- Keep internal haul routes well maintained and avoid steep gradients;
- Use rubber linings in chutes and dumpers to reduce impact noise;
- Minimise drop height of materials;
- Start-up plant and vehicles sequentially rather than all together;
- In accordance with best practicable means, plant and activities to be employed on site will be reviewed to ensure that they are the quietest available for the required purpose;
- Where required, improved sound reduction methods, e.g. enclosures should be used;
- Site equipment should be located away from noise sensitive areas, as much as is feasible;
- Regular and effective maintenance by trained personnel should be carried out to reduce noise and/or vibration from plant and machinery;
- Limit noisy construction works to 7am to 7pm weekdays with Saturday working from 9am to 1pm unless otherwise agreed with the local authority. Relatively quiet construction activities could be carried out outside these hours, subject to controls being put in place;
- Maintain ongoing contact with local residents to ensure any complaints relating to construction phase noise for the project from local residents can be addressed. Also, prior to any particularly noisy activities, local residents should be contacted in order to minimise the perceived noise impact;

- Monitoring typical levels of noise and vibration during critical periods and at sensitive locations for comparison with limits and background levels; If there is a requirement to undertake vibration monitoring, the following guidance on vibration monitoring (monitoring of peak particle velocity) should be followed; The instrumentation should monitor three orthogonal components of peak particle velocity (p.p.v) and the trigger values / limits are set based on the maximum of these (the peak component particle velocity) as follows:
 - Warning Level = 7.5 mm/s (Operatives should be notified if this level is reached; work may continue but with caution – review of working method should be considered).
 - Stop Level = 10 mm/s: work should be stopped if this level is reached and working method reviewed; revised method of working to be agreed prior to works proceeding again; Site Foreman & Operatives to be notified immediately.
 - Visible & audible alarms should form part of the monitoring system so that it is easily established when the trigger / alarm levels are reached.

The contractor will erect construction site hoarding along noise sensitive boundaries, particularly where no existing screening such as boundary walls are in place at the nearest NSRs. This will be particularly required along the eastern and southern boundaries of the proposed site.

The site contractor will prepare a Noise and Vibration Management Plan (NVMP) which will deal specifically with onsite activities in a strategic manner to remove or reduce significant noise and vibration impacts associated with the construction works. The NVMP will specify the noise and vibration monitoring and reporting that will be carried out.

The contractor will appoint a community relations officer who will deal on a one-to-one basis with local stakeholders and will notify them before the commencement of any works forecast to generate appreciable levels of noise or vibration, explaining the nature and duration of the works. The community relations officer shall also distribute information circulars informing people of the progress of works and any likely periods of significant noise and vibration.

Operational Phase

There are no adverse noise impacts associated with the operational phase of the development and consequently there are no mitigation measures proposed.

16.2.7 Material Assets: Traffic and Transport

Mitigation Measure

Construction Phase

All construction related parking will be provided on-site.

Provision of a Construction Management Plan, to be agreed with the Local Authority, will include details on the following:

- Prescribed and agreed working hours;

- Agreed haul routes for incoming materials;
- Licensed hauliers to be used;
- Disposal sites;
- Travel arrangements for construction personnel;
- Appropriate on-site parking arrangements for construction personnel to prevent overspill parking on the local road network;
- Temporary construction entrances to be provided (if necessary)
- Wheel wash facilities to be provided;
- Road cleaning and sweeping measures to be put in place if required;
- Temporary construction signage to be put in place and maintained;
- Any proposed traffic management measures such as temporary traffic lights and signage on any public roads

Operational Phase

In order to promote and maximise sustainable transportation modes, cycle parking has been provided at a rate which exceeds Kildare County Development Plan (2017-2023) minimum standards, whilst apartment vehicle parking spaces have been provided at a rate slightly below the Department of Housing, Planning and Local Government's Sustainable Urban Housing: Design Standards for New Apartments Guidelines (0.97/unit). The increase in cycle parking provisions, and simultaneous reduction in vehicle parking provisions for apartment and duplex units aim to increase the number of cycle trips taken and therefore encourage a modal split shift towards cycling for short to medium distance trips.

The proposed pedestrian access points and pedestrian linkages to/from the subject site will encourage and support the uptake walking trips for short to medium distance trips.

16.2.8 Material Assets: Water Supply, Drainage and Utilities

Mitigation Measure

Construction Phase

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.

To mitigate against spillages contaminating the surrounding surface water and hydrogeological environments, 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 hardstand area which is also remote from any surface water inlets (where not possible to carry out such activities off site).

Concrete batching will take place off site and wash down and wash out of concrete trucks will take place off site (at authorised concrete batching plant in full compliance with relevant planning and environmental consents).

Discharge from any vehicle wheel wash areas will be directed to on-site settlement ponds.

To reduce the risk of defective or leaking sewers, all new sewers will be laid in accordance with the relevant standards, pressure tested, and CCTV surveyed to ascertain any possible defects.

Regular maintenance of the drainage network including the petrol interceptor, flow control and surface water storage system will ensure that they are operating correctly.

A contract will be entered into with a suitably qualified contractor from maintenance of the attenuation system, Hydrobrake and full retention fuel / oil separator.

The construction compound will include adequate staff welfare facilities including foul drainage. 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.

Diversion of the existing Foul Sewer traversing the site will be fully coordinated with Irish Water to ensure interruption to the existing foul network is minimised. Foul sewer along the proposed relocated route will be constructed and ready for rerouting in advance of decommissioning and removal of existing foul sewer.

It is envisaged that the development will 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.

The watermains will be tested according to the requirements of Irish Water and Kildare County Council prior to commissioning.

Where possible backup network supply to any services will be provided should the need for relocation or diversion of existing services be required otherwise relocation or diversion works will be planned to incur minimal impact, with users notified in advance of any works.

Contractor will prepare Method Statement detailing proposals for works in the vicinity of existing utilities (method statement to be agreed with PSDP).

Contractor will locate and record all services on site prior to commencement of excavations (including but not limited to a GPR utility survey along the Maynooth Road and slit trench investigation to confirm the location of electrical infrastructure).

Connections to the existing electrical networks will be coordinated with the relevant utility provider and carried out by approved contractors.

Contractor will comply with HSA Code of Practice for Avoiding Danger from Underground Services.

Relocation of existing overhead ESB lines will be fully coordinated with ESB Networks to ensure interruption to the existing electricity network is minimised (e.g. agreeing electricity outage to facilitate relocation of cables).

Ducting and / or poles along the proposed relocated route will be constructed and ready for rerouting of cables in advance of decommissioning of existing overhead electricity lines.

Connections to the existing gas networks will be coordinated with the relevant utility provider (e.g. agreeing outage to facilitate connection) and carried out by approved contractors.

Contractor to comply with HSA Code of Practice for Avoiding Danger from Underground Services.

Connections to the existing telecoms networks will be coordinated with the relevant utility provider (e.g. agreeing outage to facilitate connection). and carried out by approved contractors.

Operational Phase

The design of proposed site levels (roads, FFL etc.) has been carried out to ensure the proposed development is elevated and set in such a way as to avoid concentrating additional surface water flow in a particular location.

Surface water runoff from the site will be attenuated to the greenfield runoff rate as outlined in the Greater Dublin Strategic Drainage Study (GDSDS).

Surface water discharge rates will be controlled by a Hydrobrake type vortex control device.

16.2.9 Cultural Heritage & Archaeology

The following recommendations are made subject to the approval of The Department of Culture, Heritage and the Gaeltacht. As the statutory body responsible for the protection of Ireland's archaeological and cultural heritage resource, the DCHG may issue alternative or additional recommendations.

Mitigation Measure

Construction Phase

Topsoil stripping of the remainder of the wider site be subject to archaeological monitoring licensed under the National Monuments Acts.

The wall comprising the townland boundary with Castletown will be recorded by Building Survey.

The condition of the wall comprising the townland boundary with Castletown will be monitored over the course of the construction phase to ensure that there is no damage done to the structure.

The visual impact on Connolly Folly to the NW and on Castletown House and Demesne to the east will be assessed when development proposals are finalised.

Operational Phase

No mitigation measure(s) are considered necessary as the implementation of the proposed development in accordance with the proposed site layout plan will ensure sufficient separation between new houses and the existing the wall comprising the townland boundary with Castletown

16.2.10 Landscape and Visual Assessment

Mitigation Measure

Construction Phase

Existing boundary planting and earthwork along the North-western boundary to be retained. Existing roadside planting along the southern boundary (Maynooth Road) will also be retained where possible. All external boundaries shall be augmented with additional tree planting.

Replacement hedgerow planting along the north-eastern boundary of the application site (where a portion of existing hedge will be removed) is proposed that will augment / reconnect with the remaining section of hedgerow. This not only offers potential screening and integration of the development, but it also maintains ecological corridors and green infrastructure. Species will complement those within the existing hedgerows and generally include native species which form the landscape character area.

Lighting Mitigation Measures during the Construction Phase include the following:

- Specified working hours, uses of lighting, location of temporary floodlights and construction compound to be agreed with the Local Authority;
- Lighting to be switched off when not required specifically for construction activities or required for security or health and safety;
- The programme of works will take into account the location of sensitive receptors, particularly towards Castletown Demesne
- Glare caused by poorly directed security and flood lighting will be minimised by positioning lights to <70 degrees and directing into the centre of the site, in a generally west and southward direction.
- Light spill will be minimised by avoiding poorly sighted lights on the boundary of the development;
- Sky glow will be minimised by use of modern flood lights with appropriate cowling to avoid light spilling upwards; and,
- Should any illuminated advertising be installed to advertise the development during construction, the signage should be carefully illuminated in order to minimise glare and follow best practice guidelines.

Operational Phase

Proposed lighting mitigation measures during the operational phase include:

Installation of lighting to achieve minimum luminance levels (within the appropriate guidance specification required) to provide a safe night-time environment for residents and others using onsite facilities e.g. creche.

Minimisation of sky glow and limiting external light spill, particularly in the direction of Castletown demesne and the designated view corridor:

- Fitting of luminaires typical of a rural town or village location are installed. This would require luminaires that permit up to 2.5% sky glow upward lighting ratio; however, it would be prudent to choose a high specification where possible. Such a specification would have a better performance than the majority of existing light fittings in residential areas surrounding the site.
- All lamps used for external lighting should be high pressure sodium lamps of the same colour and temperature. The whiter light emitted by high pressure sodium lamps provide superior colour rendering to the more orange low-pressure sodium lamps, and additionally reduce impacts on the night time scene (due to their poor performance, low pressure sodium lights have now been phased out for new developments or lighting upgrades).
- Minimising glare from any luminaires installed, by ensuring the correct luminaire is selected and installed correctly.
- Where practicable, switch off lights when not required for safety, security or enhancement of the night-time scene (this could be achieved through automatic timer in appropriate locations);
- The lighting design prepared at the detailed design stage should utilise low light pollution flat glass luminaires throughout to ensure adherence with rural environmental standards; and, Low level and bollard lights could be proposed as a subtle alternative to taller columns along the footpaths and cycle routes, particularly through the open spaces.

16.2.11 Monitoring

Where monitoring is proposed in the foregoing chapters, these requirements have been summarised below.

Construction Phase Monitoring

Proposed monitoring during the construction phase in relation to the soil and geological environment (Chapter 7) are as follows:

- Adherence to Outline Construction Management Plan
- Construction monitoring of the works (e.g. inspection of existing ground conditions on completion of cut to road formation level in advance of placing capping material, stability of excavations etc.).
- Inspection of fuel / oil storage areas.

- Monitoring cleanliness of adjacent road network, implementation of dust suppression and provision vehicle wheel wash facilities.
- Monitoring of contractor's stockpile management (e.g. protection of excavated material to be reused as fill, protection of soils for removal from site from contamination)
- Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.)

Proposed monitoring during the construction phase in relation to the air quality and climatic factors (Chapter 9) are as follows:

- A dust deposition monitoring programme will be implemented at the site boundaries for the duration of the construction phase in order to verify the continued compliance with relevant standards and limits.
- Monitoring of construction dust deposition at nearby sensitive receptors (residential dwellings) 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/(m²*day) during the monitoring period between 28 - 32 days.

Proposed monitoring during the construction phase in relation to noise and vibration factors (Chapter 10) are as follows:

- It is recommended that the site contractor will prepare a Noise and Vibration Management Plan (NVMP) which will deal specifically with onsite activities in a strategic manner to remove or reduce significant noise and vibration impacts associated with the construction works. The NVMP should specify the noise and vibration monitoring and reporting that will be carried out.

Proposed monitoring during the construction phase in relation to archaeology (Chapter 13) are as follows:

- Continued archaeological monitoring (licensed under the National Monuments Acts) of the topsoil stripping of the remainder of the wider site.
- Condition monitoring of the stone wall comprising the townland boundary with Castletown over the course of the construction phase to ensure that it does not suffer any damage.

Operational Phase Monitoring

No monitoring is required during the operational phase of the development.