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INTRODUCTION

- 16.1 This Environmental Impact Assessment Report was prepared by SLR Consulting on behalf of Kilsaran as an integrated document, rather than a collection of separate reports.
- 16.2 A summary of mitigation and monitoring commitments as recommended by Section 3.8.4 of the Environmental Protection Agency Guidelines on the Information to be contained in Environmental Impact Assessment Reports are contained within this chapter.

MITIGATION MEASURES

Inherent and 'Designed-In'- Mitigation Measures

- 16.3 The application site, by its nature, offers a number of advantages in terms of natural mitigation. For example, the site is largely screened in views from the surrounding area by existing mature vegetation, screening berms and topography.
- 16.4 A number of elements of the proposed development have been designed with the specific purpose of introducing enhanced environmental mitigation measures to the existing quarry.
- 16.5 The proposed new milling plant to be located on the existing quarry floor will significantly reduce impacts on nearby residences in terms of noise and the greater potential for any airborne material to settle within the site.
- 16.6 The majority of rock extraction will be carried within the existing quarry void at depth with the existing quarry faces providing acoustic, visual and dust screening. Additional vegetation planting berm along the site boundary will provide additional screening.

Legislation and Best Practice Mitigation Measures

- 16.7 The operation of the quarry is covered by legislation and industry best practice that is followed by Kilsaran in all of its operations.
- 16.8 For example, 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 quarry faces or instability in adjacent lands. Planning legislation enforced through the planning conditions associated with previous planning permissions at the site have required implementation of environmental mitigation and monitoring.
- 16.9 Current best practice guidance followed 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

- 16.10 **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

Topic	Mitigation Measure Proposed	Timeframe
Population & Human Health	<p>The main potential for nuisance/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 below are also considered appropriate to address population and human health issues.</p> <p>It is possible that any planning contributions payable in relation to a grant of planning permission can be used to fund improvements in services and facilities for local communities.</p>	
Biodiversity – Hedgerows and Trees	Proposed hedge planting in a number of locations along the southern and western boundary to tie into existing dense vegetation along those boundaries (c. 330m in total).	At earliest available opportunity within the appropriate season of Year 1
Biodiversity – Dry Meadows (GS2) / Orchids	There will no further storage of over-burden in this area and it will be left in its current state and act as a biodiversity area. This means that any orchid species present will not be impacted by any future works and no Annex I habitat will be affected.	All stages of the proposed development
Biodiversity – Amphibians	<p>The majority of the suitable terrestrial habitat will be retained, with only c.50m of treeline to be removed. All terrestrial habitats surrounding the pond (i.e., the terrestrial habitats of highest value to amphibians) will be retained in the proposed development. In addition, the deadwood created from the loss of the treeline will be positioned within retained habitats surrounding the pond. This will create potential refugia for amphibians on the Site.</p> <p>Furthermore, the quarry void will be filled with water during the restoration phase. These measures will create additional potential breeding habitat for amphibians on the Site, providing a long-term positive impact.</p>	All stages of the proposed development
Biodiversity – Cliff Nesting Birds	Cliff-nesting birds can establish nesting sites early in the bird nesting season; if construction works are to begin in the bird nesting season (1 st March – 31 st August), it is recommended that pre-construction surveys for cliff-nesting birds are undertaken on the Site. These surveys will confirm presence / absence of cliff-nesting nesting bids such as peregrine and allow appropriate mitigation to avoid disturbance of nesting birds, if present. The	All stages of the proposed development

Topic	Mitigation Measure Proposed	Timeframe
	<p>surveys will comprise of up to three survey visits¹ following guidance adopted from the BTO²:</p> <ul style="list-style-type: none"> • The first visit will take be undertaken between early March and mid-April. • If no birds are recorded on the first visit, a second survey visit should be undertaken 2-6 weeks following the first visit to establish if late breeding birds have begun nesting. If no nests are found at this time construction works can commence. <p>It is anticipated that cliff-nesting birds such as peregrines will be able to use other areas of the quarry that are not undergoing planned works, with retained areas of the quarry providing suitable ledges for nesting during the operational phase.</p> <p>All works will stop if evidence of cliff-nesting are noted within the working area of the quarry. The advice of a qualified ecologist will be sought and a suitable buffer area where no works will take place will be communicated (i.e. no interference of the nest during the bird nesting season of 1st March to 31st August). Monitoring surveys will be implemented to establish when the peregrines are considered to no longer be nesting and works can resume.</p> <p>The restoration phase will allow the quarry to flood and create a permanent lake but will also leave exposed cliff faces above the water level. Therefore, it is likely that cliff-nesting birds will still be able to nest on the quarry face and may actually benefit from the flooding of the quarry, through increased protection from predators.</p>	
Biodiversity – Passerine Birds	<p>Existing external hedgerows, treelines (other than approximately 50 m of treeline), and existing vegetation along the application site boundaries will be protected and retained. This will maintain ecological corridors along the boundaries of the Site to the surrounding habitats and will provide suitable bird nesting habitat.</p> <p>The necessary vegetation removal to facilitate the proposed works will be removed outside the nesting bird season (which runs between 1st March to 31st August) to avoid harming nesting birds that may be present during the nesting season. If any vegetation removal is required inside the nesting season, a preliminary nesting bird check will be undertaken by a qualified ecologist no longer than 48 hours prior to the</p>	All stages of the proposed development

¹ If peregrine presence is recorded, following survey visits are not necessary.

² BTO (2014). The 2014 Peregrine Survey Guidelines for Contributors. Available from https://www.bto.org/sites/default/files/shared_documents/peregrine_survey/2014-peregrine-survey-guidelines-contributors.pdf. Last accessed October 2023.

Topic	Mitigation Measure Proposed	Timeframe
	<p>removal. Any confirmed nests will be protected through a suitable buffer zone, communicated by the ecologist. All confirmed nests will be left <i>in situ</i> until all chicks have fledged and the nest is disused.</p> <p>Proposed hedgerow planting will infill existing gaps within the hedgerow and provide a net gain of suitable nesting and foraging habitat for passerine birds on the Site.</p> <p>During the restoration phase, areas of the Site will be allowed to naturally re-vegetate. This will lead to an overall increase in nesting and foraging habitat for passerine birds in the long-term.</p>	
Biodiversity – Bats	<p>The three trees with low bat roosting potential will be mitigated for and undergo a soft-felling technique. This will include individually removing limbs and slowly lowering to the ground. Any PRFs will be left unobstructed. All parts of the tree will be left for a minimum period of 24 hours to allow any bats potentially inside to escape.</p> <p>All existing external hedgerows, treelines, existing planting along the application site boundaries will be protected and retained as far as possible. This will retain ecological corridors along the boundaries of the Site.</p> <p>The proposed restoration plan (EIAR Figure 2-5) will revert all lands within the Site for natural re-vegetation and ecological habitat use. This will represent a replacement (like for like) of potential breeding and foraging habitat for bats.</p>	During site preparation works
Biodiversity – Badger, Pine Marten, Hedgehog and invertebrates	<p>All suitable habitats for these species, other than c.50 m of treeline will be retained. It is recommended that the required loss of treeline will be undertaken under the supervision of a qualified ecologist. This ecologist will check for these species in this area immediately prior to the vegetation removal.</p> <p>The proposed restoration plan (EIAR Figure 2-5) will revert all lands within the Site for natural re-vegetation and ecological habitat use. This will represent a replacement (like for like) of potential breeding and foraging habitat for these species and represents a long-term positive residual effect.</p>	During site preparation works and on completion of restoration
Biodiversity – Restoration	<p>Aftercare will consist of establishment maintenance for 2 years following the planting works (minimum 3 maintenance visits per year). This will include weed control, replacement planting where required and the adjustment/removal of tree ties and spiral guards.</p>	On completion of restoration

Topic	Mitigation Measure Proposed	Timeframe
Land, Soils, Geology – Soil Management	<p>Soils will be managed on-site in line with best practice national guidelines (National Roads Authority, 2006) and Specification for Road Works Series 600 – Earthworks (Transport Infrastructure Ireland, March 2013).</p> <p>All stripped soil will remain on site and be stored in the designated overburden storage area.</p> <p>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 quarry faces or instability in adjacent lands.</p> <p>Kilsaran will facilitate access to the quarry by GSI staff in order to inspect the geology at Rathcore quarry if required.</p>	During site preparation works / life of development
Water – Groundwater Levels	Kilsaran will continue to monitor groundwater levels in both on-site boreholes and local private wells throughout the operation phase to identify any further potential effects. In the event that a significant effect is identified, Kilsaran will either deepen the well or provide an alternative water supply to the property.	All stages of the proposed development
Water – Downstream Surface Water Flow Volumes	<p>A water management system is already in place at Rathcore Quarry whereby a combination of groundwater and surface water is treated and attenuated within the site prior to discharge in accordance with the existing discharge licence.</p> <p>The existing water management system will be upgraded as required to deal with the increasing volumes of water. The following mitigation measures will be implemented with respect to surface water discharge volumes:</p> <ul style="list-style-type: none"> • An expanded temporary sump on the quarry floor will provide attenuation of water; • Water will be pumped to the existing settlement pond which will provide additional attenuation; • An additional settlement pond (equivalent to the existing pond) will be installed if sampling results for suspended solids indicates that additional treatment is required; • Kilsaran will apply to Meath County Council for a review of the existing discharge licence at the site. This licence will set out a new discharge volume limit and Kilsaran will comply with the conditions in any revised discharge licence and will put in place the necessary measures to achieve this; and, • The volume of water to be discharged will increase gradually throughout the operational phase as the 	All stages of the proposed development

Topic	Mitigation Measure Proposed	Timeframe
	<p>quarry void is extended and deepened. Site investigations have shown that the bedrock in the north of the quarry contains a higher concentration of water bearing fractures and conduits in comparison to the southern area. A key mitigation during the operational phase will be to work the benches from south to north, thereby reducing the periods when maximum discharge volumes will be required.</p>	
Water – Downstream Surface Water Quality	<p>The following mitigation measures will be in place for the operational phase once the initial dirty water has been treated:</p> <ul style="list-style-type: none"> • The water will be directed to the quarry sump through channels on the quarry floor and will then be pumped up to the discharge treatment area be treated through the settlement lagoon(s), hydrocarbon interceptor and a constructed reed bed prior to discharge as surface water; • An additional settlement pond will be installed if sampling results for suspended solids indicates that additional treatment is required. The settlement pond and the sump on the quarry floor will be sized to ensure there is adequate retention time for the settling of solids; • Additional treatment capacity for hydrocarbons, in the form of hydrocarbon separator(s), will be added as required with the increase in discharge from the site; • Kilsaran will apply to Meath County Council for a review of the existing discharge licence at the site. Kilsaran will comply with the conditions in any revised discharge licence and will put in place the necessary measures to achieve this; • Fuel will be stored in the designated bunded tanks at the site with 110% of the tank capacity, and in a double skinned tank for the pump generator; • Surface water from bunds will be pumped out through a suitable oil interceptor or will be taken off site by a licenced contractor for disposal; • All chemicals and lubricating/hydraulic oils will be stored on spill trays under cover in the existing workshop; • Waste oils will be stored under cover in the workshop on spill pallets and will be collected and disposed of by a licenced contractor; • All plant will be regularly maintained and inspected daily for leaks of fuels, lubricating oil or other contaminating liquids/liquors; 	All stages of the proposed development

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Topic	Mitigation Measure Proposed	Timeframe
	<ul style="list-style-type: none"> Maintenance of plant and machinery will be undertaken within existing site maintenance sheds / workshop or on the hard stand area in front of the workshop, as appropriate, in order to minimise the risk of uncontrolled release of polluting liquids; The refuelling of vehicles will be undertaken on the surfaced area adjacent from the fuel tank beside the workshop, in order to minimise the risk of uncontrolled release of polluting liquids / liquors reaching the receiving environment; The refuelling of plant and machinery on the quarry floor will only be undertaken using a mobile double skinned fuel bowser, in order to minimise the risk of uncontrolled release of polluting liquids/liquors which may arise from an accident; and, A spill kit is kept on site to stop the migration of any accidental spillages, should they occur. 	
Water - Wastewater	Wastewater at the site will be treated in a new proprietary treatment system which will comprise of a septic tank and filter system. The treated effluent will be released through a percolation area.	All stages of the proposed development
Water - Hydrocarbons	<p>The following mitigation measures will be employed with respect to hydrocarbons:</p> <ul style="list-style-type: none"> All plant and machinery will be serviced before being mobilised to site; Refuelling will be completed in a controlled manner using drip trays (bundled container trays) at all times; 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; and, <p>All water pumped from the quarry will pass through a hydrocarbon interceptor prior to discharge.</p>	All stages of the proposed development
Air Quality – Dust Management	<ul style="list-style-type: none"> Training on dust mitigation measures shall be provided to site-based staff. Drop heights will be minimised when handling materials. Use of excavated soil will be maximised in the construction of vegetated screening berms or in quarry restoration works. Mechanical disturbance of materials more likely to become airborne will be limited during adverse weather conditions. 	All stages of the proposed development

Topic	Mitigation Measure Proposed	Timeframe
	<ul style="list-style-type: none"> Protection from wind will be catered for where possible, such as locating stockpiles to take advantage of any available shelter. Length of on-site haul routes will be minimised and vehicle speeds will be restricted to less than 20kph. Signage will be erected and staff training provided. Traffic will be routed away from surrounding sensitive receptors as far as possible. Road sweeper will be used to reduce the amount of material available for re-suspension. Hard paved surfaces / access road to be provided. HGVs will be routed through wheelwash facility. Vehicles carrying loads of fine, dry particulate materials (which may be more likely to become airborne) will be covered prior to exiting the quarry. New rock milling plant will be enclosed within a steel-clad building, plant will be fitted with a bag filter and milled lime will be stored in enclosed silos, discharging by enclosed chute directly to haulage tankers eliminating exposure to wind. 	
Climate – Reducing GHG Emissions	<p>The Applicant will implement a GHG monitoring programme and seek to reduce CO₂ emissions from the site through the following:</p> <ul style="list-style-type: none"> Consideration of using renewable energy sources / suppliers; Using low carbon construction materials where possible; Using energy efficient machinery / energy; Avoiding unnecessary equipment / transport journeys by management of transport and travel demands; and Equipment not to be left idling. 	All stages of the proposed development
Noise – Management Measures	<p>Screening:</p> <ul style="list-style-type: none"> existing perimeter berms and hedge planting will be retained and supplemented where necessary; the proposed new rock milling plant will be located on the existing quarry floor to maximise screening by the existing quarry faces. <p>Machinery and Plant:</p> <ul style="list-style-type: none"> all mobile plant used at the development will have noise emission levels that comply with the limiting levels defined in EC Directive 86/662/EEC and any subsequent amendments; all plant items will be properly and regularly maintained and operated according to the manufacturers' recommendations, in such a 	All stages of the proposed development

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Topic	Mitigation Measure Proposed	Timeframe
	<p>manner as to avoid causing excessive noise (i.e. all moving parts are kept well lubricated, all cutting edges are kept sharpened, the integrity of silencers and acoustic hoods are maintained);</p> <ul style="list-style-type: none"> 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; similar to the existing lime processing plant on site, the proposed new rock milling plant will be within an enclosed unit which will be further enclosed within a steel-clad building to minimise noise. <p>Traffic:</p> <ul style="list-style-type: none"> all operations on site will be programmed to be carried out during daytime hours only; care will be taken when loading vehicles to reduce or minimise potential disturbance to local residents; 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 quarry will be prohibited from leaving their engines running and there should be no unnecessary revving of engines. 	
Vibration – Management Measures	<p>The following measures have been and are implemented at the planning application area to minimise disturbances due to blasting operations. These mitigation measures are in accordance with the 'best practice / mitigation' measures:</p> <ul style="list-style-type: none"> blasting is carried out between the hours of 10:00 hrs to 17:00 hrs from Monday to Friday (except in emergencies or for health and safety reasons beyond the control of the operator). A blast must be carried out on site on the specified day, as concerns over security does not allow for explosives to be stored on site; blasting is not carried out on Saturdays, Sundays or public holidays; blast notifications are provided for residences within 500m of the quarry and by pre and post siren warnings; all blasting operations have been and are carried out by a certified 'shotfirer' in accordance with the relevant health and safety regulations; the optimum blast ratio is maintained, and the maximum instantaneous charge is optimised. 	Operation of the proposed development

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Topic	Mitigation Measure Proposed	Timeframe
	<ul style="list-style-type: none"> to avoid any risk of damage to properties in the vicinity of the site, the groundborne vibration levels from blasting does not exceed a peak particle velocity of 12 mm/sec. 	
Traffic	<p>A Construction Environmental Management Plan (CEMP) will be prepared, including measures to provide information to affected parties, including advising land and property owners in advance of any diversions. Local access shall be maintained at all times. In addition, it is proposed that temporary signage shall be put in place to minimise disruption and ensure all road users understand that construction works are in progress.</p> <p>The CEMP will detail the allowable working day, construction traffic, parking arrangements and will incorporate environmental protection measures. Provisions to reduce the environmental effect of the construction activities will include the following:</p> <ul style="list-style-type: none"> Requiring contractors to ensure that no pollution or obstruction of ground water and watercourses is caused by their operations; Requiring contractors to take reasonable precautions to ensure that all wastewater discharged shall not be harmful to or cause obstruction or deposit in drains and to prevent oil, grease or other objectionable matter being discharged into drains; Requiring contractors, during the execution of works, to keep all plant and materials and all equipment connected with the construction of the works in good order and clean and tidy; Requiring contractors to remove any waste materials from the site to a licensed waste facility; Requiring contractors to ensure that the public roads in the vicinity of the site are maintained free from all mud, dirt and rubbish, which may arise from or by reason of the execution of the works. To facilitate this, the Contractor could be required to provide a wheel washing facility to an approved standard within the construction site; Prohibiting the disposal of excess concrete on any part of the construction site; Requiring the contractor to provide a designated bin for washing down the chutes of concrete lorries on site; Requiring the contractors to keep the construction compounds free and clear of excess dirt, rubbish piles and scrap wood etc. at all times. Requiring the contractors to keep the designated parking area and 	During site preparation works

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Topic	Mitigation Measure Proposed	Timeframe
	<p>other common areas clear and free of rubbish and debris;</p> <ul style="list-style-type: none"> • Requiring contractors to be responsible for the disposal of all wood, food, food packaging and paper generated during the construction phase and requiring them to furnish containers and vehicles to collect and haul these items and dispose of them to a licensed waste facility. Dumping of these items within the construction site will be prohibited; • Requiring scrap materials, rubbish, etc. to be hauled out of the work areas (daily) and disposed of by the Contractor on a daily basis to a licensed waste disposal facility; • Requiring the contractor to obtain any necessary permits from the Local Authority or Environmental Protection Agency for the disposal of waste; • Requiring individual contractors to provide sanitary facilities that would be adequate for their construction personnel. Sanitary facilities should include proper wash down WC's with sewer connections, or if this is impractical, chemical closets; • Requiring that all temporary buildings associated with construction of the development comply with the Safety, Health and Welfare Regulations. On completion of the works, contractors should remove them entirely with all slab, drains and water mains and restore the surface of the land to its original condition or other reasonable conditions. • Aggregate haulage lorries will continue to predominantly turn left out of the existing site entrance and will use the prescribed haul route along L6226 to R148. Haulage vehicles will be regularly maintained, serviced and replaced at intervals. • In order to prevent transport of soil and dirt out of the site onto public roads, a wheelwash facility is provided for all HGV's exiting the site. All the aggregates haulage vehicles are required to pass through the wheelwash prior to leaving the site. Any accidentally spilled material will be removed from the public road by Kilsaran in a safe and timely manner. <p>There are currently no advance warning signs on the approaches to the site access. It is proposed that new advance signs are erected with the agreement of the Local Authority. The suggested layout will show a standard junction ahead warning sign which indicates to drivers which side of the road the entrance is on. It</p>	

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Topic	Mitigation Measure Proposed	Timeframe
	is proposed to augment the sign with an information plate reading 'Quarry Entrance 200m'. If the Planning Authority considers it worthwhile a second set of similar signs can be placed at 100m distance from the site access. The size of the signs and the details of legend size etc. will be designed in accordance with the Traffic Signs Manual and the precise location agreed with the planning authority.	
Cultural Heritage	Due to the possibility of the survival of previously unknown sub-surface archaeological deposits or finds within Area 2, the unquarried headland, it is recommended that topsoil stripping within Area 2 be archaeologically monitored.	During site preparation works

MONITORING MEASURES

- 16.11 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.
- 16.12 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**.
- 16.13 EIAR **Figures 7-2, 7-3, 8-1 and 10-1** indicates the monitoring locations across the application site. Additional monitoring locations can be provided if deemed necessary by the Planning Authority 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, noise and vibration.

Biodiversity

- 16.15 General aftercare monitoring of newly created habitats will be undertaken as set out in Chapter 2.
- 16.16 An ecologist should be present for treeline removal and undertake a preliminary search of this habitat for potential bat, hedgehog and other mammal presence.

Land, Soils and Geology

- 16.17 Following the final restoration of the quarry monitoring will be required over a period of three years to ensure that the restored soils and land use is successful and that the remaining quarry faces are stable.

- 16.18 Kilsaran will facilitate access to the quarry by GSI staff in order to inspect the geology at the site if required.

Hydrogeology and Hydrology

- 16.19 Surface water and groundwater monitoring is currently undertaken at the site in compliance with existing planning conditions and the existing discharge licence as set out below. The existing monitoring regime at the site will continue or as revised by conditions in a reviewed discharge licence.
- 16.20 Groundwater levels will continue to be recorded on a weekly basis for the onsite wells and on a monthly basis for nearby residences. No monitoring is required at St. Gorman's Well as the intermediate monitoring to be completed onsite and at nearby residences will detect any increased groundwater drawdown.
- 16.21 However, in order to advance the hydrogeological understanding at St. Gorman's well Kilsaran propose to continue to monitor groundwater levels in a borehole adjacent to the spring. A continuous water level datalogger will be installed and will be downloaded at quarterly intervals (permission has been granted by the landowner of Hotwell House for this activity). In the future this data can be used to further our understanding of Irish geothermal springs and will be made available to the GSI.

Surface Water Quality Parameters

- 16.22 Discharge quality and volume is monitored as per the conditions in the existing discharge licence (Ref. No. 13/02) for the site. Monitoring will continue during the proposed works.
- 16.23 Discharge water quality is monitored on a monthly basis for the following parameters:
- BOD (mg/l);
 - COD (mg/l);
 - Suspended Solids (mg/l);
 - pH;
 - Orthophosphate (mg/l);
 - Nitrates (N) (mg/l);
 - Ammonium (N) (mg/l);
 - TPH (µg/l);
 - BTEX (µg/l);
- 16.24 Discharge volume is monitored on a continuous basis using the existing weir and an automatic flow level logger.

Groundwater Quality Parameters

- 16.25 Groundwater sampling and testing will be undertaken on an annual basis at the site potable supply well (PW2) and at the groundwater monitoring wells (D1-D4) as indicated on EIAR **Figure 7-2**. Groundwater samples will be tested for a range of physical and chemical parameters in order to assess water quality. The parameters to be tested for are:
- Conductivity;
 - pH value;

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- Total Coliforms CFU/100mls;
- Ammonia mg/l $\text{NH}_3\text{-N}$;
- Nitrate mg/l NO_3 ;
- Nitrite mg/l;
- Ortho Phosphate / Ortho Phosphate mg/l as P;
- TPH mg/l;
- PRO mg/l; and
- DRO mg/l

Air Quality

- 16.26 Dust monitoring is already carried out at the overall site under the requirements of Condition 7 of the Section 261 Quarry Registration (QY/53) .
- 16.27 Monthly monitoring is carried out at three locations around the existing site (D1 – D3 indicated on EIAR **Figure 8-1**).
- 16.28 The dust monitoring gauges are located close to sensitive receptors located beyond the site boundary. It is proposed that the existing dust monitoring stations will remain in place for the duration of extraction and processing operations at the site.

Climate

- 16.29 GHG emissions and reductions at the quarry are monitored through recording of energy and fuel use by the applicant. These are then fed into and are fed into Kilsaran's ESG model and strategy centred around the four pillars, Planet, People, Solutions and Performance.'

Noise

- 16.30 Noise monitoring is already carried out at the overall site under the requirements of Conditions 7, 8 and 19 of P. Ref. 01/1018 (PL17.127391).
- 16.31 Monthly monitoring is carried out at two locations around the existing site (N1 – N2 indicated on EIAR **Figure 10-1**).
- 16.32 The noise monitoring locations are located close to sensitive receptors located beyond the site boundary. It is proposed that the existing noise monitoring stations will remain in place for the duration of extraction and processing operations at the site.

Vibration

- 16.33 Vibration monitoring will continue to be undertaken under the requirements of Condition no's 20 and 21 of the PL17.127391 for the site. Monitoring is carried out at five designated locations around the quarry footprint (B1 – B3 , and B6 and B7 indicated on EIAR **Figure 10-1**) used for monitoring under the previous grant of planning permission 01/1018
- 16.34 Ground-borne vibration and air overpressure will be measured utilising portable seismographs, located at nearby residences (subject to the owner's agreement). Air overpressure will be measured utilising a calibrated microphone, incorporated into the seismograph. Each seismograph shall be calibrated in accordance with the manufacture's requirements.

Landscape and Visual

- 16.35 Regular monitoring will be undertaken during the proposed 2-year aftercare period, as part of the restoration proposals, to ensure the successful establishment of the vegetation.

Traffic

- 16.36 During the construction stage the operator of the site will monitor construction vehicle movements in and out of the site to ensure the guidance set out in the site CEMP and Traffic Management Plan is being followed. The implementation and performance of traffic management and haul route management measures and initiatives including any ongoing revisions or new initiatives will be monitored and evaluated throughout the Construction Phase.
- 16.37 The implementation and performance of traffic management and haul route management measures and initiatives including any ongoing revisions or new initiatives will be monitored and evaluated throughout the Operational Phase. Monitoring of vehicle haul routes for debris and monitoring of condition of advance warning signage. Monitoring performance of site management measures including timing of arrivals and departures and effectiveness of wheelwash facility.

Other Monitoring

- 16.38 The Environmental Impact Assessment did not identify a requirement for ongoing monitoring in relation to material assets.

Table 16-2
Indicative Schedule of Environmental Monitoring

Topic	Q1			Q2			Q3			Q4		
Groundwater Levels												
Groundwater Quality												
Surface Water Quality												
Dust Monitoring												
Noise Monitoring												
Vibration Monitoring	As and when blasting is carried out											
Biodiversity	Dependent on time of tree felling											
Land, Soils & Geology	Regular post restoration monitoring to ensure that the restored soils and land use is successful and that the remaining quarry faces are stable.											
Cultural Heritage	As and when soil stripping is carried out											
Climate	This data gathering is ongoing and feeds into the Company's Sustainability Goals and Policy											
Landscape	Regularly over a 2 year period following restoration											

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FIGURES

Refer to EIAR Figure 7-2 for Water Monitoring Locations

Refer to EIAR Figure 8-1 for Dust Monitoring Locations

Refer to EIAR Figure 10-1 for Noise Monitoring Locations

Refer to EIAR Figure 10-1 for Blast Monitoring Locations