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Introduction

- 16.1 This chapter of the Environmental Impact Assessment Report (EIAR) provides a summary of mitigation and monitoring commitments set out within the technical chapters, as recommended by Section 3.8.4 of the Environmental Protection Agency (2022) Guidelines on the Information to be contained in Environmental Impact Assessment Reports.

Mitigation Measures

Inherent and 'Designed-In' Mitigation Measures

- 16.2 The application site, by its nature, offers a number of advantages in terms of natural mitigation. The proposed development maximises the potential of an existing established sand and gravel pit with ancillary infrastructure, such as the existing conveyor system that can be extended to the extension area, negating the requirement for vehicular transportation of aggregates from the extraction area to the central processing area.
- 16.3 Within the newly proposed extension area, the topography is gently sloping from north to south, the highest point being the northern tip of the site at c. 140m AOD, and the lowest point being the southern boundary at c. 132m AOD. The surrounding landscape is gently undulating at elevations of between 120 and 140m AOD. The R195 regional road to the southeast of the application site, along with an intervening area of c. 100m covered by mature forestry, fully screens both the existing sand and gravel pit and the extension land areas from public view.
- 16.4 Stripped topsoil and overburden from the extension area will be used to create additional screening berms, which along with the intervening mature forestry plantations, will provide additional acoustic and dust screening to the nearest residences to the south (R1-R4).
- 16.5 All hedges and trees planted as part of the proposed landscaping and restoration plans will be comprised of native and typically occurring species present in the local vegetation and/or hedgerows in Co. Meath. 375 m of diverse native hedge will be planted as part of the restoration proposal.

Legislation and Best Practice Mitigation Measures

- 16.6 The operation of the pit is covered by legislation and industry best practice that is followed by BD Flood Unlimited Company in all of its operations.
- 16.7 The company is committed to achieving high environmental standards and has an established in-house environmental management system (EMS) at the site. BD Flood is a member of the Irish Concrete Federation (ICF) and as a member commits itself to the principles of the Federations Environmental Code, which states:
"ICF members will minimise production of waste and where appropriate consider its beneficial use including recycling. They will deal with all waste in accordance with the relevant legislation and other controls in place, including waste contractors with valid Waste Collection Permits".
- 16.8 The company has achieved accreditation ISO14000 for its Environmental Management Systems. Copies of the company's Environmental Policy & NSAI 14001 Environmental Management Certification are provided in EIAR Chapter 1, **Appendix 1-B**.
- 16.9 Operations at the site will adhere to the Health and Safety Authority Safe Quarry Guidelines in relation to the Safety Health and Welfare at Work (Quarries) Regulations 2008 and this will limit the potential for unplanned events such as instability of pit faces or instability in

adjacent lands. Planning legislation enforced through the planning conditions associated with the Section 261 registration process at the existing site has required implementation of environmental mitigation and monitoring there.

- 16.10 Current best practice guidance include, but is not limited to the following:
- EPA Environmental Management Guidelines (2006): Environmental Management in the Extractive Industry (Non-Scheduled Minerals); and
 - DoEHLG (Department of the Environment, Heritage and Local Government) April 2004: Quarries and Ancillary Activities Guidelines for Planning Authorities.

Specific Mitigation Measures

- 16.11 **Table 16-1** below sets out the specific mitigation measures that are proposed to be implemented through the proposed development.

Table 16-1: Schedule of Site-Specific Mitigation Measures to be Implemented

Mitigation Measure Proposed	Timeframe
General BD Flood is committed to achieving high environmental standards and has an established in-house environmental management system (EMS) at the site, and the precast manufacturing facility within the landholding has ISO14000 accreditation. If planning permission is granted for the proposed extension, then the EMS will be extended to the proposed extension area. The EMS is provided in Chapter 2: Appendix 2-A.	Throughout all activities of the applicant
Population and Human Health - General The main potential for disturbance to the local population and human health is through the potential for environmental emissions associated with the topic areas that are assessed within other chapters of the EIAR, therefore the mitigation measures proposed in relation to those are considered appropriate to address population and human health issues.	Throughout development
Population and Human Health - Radon Radon testing can be undertaken at on-site structures and, should elevated radon gas levels be detected, remedial measures such as enhanced ventilation or installation of a radon sump can be implemented in agreement with an EPA registered radon tester.	Following construction
Biodiversity – Protection of Species and Habitats Mitigation measures in relation to water, noise and air quality (identified under those headings below) will protect the biodiversity and integrity of the nearby and downstream ecological receptors.	Throughout development
Biodiversity - Hedgerows Native hedgerows will be planted over a length of c. 375 m within the restored pit floor area to replace the hedgerow which will be removed during the extraction phase	On restoration
Biodiversity – Enhancement On completion of the extraction works the sand and gravel pit floor will be restored to an agricultural use, and pit slopes will be partly retained and regraded and allowed to naturally regenerate to provide a more diverse biodiversity habitat area	On restoration
Land, Soils and Geology – Soil Management A specific Soil Management Plan will be developed for the site for the stripping, storage and reuse of the soils in restoration at the site.	Prior to commencement
Soil Management Soils will be managed on site in line with best practice measures identified in The Institute of Quarrying Good Practice Guide for Handling Soils in Mineral Workings, 2021. In order to limit the effects of erosion and deterioration on the soil, material will not be removed during either periods of prolonged dry weather or excessively wet weather; this is to avoid the higher potential for dust generation during extended periods of dry weather, and conversely the greater potential for soil erosion during extended periods of wet weather. The soil handling method can affect the quality of the restoration through severe soil deformation (compression and smearing); this is primarily caused through trafficking, the effects of which increase with soil moisture content. The scheme will involve progressive soil stripping across the	Throughout the development

Mitigation Measure Proposed	Timeframe
<p>proposed extension area. The soil stripping and storage operations will be undertaken in such a manner so as to minimise soil compaction. The Soil Management Plan will cover the following focus areas:</p> <ul style="list-style-type: none"> • Soil Resource Conservation • Topsoil and Subsoil Management • Soil Handling during Adverse Weather Conditions • Minimising Erosion and Runoff • Soil Replacement and Site Restoration • Biodiversity and Ecological Protection • Monitoring and Adaptive Management 	<p>04/07/2025</p>
<p>Land, Soils and Geology – Stockpile Management</p> <p>Topsoil storage will not exceed 3m in height (typical height will be 2m) in order to protect the structure of the soils for use in restoration and any subsoils, if present, will be stored at a maximum height of 5m on the pit floor.</p> <p>Stripped soils will be re-vegetated where they are in place for a sufficient length of time to justify such a measure. The re-handling of soil material will be minimised as much as possible in order to preserve the integrity of the topsoil material. This is also an economically prudent practice.</p>	<p>Throughout the development</p>
<p>Land, Soils and Geology – Land Stability</p> <p>The design of the extraction area has provided suitable set-back distances to adjoining land boundaries and the final pit slopes to ensure long term stability.</p> <p>Operations at the proposed development site will comply with the Health and Safety Authority Safe Quarry Guidelines in relation to the Safety Health and Welfare at Work (Quarries) Regulations 2008 to ensure stability of the adjoining lands.</p>	<p>Throughout the development</p>
<p>Land, Soils and Geology –Geological Heritage</p> <p>In terms of geological heritage, subject to prior agreement and appropriate H&S requirements for working at the site, scientists or competent geologists will be provided access to pit faces during operations to study new stratigraphy's and morphology. The pit faces will be retained for the duration of extraction operations to allow the investigation of the stratigraphy.</p>	<p>Throughout the operational period of development</p>
<p>Hydrology and Hydrogeology - Protection of Water Quality</p> <p>In order to mitigate against the risk of pollution to groundwater and surface water occurring at the site the following management measures will be implemented:</p> <ul style="list-style-type: none"> • Rain falling across the site will percolate downwards and recharge to the underlying sand and gravel. There will be no surface water run-off or overground flow across the site • There will be no off-site discharge from the proposed development to any surface water course. 	<p>Throughout the development</p>

Mitigation Measure Proposed	Timeframe	
<ul style="list-style-type: none"> No re-fuelling (or servicing) of excavation plant will occur at the extraction area. Refuelling will take place adjacent to the bunded fuel storage area on a concrete pad with associated hydrocarbon interceptor attached in the existing operational site area at the BD Flood Site, with the exception of the jaw crusher and excavator which are refuelled at the working face using a bunded fuel bowser. No fuel and oils will be stored at the application site. Fuel and oils will continue to be stored in the bunded fuel tanks at the existing site. Final floor levels at the proposed pit excavations will be maintained above the underlying (seasonal maximum) groundwater level and any rain falling across the pit will percolate naturally through unsaturated ground to the underlying groundwater. A number of spill kits will be available on-site to stop the migration of any minor accidental leakages or spillages should they arise. In order to control dust emissions, water will be sprayed from a tractor drawn bowser on dry exposed surfaces and stockpiles (paved roads, unsealed haul roads and hardstand areas) as required Areas of bare or exposed soils will, insofar as practicable, be kept to a minimum during the extraction operations. All HGVs exiting the site will be routed through the existing wheelwash at the BD Flood Site. This will minimise the transport of fines by HGVs over the access / egress road and the public road network. Periodic sweeping of the internal paved site access road and surrounding public roads will be carried out as required by a mechanical road sweeper. 		
<p>Hydrology and Hydrogeology – Reduced Water Consumption</p>	<p>The water requirement at the site is minimal and will be reduced further through monitoring water use and by promoting recycling and water efficient practices at the existing BD Flood Site. The current washing plant recycles 90% of the water for reuse in the current onsite washing operations.</p>	<p>Throughout the development</p>
<p>Air – Additional Dust Management</p>	<p>Site preparation / restoration</p> <ul style="list-style-type: none"> Restricted vehicular access to restored areas Handling minimised where possible and drop heights reduced to the minimum practicable <p>Excavation</p> <ul style="list-style-type: none"> Majority of excavation undertaken below the natural lay of the land, acting as a natural barrier <p>Material handling</p> <ul style="list-style-type: none"> Application of water suppression using onsite bowser, as required 	<p>Throughout the development</p>

Mitigation Measure Proposed	Timeframe
<ul style="list-style-type: none"> Minimise drop heights when handling material. Protect from wind where possible. <p>On-site transportation</p> <ul style="list-style-type: none"> All onsite haulage routes regularly inspected for integrity with repairs instigated as soon as practicable (all inspections / actions recorded in site log book) All onsite haulage routes regularly inspected for integrity with repairs instigated as soon as practicable (all inspections / actions recorded in site log book) <p>Off-site transportation</p> <ul style="list-style-type: none"> Application of water suppression using onsite bowser, as required Site speed limit of 15kph <p>Processing</p> <ul style="list-style-type: none"> All plant used within their design capacity and serviced in line with manufacturers' recommendations (all to be recorded within site log book) <p>Storage – soil / overburden</p> <ul style="list-style-type: none"> Mobile Crushing Plant: Fitted with a dust suppression system, to be used at all times when in operation. Application of water suppression using onsite bowser, as required <p>Storage – other</p> <ul style="list-style-type: none"> Seed / vegetate surfaces of stockpiles of overburden / soils. 	
<p>Climate Change - Resilience</p> <p>Procedures to facilitate operational shutdown will be implemented where required during extreme weather conditions.</p> <p>Selection, design, operation, and maintenance of plant and equipment will be considered in terms of climate resilience.</p> <p>Insurance for site assets and operations will be obtained.</p>	<p>Throughout the development</p>
<p>Climate Change - Mitigation</p> <p>The Applicant will implement its company-wide Energy and Carbon Policy.</p> <p>Measures that will be considered include use of renewable energy sources / suppliers, use of energy efficient machinery / energy, consider future use of electric plant & machinery where practical, avoidance of unnecessary equipment / transport journeys should be avoided by management of transport and travel demands.</p> <p>Equipment should not be left in unnecessary idling mode.</p> <p>Training programme for GHG mitigation to be provided for employees/ contractors.</p>	<p>Throughout the development</p>

Mitigation Measure Proposed	Timeframe
<p>Noise – Management Measures</p> <p>General best practice guidance on several aspects of construction site mitigation measures, including, but not limited to will be implemented:</p> <ul style="list-style-type: none"> • Selection of quiet and / or low vibration emitting plant; • Control of noise sources; • Screening; • Hours of work; • Liaison with the public; and • Monitoring. <p>Mechanical Plant</p> <ul style="list-style-type: none"> • All plant items will be properly and regularly maintained and operated according to the manufacturers’ recommendations, in such a manner as to avoid causing excessive noise. • All plant will be fitted with effective exhaust silencers which are maintained in good working order to meet manufacturers’ noise rating levels. Any defective silencers will be replaced immediately. <p>Vehicle Movement within Site Boundary</p> <ul style="list-style-type: none"> • Access / internal haul roads will be kept clean and maintained in a good state of repair, i.e., any potholes are filled, and large bumps removed, to avoid unwanted rattle and “body-slap” from heavy goods vehicles. • Vehicles waiting within the site will be prohibited from leaving their engines running and there will be no unnecessary revving of engines. • Care will be taken when unloading vehicles to reduce or minimise potential noise disturbance to residents 	<p>Throughout the development</p>
<p>Material Assets - ESB</p> <p>Works in the area of the underground higher voltage cable running inside the southwestern boundary of the new proposed extension area will be carried out in close consultation with ESB Networks. No excavation works will be carried out within the buffer zone (i.e. within 5m either side of the route)</p>	<p>During site establishment and extraction</p>
<p>Material Assets - Waste</p> <p>All waste generated at the site will be appropriately stored and removed by licensed contractors</p>	<p>Throughout the development</p>
<p>Archaeology and Cultural Heritage – Archaeological Resources</p> <p>Due to the possibility of the survival of previously unknown sub-surface archaeological deposits or finds within the newly proposed extension area, all topsoil-stripping in this area should be monitored by a qualified archaeologist under licence from the National Monuments Service.</p>	<p>During site preparation</p>

Monitoring Measures

- 16.12 A number of environmental monitoring activities are to be continued during all stages of the proposed development to confirm the effectiveness of the mitigation measures described above, to establish if there are any trends in environmental parameters and to highlight the need for remedial action if necessary.
- 16.13 Environmental monitoring requirements have been identified in the specific chapters of the EIAR. The frequency of the monitoring requirements identified below have been collated and provided in a schedule displayed in **Table 16-2**. **Figure 16-1** indicates the monitoring locations across the application site. Additional monitoring locations can be provided if deemed necessary by Meath County Council should planning permission be granted.

Population and Human Health

- 16.14 Monitoring for the protection of population and human health during the proposed development will be carried out in accordance with the wider environmental monitoring programme for the protection of water, air quality and noise.

Biodiversity

- 16.15 The proposed removal of one ash tree with potential roost features (PRFs) on-site must undergo reasonable avoidance measures, whereby the tree should be soft felled with any sections possessing PRFs being lowered gently to the ground and left for at least 24 hours, leaving the PRF unobstructed.
- 16.16 No vegetation loss should be undertaken during the breeding bird season to avoid impacting birds during this sensitive time. If vegetation removal is required during this time as a last resort (using an exemption in the Wildlife Act¹), a nesting bird check conducted by a suitably qualified ecologist should be undertaken no more than 24 hours prior to the planned removal.
- 16.17 If nesting birds are found during this check, they must be left in situ with a suitable buffer around the nest (detailed by the ecologist following the nesting bird check) until the chicks have fledged.

Land, Soils and Geology

- 16.18 BD Flood will clearly define the management responsibility for the site restoration work and will ensure that this person has the necessary information (from the planning application) and authority to manage the whole restoration process. Relevant staff will be briefed on the scheme and will be adequately supervised / controlled. A system of record keeping for the key restoration activities will be put in place.
- 16.19 A final site inspection 6 months after formal site closure will be carried out to confirm the final site restoration as implemented is functioning.

Hydrology and Hydrogeology

- 16.20 Development of the sand and gravel pit presents an opportunity to protect and improve surface water quality in a sub catchment. The proposed monitoring program will allow for the following data collection in this sensitive sub catchment.

¹ Section 40 of the Wildlife Act 1976 as amended by the Wildlife (Amendment) Act 2000 and the Heritage Act 2018 – Section 40(2) (e)

- 16.21 A network of groundwater monitoring boreholes has been installed across the site.
- 16.22 The following monitoring activities will be carried out to demonstrate that the development is not having an adverse impact on the surrounding environment and will document any improvements in water quality.
- groundwater levels in all boreholes will be monitored on a quarterly basis for the duration of the proposed development;
 - groundwater quality monitoring to be undertaken on an annual basis for the duration of the proposed development; and
 - surface water quality monitoring to be undertaken monthly (March – September) for the duration of the proposed development.

Air Quality

- 16.23 Dust deposition monitoring will be undertaken at the site for the duration of the proposed development in accordance with conditions attached to any future planning permission and in line with the EPA and DoEHLG guidelines).
- 16.24 Dust monitoring should continue using the Bergerhoff Method at the existing monitoring locations D1 to D8. It is recommended that an additional dust monitor (D9) is installed along the southern boundary of the wider landholding (i.e. between the southern extent of the proposed development and the residential areas along the R195), to ensure levels of dust deposition in at the residences south of the proposed development are monitored.

Noise

- 16.25 Noise monitoring will be undertaken at noise sensitive locations around the periphery of the overall landholding site for the duration of the proposed development in accordance with conditions attached to any future planning permission and in line with the EPA and DoEHLG guidelines).
- 16.26 It will be necessary that the operator continues to complete annual compliance noise surveys (twice per year) to establish operational noise emissions from the site. The surveys shall be completed by a Competent Person in accordance with the EPA *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities* (NG4). The surveys shall be completed using a Class 1 Sound Level meter.

Archaeological Monitoring

- 16.27 Due to the possibility of the survival of previously unknown sub-surface archaeological deposits or finds within the newly proposed extension area, all topsoil-stripping in this area should be monitored by a qualified archaeologist under licence from the National Monuments Service.

Landscape

- 16.28 With regard to the hedge planting, establishment maintenance will be carried out for 2 years following the planting works (minimum 3 maintenance visits per year; i.e. spring, summer and autumn). This will include weed control, replacement planting, watering (if required) and the adjustment/removal of tree ties and spiral guards (refer to EIAR **Figures 2-4**). Thereafter, there are no specific landscape monitoring requirements.

Table 16-2 Indicative Schedule of Environmental Monitoring

Activity (Responsibility)	Q1			Q2			Q3			Q4		
	J	F	M	A	M	J	J	A	S	O	N	D
Land, Soils and Geology - Continual monitoring during Restoration (Applicant)												
Monthly Dust Monitoring at 8 locations (Contracted Consultant), supplemented by visual checks												
Quarterly Groundwater Level in 6 boreholes with loggers (Contracted Consultant)												
Annual Groundwater Quality in 6 boreholes – manual dips (Contracted Consultant)												
Annual Surface Water Quality in 2 stream locations (Contracted Consultant)												
Annual Noise Monitoring at 6 locations (Contracted Consultant)												
Climate Progress – GHG Monitoring Report (Applicant)	<i>In line with wider BD Flood Reporting</i>											
Landscape Maintenance (Contracted Consultant – 2-years following final restoration works)												

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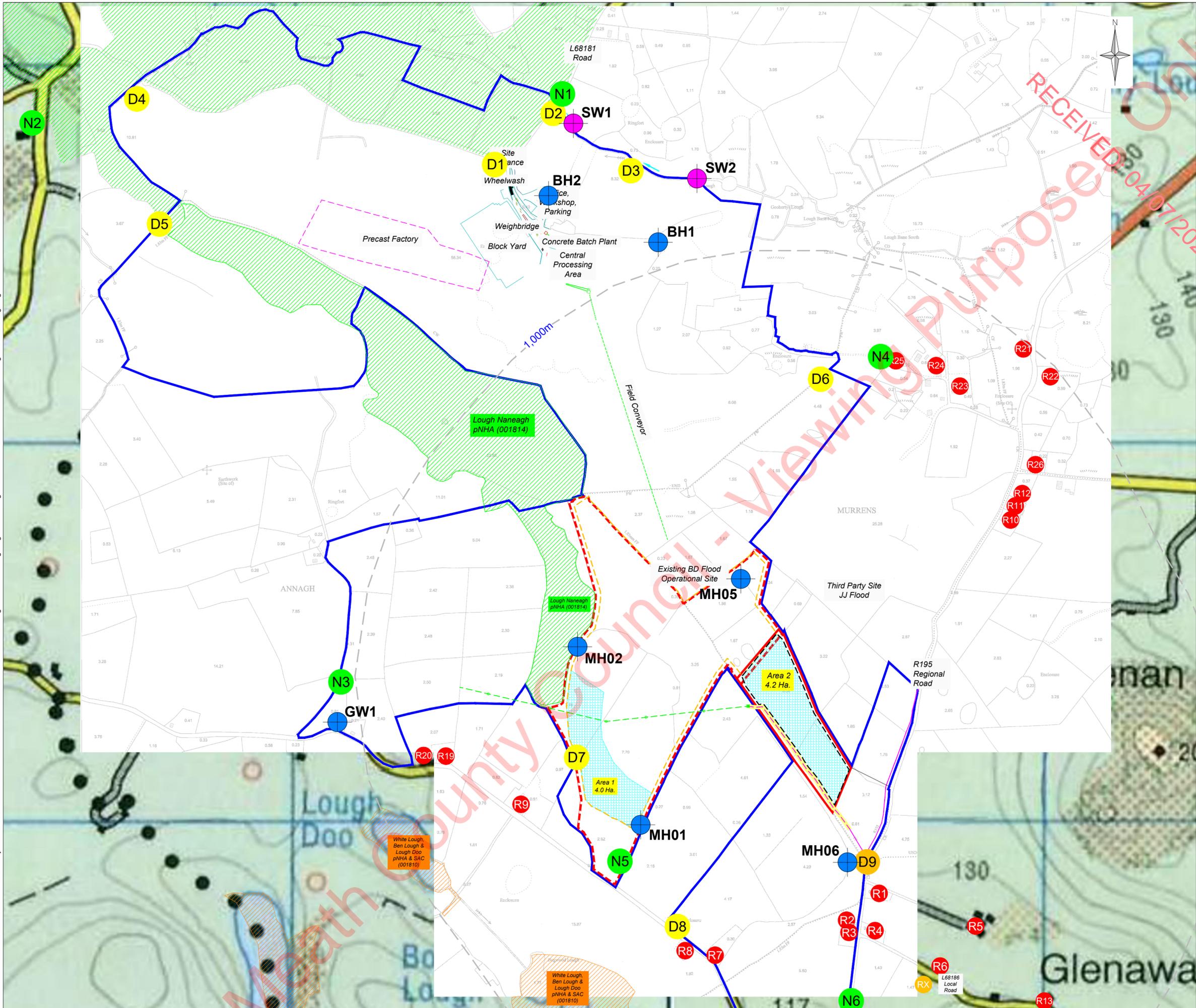
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Figures

Figure 16-1: Environmental Monitoring Locations

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 02/07/2025
 CYAL50381397
 © Taite Éireann - Surveying.



Notes:
 1. Based on Taite Éireann Digital maps 2304, 2305, 2367, 2368

- Legend:**
- Landholding
 - Planning Application Area (c. 5.8 hectares)
 - Proposed Extraction Area (c. 4.2 hectares)
 - Planning Permission KA14/1129 (c. 28.5 hectares)
 - Permitted Extraction Area KA14/1129 (c. 23.9 hectares)
 - Distance Off-Sets from Planning Application Boundary (1km)
 - R2 Residential Property Locations
Residences within 1km of Red Line Application Boundary
 - RX Residential Property permitted within the last 5 years but not yet constructed
 - D1 Existing Dust Monitoring Locations
 - D9 Proposed New Dust Monitoring Location
 - N1 Existing Noise Monitoring Locations
 - BH1 Groundwater Monitoring Locations
 - SW1 Surface Water Monitoring Locations (Stream along northern landholding boundary)

AREA 1 = 4.0 hectares **inside** existing permitted extraction area
AREA 2 = 4.7 hectares **outside** existing permitted extraction area

- PROPOSAL TO:**
- Not extract **Area 1** and agricultural lands remain in-situ
 - Seek permission to extract sand & gravel from **Area 2** in-lieu of Area 1
 - No requirement for any amendment of conditions attached to existing permission KA14-1129
 - planning permission term to remain the same
 - permitted annual extraction rate to remain the same

Rev	Amendments	Date	By	Chk	Auth

www.slrconsulting.com

Client
 BD Flood Unlimited Company

Project
 Sand & Gravel Pit Extension
 The Murrens, Oldcastle, Co. Meath

Figure Title
 Environmental Monitoring Locations

Scale NTS @ A2		SLR Project No. 501.065670.00001	
Designed smcd	Drawn smcd	Checked lh	Authorised lh
Date 01/25	Date 01/25	Date 03/25	Date 03/25

Figure Number
Figure 16-1