15 MITIGATION AND MONITORING MEASURES

15.1 Introduction

This EIAR has assessed the impacts and resulting effects likely to occur as a result of the Proposed Development on the various aspects of the receiving environment.

The Proposed Development will be operated in a manner that will ensure that the potential impacts on the receiving environment are avoided where possible. In cases where impacts or potential impacts have been identified, mitigation measures have been proposed to reduce the significance of particular impacts. These mitigation recommendations are contained within each chapter exploring specific environmental aspects.

This chapter of the EIAR collates and summarises the mitigation commitments made in Chapter 4 to Chapter 13.

15.2 Summary of Mitigation Measures

15.2.1 Population and Human Health

15.2.1.1 Construction Phase

15.2.1.1.1 Mitigation

During the Construction Phase, a number of mitigation measures will be implemented to protect human health. HSE guidelines will be adhered to in relation to social distancing, cough and sneeze etiquette, face masks and hand washing. Appropriate welfare facilities will be provided at the facility. Frequently touched objects and surfaces such as door handles, machine steering wheels and gear levers will be cleaned and disinfected frequently.

- Construction traffic activity is expected to take place between 07:00 and 18:00, Monday to Friday.
- No construction activity will be carried out on Monday to Friday evenings after 18:00, on Sundays or on Bank Holidays.
- There will be no unnecessary revving of vehicles during arrival or departures to and from the site to ensure that construction related traffic does not give rise to unnecessary noise nuisances.
- All vehicles will be switched off when not in use on-site. There will be no unnecessary idling of vehicles or machinery on-site during the Construction Phase. This will reduce or eliminate any potential noise impacts.
- A speed limit of 15km per will be put in place on-site for the Construction Phase of the Proposed Development. This will ensure that traffic will not give rise to dust in periods of prolonged dry weather.
- In periods of prolonged dry weather, the entrance roadway will be dampened down with water to prevent dust if considered necessary during the Construction Phase.

No other specific mitigation measures are required during the Construction Phase of the Proposed Development in relation to population and human health, given the lack of direct effects resulting from the Proposed Development. However, where required, mitigation

measures in relation to air emissions (dust), noise, traffic, waste etc. are identified in their respective chapters in this EIAR.

15.2.1.1.2 Monitoring

No specific monitoring measures are proposed or required in relation to Population and Human Health for the Construction Phase of the Proposed Development.

15.2.1.2 Operational Phase

15.2.1.2.1 Mitigation

Dust control measures will be in place at the quarry to ensure that dust does not cause any health impacts. These are detailed in Chapter 8 of this EIAR. General dust mitigation measures specified in Chapter 8 will also serve to protect human health in relation to dust containing silica. In addition;

- Safe systems of work such as wet methods for dust removal/suppression will be implemented.
- Engineering controls such as Local Exhaust Ventilation (LEV) or containment measures will be used where appropriate.
- Suitable PPE such as coveralls and appropriate gloves will be worn.
- Respiratory Protective Equipment (RPE) should either be a FFP3 disposable respirator or a P3 particulate filter fitted to a half or full-face mask to provide effective protection and be CE marked. All RPE should fit the employee correctly.
- Any RPE worn should be properly fit tested.
- All personnel will be obliged to undertake a programme of awareness training relating to the potential risk associated with dust containing silica.

No other specific mitigation measures are required in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, where required, mitigation measures in relation to air emissions, noise, traffic, water etc. are identified in their respective chapters in this EIA Report.

15.2.1.2.2 Monitoring

It is recommended that a radon detector be installed for a period of 3 months after which time the detector should be sent to one of the testing services recommended by the EPA. The acceptable level, or Reference Level, for workplaces in Ireland is 300 becquerels per cubic metre (Bq/m3). If radon results are below 300 Bq/m3 no further action is required unless major refurbishment work is carried out.

No other specific monitoring measures are required in relation to population and settlements, given the lack of direct effects resulting from the Proposed Development. However, where required, monitoring in relation to air emissions, water, noise, and traffic are identified in their respective Chapters in this EIAR.

15.2.2 Biodiversity

15.2.2.1 Construction Phase

15.2.2.1.1 Mitigation

Mitigation by Design

The following mitigation by design is proposed:

- All plant and machinery will be serviced before being mobilised to site;
- Refuelling will be completed in a controlled manner using drip trays (bunded container trays) at all times; and
- Only designated trained operators will be authorised to refuel plant on site.

Procedures and contingency plans will be set up to deal with emergency accidents or spills.

Control and Management of Water and Surface Water Runoff

Prior to the commencement of earthworks, silt fencing will be placed downgradient of the construction areas where surface water may drain towards the Baunleath stream and/or other small drainage ditches present within or adjacent the site. These silt fences will be embedded into the local soils to ensure all site water is captured and filtered.

Daily monitoring and inspections of runoff during the Construction Phase will be completed and should be detailed in a CEMP. Earthworks for the Construction Phase will take place during periods of low rainfall to reduce run-off and potential siltation of downstream watercourses.

The proposed water management system will direct surface water and any minor groundwater inflows in the site towards suitably designed settlement lagoons on the quarry floor. These lagoons will serve to attenuate discharge from the site and will ensure that discharge rates to the Baunleath stream do not exceed the existing greenfield runoff rates or the maximum permitted daily discharge volume as per the discharge license. Water from the wheel wash will be recycled and will not enter the settlement ponds or be discharge to the Baunleath stream.

Drainage controls within the Proposed Development will include the following:

A series of land drains are proposed below the soil storage area, and these drain to an open drain on the eastern edge of the soil storage area. Any drainage water and runoff arising from this area will be directed into the quarry void and managed via the quarry water management system.

- The setdown area will have a hardcore surface. Part of the setdown area also drains into the quarry void. The southern half of the setdown has bounding collection drains, and these will be filled with drainage stone (i.e., french drains), and any excess surface water arising from these French drains will discharge to ground via a proposed soakaway.

- Within the quarry void surface water and groundwater will be collected and pumped from temporary sumps to the main settlement pond. Water within the settlement pond will drain via gravity and flow through a hydrocarbon interceptor and then discharge to a drain at the northeastern corner of the proposed site. The drain flows via a culvert under the L3036 towards the Baunleath stream which in turn flows into the Madlin River further downstream. A discharge licence will be required for this proposed discharge.

- Drainage water from the main site access road will be collected in a roadside filter drain. Excess water from the filter drain will flow through a hydrocarbon interceptor and recharge to groundwater in a soakaway at the southeast of the site.

- Aco drains are proposed across the site entrance. The Aco drain closest to the entrance gate will drain into the filter drain/hydrocarbon interceptor/soakaway arrangement outlined in the previous paragraph. The second Aco drain prevents runoff from the site entrance area onto the public road. This Aco drain direct water to the south into a french drain/linear soakaway located inside the site boundary.

The Proposed Development will require discharge of surface water and a small amount of groundwater as the proposed quarry void intersects the local groundwater table. Similar to the existing quarry (to the north), there is likely to be little groundwater inflows to the quarry except for water entering from the upper weathered bedrock. Excess water can be stored in the quarry floor, so discharge can be limited/attenuated to ensure no impacts on downstream receiving waters and the associated SAC. Please see Chapter 7: Hydrology of this EIAR for further details.

Timing of Vegetation Clearance & Removal of Buildings

Prior to vegetation removal and the removal of derelict buildings it is recommended that bird surveys and bat surveys are undertaken in adherence to best practice guidelines, the findings of which will be used to inform the below recommendations and can be implanted via a CEMP. Furthermore, the findings of the survey will be used to provide specific mitigation measures, including location and number of bird and bat boxes to be implemented.

Bats

Bats are assessed further in Section 5.5.

Birds

To ensure compliance with the Wildlife Act 2000 as amended, the removal of areas of vegetation will not take place within the nesting bird season (March 1st to August 31st inclusive) to ensure that no significant impacts (i.e., nest/egg destruction, harm to juvenile birds) occur as a result of the Proposed Development. However, this shall be extended to include December, January and February due to conifer plantations being the preferred habitats for the winter nesting common crossbill (*Loxia curvirostra*). Where any removal of vegetation within this period is deemed unavoidable, a qualified ecologist will be instructed to survey the vegetation prior to any removal taking place, furthermore, this should include nocturnal surveys for owl species which may nest within the plantation woodland . Should nesting birds

be found, then the area of habitat in question will be noted and suitably protected until the ecologist confirms the young have fledged.

Terrestrial Mammals

Information in relation to vegetation clearance and other suitable mitigation measures for terrestrial mammals, namely badger, are assess further in Section 5.7.1.8.3.

Herptiles

Any clearance of habitat likely to support reptiles or amphibians, for example removal meadow grassland, will be carried out with the following considerations:

e) Habitat removal will be carried out in **September/October** to ensure that Lizards are active but also that nesting birds aren't impacted, (See Table 15-1).

f) Should any suitable vegetation removal be required during this period, an ecologist will be consulted, and instruction taken on how to proceed.

g) Any suitable vegetation removal (e.g., meadow grassland and hedgerows), if required in the active season, will be undertaken as detailed below.

h) Any hibernacula encountered should be dismantled by hand during the reptile active season.

To ensure no adverse effect of any herptiles which may be present on site, a phased approach to clearance, under the supervision of an ecologist, will be used to allow wildlife to move from any suitable habitat that will be removed. This will take place during weather that is suitable for reptiles and amphibians to be active (above 10°C with little rain), during the main activity season (generally March to September inclusive):

- Phase 1 – Directional cutting vegetation to 150-200 mm and removing the arisings. This should be left for a minimum of 24 hr for any sheltering reptiles to disperse;

- Phase 2 – Hand-searching the cut areas (conducted by an ecologist) and removing any sheltering habitat (e.g., logs or debris) then cutting vegetation to ground level and removing the arisings; and

- Phase 3 – Soil scrape.

Should any suitable refugia (such as log piles) need to be removed, this will be undertaken outside the reptile gravid period and outside their hibernation period (September/October) and will be supervised by the ecologist.

Should above ground vegetation removal be required during winter when reptiles and amphibians are in torpor, it is advised the vegetation is removed to ground level, and all earth works is undertaken during the active season under a watching brief by a suitability experienced ecologist.

Table 15-1 provides guidance for when vegetation/habitat clearance is permissible. Information sources include Herpetological Society of Ireland, British Hedgehog Preservation Society's *Hedgehogs and Development and the Wildlife (Amendment) Act*, 2000, Collins (2016) and NRA (2009).

The optimal period for vegetation/habitat clearance for all species is within the months of **September and October**. Where this seasonal restriction cannot be observed, a check(s) will be carried out prior to any site clearance by an appropriately qualified ecologist/ornithologist and repeated as required to ensure compliance with legislative requirements.

Works will be undertaken in adherence to a detailed Method Statement for vegetation removal.

Table 15-1 Seasonal Restrictions on Vegetation Removal. Red Boxes Indicate Periods When Clearance / Works are Note Permissible

<table>
<tr><th>Ecological Feature</th><th>January</th><th>February</th><th>March</th><th>April</th><th>May</th><th>June</th><th>July</th><th>August</th><th>September</th><th>October</th><th>November</th><th>December</th></tr>
<tr><td>Breeding Birds</td><td colspan="8">Nesting bird season.

No clearance of vegetation unless confirmed to be devoid of nesting birds by an ecologist. (Mar - Aug)</td><td colspan="3">Vegetation clearance permissible (Sept - Nov)</td><td></td></tr>
<tr><td>Bats</td><td colspan="8">Tree felling to be avoided unless confirmed to be devoid of bats by an ecologist. (Jan - Aug)</td><td colspan="2">Preferred period for tree-felling (Sep - Oct)</td><td>Tree felling to be avoided unless confirmed to be devoid of bats by an ecologist (Nov - Dec)</td></tr>
<tr><td>Terrestrial Mammals (e.g., Hedgehog, Pygmy Shrew, stoat)</td><td colspan="3">Mammal hibernation season.

No clearance of vegetation unless confirmed to be devoid of hibernating mammals by an ecologist.

(Jan - Mar)</td><td colspan="7">Vegetation clearance permissible (Apr - Oct)</td><td>Mammal hibernation season.

No clearance of vegetation unless confirmed to be devoid of hibernating mammals by an ecologist. (Nov - Dec)</td></tr>
</table>

Ecological Feature	January	February	March	April	May	June	July	August	September	October	November	December
Amphibians	Habitat clearance permissible **(Jan - Feb)**		Amphibian breeding season (estimated). No habitat destruction (Ponds, drainage ditches) unless confirmed to be devoid of tadpoles and other signs of amphibians. **(Mar - June)**				Habitat clearance permissible if devoid of tadpoles and signs of amphibians **(July - Dec)**					
Common Lizard	Lizard Hibernation Season No habitat clearance permissible **(November – March)**		Active period Habitat (Scrub, old stone walls) clearance permissible **(Early March - October)**									Lizard Hibernation Season No habitat clearance permissible **(November – March)**

Invasive Species

There were no high impact or legally controlled invasive plant species identified at the site during field surveys by Enviroguide Consulting. No Third Schedule invasive species were recorded on the site; therefore, no impacts from invasive species are anticipated. However, guidelines for best practice will be followed, as will the CEMP associated with the Proposed Development, to ensure no invasive species material will be brought on-site during construction.

Protection of Fauna

Waste Management

As best practice all construction-related rubbish on site e.g., plastic sheeting, netting etc. will be kept in a designated area and kept off ground level so as to prevent small mammals such as hedgehogs from entrapment and death.

Log piles for Fauna

Piles of logs and other woody vegetation arising from proposed vegetation removal will be left in suitable secluded corners/margins of the site; to provide habitat for common frog, lizards, and small mammals such as hedgehog and pygmy shrew. These areas of woody debris will also benefit local invertebrate species through provision of shelter and food sources.

Protection of Badgers

Transport Infrastructure Ireland's (TII, previously the NRA) Guidelines for the treatment of badgers prior to the construction of national road schemes, was consulted in terms of the management of potential badger setts at the site. The following measures are taken from the guidance document and adapted to apply to the Proposed Development.

Prior to the commencement of construction works, a badger activity survey will be carried out by a suitably qualified badger specialist; to establish the current status and activity levels of potential badger setts (main, annex, subsidiary or outlier sett) if located on site. This may involve the further use of camera traps and other forms such as placing sand and sticks across any identified sett entrances to determine presence/absence. As badgers are known to be present on site and surrounding lands, a Method Statement will be prepared by a suitably qualified ecologist. Should an active badger sett be identified on site or within the ZOI, NPWS will be consulted prior to any works commencing and a derogation licence will be sought. It should be noted that badgers are able to excavate new sett's quickly, hence the requirement for a survey prior to commencement of construction. The accompanying Method Statement will detail any protection zones required to ensure the works do not undermine the setts (if present) or their tunnels, and the mitigation measures that will be required to protect badger for the extent of the Construction Phase (e.g., no works buffer zone, badger-proof fencing to prevent access to the site during works etc.).

Works close to an active badger sett or the removal of vegetation will only be conducted under the supervision of the suitably qualified ecologist under licence from the NPWS. During the breeding season (December to June inclusive), no works should be undertaken within 50m of active setts. Badger sett tunnel systems can extend up to 20m from sett entrances. As there is the possibility that tunnels would be destroyed by the movement of heavy plant over the ground above the tunnel system, it is essential that no heavy plant cross within 30m of a sett entrance. This will ensure that setts are not damaged and that badgers are not inadvertently crushed during construction. Lighter machinery (generally wheeled vehicles) will not be used within 20m of a sett entrance, light works such as digging by hand or scrub clearance will not take place within 10m of a sett entrance unless under the supervision of the ecologist.

Plan for possible sett removal

The retention of any discovered setts in-situ may be unfeasible due to spatial constraints and the footprint of the Proposed Development. As such, a suitably qualified ecologist would be instructed to prepare an exclusion plan for the decommissioning of any setts and their destruction once badgers have been confirmed to have vacated. The objective would be to allow the badgers to remain within their territory, even though a portion of their current territory will be lost as a result of the Proposed Development. The provision of an artificial sett within the site would also be incorporated into the landscape plan as detailed below, should badger setts be found prior to the commencement of the Construction Phase.

Any existing active setts would not be excluded or destroyed until the artificial replacement sett has been constructed, further details will be presented in the Method Statement and presented to the Local Planning Authority prior to commencement.

Possible Exclusion of badgers from active setts

Exclusion of badgers from any identified active setts would only be carried out during the period of July to November (inclusive) to avoid the badger breeding season. As per the TII guidelines, the removal of badgers from affected setts and subsequent destruction of these setts will only be conducted with NPWS permission/approval and by experienced ecologist. The exclusion process would include monitoring to ensure that badgers have fully evacuated the setts prior to destruction. The NPWS grant permission/approval to the experts undertaking the badger operations and not to the development or contractor. A badger sett exclusion plan and Method Statement would be prepared and provided to the NPWS prior to commencement for their approval. No works will take place in the vicinity of the active setts, or vegetation clearance without the supervision of the ecologist.

Measures to ensure the sett has been vacated and is devoid of all badgers will be designed by the badger specialist, involving a combination of:

- One-way badger proof gates on active entrances.
- Badger proof fencing.
- Soft and hard blocking of inactive entrances, and
- Recurring inspections.

Gates would be left installed, with regular inspections over a minimum period of 21 days before the sett could be deemed inactive. Any badger activity would require the procedures to be repeated or additional measures taken. No exclusion can commence in advance of the completion of the artificial sett. All sets should be assessed on a case-by-case basis by a suitably qualified experienced badger expert, with measures adapted to suit the situation as per the expert's direction.

Possible Sett destruction

Sett destruction, if required, should commence immediately following the 21-day exclusion period, provided that all badgers have been excluded. Should a badger be discovered during this operation, the NPWS will be advised immediately, and all excavation will cease until it is agreed with the NPWS that it may continue. The destruction of a successfully evacuated badger sett may only be conducted under the supervision of qualified and experienced personnel with approval/permission from the NPWS. The possibility of badgers remaining within a sett must always be considered; suitable equipment should be available on hand to deal with badgers within the sett or any badgers injured during sett destruction.

TII guidelines recommend that sett destruction is usually undertaken with a tracked 12-25 ton excavator, commencing at ca. 25m from the outer sett entrance and working towards the centre of the sett, cutting ca. 0.5m slices in a trench to a depth of 2m. exposed tunnels may be checked for recent badger activity with full attention paid to safety requirements. A report detailing the evacuation procedures, sett excavation and destruction, and any other relevant issues will be prepared by the badger specialist and submitted to the NPWS.

Artificial sett provision

An artificial main sett would be provided if an active sett needs to be removed to facilitate works (location determined by ecologist). See Figure 5-15 for example of proposed artificial sett).

A dense section of scrub vegetation (e.g., bramble, hawthorn, blackthorn) should be planted within the designated artificial sett area; the goal being to connect the sett with the boundary hedgerow and treelines and provide cover, shelter and protection for the badgers, maximising the setts chances of being adopted. Wildlife friendly lighting would ensure an artificial sett is not illuminated.

Figure 15-1 An example of an artificial sett under construction with pipe tunnels and 7 chambers (Extracted from NRA (now TII), 2005b)

Potential recommendations for artificial sett construction and location are as follows (as per the guidance):

- Construction of an artificial sett must not place any existing setts in danger.
- All construction equipment must remain a minimum of 30m (up to 50m during breeding season) from all existing (naturally constructed) active sett entrances during the creation of the new sett.
- The artificial sett would need to be constructed several months in advance of the closure of the active setts, if required. In this interval, the affected badgers would be encouraged to utilise the artificial sett by means of attractive food baits (peanuts etc.) and materials from the active sett added to the new artificial sett (bedding, discarded spoil).
- The construction of an effective artificial sett is an exercise best conducted by experienced personnel.
- The constructed tunnels and chamber system would be located in well-drained soils and be landscaped and planted to ensure adequate cover and lack of disturbance.

Potential Disturbance limitation

In order to minimise the potential for disturbance of a new sett area and its surrounding vegetation, access to this portion of the site would be restricted and discouraged through landscaping (e.g., fencing, dense planting) and signage. Timing of works in the vicinity of an artificial sett will ensure any noisy or intrusive works required in this area take place prior to any artificial sett becoming active.

Protection of Bats

The derelict buildings, mature treeline and hedgerows found throughout the site will not be retained due to the scope of works. As all may provide suitable habitats for roosting, hibernating and/or breeding bats, mitigation measures must be put in place to minimize any potential disturbance to these species. It is also recommended that seasonal bat activity surveys are undertaken, in adherence to best practice guidelines, however, in the absence of survey the below mitigation is presented in adherence to the precautionary principle.

Tree Felling

All trees within the site identified for removal to facilitate the proposed extraction works must firstly be surveyed by a qualified individual to assess their potential for roosting bats. Following assessment of their potential (whether there are adequate roost features etc.), best practice measures can be undertaken in their felling and/or further surveys undertaken.

This shall include the following survey effort for adversely effected trees, in adherence to current best practice guidelines:

- Trees with high potential roost features will be subject to 3 emergence surveys or aerial assessments. Should bats be observed using the roost, NPWS will be consulted, and a derogation licence would be required;
- Trees with moderate potential roost features will be subject to 2 emergence surveys or aerial assessments. Should bats be observed using the roost, NPWS will be consulted, and a derogation licence would be required;
- Trees with low potential roost features will be ‘soft’ felled via section or limbs being cut and lowered to the ground or the tree shall be felled and left in situ for 24 hours prior to sectioning; and
- Trees with negligible potential can be felled without consideration for bats.

Trees with high or moderate potential, not found to support bats when surveyed would be ‘soft felled’ as per the methods present on trees of low roost suitability.

Should bats be found during felling, works will be postponed until a derogation licence is obtained by the bat ecologist from the NPWS. This will avoid any harm to bats and the committing of an offence under The Wildlife Act 1976 as amended.

Should the condition of trees have deteriorated between the writing of this report and the receipt of grant of planning or a significant time elapsed i.e. one year, an updated roost assessment should be undertaken to ensure no significant alterations from the baseline.

soft felling will follow current best practice guidelines (as per NRA (Now TII) 2005 Guidelines):

- Tree-felling will be undertaken in the period September to late October. During this period bats are capable of flight and may avoid the risks of tree-felling if proper measures are undertaken.
- Tree-felling will be undertaken using heavy plant and chainsaw. Prior to felling 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.
- Trees will not be sawn up or mulched immediately. A period of at least 24 hours, and preferably 48 hours, will elapse prior to such operations to allow bats to escape.
- When felling trees with a chainsaw, it is important to ensure that the rate of fall is not accelerated by the use of a chain and vehicle (e.g., tractor). It is unlikely that a bat would survive such a heavy impact.

Derelict Building Removal

Derelict buildings on site must firstly be assessed by a suitably qualified individual to determine their potential for bat activity and as bat roost sites.

To ensure no adverse effect on bats, it is recommended that a dusk/dawn emergence survey of the buildings is undertaken to current best practice guidelines (Collins, 2016). This will include one visit for buildings of low potential, two visits for buildings of moderate potential and three visits for buildings of high potential. This can be conducted between May and September, with at least one visit before August and surveys spaced a minimum of two weeks apart. The results of these surveys would be relied upon to inform further works. These can be divided into two probable outcomes;

3. No bats are recorded roosting within the structures and the building can be removed, this would likely require no further input from an ecologist, but it would be advisable to undertake works at the earliest convenience to prevent potential future occupation. Should works be delayed beyond 2023 an ecologist should be consulted to ensure no bats are in occupation, as bats are a transient species and will readily occupy suitable structures. In the unlikely event of any bats being found before or during the demolition, the works will stop, a bat specialist will be consulted, and a derogation licence may be required from the NPWS to continue works.
4. Should a bat roost be identified during the emergence surveys, a derogation licence will be required from NPWS prior to demolition works taking place. This is a legal requirement and can be applied for following planning permission being granted. The

application process will likely take 8 – 12 weeks to process by NPWS. The NPWS ranger (or otherwise qualified person) will need to be on-site during demolition works should any bats be present. In the event of bats being present, demolition works should be carried out between late August and early November under licence, in order to ensure that a potentially breeding populations of bats are protected. During this period young bats are capable of flight and the breeding season should be over.

Bat Roosting Opportunities

To offset the loss of trees and other roosting features potentially on site, a series of bat boxes will be erected on suitably large trees along the boundaries of the site to provide future roosting opportunities. The guidance of a suitably qualified Bat ecologist will be sought in the selection of bat box type and placement; to avoid disturbance from lighting generated by the Proposed Development and maximise the likelihood of their uptake by local bats. Bat boxes will be placed over 4m high (if possible) onto retained mature trees, the trees in which they are placed will not be illuminated. This will be detailed within a Method Statement or similar document for submission to the Planning Authority prior to commencement.

Bat Friendly Lighting Measures

In the absence of bat surveys and subject to grant of permission, the construction stage lighting plan will be prepared by the main contractor when they are appointed, and this will be reviewed by a bat ecologist to ensure that no significant night-time light spill on to the boundary treelines at the site occur as result of night-time security lighting or similar (if such lighting is required). Every effort will be made to ensure that there will be no night-time construction lighting within or directed into vegetated areas and treelines. To ensure there is no light spill into these areas, the following luminaire specifications, taken from latest guidance (ILP, 2018), will be adhered to during the Construction Phase:

- A bat ecologist (with lighting expertise) will assess the lighting report for the area containing trees which are identified as roosts e.g., the area containing trees T916 to T924 to ensure no lighting disturbance to roosts, or potential bat roost trees. They will advise further lighting mitigation as required.
- Retained treelines will not incur an increase in the current lux level due to the new development.
- All luminaires used will lack UV/IR elements to reduce impact.
- LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (<2700 Kelvins will be used to reduce the blue light component of the LED spectrum).
- Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Column heights will be carefully considered to minimise light spill. The shortest column height allowed will be used where possible.

- Only luminaires with an upward light ratio of 0% and with good optical control will be used.
- Luminaires will be mounted on the horizontal, i.e., no upward tilt.
- Any external security lighting will be set on motion-sensors and short (1min) timers.
- As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.

Noise Disturbance

Increases in disturbance levels as a direct result of human activity and through increased generation of noise during the Construction Phase can have a range of impacts depending upon the sensitivity of the ecological receptor, the nature and duration of the disturbance and its timing. To control likely noise impacts caused by the proposed external operations, mitigation measures as set out in *BS 5228-1: A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise* will be adopted:

- Selection of plant with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors as permitted by site constraints.
- Avoid unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Minimise drop heights for materials or ensure a resilient material underlies.
- Use of alternative reversing alarm systems on plant machinery.
- Limiting the hours during which site activities likely to create high levels of noise are permitted.
- Appointing a site representative responsible for matters relating to noise.
- Monitoring typical levels of noise during critical periods and at sensitive locations.

These measures will ensure that any noise disturbance to nesting birds or any other fauna species in the vicinity of the site will be reduced to a minimum.

Dust Disturbance

The following general dust control measures will be followed for the duration of the Construction/Infill Phase of the Proposed Development and will ensure no significant dust related impacts occur to nearby sensitive receptors including local faunal species:

- In situations where the source of dust is within 25m of sensitive receptors screens (permeable or semi-permeable) will be erected.
- Haulage vehicles transporting gravel and other similar materials to site will be covered by a tarpaulin or similar.
- Access and exit of vehicles will be restricted to certain access/exit points.
- Vehicle speed restrictions of 20km/hr will be in place.
- Bowsers will be available during periods of dry weather throughout the Construction/Infill period.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil thereby reducing the amount of dust.
- Stockpiling of imported materials will be avoided where possible with imported materials ideally placed on site in their proposed location upon receipt with double handling avoided.
- Stockpiles will be stored in sheltered areas of the site, covered, and watered regularly or as needed if exposed during dry weather.
- Gravel should be used at site exit points to remove caked-on dirt from tyre tracks.
- Hard surfaced roads will be wet swept to remove any deposited materials.
- Unsurfaced roads will be restricted to essential traffic only.
- If required to control dust nuisance wheel-washing facilities will be located at the exit from the construction site.
- Dust production as a result of site activity will be minimised by regular cleaning of the site access roads using vacuum road sweepers and washers. Access roads should be cleaned at least 0.5km on either side of the approach roads to the access points.
- Public roads outside the site shall be regularly inspected for cleanliness, as a minimum daily, and cleaned as necessary. A road sweeper will be made available to ensure that public roads are kept free of debris.
- The frequency of cleaning will be determined by the site agent and is weather and activity dependent.

- The height of stockpiles will be kept to a minimum and slopes should be gentle to avoid windblown soil dust.
- The following will be dampened during dry weather:
    - Unpaved areas subject to traffic and wind
    - Stockpiles
    - Areas where there will be loading and unloading of dust-generating materials.
- Under no circumstances will wastewater from equipment, wheel or surface cleaning enter the *River Barrow and River Nore SAC*, via indirect water sources.

These measures will ensure that any dust disturbance to adjacent habitats, nesting birds or any other fauna species in the vicinity of the site will be reduced to a minimum.

15.2.2.1.2 Monitoring

Surface Water Protection

Regular monitoring will be carried out by the contractor to ensure water quality protection measures (e.g., drain blocks), silt fences are working throughout the entire Construction Phase. All containment and treatment facilities will be maintained and inspected regularly based on site and weather conditions for any signs of contamination of excessive silt deposits and records of these checks will be maintained for inspection. The approach and frequency of checks will be determined before construction commences and should be agreed with the Local Planning Authority.

Dust, Noise and Light

Regular on-site and off-site inspections will be undertaken where receptors are nearby, to monitor dust, noise, and light levels. The frequency and approach will be detailed in a CEMP. Regular site inspections will be carried out to monitor compliance with the CEMP, and all inspection results will be recorded. The inspection log will be created and made available to the local authority if requested. There will be an increase in the frequency of site inspections by the person accountable for air quality and dust issues on-site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

15.2.2.2 Operational Phase

15.2.2.2.1 Mitigation

The Construction Phase of the Proposed Development is relatively short-term, whereas the Operational Phase will comprise 10+ years of bedrock extraction at the site.

Operational Control and Management of Water Quality (Surface and Groundwater)

All quarrying activities at the site will operate within a site-specific protocol for extraction which will follow the current international best practice. Please see Chapter 7: Hydrology of this EIAR for further details.

Mitigation measures to protect groundwater quality will be implemented throughout the Operational Phase. The primary risks to groundwater quality result from hydrocarbon spills and leaks. The following mitigation measures will be implemented at the site:

- No refuelling or maintenance of operation vehicles or plant will take place within the extraction area;
- Preventative maintenance and relevant maintenance logs will be kept for all on-site plant and equipment;
- Refuelling will only occur at the designated fuel pad area, which will include an oil/fuel interceptor, from a mobile double skinned fuel bowser or equivalent;
- A spill kit will be kept beside the designated fuel pad area. The spill kit will contain fuel absorbent material, pads/mats and oil boom for use in the event of any accidental spill;
- Drip trays and fuel absorbent mats will be used during all refuelling operations;
- Onsite refuelling will be carried out by trained and competent personnel only;
- All plant and machinery will be serviced before been mobilized to site and regular leak inspections and fitness for purpose will be completed during the backfilling works;
- No substantial plant maintenance will be completed on site, any broken down plant will be removed from site to be fixed; and,
- The site will operate under a dedicated Environmental Management System.

With the implementation of the mitigation measures outlined above for the protection of surface and groundwater quality/quantity, the local waterbodies including the *River Barrow and River Nore SAC* will not be affected by the Proposed Development during the Operational Phase.

Noise Disturbance

Increases in disturbance levels as a direct result of human activity and through increased generation of noise during the Operational Phases can have a range of impacts depending upon the sensitivity of the ecological receptor, the nature and duration of the disturbance and its timing. To control likely noise impacts caused by the proposed external operations, mitigation measures as set out in BS 5228-1: A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise will be adopted:

- Selection of plant with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors as permitted by site constraints.
- Avoid unnecessary revving of engines and switch off plant items when not required.

- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Minimise drop heights for materials or ensure a resilient material underlies.
- Use of alternative reversing alarm systems on plant machinery.
- Limiting the hours during which site activities likely to create high levels of noise are permitted.
- Appointing a site representative responsible for matters relating to noise.

These measures will ensure that any noise disturbance to nesting birds or any other fauna species in the vicinity of the site during the Operational Phase will be reduced to a minimum.

Operational Dust Disturbance

To minimise the potential of dust impacts occurring during the Operational Phase of the Proposed Development, a series of mitigation measures have been prepared:

- Rotary atomisers and water bowsers will be employed during dry weather and during any site preparation activities including overburden removal, excavation of works area, internal roads.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind and shorten the length of time for which material will be stockpiled.
- Regular spraying of material stockpiles and haul roads during dry and/or windy weather.
- Covering of loose loads of fine sized materials during transit.
- Regular use of a road sweeper unit on the site entrance road and at the site exit.
- A wheel wash will be employed for dust suppression to ensure dust is not transferred off the working site area.
- Daily visual observations will be made on fugitive dust levels; in the event of high dust levels, operations giving rise to such emissions will be ceased or curtailed.

These measures will ensure that any dust disturbance to neighbouring habitats, nesting birds or any other fauna species in the vicinity of the site will be reduced to a minimum.

Restoration Plan

Section 16.16.3 of the Carlow County Development Plan 2022-2028 requires a planning application for a quarry to include the implementation of a restoration plan following the

cessation of the proposed extraction activities (Figure 5-16). The Restoration Plan Objectives are:

- Create a natural habitat throughout the site, which is one of the beneficial after uses proposed in the EPA Guidelines: ‘Environmental Management in the Extractive Industry (2008)".
- On completion of all quarry activities, the following will be completed:
    - remove all remaining stone and materials from the storage/processing yard and place them in the base of the quarry void.
    - Leave the cleared areas for natural recolonisation.
    - All structures will be cleared and removed from site.
    - The quarry void will be left to naturally infill with groundwater, which will likely settle at around ~70m AOD.
    - Spoil material from the perimeter berms will be placed in the eastern section of the quarry void and will be used to create a gradual sloping shoreline, and also to place spoil on residual quarry benches to foster a variety of wildlife.
    - The definition of post and wire fence to secure waterfilled quarry void.
    - A Native Planting Mix is considered, with the following guidelines:
        - Hedging to be planted as a double staggered row, with plants within each row 40cm apart (i.e. 5 plants per m). Rows to be 0.5m apart.
        - Planting in same species groups of 5-10 and transplants to be supplied with spiral guards.
        - Planting mix should be equal amounts of Silver Birch, Hawthorn, Blackhorn, Sally and Rowan.
        - Also, Gorse (*Ulex europaeus*) will be encouraged to grow on the elevated section along the western boundary and on the soil storage area. This may colonise naturally and will also be introduced via seed. Most of the Northern, Easter and South-eastern existing hedgerows are kept within the Proposed Development. This is fundamental to mitigate the visual impacts from most of the visual receptors identified in Chapter 10, of this EIAR.

The installation of the new green structure will compensate for the existing vegetation that will be removed. The new plantations are placed along the different slopes, creating a “green wall” that will mitigate, in the medium-term, the visual impacts of the Proposed Development. Please see Chapter 10 of this EIAR for further details.

15.2.2.2.2 Monitoring

The following will be checked/monitored during the Operational Phase, the details of which are to be included with the CEMP and/or BMP:

- Noise levels in the surrounding area;
- Implementation of lighting plan;
- Installation of and location of nest boxes;
- Installation of an artificial badger sett (if required);

- Implementation of Biodiversity Monitoring Plan
- Air quality (as determined within CEMP).
- Water quality (as determined within CEMP).

15.2.3 Land, Soils and Geology

15.2.3.1 Construction Phase

Mitigation

Effect on Land and Landuse

The loss of agricultural land and forestry resulting from the Proposed Development on a local or
regional scale is minimal and therefore the effects of actual agricultural/forestry land loss is not significant.

Given the local topography of the site, any change in topography is likely to be minimal in the overall landscape. The stripped overburden will be used in the construction of berms surrounding the extraction area.

Mitigation will include a restoration plan which will return the some of the proposed site to scrubland and will comprise planting of trees within the site. An area of the quarry void will be backfilled with topsoil and overburden which was previously stripped while some of the quarry void will be allowed to fill with water.

Excavation of Soil and Subsoils

site earthworks and the stripping of soil and subsoils will result in a direct impact on the local geological environment.

The impacts will be localised (i.e., only within the proposed extraction area) and will be mostly mitigated through the adoption of a suitable landscape and restoration plan which will be undertaken on completion of the extraction works. The stripped topsoil will be used to form a berm around the extraction area and/or stored within a proposed soil storage area and will ultimately be used in the restoration of the site.

Furthermore, the glacial till subsoils at the site are considered to be of low importance.

Any impacts are considered an acceptable and unavoidable part of the Proposed Development as the soils and subsoils must be removed in order to expose the underlying bedrock which will be extracted for economic purposes.

Contamination of Soil, Subsoils and Bedrock by Oil/Fuel Spillages and Leaks

The following mitigation measures are proposed:

- All plant and machinery will be serviced before being mobilised to application site;
- Refuelling will be completed in a controlled manner using drip trays (bunded container trays) at all times;

- Drip-trays will be used for fixed or mobile plant in order to retain oil leaks and spills;
- Only designated trained operators will be authorised to refuel plant on site;
- Procedures and contingency plans will be set up to deal with emergency accidents and spills; and,
- An emergency spill kit with oil boom, absorbers etc. will be kept on site for use in the event of an accidental spillage

Erosion of Exposed Soils and Subsoils

The following mitigation measures will be used:

- Soil removed from extraction area will be used to create a boundary berm around the extraction site;
- Any excess soil/subsoil not required in the construction of the berms will be stored at the proposed soil storage area;
- Where possible, the upper vegetative layer (where still present) will be stored with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the stored soil within the soil storage areas; and,
- Re-seeding and spreading/planting will also be carried out in these areas.

Monitoring

No monitoring is required in terms of the land, soils and geological environment.

15.2.3.2 Operational Phase

Mitigation

Excavation of Bedrock

Bedrock extraction will result in a direct impact on the local geological environment.

The bedrock in this area is of High Importance and has a high potential for the development of a quarry. The presence of Old Leighlin Quarry immediately to the north of the site indicates the economic suitability of this area for the development of a dimension stone quarry.

The proposed bedrock extraction is considered to be an acceptable and unavoidable part of the Proposed Development. The impacts however will be localised within the proposed extraction area of ~2.49ha. This proposed extraction area comprises ~26.6% of the application area and ~9.6% of the overall landholding.

Therefore, no specific mitigation measures are required.

Contamination of Bedrock by Oil/Fuel Spillages and Leaks

The measures are as per the construction phase as outlined in **Section 6.6.1.3**.

Impact on Geological Heritage Sites

No mitigation measures are required as the Proposed Development has no potential to impact on any geological heritage site.

Monitoring

No monitoring is required in terms of the land, soils and geological environment.

15.2.4 Hydrology

15.2.4.1 Construction Phase

Mitigation

Potential Impacts on Groundwater Vulnerability

There will be an increase in groundwater vulnerability rating due to the removal of overburden (i.e. soils and subsoils over 2.44ha). The increase in groundwater vulnerability will only be slight as subsoils are relatively thin at the site and the existing vulnerability is mapped largely as high to extreme.

The main increase in groundwater vulnerability will occur during the Operational Stage when extraction is proposed below the local groundwater table.

The main mitigation with respect to groundwater quality will be employed during the operational stage with the employment of best practice mitigation measures with respect to oil usage and refuelling of plant and machinery. However mitigation measures will also be employed throughout the construction phase to ensure no groundwater contamination occurs (refer to Section 7.5.1.2).

Surface and Groundwater Contamination from Oil/Fuel Spills and Leaks

The following mitigation by design is proposed:

- All plant and machinery will be serviced before being mobilised to site;
- Refuelling will be completed in a controlled manner using drip trays (bunded container trays) at all times;
- Only designated trained operators will be authorised to refuel plant on site; and,
- Procedures and contingency plans will be set up to deal with emergency accidents or spills.

Earthworks Resulting in Suspended Solids Entrainment in Surface Waters

Prior to the commencement of earthworks, silt fencing will be placed down-gradient of the construction areas where surface water may drain towards the Baunleath stream and/or other small drainage ditches present within or adjacent the site. These silt fences will be embedded into the local soils to ensure all site water is captured and filtered.

Daily monitoring and inspections of runoff during the construction phase will be completed. Earthworks for the construction phase will take place during periods of low rainfall to reduce run-off and potential siltation of downstream watercourses.

Excavated soil will be utilised in the construction of berms surrounding the proposed extraction area with any excess soil stored in the proposed soil storage area. These spoil areas will be vegetated as soon as practicable and silt fences placed downstream of all soil storage area until they have been stabilised.

Potential Effects on Surface and Groundwater WFD Status

Due to the hydrogeological regime at the proposed extraction area, characterised by high rates of groundwater recharge and low rates surface water runoff, the underlying GWBs are the most sensitive receptors. Surface watercourses will be less susceptible to effects during the construction phase due to the lack of surface water pathways between the extraction area and downstream SWBs.

Strict mitigation measures in relation to the use of oils and fuels on-site will be implemented during the construction phase and will ensure the ongoing protection of groundwater and surface water quality.

There will be no change in GWB or SWB status in the underlying GWBs or downstream SWBs resulting from the Proposed Development (refer to Table 7-12). There will be no change in quantitative (volume) or qualitative (chemical) status, and the underlying GWBs are protected from any potential deterioration from chemical pollution.

As such, the Proposed Development is compliant with the requirements of the Water Framework Directive (2000/60/EC).

Monitoring

Surface water quality monitoring should be completed during the construction phase of the Proposed Development.

Surface water quality monitoring will be completed at discharge points (downstream of settlement ponds). The monitoring will include the following analytes:

- Visual Inspection
- Temperature
- pH
- Flow
- BOD
- Suspended Solids
- Ammonia (as N)
- Orthophosphate
- Dissolved metals (Cd, Cu, Fe, Pb, Mg, Mn, Ni & Zn)
- Diesel Range Organics
- Petrol Range Organics

15.2.4.2 Operational Phase

Mitigation

Increased Surface Water Discharge Volumes

The Proposed Development includes the provision of a water management system which will include the installation of surface water attenuation and settlement ponds on the quarry floor.

The proposed water management system will direct surface water and any minor groundwater inflows in the site towards suitably designed settlement lagoons on the quarry floor. These

lagoons will serve to attenuate discharge from the site and will ensure that discharge rates to the Baunleath stream do not exceed the existing greenfield runoff rates or the maximum permitted daily discharge volume as per the discharge licence. The discharge rate is estimated to be ~200m^3/day (2.3 L/s).

The proposed infrastructure will attenuate storm water so that any increase in discharge volumes during storm events are gradual and controlled, preventing an increase in the flood risk downstream of the site.

Potential Impacts on Surface Water Quality

The Proposed Development will utilise a water management system designed to prevent contamination of local surface waters with elevation concentrations of suspended solids or hydrocarbons.

Water from the wheel wash will be recycled and will not enter the settlement ponds or be discharge to the Baunleath stream.

In addition the following measures will be implemented to ensure that surface waters are not contaminated with hydrocarbons:

- Hydrocarbons at the site will be delivered via fuel truck. There will be no storage of hydrocarbons on site.
- Major repairs will be completed off site. Emergency mechanical repairs will use spill kits kept on-site.
- All water from the site will be passed through a hydrocarbon interceptor prior to discharge to the receiving watercourse.

Potential Impacts on Groundwater Quality

All quarrying activities at the site will operate within a site-specific protocol for extraction which will follow the current international best practice.

Mitigation measures to protect groundwater quality will be implemented throughout the operational phase. The primary risks to groundwater quality result from hydrocarbon spills and leaks. The following mitigation measures will be implemented at the site.

- No refuelling or maintenance of construction/operation vehicles or plant will take place within the extraction area;
- Preventative maintenance and relevant maintenance logs will be kept for all on-site plant and equipment;
- Refuelling will only occur at the designated fuel pad area, which will include an oil/fuel interceptor, from a mobile double skinned fuel bowser or equivalent;
- A spill kit will be kept beside the designated fuel pad area. The spill kit will contain fuel absorbent material, pads/mats and oil boom for use in the event of any accidental spill;
- Drip trays and fuel absorbent mats will be used during all refuelling operations;
- Onsite refuelling will be carried out by trained and competent personnel only;
- All plant and machinery will be serviced before been mobilized to site and regular leak inspections and fitness for purpose will be completed during the backfilling works;

- No substantial plant maintenance will be completed on site, any broken down plant will be removed from site to be fixed; and,
- The site will operate under a dedicated Environmental Management System.

Groundwater Drawdown Associated with Dewatering

The proposed extraction will only extend to 56.5mOD, thereby limiting the extent of any potential local groundwater drawdown. The discharge rate from the proposed quarry is estimated to be ~200m^3/day (2.3 L/s).

Groundwater monitoring has revealed that the quarrying activities immediately to the north of the site have not resulted in any impact on local groundwater wells (SLR, 2017). Therefore, given the absence of karst features and flow conduits in the bedrock aquifer beneath the site, groundwater inflow into the proposed quarry will be minimal. Hence, the Proposed Development will not have a significant impact on local groundwater levels.

No specific mitigation measures are required however groundwater monitoring in installed monitoring wells will be completed as part of the Proposed Development.

Potential Impact on Designated Sites

The Proposed Development is located upstream of the River Barrow and River Nore SAC. Surface water connections from the site to the Baunleath stream could transfer poor quality surface water that may affect this SACs. Groundwater from below the proposed extraction area may also discharge as baseflow to the River Barrow.

However, with the implementation of the mitigation measures outlined above for the protection of surface and groundwater quality/quantity, the River Barrow and River Nore SAC will not be affected by the Proposed Development.

Potential Impact on WFD Status

Strict mitigation measures in relation to the protection of surface and groundwaters are outlined above. The implementation of these mitigation measures during the operational phase of the development will ensure the qualitative and quantitative status of the receiving groundwaters waters and surface waters will not be altered by the Proposed Development.

There will be no change in GWB or SWB status in the underlying GWBs or downstream SWBs resulting from the Proposed Development (refer to Table 7-12). There will be no change in quantitative (volume) or qualitative (chemical) status, and the underlying GWBs are protected from any potential deterioration from chemical pollution.

As such, the Proposed Development is compliant with the requirements of the Water Framework Directive (2000/60/EC).

Monitoring

Surface water monitoring will be completed through the operational phase of the Proposed Development as outlined in Section 7.9.1 above.

Groundwater quality should also be completed on a biannual basis and shall include testing for the following parameters:

- pH
- BOD
- Ammonia (as N)
- Nitrate
- Total Nitrogen (as N)
- Orthophosphate (as P)
- Total Dissolved Solids
- Dissolved Metals ((Cd, Cu, Fe, Pb, Mg, Mn, Ni & Zn)
- Total Petroleum Hydrocarbons
- Diesel Range Organics
- Petrol Range Organics
- Total Coliforms
- Faecal Coliforms

Groundwater level monitoring is also recommended throughout the operation phase of the Proposed Development. Groundwater level monitoring will be completed in the on-site monitoring wells (BH1, BH2 and BH5)

15.2.5 Air Quality and Climate

15.2.5.1 Construction Phase

Mitigation

Air Quality

Due to the nature and duration of the proposed demolition works, it is not expected that adverse air quality impacts are likely to occur. However, appropriate mitigation measures will be employed to further prevent such impacts occurring.

- Rotary atomisers and water bowsers will be employed during dry weather;
- A wheel wash will be employed for dust suppression to ensure dust is not transferred to external roads;
- Daily visual observations will be made on fugitive dust levels; in the event of high dust levels, operations giving rise to such emissions will be ceased or curtailed;
- Engines and exhaust systems should be maintained so that exhaust emissions do not breach stationary emission limits set for the vehicle / equipment type and mode of operation;
- Exhaust emissions from vehicles and machinery will be minimised by avoidance of engines running unnecessarily as idle engines will not be permitted for excessive periods; and

- The transport of dusty materials and aggregates will be carried out using covered / sheeted lorries.

Climate

As negative climatic impacts associated with the Construction of the development are negligible, no mitigation measures are proposed. Best practice measures will be implemented to minimise exhaust emissions from construction vehicles and machinery by avoidance of engines running unnecessarily, as idle engines will not be permitted for excessive periods.

Monitoring

Routine monitoring of dust deposition levels will be carried out at site boundaries to assess compliance with site planning conditions and to ensure that the residential amenity of local residential properties is not significantly impacted by site operations.

This will be conducted using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119.

15.2.5.2 Operational Phase

Mitigation

Air Quality

To minimise the potential risks of air quality impacts occurring during operations, a series of mitigation measures have been prepared:

- Rotary atomisers and water bowsers will be employed during dry weather and during any site preparation activities including overburden removal, excavation of works area, internal roads;

- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind and shorten the length of time for which material will be stockpiled;

- Regular spraying of material stockpiles and haul roads during dry and/or windy weather;

- Covering of loose loads of fine sized materials during transit;

- Regular use of a road sweeper unit on the site entrance road and at the site exit onto the local road network;

- A wheel wash will be employed for dust suppression to ensure dust is not transferred to external roads;

- Daily visual observations will be made on fugitive dust levels; in the event of high dust levels, operations giving rise to such emissions will be ceased or curtailed;

- Exhaust emissions from vehicles and machinery will be minimised by avoidance of engines running unnecessarily as idle engines will not be permitted for excessive periods; and

- The transport of dusty materials and aggregates will be carried out using covered / sheeted lorries.

Climate

As negative climatic impacts associated with the Operational Phase of the development are negligible, no mitigation measures are proposed. Best practice measures will be implemented to minimise exhaust emissions from vehicles and machinery by avoidance of engines running unnecessarily, as idle engines will not be permitted for excessive periods.

Monitoring

Routine monitoring of dust deposition levels will be carried out at site boundaries to assess compliance with site planning conditions and to ensure that the residential amenity of local residential properties is not significantly impacted by site operations.

This will be conducted using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119.

15.2.6 Noise and Vibration

Mitigation

In order to control likely noise impacts caused by the proposed external operations, mitigation measures as set out in *BS 5228-1: A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise* can be adopted:

- Selection of plant with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors as permitted by site constraints.
- Avoid unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Minimise drop heights for materials or ensure a resilient material underlies.
- Use of alternative reversing alarm systems on plant machinery.
- Where noise becomes a source of resonating body panels and cover plates, additional stiffening ribs or materials should be safely applied where appropriate.
- Limiting the hours during which site activities likely to create high levels of noise are permitted.
- Appointing a site representative responsible for matters relating to noise.
- Monitoring typical levels of noise during critical periods and at sensitive locations.

Monitoring

Noise will be monitored in accordance with the planning permission granted for the Proposed Development.

Noise limits as outlined in Section 9.3.2 of this chapter will be complied with.

15.2.7 Landscape and Visual

15.2.7.1 Construction Phase

Measures will be included in the CEMP to ensure landscape and visual impacts are minimised during the Construction Phase.

Monitoring

Landscape tender drawings and specifications were produced to ensure that the proposed planting is implemented in accordance with best practice. This document will include tree work procedures, soil handling, planting and maintenance. The contract works will be supervised by a suitably qualified landscape architect. The planting works will be undertaken in the planting season after completion of the other works predicted in the Construction Phase.

Any construction works within close proximity to retained trees are advised to be undertaken in accordance with approved method statements prepared by the construction contractor under the direct supervision of a qualified Landscape Architect. Therefore, during the construction works, a professionally qualified Landscape Architect is recommended to be retained by the principal contractor or site manager to monitor and advice on any works within the RPA of retained trees to ensure successful tree retention and planning compliance. The Landscape Architect is to make regular site visits to ensure that the tree protection measures are in place and adhered to.

15.2.7.2 Operational Phase

15.2.7.2.1 Mitigation

For those trees proposed for retention (hedgerows in the peripheral areas of the site, indicated in Figure 15-2), mitigation measures will be put in place in order to prevent or reduce impact to its very minimum. Mitigation measures used will need to include the erection of protective fencing at the very start of the works, ground protection installation within root zones where fencing cannot be erected to enclose the entire root zones, monitoring of the site works by a qualified Landscape Architect throughout the construction process and the use of tree friendly techniques and products for the construction process.

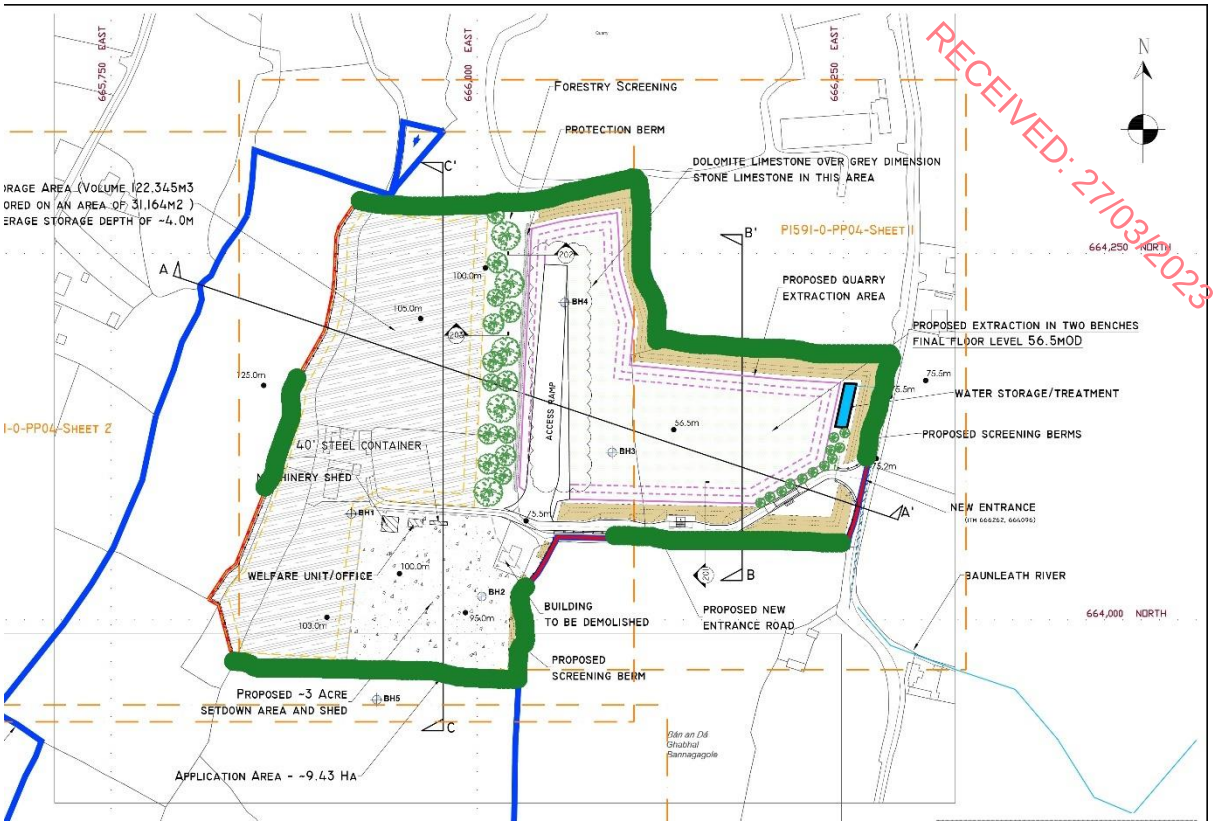

Figure 15-2 Scheme with the existing hedgerows to be retained

15.2.7.2.2 Monitoring

Monitoring of the mitigation measures will form part of the Landscape Architect supervision. Replacement trees, replacement planting and pruning measures will be undertaken if necessary. All landscape works will be in an establishment phase for the initial three years from planting. Prior to completion of the landscape works, a competent landscape contractor will be engaged and a detailed maintenance plan, scope of operation and methodology will be put in place.

15.2.8 Archaeology and Cultural Heritage

15.2.8.1 Mitigation

Should archaeological features and or deposits be revealed then any further work would be subject to further licensing with approval from the Department of Arts, Heritage and the Gaeltacht who may recommend preservation *in situ* or preservation by record.

All recommendations in this report are subject to discussion with and approval from the Department of Arts, Heritage and the Gaeltacht.

15.2.8.2 Monitoring

No specific monitoring measures are required in relation to archaeology and cultural heritage given the fact that it is not predicted that the Proposed Development will have any adverse impacts on any archaeological features or deposits. The mitigation measures detailed in Section 11.6 will also function as a monitoring system to ensure the ongoing analysis of the effectiveness of the mitigation for both the Construction and Operational Phases.

15.2.9 Materials Assets – Waste and Utilities

15.2.9.1 Mitigation

As the use of material assets for the Proposed Development is considered to be minimal, it is not foreseen that any avoidance, remedial or mitigation measures will be required for the Proposed Development.

Specific avoidance, remedial and mitigation measures have been detailed in other Chapters of the is EIAR to ensure that there will be no significant impact on the surrounding environment and associated sensitive receptors.

15.2.9.2 Monitoring

An environmental monitoring programme will be developed and implemented for the operational lifetime of the Proposed Development. The monitoring programme will verify (i) that implemented controls prevent and minimise emissions from the Proposed Development and (ii) that there is no negative impact on the receiving environment via uncontrolled releases of pollutants, sediment, dust, noise or vibration. Monitoring will also assess the effects of the quarrying activities on the environment so that operational changes and improvements can be made where appropriate. The monitoring programme and sampling frequency will be agreed with Carlow County Council.

15.2.10 Materials Assets - Traffic

15.2.10.1 Construction Phase

Mitigation

As part of the construction phase, a number of mitigation measures are proposed. These are as follows;

- In order to minimise the potential impact on the local road network surfaces, road cleaning is proposed to be implemented on site during the earliest construction phase

(e.g. earth extraction) to mitigate against material such as dust, earth, debris etc. from entering the local road network, as required.

- Furthermore, as outlined in Section 12.1.5.1, the site shall be cleared to allow the parking of all construction vehicles including staff vehicles within the bounds of the subject site.
- Haul routes outlined within 12.1.5.2.4 will be strictly adhered to by construction vehicles so as not to have an undue impact on the town of Old Leighlin. Construction vehicles are proposed to access and egress the town from the south and only as far as the 3-arm L3036/ L3036 junction. These haul routes shall be strictly controlled by the client or the appointed main constructor during the duration of the construction phase with all construction vehicle operators employed being issued maps of sanctioned haul routes to and from the site and under strict instructions to follow these routes.

Monitoring

The potential impact of construction traffic on the local road network in the vicinity of the site will be monitored during the construction phases, with regular observations of the local road network. Should monitoring indicate any excess mud or debris on the road, a road sweeper can be organised (if required) to clean the surface.

Compliance with haul routes to site will be monitored for the duration of the construction phase with spot checks carried out at Old Leighlin to ensure that any construction vehicles follow the haul routes prescribed.

15.2.10.2 Operational Phase

Mitigation

As part of the operational phase, several mitigation measures are proposed, which are as follows;

- The site access arm of the junction shall be aligned so that in interfaces with the adjoining L3036 in a perpendicular fashion and to ensure adequate visibility for vehicles egressing the site of oncoming traffic to both the east and west.
- it is proposed to ensure that the required sightlines of 90 metres (based upon the effective speed limit of 60km/h on the L3036 in the vicinity of the site access junction, based upon findings of an ATC speed survey undertaken in November 2022) are achievable in both directions to ensure adequate visibility of drivers egressing the site of oncoming traffic. See Appendix I of this document.
- The site access junction will also be provided with stop road markings and signage to ensure that vehicles egressing the site are mandated to come to a full stop before turning onto the L3036.
- In order to mitigate against the undue impact of heavy vehicles on the town of Old Leighlin, haul routes have been proposed which access and egress the town from the south and only as far as the 3-arm L3036/ L3036 junction. These haul routes shall be strictly controlled by the client during the duration of the operational phase with all heavy vehicle operators employed being issued maps of sanctioned haul routes to and from the site and under strict instructions to follow these routes.

Monitoring

Compliance with haul routes to site will be monitored continuously during the operational phase with spot checks carried out at Old Leighlin to ensure that all heavy vehicles follow the haul routes prescribed. Only pre-approved sources, authorised collection companies, sign up to agreed haulage routes as part of approval process.

Enviroguide CONSULTING

enviroguide.ie

Head Office
3D, Core C, Block 71, The Plaza, Park West, Dublin 12, D12F9TN, Ireland.
Tel: +353 1 565 4730
Email: info@enviroguide.ie

South West Regional Office
19 Henry Street, Kenmare, County Kerry, V93 CVH0, Ireland.
Tel: +353 646 641932
Email: info@enviroguide.ie

South East Regional Office
M10 Wexford Enterprise Centre, Strandfield Business Park, Rosslare Rd, Strandfield, Kerlogue, Co. Wexford, Y35 W5RD, Ireland.
Tel: +353 1 565 4730
Email: info@enviroguide.ie

Environmental Consultancy Services