Kereen Quarries Ltd.

Environmental Impact Assessment Report (EIAR)

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INTRODUCTION

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INTRODUCTION

This Environmental Impact Assessment Report (EIAR) provides supporting information to accompany a planning application to Waterford City and County Council submitted by NRGE Ltd. on behalf of Kereen Quarries Ltd. in respect of their existing quarry at Kereen Lower, Cappoquin, Co. Waterford.

The application site extends to c. 0.42 hectares – refer to attachment 1 for associated site location maps.

The proposed development being applied for under this current application is shown in Drawing No 001 and is similar to that previously granted under Waterford City and County Council Ref. No. 17160 and will consist of:

- An area to recycle construction materials

This activity requires a waste facility permit. A valid permit is currently in place on the site under ref: WFP-WCCC-18-0004-01

THE SITE

Site Location

The lands which are the subject of this application comprise c. 0.42ha and are located in the townlands of Kereen Lower, Cappoquin, Co. Waterford. The proposed development is located wholly within the existing permitted quarry area.

The quarry is located near one regional road, the R671 to the East and a local road to the South. The site occupies ground with elevations ranging between 42.18 OD and 41.00 OD. The lower quarry floor is currently at 29.00 OD with the current planning permission authorising extraction to 29.00 OD.

Site Description

The quarry operations comprise of the recycling of construction material for use in construction activities namely road construction and site development works.

Facilities at the quarry include offices, weighbridge, canteen, bunded fuel storage areas a workshop for repairs. These facilities are located near the entrance to the quarry.

Site Access

The quarry is located approximately 10 Km south of the village of Cappaquinn and 13 km west of the town of Dungarvan and is accessed by the aforementioned regional road the R671 from either a northern route or a southern route.

The quarry and the processing area are located on the same site with the material from the quarry being transported to the processing area by the site machinery.

All site traffic including site personnel and site visitors use the same entrance on the R671. Due to its proximity to this road, mature hedging and screening surrounding the main quarry entrance has been maintained, however it does not impede those entering and exiting the site.

All traffic to the site either enters via the access road or via the weighbridge located adjacent to the entrance. All traffic exits via the same exit routes.

Surrounding Land-Use

The quarry area is surrounded by agricultural lands mainly grasslands on 3 sides and the R671 to the eastern boundary. As the quarry is a rural location, there are no industrial or commercial units in the vicinity.

Residences within the area consist of one off rural dwelling houses, mainly connected to farmyards. The nearest residence to the quarry is a 3rd party dwelling house and is approximately 50m to the entrance of the site.

THE APPLICANT

The applicant Kereen Quarries Ltd., a family business was set up in 1992 and has a registered address at Ballycullane, Dungarvan, Co. Waterford.

ENVIRONMENTAL IMPACT ASSESSMENT SCREENING

Part 1 and Part 2 of Schedule 5 of the Planning and Development Regulations 2001 (as amended) sets out the types of developments that are required to prepare and submit an Environmental Impact Assessment Report with any Planning Permission Applications.

The requirement for quarrying developments to complete an Environmental Impact Assessment Report is detailed in section 19 of Part 1 of Schedule 5 and states the following 'Quarries and open-cast mining where the surface of the site exceeds 25 hectares.

Section 2 of Part 2 of Schedule 5 refers to extractive industries with part b of this section stating that the following requires an Environmental Impact Assessment Report to be completed: 'Extraction of stone, gravel sand or clay, where the area of extraction would be greater than 5 hectares'.

Section 11 of Part 2 of Schedule 5 refers to other projects with part b of this section stating that following requires EIAR to be completed 'installations for the disposal of waste with an annual intake greater than 25,000 tonnes not included in Part 1 of this schedule.'

The proposed development relates to the annual intake of waste greater 25,00 tonnes it is therefore on this basis that an Environmental Impact Assessment Report is required.

SCOPE OF WORKS

Preliminary discussions were had with a number of parties in the preparation of this report namely:

- NRGE Ltd.
- Waterford City and County Council
- Environmental Protection Agency
- Geological Survey of Ireland
- Met Eireann
- Central Fisheries Board
- Office of Public Works
- Department of Agriculture, Food and the Marine
- Department of Housing, Planning and the Local Environment
- National Parks and Wildlife Service

Specialists were drafted in where required and discussions were held between these experts in their relevant fields and NRGE ltd. personnel.

DIFFICULTIES ENCOUNTERED

All information within this report was compiled on the basis of available information. No difficulties were encountered in the compilation of this report.

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

As per the Environmental Protection Agency (EPA), an Environmental Impact Assessment Report is a report or statement of the effects, if any, which the proposed project, if carried out, would have on the environment and is prepared by the developer to inform the EIA process.

The main objectives of this report are to:

- prior to any alterations in activities being carried out, identify or predict any impacts that the proposed development will result.

- with these in mind, identify ways in which these impacts can be reduced or eliminated.

This Environmental Impact Assessment Report has been prepared in accordance with the EPA's *Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR) August 2017.*

The layout of the report is as follows:

- ***Chapter 1 Introduction***
  A description of the site, it's location, the definition of an EIAR, it's objectives and the organisations and agencies consulted in order to prepare this report.

- ***Chapter 2 Project Description***
  This chapter details the characteristics and components of the quarrying operations taking place at the site.

- **Chapter 3 Reasonable Alternatives**
  A description of the reasonable alternatives that were seen as being applicable to the proposed and subsequently researched by the applicant Kereen Quarries Ltd. Also, reasons for the selection of the proposed option will be documented in this chapter.

- **Chapter 4 – 14**
  Chapter 4 to 15 provide information on the existing environment, including for: Population and Human Health, Biodiversity, Land, Soils and Geology, Water, Air, Climate, Noise and Vibration, Material Assets, Cultural Heritage, Landscape, Traffic and Transport.
  Along with this, a description of the characteristics of the proposed development and the land use requirements during construction and operation will be provided along with the description of the measures envisaged to avoid, reduce prevent or if possible offset any identified significant adverse effects on the environment.

  The layout is as follows:
  Chapter 4: Population and Human Health
  Chapter 5: Biodiversity
  Chapter 6: Land, Soils and Geology
  Chapter 7: Water
  Chapter 8: Air
  Chapter 9: Climate
  Chapter 10: Noise and Vibration
  Chapter 11: Material Assets
  Chapter 12: Cultural Heritage
  Chapter 13: Landscape
  Chapter 14: Traffic and Transport

All associated attachments including location maps and drawings can be found to the rear of this report.

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CHAPTER 2

PROJECT DESCRIPTION

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EXISTING DEVELOPMENT

The existing quarry occupies an area of approximately c. 8.2 hectares, as shown in the attached site location map – Attachment 1. The lower quarry floor is currently at 29.00 OD with the current planning permission and permit authorising extraction to 29.00 OD.

Planning permission was granted to Kereen Quarries Ltd. by Waterford City and County Council (Planning Ref. 17160) for the extension to infill part of the exhausted quarry with Inert Material and an area to recycle construction materials

The development comprised of the importation of inert fill material from construction and demolition works to fill a section of the quarry void and to reinstate the area of land for agricultural use with top soil. Materials used to fill the void include:

Material	EWC Code
Concrete Block/Stone/Plaster	17 01 00
Concrete	17 01 01
Brick	17 01 02
Stone/Plaster/Clay/Fines	17 05 04
Slates	17 01 03

Figure 2. 1 EWC codes of imported material

The planning approval was granted subject to 9 no. conditions.

Furthermore, a waste facility permit was issued by Waterford City and County Council on 14th November 2018. This permit is valid until 13th November 2023 and is submit to 10 conditions (Attachment 2)

PROPOSED DEVELOPMENT

Development Overview

The proposed development is similar to that previously granted under Waterford City and County Council Ref 17160 and consists of the continuation to import construction and demolition works for the recycling of aggregates. All material that enters the facility is recycled and leaves the facility for reuse. No infilling of the quarry void will take place at the proposed development.

Duration of works

The duration of works will largely be dictated by the availability of the construction and demolition material to be recycled into aggregates.

Site Screening

Kereen Quarry has been in operation since 1992 and is therefore an established part of the landscape at Kereen Lower. The views at the quarry would be unchanged by the continuation of recycling of construction material.

Site Drainage

A hydrogeological assessment has been carried out taking in to consideration the routes of the existing water flows at the site. This assessment addresses the mitigation measures that will be implemented in order to eliminate or minimise the possible surface and groundwater impacts.

Operational Hours

In accordance with condition no. 4 of the planning application ref. no. 17160, the hours of operation are restricted to the hours of 08:00 and 18:00 Monday to Friday 08.00 and 14.00 Saturday with no working Sundays or Public Holidays.

In accordance with condition no. 2.4 of the site's Waste Facility Permit, waste acceptance hours are restricted to the hours of 08:00 and 18:00 Monday to Friday inclusive and 08:00 and 14:00 on Saturdays. Waste is not permitted to be accepted to the quarry on Sundays or Bank Holidays.

The proposed development will therefore adhere to these conditions.

Employment

The current site operations provide direct employment for 12 people in addition to a number of indirect positions through HGV drivers, maintenance., sub-contractors.

The proposed development will not vary greatly from the direct or indirect employment level associated with the site presently.

SITE INFRASTRUCTURE

Site access and security

The proposed development that is the subject of this application will be accessed via the existing entrance located on the eastern side of the site which exits on to the regional road, the R671.

There is no other access to the quarry and the quarry's entrance is locked outside of operational hours.

The quarry's boundary is secured with existing hedgerow and by post and wire fencing. There will be no requirement for additional security for the proposed development.

Site roads, parking and hardstanding areas

There are a number of roads onsite, all of which are essential for the machinery onsite to gain access to the whole site. Adequate on-site space is provided to ensure that the turning movements of all vehicles associated with the quarry can be facilitated for.

Sufficient parking is provided on-site for staff and visitors located adjacent to the site offices.

Weighbridge

Incoming material associated with the proposed development will pass over the weighbridge located adjacent to the entrance in order to keep records of same.

Facilities and Utilities

Office and W/C facilities are provided for adjacent to the entrance. There is also a workshop located to the North of the entrance and bunded fuel storage tanks.

Electrical power is currently provided to the workshop and the office facilities via the mains supply. This electrical source also powers the lighting throughout the site.

Fuel storage

Chemicals to be stored onsite for use during operations that have cause for concern in relation to the pollution of surface and ground waters include oils and diesel fuels. Storage of fuels is provided onsite in certified tanks which have a sufficient bund capacity. All refuelling is carried out in a designed area where a spill kit is readily available.

WASTE MANAGEMENT

Potential waste produced as a result of the proposed development will not vary greatly from that that is being produced onsite presently and includes for:

- Waste Metals – produced as a result of the quarrying machinery in operation onsite and the separation of metals from aggregates during recycling. These can cause a nuisance if it is neglected and allowed to build up. A designated area has been assigned for these material and regular scrap metal collections are organised for its removal off of site.
- Used oil filters and batteries - a resultant of the maintenance checks carried out on the quarrying machinery are removed off site by a permitted contractor.
- Domestic waste – resulting from the office area is segregated onsite and is removed off of site by a permitted contractor.

EXISTING ENVIRONMENTAL CONTROLS

General

Control measures for birds, litter, odour and vermin are in place or will not be an issue onsite.

Traffic Control

As the proposed development is similar to that previously granted under Waterford City and County Council Ref. No. 17160 the traffic control currently in place onsite will remain unchanged.

Surface Water and Groundwater Management

The water management plan currently within the site consists of a settlement pond at the lowest point of the quarry floor – the quarry contours fall to the North East of the quarry deposit excavation. All surface water that falls on the quarry accumulates in a sump at the North East corner. It is then pumped from the quarry floor to the settling pond which is 1,639 m2 in area.

There is one discharge point. This discharge is effectively rainwater that accumulates in the aforementioned settlement pond. Discharge from this point is restricted by a 150mm diameter pipe.

Water analysis is carried out monthly at three locations. These samples are tested at an independent laboratory for pH and suspended solids. The results of which are forwarded to Waterford City and County Council for review.

The current surface water management plan will remain unchanged.

Dust Generation and Control

Dust only becomes a problem onsite during dry weather mainly the summer months. If dust levels exceed 350 mg/m2/day, water is sprayed from a tanker to mitigate possible impacts.

Dust monitoring is carried out, the locations of which are indicated as N1 to N6 on the location maps attached. (Figure 8.1)

As per condition No. 5 of the Planning Permission Ref: 17160, dust emissions from the site shall not exceed 130 mg/m2 per day averaged over a continuous period of 30 days, measured as deposition of insoluble particulate matter at any position along the site boundary. It should be noted that the 130mg/m2/day is related to outdated methodology. Current guidelines now recommend a limit of 350mg/m2/day

Noise Generation and Control

The sources of noise located within the quarry are primarily related to machinery in operation.

Good house-keeping measures are implemented and include for the regular maintenance of all machinery, noise reducing modifications and site speeding limits.

Furthermore, noise monitoring locations are located at prevailing down-wind locations and are indicated with Chapter 10 Noise

To date, the site has received no noise related complaints.

The sources of noise from the proposed development will be similar to those created presently onsite and therefore the control methods currently in place will remain unchanged.

Blasting Control

The proposed development will not require the use of blasting activities.

CHAPTER 3

ALTERNATIVES

INTRODUCTION

Alternative Designs/Layouts

Alternative designs and layouts were not considered as this application relates to the continuation of the recycling of construction aggregates.

Alternative Locations

The proposed development is similar to that previously granted under Waterford City and County Council Ref 17160 and consists of the continuation to import of construction and demolition works for the recycling of the aggregates for reuse. Therefore, there is no suitable alternative location for the development to be carried out as it is a continuation of works currently being carried out.

CHAPTER 4

POPULATION AND HUMAN HEALTH

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INTRODUCTION

This chapter relates to the potential impacts the proposed development could have on human health and the population in the vicinity of the quarry.

Information was gathered from various online sources and from onsite field studies.

EPA Guidelines

The EPA's Guidelines on the information to be contained in Environmental Impact Assessment Reports Draft August 2017 page 29 refer to the following aspects with regards to population and human health:

- The legislation does not generally require assessment of land-use planning, demographic issues or detailed socio-economic analysis.
- Economic or settlement patterns are not required unless the proposed is a new development and the associated effects.
- Human health should be considered in the context of the other issues considered in the EIAR i.e. air, water, soil etc.
- Assessment of other health and safety issues are to be carried out under EU Directives as relevant.

Impact Assessment

The proposed development is of average scale by current standards and it would not add to the activity on the site as it is a continuation of the activities taking place onsite presently.

Proximity Impact

There are no third part dwellings close to the proposed development area as to be adversely affected by, or experience significant impairment of amenity due to the proposed development. The proposed development is a continuation of the current activities and therefore there will be no additional adverse effects associated with it.

Noise and Odour Impacts

The proposed development is unlikely to generate or release sounds or odours that will significantly impair amenity beyond the site boundary. The experience of other similar sites indicates that the legal limits for such emissions, 55dB daytime and 45dB night-time are highly unlikely to be exceeded beyond the site boundary without being attributed to other noise sources.

There are no processes proposed which will constantly or regularly release odorous emissions from the site at nuisance levels.

Waterford City and County Plan

The existing quarry and proposed development are not located close to and /or likely to adversely impact any areas of Primary or Secondary Amenity value as detailed in

the Waterford City and County Development Plan 2013 – 2019. Based on this information, significant effects are not anticipated.

Mitigation Measures

Where people object or nuisance impacts occur, under statutory requirements investigations will have to be carried out and will have to be corrected if found to be real and justified.

Receiving Environment

Study Area

The study area refers to the area surrounding the proposed site and to dwellings and other buildings on the road adjacent to the site.

Environmental and Heritage Designations

Blackwater River (Cork/Waterford) SAC is located 1.4Km to the North and 4.1Km to the West of the site. Proposed Natural Heritage Area Blackwater River and Estuary is located 4.1Km to the West of the site.

The Record of Monuments in the area of the proposed site include the following:

- Ref: WA029-015: Ancient Route to Ardmore turned SE on the line of the public road to Kilmolash church. This site is note scheduled for inclusion in the next revision of the RMP.
- Ref: WA030-092: Road/Trackway, no further information available from ASI. This site is not scheduled for inclusion in the next revision of the RMP.
- Ref: WA029-034: Ringfort or Rath.

There are no recorded monuments within the proposed site

There are no buildings on the National Inventory of Architectural Heritage in the area surrounding the proposed development.

Population

A review of the population based on Electoral Divisions of Kereen, in which the proposed development is located. The change in population between 2011 and 2016 is detailed below in Table 4.1.

	2011	2016	% Change
Kereen	227	227	0
Waterford	46,732	116,176	148
Ireland	4,588,252	4,761,865	3.7

Table 4.1: Population change 2011-2016

The census results indicate that the population growth in Waterford is far above the national average. However the was no change in population change in the vicinity of the proposed development.

Employment

The Live Register August 2021 statistics there were 1005 persons in Dungarvan on the live register. This is down from 1,099 in 2020 and 1,108 in 2019.

Kereen electoral area has a population of 227 based on the 2016 census. The population is assessed by occupation and described in Table 4.2.

Occupation	Number
Managers, Directors and Senior Officials	6
Professional Occupations	9
Associate Professional and Technical Occupations	5
Administration and Secretarial Occupations	8
Skilled Trades Occupations	31
Caring, Leisure and Other Service Occupations	11
Sales and Customer Service Occupations	7
Process, Plant and Machine Operatives	14
Elementary Occupations	13
Not Stated	12
Total	116

Table 4.2 Occupations of population in Kereen

A breakdown of the industry where the population work is detailed below in Table 4.3. A larger proportion of the population work in agriculture and manufacturing than in other industries.

Industry	Number
Agriculture, forestry and fishing	18
Building and construction	6
Manufacturing industries	18
Commence and trade	15
Transport and communications	5
Public administration	3
Professional services	18
Other	21
Total	104

Table 4.3 Persons at work by industry

Sensitive Receptors

The proposed development is in a rural area, the road network has sparsely dispersed housing along the local road network.

The closest residential dwelling to the proposed development is 300m from site entrance.

There are no schools, shops and churches within the area of the development.

Impact assessment

The evaluation of the proposed development on employment, human health and the amenity is based on a qualitative analysis of potential effects on the environment undertaken in other chapters of this EIAR.

Employment

The proposed development will not increase the direct employment above the current levels. However it is anticipated there will be several indirect additional people employed through the haulage sector in the delivery of materials to site and the removal of recycled aggregates for the construction sector. There will also be additional employment through subcontractors, maintenance and suppliers.

The proposed development will assist in sustaining the local economy through the continued supply of recycled aggregates.

Human Health

The pathways in relation to human health in this instance are noise, air, water and soil.

Operational stage impacts

The operational stage relates to the recycling of aggregates for the construction sector. The proposed development is a continuation of current activities on site. This stage has the potential to generate impacts that would affect human health through the pathways on noise, air, water and soil.

As outlined in chapters, 6, 7, 8 & 10 a number of mitigation measures have been proposed and remaining effects are deemed to be negligible on the population in the area.

On this basis, it is determined that there would be no likely adverse effects on human health as a result of this development during the construction or operation phases.

Post-operational stage impacts

Following the cessation of quarrying activates the land will returned to agriculture on a phased basis using part of the recycled aggregate materials.

As outlined in chapters, 6, 7, 8 & 10 a number of mitigation measures have been proposed and remaining effects are deemed to be negligible on the population in the area.

Amenity

The key parameters in relation to amenity in this instance area air, noise, vibration, landscape and traffic.

Operational stage impacts

The operation stage would require the recycling of inert fill material from the construction sector. This operation has the potential to generate dust, noise & vibrations. There would be vehicle movements in relation to the importation of inert fill and transport of recycled aggregates. There is no change to the landscape.

As outlined in chapters, 6, 7, 8 & 10 a number of mitigation measures have been proposed and remaining effects are deemed to be negligible on the population in the area.

Post operational impacts

Following the cessation of quarrying activates the land will returned to agriculture on a phased basis using part of the recycled aggregate materials.

As outlined in chapters, 6, 7, 8 & 10 a number of mitigation measures have been proposed and remaining effects are deemed to be negligible on the population in the area.

Unplanned Events

The EPA has issued guidance on the preparation of EIAR reports. The guidance makes reference to unplanned events that have the potential to cause significant sudden environmental effects.

Due to the simplicity of the activities to be carried out at the facility the risk of accidents, unplanned events or natural disasters are limited. The proposed development is a continuation of the current activities previously granted permission by Waterford County Council and is subject to several conditions.

Unplanned events associate with this development could include the following:

- Instability of ground following stockpiling of material
- Spill from site equipment
- Flooding

Ensuring HSA Safe Quarry guidelines to the health and welfare at work (quarries) 2008 will minimise the rise of unplanned events taking place. Instability following the stockpiling inert material would unlikely have any significant impact on the employment, human health or the amenity.

Spillages from site equipment could take place without proper control or supervision. Ensuring timely maintenance of equipment and speed limits within the site boundary will minimise the risk of spillages occurring.

Cumulative Impacts

A desktop search of Waterford County Council showed at the time of writing there were no other planning developments proposed for the Kereen Lower area. Previously granted planning applications in the area relate to domestic dwellings, and agricultural buildings. It is considered there will be on adverse in combination effects as a result of this development.

Interactions with other impacts

it is not envisaged that the effects of the proposed development on population and human health will interact with other impacts.

Do nothing scenario

If the permission is not granted for the aggregate recycling the applicant would be required to cease operations and additional virgin rock mined to meet economic demand. There would be an adverse effect on employment as there would be no increase in indirect employment. If the permission was not grated, it may limit

economic growth in the area due to lack of capacity at facilities to cater for construction and demolition materials.

Mitigation measures

Mitigation measures to be utilised in regard to population and human health during the operation phase will relate to minimising the effect of the development on the surrounding area. Noise, air, soil and water are considered, mitigation measures relate to the prevention or reduction of adverse effects, these mitigations measures are discussed in the relevant chapters relating to noise, air, soil and water.

Residual impact

As outlined in the mitigation measures of chapters 6, 7, 8 & 10 the measures would successfully mitigate against the effects of the proposed development during the operational phase. No Specific mitigation measures are proposed for population and human health.

Monitoring

As outlined in chapters 6, 7, 8 & 10, monitoring in relation to the proposed development will take place in respect of noise, air & water. On this basis no specific monitoring is proposed in relation to population and human health.

CHAPTER 5

BIODIVERSITY

INTRODUCTION

This Biodiversity chapter forms part of the Environmental Impact Assessment Report prepared in support of a Planning application for the continued aggregate recycling. The report relates to the potential impacts the proposed development could have on biodiversity in the vicinity of the quarry.

Information was gathered from various online sources and from onsite field studies. This section of the report was prepared by Panther Environmental and is included as an attachment to this document.

CHAPTER 6

LAND, SOIL AND GEOLOGY

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INTRODUCTION

This chapter forms part of the Environmental Impact Assessment Report prepared to accompany a Planning application to Waterford City and County Council submitted by NRGE Ltd, on behalf of Kereen Quarries Ltd, in relation to the existing quarry at Kereen Lower, Cappoquin, Co. Waterford.

The proposed development site has a total area of 0.42 and is being applied for under this application. The proposed development will consist of the import, processing and export of construction materials with all processing activity to be contained within the redline site boundary.

This chapter relates to the potential likely and significant impacts the development could have on the receiving land, soils and geological environment.

Information was gathered from various online sources and from onsite field studies.

Background

Due to the nature of the activities to be carried out at the site, the potential effects of the proposed development on the land, soil and geological environmental relate to the importation, processing and exportation of construction material.

Impact Assessment

The importance / sensitivity of the geological receptors was assessed on completion of the desk study and baseline assessment.

Using the NRA Guidance [18], an estimation of the importance / sensitivity of the geological environments within the Proposed Development Site is set out in **Error! Reference source not found.**.

Importance	Criteria	Typical Example
Very High	Attribute has a high quality, significance or value on a regional or national scale. Degree or extent of soil contamination is significant on a national or regional scale. Volume of peat and / or soft organic soil underlying route is significant on a national or regional scale	• Geological feature rare on a regional or national scale (NHA). • Large existing quarry or pit. • Proven economically extractable mineral resource
High	Attribute has a high quality, significance or value on a local scale. Degree or extent of soil contamination is significant on a local scale. Volume of peat and / or soft organic soil underlying site is significant on a local scale	• Contaminated soil on site with previous heavy industrial usage. • Large recent landfill site for mixed wastes. • Geologically feature of high value on a local scale (County Geological Site). • Well drained and / or high fertility soils. • Moderately sized existing quarry or pit. • Marginally economic extractable mineral resource.
Medium	Attribute has a medium quality, significance or value on a local scale. Degree or extent of soil contamination is moderate on a local scale. Volume of peat and / or soft organic soil underlying site is moderate on a local scale.	• Contaminated soil on site with previous light industrial usage. • Small recent landfill site for mixed wastes. • Moderately drained and / or moderate fertility soils. • Small existing quarry or pit. • Sub-economic extractable mineral resource.
Low	Attribute has a low quality, significance or value on a local scale. Degree or extent of soil contamination is minor on a local scale. Volume of peat and / or soft organic soil underlying site is small on a local scale.	• Large historical and / or recent site for construction and demolition wastes. • Small historical and / or recent site for construction and demolition wastes. • Poorly drained and / or low fertility soils. • Uneconomically extractable mineral resource.

Table 0-1: Estimation of Importance of Geology Attributes

The guideline criteria (EPA, 2017) for the assessment of likely significant effects require that likely effects are described with respect to their extent, magnitude, type (i.e. negative, positive or neutral) probability, duration, frequency, reversibility, and transfrontier nature (if applicable). The descriptors used in this environmental impact assessment report are those set out in the EPA (2017) Glossary of Impacts as shown in Chapter 1 of this EIAR. In addition, the two impact characteristics proximity and probability are described for each impact and these are defined in **Error! Reference source not found.**.

In order to provide an understanding of this descriptive system in terms of the geological/hydrological environment, elements of this system of description of effects are related to examples of potential likely significant effects on the geology and morphology of the existing environment, as listed in **Error! Reference source not found.**.

Impact Characteristic	Degree/Nature	Description
Proximity	Direct	An impact which occurs within the area of proposed project, as a direct result of the proposed project.
	Indirect	An impact which is caused by the interaction of effects, or by off-site developments.
Probability	Low	A low likelihood of occurrence of the impact.
	Medium	A medium likelihood of occurrence of the impact.
	High	A high likelihood of occurrence of the impact.

Table 0-2: Additional Impact Characteristics

Impact Characteristics		Potential Geological/Hydrological Impacts
Quality	Significance	
Negative only	Profound	Widespread permanent impact on: • The extent or morphology of a cSAC. • Regionally important aquifers. • Extents of floodplains. Mitigation measures are unlikely to remove such impacts.
Positive or Negative	Significant	Local or widespread time-dependent impacts on: • The extent or morphology of a cSAC / ecologically important area. • A regionally important hydrogeological feature (or widespread effects to minor hydrogeological features). • Extent of floodplains. Widespread permanent impacts on the extent or morphology of an NHA/ecologically important area. Mitigation measures (to design) will reduce but not completely remove the impact – residual impacts will occur.
Positive or Negative	Moderate	Local time-dependent impacts on: • The extent or morphology of a cSAC / NHA / ecologically important area. • A minor hydrogeological feature. • Extent of floodplains. Mitigation measures can mitigate the impact OR residual impacts occur, but these are consistent with existing or emerging trends
Positive, Negative or Neutral	Slight	Local perceptible time-dependent impacts not requiring mitigation.
Neutral	Imperceptible	No impacts, or impacts which are beneath levels of perception, within normal bounds of variation, or within the bounds of measurement or forecasting error.

Table 0-3: Impact descriptors relating to the receiving environment

Scope of works

A desk study of the site was completed in advance of undertaking a site walkover survey. The desk study involved collecting all the relevant geological data for the site which included consultation with the following:

- Environmental Protection Agency soils mapping (www.epa.ie);
- Geological Survey of Ireland – Geological databases (www.gsi.ie);
- Bedrock Geology 1:100,000 Scale Map Series, Sheet 22; and,
- Geological Survey of Ireland – 1:25,000 Field Mapping Sheets.

A site visit and walkover survey were completed by HES on 17th November 2021.

The data presented and reviewed in this chapter incorporates observations made during the site walkover survey and all data obtained from the desk study.

Contributors/ Authors(s)

Hydro-Environmental Services (HES) are a specialist geological, hydrological, hydrogeological and environmental practice which delivers a range of water and environmental management consultancy services to the private and public sectors across Ireland and Northern Ireland. HES was established in 2005, and our office is located in Dungarvan, County Waterford.

Our core areas of expertise and experience includes soils, subsoils and geology. We routinely complete impact assessments for land, soils and geology, hydrology and hydrogeology for a large variety of project types including quarries and and renewable energy projects.

This chapter of the EIAR was prepared by Michael Gill and Conor McGettigan.

Michael Gill P. Geo (BA, BAI, Dip Geol., MSc, MIEI) is an Environmental Engineer and Hydrogeologist with over 18 years' environmental consultancy experience in Ireland. Michael has completed numerous land, soils and geology impact assessments of quarry projects in Ireland.

Conor McGettigan (BSc, MSc) is a junior environmental scientist with 1 years' experience in the environmental sector in Ireland. Conor holds an M.Sc. in Applied Environmental Science (2020) and a B.Sc. in Geology (2016) from University College Dublin. In recent times Conor has assisted in the preparation of the land, soils and geology chapters for several quarry and renewable energy developments.

Legislation

The EIAR is prepared in accordance with the requirements of European Union Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (the 'EIA Directive') as amended by Directive 2014/52/EU.

Regard has also been taken of the requirements of the following legislation (where relevant):

- Planning and Development Acts, 2000-2020;
- Planning and Development Regulations, 2001 (as amended);
- Directives 2011/92/EU and 2014/52/EU on the assessment of the effects of certain public and private projects on the environment, including Circular Letter PL 1/2017: Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive);
- S.I. No. 296 of 2018 European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018;
- European Communities (Environmental Impact Assessment) Regulations 1989 to 2006; and,
- S.I. No. 4 of 1995: The Heritage Act 1995, as amended.

In addition, the land, soils and geology chapter of this EIAR was prepared having regard to guidance contained in the following documents:

- Environmental Protection Agency (2017): Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports;
- Environmental Protection Agency (2015): Draft - Advice Notes on Current Practice (in the preparation of Environmental Impact Statements);
- Environmental Protection Agency (2015): Draft – Revised Guidelines on the Information to be contained in Environmental Impact Statements;
- Environmental Protection Agency (2003): Advice Notes on Current Practice (in the Preparation of Environmental Impact Statements);
- Environmental Protection Agency (2002): Guidelines on the information to be contained in Environmental Impact Statements;
- Institute of Geologists Ireland (2013): Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements;
- National Roads Authority (2008); Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes;
- PPG1 – General Guide to Prevention of Pollution (UK Guidance Note); and,
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (DoHPLG, 2018).

Receiving environment

Site Description and Topography

Kereen Quarry is located ~10km south of the village of Cappoquinn and ~13km west of the town of Dungarvan. The quarry is located in the townland of Kereen Lower, approximately 3Km from Aglish, Co. Waterford.

The proposed development site ('the site') which is being applied for under this planning application has a total area of 0.42ha and lies in the south of the overall quarry landholding. Historically soil and subsoil have been removed from the site and

bedrock extracted. However no extraction is currently taking place within the site boundary, although quarrying in other parts of the landholding continues. Quarrying operations are continuing elsewhere in the quarry with material being processed using mobile plant. These quarrying operations are not dealt with in this EIAR. The proposed development relates to the import, processing and export of construction materials (50,000 tonnes per annum) within the site. Current facilities existing at Kereen Quarry include offices, weighbridge, canteen, bunded fuel storage area all of which are located near the quarry entrance in the southeast of the overall landholding.

Access to the quarry is via the R671 located along the eastern boundary of the quarry. All site traffic enters via the access road and weighbridge located at the entrance. It is proposed that this entrance will continue as the sole access point to the site.

Ground elevation contours show local topography sloping towards the east and the EPA mapped Clashnadarriv River. Local pre-quarrying ground elevations ranged from 72mOD (metres above Ordnance Datum) in the west to ~42mOD in the east of the overall quarry landholding. Locally elevations within the site ranged from ~57mOD to ~63mOD. Current ground elevations are lower due to soil/subsoil removal and extraction of bedrock. The current elevation of the site ranges from 41-41.18mOD. The main quarry floor to the north of the site currently stands at 29mOD as permitted within the existing permissions.

Land-Use

The site is located entirely within the quarry landholding and inside the footprint of the existing quarry void. Inspection of recent aerial photographs and a site walkover survey reveal that the site is bounded to the east and south by agricultural pastures and to the north and west by the existing quarry.

Current operations in the quarry involve extraction of bedrock materials and transportation of this material to the processing areas by mobile plant. This material is then processed and recycled for use in construction.

Landuse in the wider surrounding area is predominantly agricultural, mapped by Corine (2018) as agricultural pastures. Curraghroche Woods are located approximately 1.2km northwest of the site while the closest mapped extraction area is located ~3.8km northeast of the site at Cappagh Quarry.

Several rural dwellings and farmhouses are located along local roads in the vicinity of the site and along the R671 to the east of the site. The closest dwellings are located ~50m to the east of the quarry entrance. A second dwelling is located ~150m south of the site.

Soils and Subsoils

The published soils map (www.epa.ie) for the area indicates that the site and much of the existing quarry void were overlain by acid shallow well drained (AminSW) mineral

soil prior to the commencement of extraction activities. The surrounding lands are overlain by acid deep well drained (AminDW) mineral soils with mineral alluvium (AlluvMin) mapped along the Clashnadarriv river to the east of the quarry. Acid deep poorly drained (AminPD) mineral soils mapped further south. The EPA map a small area of basic shallow well drained mineral soil (BminSW) in the north of the overall quarry landholding.

The GSI subsoils map (www.gsi.ie) show the site and much of the existing quarry area as bedrock outcrop or subcrop (Rck). Very shallow subsoils can be observed in the existing quarry faces in the vicinity of the site. The surrounding lands are underlain by till derived from Devonian sandstones (TDSs) with alluvium (A) mapped along the Clashnadarriv river. A local subsoil map is shown as Figure *0-1*.

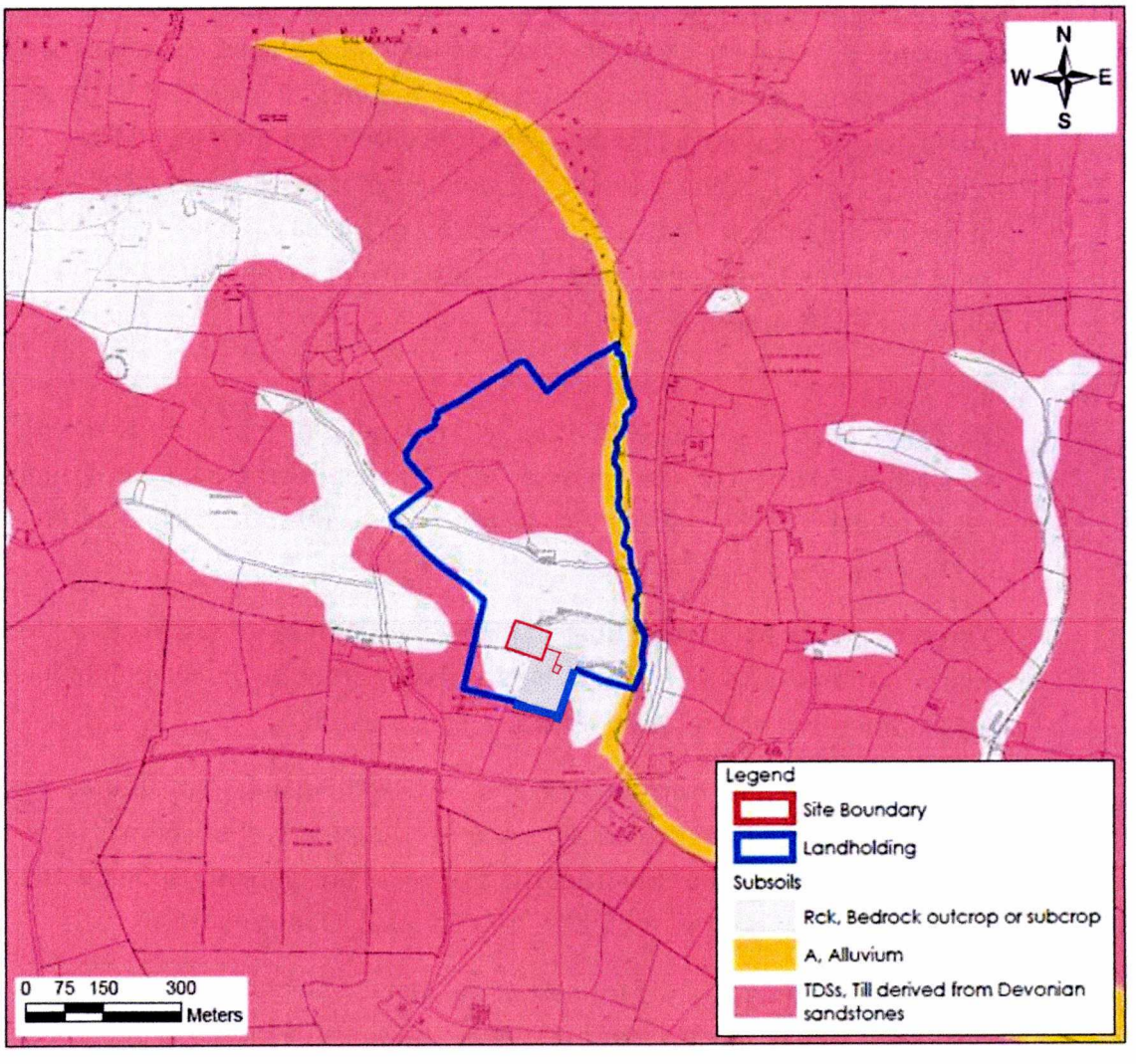

Figure 0-1: Local Subsoils Map (www.gsi.ie)

Bedrock Geology

The underlying bedrock at the site is mapped by the GSI (www.gsi.ie) as being Devonian Old Red Sandstones (DORS) and Dinantian (early) Sandstones, Shales and Limestones (DESSL).

Locally the Devonian Old Red Sandstones comprise of the Ardmore Member, the Ballyquinn Member and the Ballytrasna Formation. The Ardmore Member underlies the north of the site and much of the south of the current quarry void and comprises of grey to red sandstones and grey siltstone. The GSI provide the following lithological description of the Ardmore Member: "The formation is distinguished by regular alternations of grey and pale-red sandstones (2-9m thick) (38%), with grey-yellow siltstones up to 6m thick (62%). Where present red beds are isolated and discontinuous". The Ballyquinn Member underlies the northwest and southeast of the overall landholding and comprises of grey and red sandstone and red mudstone. The GSI provide the following lithological description of the Ballyquinn Member: "The formation comprises, alternating thick, grey and red medium-grained sandstones with thick red mudstones. The sandstones cross-cut earlier mudstones and are large-scale, tabular and trough cross-stratified and parallel laminated". The Ballytrasna Formation underlies the east of the overall quarry landholding and consists of purple mudstone and sandstones.

Locally the Dinantian Sandstones, Shales and Limestones comprise of the Crows Point Formation in the south of the site and towards the centre of the overall quarry landholding. The Crows Point formation consists of massive and thick-bedded grey sandstone. The GSI map the Lower Limestone Shale formation comprising of sandstones, mudstones and thin limestone in the north of the overall quarry landholding.

The rocks of South Munster were compressed from the south during the Variscan Orogeny which resulted in a series of east-west fold axes. One such anticlinal fold axis lies to the north of the site, with bedding dipping to the south in the vicinity of the site. Extensive fracturing and faulting accompanied the folding with the fold axes cut by north-south orientated faults. One such fault is mapped to the east of the site in the vicinity of the quarry entrance. A smaller fault splays off this larger fault in a northwest-southeast orientation.

The GSI map several areas of bedrock outcrop within the surrounding lands, generally in areas underlain by the Ballyquinn Member. Bedrock is currently exposed in the site and the quarry area due to the removal of soils and subsoils to facilitate quarrying operations.

A local bedrock geology map is shown as Figure *0-2*.

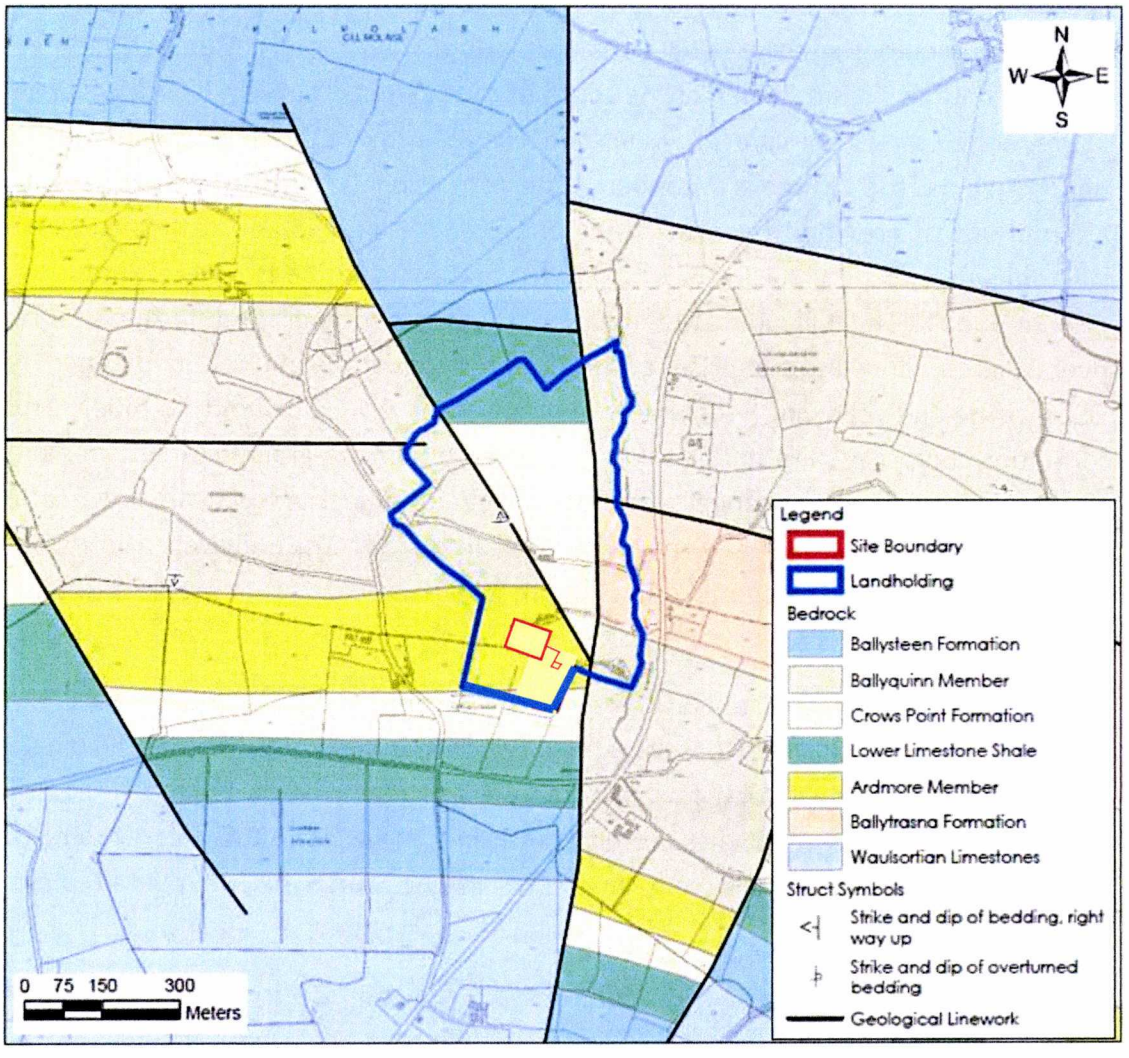

Figure 0-2: Local Bedrock Geology Map (www.gsi.ie)

Soil Contamination

According to EPA online mapping (www.epa.ie) , there are no licensed waste facilities or IPCC licences in lands surrounding the site. The closest mapped waste facility is owned by Molaisin Compost Ltd at Kilmolash, Cappoquin, Co. Waterford. This facility is described as "composting/anaerobic digestion" and is located ~600m north of the quarry.

During the site walkovers, no large areas of particular contamination concern were identified within the site.

Economic Geology

The GSI Online Minerals Database accessed via the Public Data Viewer (www.gsi.ie).

The GSI record the presence of several mineral localities ~2km to the northeast and ~3km to the southwest of the quarry. These mineral localities are mapped as dolomite. The occurrence of limestone and pottery clay are mapped ~3.8km northeast of the site at Cappagh Quarry. Cappagh Quarry is the closest active mapped quarry to the

site and is a limestone bedrock quarry extracting from the Waulsortian Limestone Formation.

The GSI online Aggregate Potential Mapping Database (www.gsi.ie) shows that the site is not mapped in an area of granular aggregate potential (i.e. potential for gravel reserves). Areas along the Clashnadarriv river are recorded as having very to moderate granular aggregate potential.

The site and the overall quarry landholding are mapped as being of very high crushed rock aggregate potential (i.e. potential for a bedrock quarry).

Geological Heritage Areas

The GSI Irish Geological Heritage Programme of audited sites (www.gsi.ie) was reviewed to establish if any geological heritage sites are present in the vicinity of the site.

The site is not mapped with a Geological Heritage Area (GHA). The closest GHA to the site is the Bewley Caves (Site Code: WD010) located ~1.9km northwest of the quarry in the townland of Bewley. This GHA is described as comprising of "several small caves in low limestone cliffs, alongside the Finisk River".

There are no other GHAs mapped within 2km of the site. Several GHAs are mapped further to the northeast of Kereen quarry and include the Balynameelagh Caves (Site Code: WD006), Kilgreany Cave (Site Code: WD040), Cappagh Quarry (Site Code: WD:013) and Oonagaloor and Brother's Cave (Site Code: WD045).

A map of local geological heritage areas is attached as Figure *0-3*.

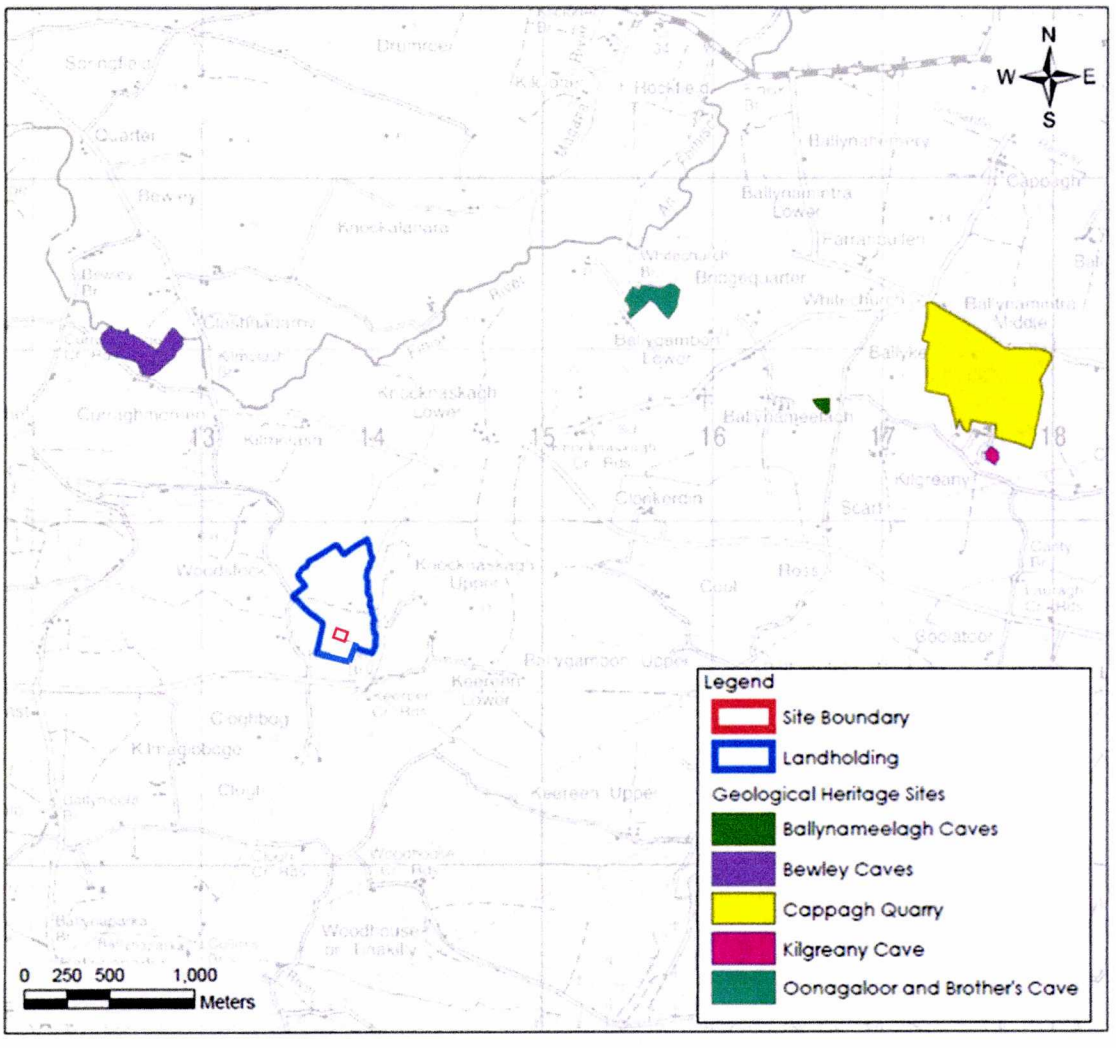

Figure 0-3: Map of local Geological Heritage Areas (www.gsi.ie)

Sensitive Receptors

Based on the criteria set out in Table *0-1* above, the land, soils and geological environment can be classed as being of very high importance due to the presence of the existing bedrock quarry.

Impact Assessment -Methodology

The proposed development includes the import, processing and export of 50,000 tonnes of material per annum. Given that the site is located within an existing quarry, the activities associated with the proposed development will not result in any changes to current land use or topography.

The release of hydrocarbons from processing plant and trucks has the potential to contaminate soil and bedrock in the vicinity of the site.

This EIAR Chapter assesses the potential effects that the proposed development may have on the land, soils and geological environment. In combination effects with other developments and land-uses in the area are also considered.

Assessment Impacts

Recycling of Aggregates – Assessment

The sources and processes associated with the proposed development and its potential to impact on the local land, soils and geological environment is detailed in **Error! Reference source not found.**.

Due to past quarrying activities the site is located within an existing quarry void. The import, processing and export of material will comprise of similar activities to those currently being undertaken within the existing quarry, where bedrock is being excavated and processed by mobile plant. The proposed development will therefore not result in any significant land-use or topographic changes and will still involve the processing of significant volumes of material.

During the aggregate recycling process, the accumulation of small spills of fuels and lubricants from the processing plant and trucks importing and exporting the material can be a pollution risk. Hydrocarbons have a high toxicity to humans, and all flora and fauns and is persistent in the environment. Large spills or leaks have to the potential to result in significant adverse impacts on the local soil and geological environments.

Predicted Impacts (Source)	**Pathway**	**Receptor**	**Pre-Mitigation Risk**
Land-use Change	Importation, processing and exportation of material	Land use within the site	Neutral, imperceptible, direct, likely, effect on land use
Contamination of Soil/Bedrock by Leakages and Spillages of Hydrocarbons	Soil, subsoil and bedrock pore space	Soil, subsoil and bedrock	Negative, slight, direct, long-term, unlikely impact on soil, subsoil and bedrock

Table 0-4: Potential Impacts, Pathways and Receptors

Cumulative impacts

The surrounding land use activities in the area are mainly agricultural while quarrying operations will continue in the existing quarry immediately to the north of the site. Due to the lack of significant residual impacts from the development that would potentially affect the wider environment, there will be no significant cumulative impacts on the land, soils and geological environment. Desktop research of Waterford

Co. Co planning files also indicates there are no sites within the vicinity of the proposed development which have the potential for significant cumulative impacts on the land, soils and geological environment of the area. All impacts on land, soils and geology relating to the proposed development will be localised and within the development footprint.

Interactions with other impacts

The proposed developments potential impacts on the land, soils and geological environment has been assessed in this chapter. Potential interactions with other environmental attributes may include impacts on ecological conditions and ecologically designated aquatic sites. The overall impact of the development on these receptors is also considered and assessed in Chapter 7.

Mitigation Measures

A range of mitigation measures to mitigate against any potential adverse effect on the land, soils and geological environment in the area is detailed in Table *0-5* below.

Predicted Impacts (Source)	Mitigation Measures	Residual Effect
Land-use Change	The proposed development is not a significant deviation from the current quarry land use activities being undertaken at the site. No mitigation measures are deemed necessary.	Neutral, imperceptible, direct, likely, effect on land use
Contamination of Soil/Bedrock by Leakages and Spillages of Hydrocarbons	The proposed mitigation measures include: • On site re-fuelling will be undertaken using a double skinned bowser with spill kits on the ready for accidental leakages or spillages; • On site re-fuelling will be undertaken by suitably trained personnel only; • Fuels stored on site will be minimised. Storage areas are bunded appropriately for the fuel storage volume for the time period of the construction and fitted with a storm drainage system and an appropriate oil interceptor; • The plant used during construction will be regularly inspected for leaks and fitness for purpose; and, • An emergency plan for the construction phase to deal with accidental spillages will be contained within a Construction and Environmental Management Plan. Spill kits will be available to deal with and accidental spillage in and outside the re-fuelling area.	Negative, imperceptible, direct, long-term, unlikely effect on the land, soils and geology environment

Table 0-5: Mitigation Measures and Residual Effect

Residual Impacts

The residual effects are summarised in Table *0-5* above and discussed below.

The import, processing and export of materials will have a negligible impact on land use at the site due to the sites' location in an existing quarry void.

The use and storage of hydrocarbons is a standard risk associated with all construction sites. Proven and effective mitigation measures to mitigate the risk of spills and leaks have been proposed above in **Error! Reference source not found.** and will break the pathway between the potential source and the receptor. The residual effect is considered to be – Negative, imperceptible, direct, long term, unlikely impact on the land soils and geology environment.

As a result of the assessment of potential adverse effects of the development, it is determined there will be no significant adverse effect on the land, soils and geological environment. The overall effects of the proposed development on are negligible.

Monitoring

No monitoring required.

CHAPTER 7

WATER

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INTRODUCTION

This chapter forms part of the Environmental Impact Assessment Report prepared to accompany a Planning application to Waterford City and County Council submitted by NRGE Ltd, on behalf of Kereen Quarries Ltd, in relation to the existing quarry at Kereen Lower, Cappoquin, Co. Waterford.

The proposed development site has a total area of 0.42 acres and is being applied for under this application. The proposed development will consist of the import, processing and export of construction materials (50,000 tonnes per annum) with all processing activity to be contained within the redline site boundary.

This chapter relates to the potential likely and significant impacts the development could have on the receiving hydrological and hydrogeological environment.

Information was gathered from various online sources and from onsite field studies.

Impact Assessment

The importance / sensitivity of the hydrological and hydrogeological receptors was assessed on completion of the desk study and baseline assessment.

Using the NRA Guidance [18], an estimation of the importance / sensitivity of the geological, hydrogeological and hydrological environments within the study area is set out Table *0-1* and Table *0-2* below.

Importance	Criteria	Typical Example
Extremely High	Attribute has a high quality, significance or value on a regional or national scale.	River, wetland or surface water body ecosystem protected by EU legislation, e.g. 'European sites' designated under the Habitats Regulations or 'Salmonid waters' designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988).
Very High	Attribute has a high quality, significance or value on a regional or national scale.	• River, wetland or surface water body ecosystem protected by national legislation – NHA status. • Regionally important potable water source supplying >2500 homes. • Quality Class A (Biotic Index Q4, Q5). • Flood plain protecting more than 50 residential or commercial properties from flooding. • Nationally important amenity site for wide range of leisure activities.
High	Attribute has a high quality, significance or value on a local scale.	• Salmon fishery locally important potable water source supplying >1000 homes. • Quality Class B (Biotic Index Q3-4). • Flood plain protecting between 5 and 50 residential or commercial properties from flooding.
Medium	Attribute has a medium quality, significance or value on a local scale.	• Coarse fishery. • Local potable water source supplying >50 homes Quality Class C (Biotic Index Q3, Q2-3). • Flood plain protecting between 1 and 5 residential or commercial properties from flooding.
Low	Attribute has a low quality, significance or value on a local scale.	• Locally important amenity site for small range of leisure activities. • Local potable water source supplying <50 homes. • Quality Class D (Biotic Index Q2, Q1) Flood plain protecting 1 residential or commercial property from flooding. • Amenity site used by small numbers of local people.

Table 0-1: Estimation of Importance of Hydrology Attributes

Importance	Criteria	Typical Example
Extremely High	Attribute has a high quality, significance or value on a regional or national scale.	• Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation, e.g. SAC or SPA status
Very High	Attribute has a high quality, significance or value on a regional or national scale.	• Regionally Important Aquifer with multiple wellfields. • Groundwater supports river, wetland or surface water body ecosystem protected by national legislation - NHA status. • Regionally important potable water source supplying >2500 homes Inner source protection area for regionally important water source.
High	Attribute has a high quality, significance or value on a local scale.	• Regionally Important Aquifer Groundwater provides large proportion of baseflow to local rivers. • Locally important potable water source supplying >1000 homes. • Outer source protection area for regionally important water source. • Inner source protection area for locally important water source.
Medium	Attribute has a medium quality, significance or value on a local scale.	• Locally Important Aquifer. • Potable water source supplying >50 homes. • Outer source protection area for locally important water source.
Low	Attribute has a low quality, significance or value on a local scale.	• Poor Bedrock Aquifer Potable water source supplying <50 homes.

Table 0-2: Estimation of Importance of Hydrogeology Attributes

Once the importance and sensitivity of the hydrological and hydrogeological attribute is established, the conventional source-pathway-receptor model for groundwater / surface water protection was applied to assess impacts on surface water and groundwater specifically on downstream sensitive ecological receptors and local groundwater supplies.

Where potential impacts are identified, the classification of impacts in the assessment follows the descriptors provided in the Glossary of Impacts contained in the following guidance documents produced by the Environmental Protection Agency (EPA):

- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003);
- Guidelines on the Information to be contained in Environmental Impact Statements (EPA, 2002);
- Environmental Protection Agency (September 2015): Draft - Advice Notes on Current Practice (in the preparation of Environmental Impact Statements); and,
- Environmental Protection Agency (August 2017): Draft – Guidelines on the Information to be contained in Environmental Impact Assessment Reports.

The description process clearly and consistently identifies the key aspects of any potential impact source, namely its character, magnitude, duration, likelihood and whether it is of a direct or indirect nature.

In order to provide an understanding of the stepwise impact assessment process applied below, we have firstly presented below a summary guide that defines the steps (1 to 7) taken in each element of the impact assessment process in the below. The guide also provides definitions and descriptions of the assessment process and shows how the source-pathway-target model and the EPA impact descriptors are combined.

Attribute	Status/Occurrence	Importance
Step 1	Identification and Description of Potential Impact Source. This section presents and describes the activity that brings about the potential impact or the potential source of pollution. The significance of effects is briefly described.	
Step 2	Pathway / Mechanism:	The route by which a potential source of impact can transfer or migrate to an identified receptor. In terms of sand and gravel extraction, surface water and groundwater flows are the primary pathways.
Step 3	Receptor:	A receptor is a part of the natural environment which could potentially be impacted upon, e.g. human health, plant / animal species, aquatic habitats, soils/geology, water resources, water sources. The potential impact can only arise as a result of a source and pathway being present.
Step 4	Pre-mitigation Impact:	Impact descriptors which describe the magnitude, likelihood, duration and direct or indirect nature of the potential impact before mitigation is put in place.
Step 5	Proposed Mitigation Measures:	Control measures that will be put in place to prevent or reduce all identified significant adverse impacts. These measures are generally provided in two types: (1) mitigation by avoidance, and (2) mitigation by best practice engineering design.
Step 6	Post Mitigation Residual Impact:	Impact descriptors which describe the magnitude, likelihood, duration and direct or indirect nature of the potential impacts after mitigation is put in place.
Step 7	Significance of Effects:	Describes the likely significant post mitigation effects of the identified potential impact source on the receiving environment.

Table 0-3: Assessment Methodology

Using this defined approach, this impact assessment process is then applied to proposed import, processing and export of construction materials. Activities related to aggregate recycling have the potential to generate a source of significant adverse

impact on the hydrological/hydrogeological (including wells, streams and water quality) environments.

- Sources

In the case of the proposed development site the primary potential sources of impact are to groundwater quality whereby the primary potential hazards are suspended solids, leaching and spillages, and accidental discharges of potential pollutants to the local groundwater causing a deterioration in water quality.

- Pathway

The pathway in terms of groundwater flowpaths is via faults and fractures in the underlying bedrock aquifer, and for surface water this will be via potential baseflow entering the Clashnadarriv stream and the Finisk River.

- Receptor

The primary local targets of concern are the nearby designated sites, the underlying regionally important aquifer, local wells and local downstream surface water receptors (i.e. Finisk and Blackwater Rivers).

Scope of works

A desk study of the site and the surrounding area was largely completed prior to the undertaking of field mapping and walkover assessments. The desk study involved collecting all relevant geological, hydrological, hydrogeological and meteorological data for the area. This included consultation of the following:

- Environmental Protection Agency database (www.epa.ie);
- Geological Survey of Ireland - Groundwater Database (www.gsi.ie);
- Met Eireann Meteorological Databases (www.met.ie);
- National Parks & Wildlife Services Public Map Viewer (www.npws.ie);
- Water Framework Directive "catchments.ie" Map Viewer (www.catchments.ie);
- Bedrock Geology 1:100,000 Scale Map Series, Sheet 22;
- Geological Survey of Ireland - Groundwater Body Characterisation Reports;
- OPW Indicative Flood Maps (www.floodmaps.ie);
- Environmental Protection Agency – "Hydrotool" Map Viewer (www.epa.ie); and,
- Department of Environment, Community and Local Government on-line mapping viewer (www.myplan.ie).

A site visit and walkover survey was completed by HES on 17th November 2021.

The data presented and reviewed in this chapter incorporates observations made during the site walkover survey and all data obtained from the desk study.

Contributors/ Authors(s)

Hydro-Environmental Services (HES) are a specialist geological, hydrological, hydrogeological and environmental practice which delivers a range of water and environmental management consultancy services to the private and public sectors across Ireland and Northern Ireland. HES was established in 2005, and our office is located in Dungarvan, County Waterford.

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Michael Gill P. Geo (BA, BAI, Dip Geol., MSc, MIEI) is an Environmental Engineer and Hydrogeologist with over 18 years' environmental consultancy experience in Ireland. Michael has completed numerous hydrology and hydrogeology impact assessments of quarry projects in Ireland.

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Legislation

The EIAR is prepared in accordance with the requirements of European Union Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (the 'EIA Directive') as amended by Directive 2014/52/EU.

The following legislation has been complied with:

- Planning and Development Acts, 2000 (as amended);
- Planning and Development Regulations, 2001 (as amended);
- S.I. No 296 of 2018: European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 which transposes the provisions of the EIA Directive as amended by the Directive 2014/52/EU into Irish Law;
- S.I. No. 94 of 1997: European Communities (Natural Habitats) Regulations, resulting from EU Directives 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive) and 79/409/EEC on the conservation of wild birds (the Birds Directive);
- S.I. No. 293 of 1988: Quality of Salmon Water Regulations;
- S.I. No. 272 of 2009: European Communities Environmental Objectives (Surface Waters) Regulations 2009, as amended, and S.I. No. 722 of 2003

European Communities (Water Policy) Regulations, as amended, which implement EU Water Framework Directive (2000/60/EC) and provide for implementation of 'daughter' Groundwater Directive (2006/118/EC). Since 2000 water management in the EU has been directed by the Water Framework Directive (WFD). The key objectives of the WFD are that all water bodies in member states achieve (or retain) at least 'good' status by 2015. Water bodies comprise both surface and groundwater bodies, and the achievement of 'Good' status for these depends also on the achievement of 'good' status by dependent ecosystems. Phases of characterisation, risk assessment, monitoring and the design of programmes of measures to achieve the objectives of the WFD have either been completed or are ongoing. In 2015 it will fully replace a number of existing water related directives, which are successively being repealed, while implementation of other Directives (such as the Habitats Directive 92/43/EEC) will form part of the achievement of implementation of the objectives of the WFD;

- S.I. No. 684 of 2007: Waste Water Discharge (Authorisation) Regulations, resulting from EU Directive 80/68/EEC on the protection of groundwater against pollution caused by certain dangerous substances (the Groundwater Directive);
- S.I. No. 249 of 1989: Quality of Surface Water Intended for Abstraction (Drinking Water), resulting from EU Directive 75/440/EEC concerning the quality required of surface water intended for the abstraction of drinking water in the Member States (as amended by 2000/60/EC in 2007);
- S.I. No. 122 of 2014: European Communities (Drinking Water) Regulations;
- S.I. No. 9 of 2010: European Communities Environmental Objectives (Groundwater) Regulations 2010, as amended; and,
- S.I. No. 296 of 2009: European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009, as amended.

In addition the Hydrology and Hydrogeology chapter of this EIAR is carried out in accordance with guidance contained in the following:

- Environmental Protection Agency (2017): Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports;
- Environmental Protection Agency (September 2015): Draft - Advice Notes on Current Practice (in the preparation of Environmental Impact Statements);
- Environmental Protection Agency (September 2015): Draft – Revised Guidelines on the Information to be Contained in Environmental Impact Statements;
- Environmental Protection Agency (2003) Advice Notes on Current Practice (in the preparation of Environmental Impact Statements);
- Environmental Protection Agency (2006): Environmental Management in the Extractive Industry;

- Environmental Protection Agency (2002) Guidelines on the Information to be Contained in Environmental Impact Statements;
- Institute of Geologists Ireland (2013) Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements;
- National Roads Authority (2008) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes;
- Inland Fisheries Ireland (2016): Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Watercourses;
- PPG1 - General Guide to Prevention of Pollution (UK Guidance Note);
- PPG5 – Works or Maintenance in or Near Water Courses (UK Guidance Note);
- CIRIA (Construction Industry Research and Information Association) Guidance on 'Control of Water Pollution from Linear Construction Projects' (CIRIA Report No. C648, 2006); and,
- Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors. CIRIA C532. London, 2001.

Existing limit values

The site is located within the footprint of an existing quarry which is operating in accordance with its planning conditions. A water treatment system currently exists at the quarry to protect surface water quality of downstream watercourses. The existing treatment system comprises a settlement pond in the northeast of the quarry from which water is pumped to a stone filled drainage channel prior to discharge into the Clashnadarriv (Glenkereen) stream. The site and the existing quarry have been operating under planning conditions since 2008 (Planning Permission Ref: 08/496).

No conditions specifically address the hydrological or hydrogeological environment. The primary risk to surface waters from quarrying activities is associated with the release of elevated concentrations of suspended solids. The Salmonid Water Regulations (1988) and the Surface Water Regulations (1989) provide limit values for concentrations of suspended solids (≤25mg/l and 50mg/l respectively).

Receiving environment

Site Description and Topography

Kareen Quarry is located ~10km south of the village of Cappoquinn and ~13km west of the town of Dungarvan. The quarry is located in the townland of Kereen Lower, approximately 3Km from Aglish, Co. Waterford.

The proposed development site ('the site') which is being applied for under this application has a total area of 0.42ha and lies in the south of the overall quarry landholding. Historically soil and subsoil have been removed from the site and bedrock extracted. However no extraction is currently taking place within the site boundary, although quarrying in other parts of the landholding continues . Quarrying operations are continuing elsewhere in the quarry with material being processed using mobile plant. These quarrying operations are not dealt with in this EIAR. The proposed development relates to the import, processing and export of construction materials within the site. Current facilities existing at Kereen Quarry include offices, weighbridge, canteen, bunded fuel storage area all of which are located near the quarry entrance in the southeast of the overall landholding.

Access to the quarry is via the R671 located along the eastern boundary of the quarry. All site traffic enters via the access road and weighbridge located at the entrance. It is proposed that this entrance will continue as the sole access point to the site.

Ground elevation contours show local topography sloping towards the east and the EPA mapped Clashnadarriv River. Local pre-quarrying ground elevations ranged from 72mOD (metres above Ordnance Datum) in the west to ~42mOD in the east of the overall landholding. Historic ground elevations within the site ranged from ~63 – 57mOD. Current ground elevations are lower due to historic removal and extraction of soils and subsoils. The elevation of the site currently ranges from 41-41.18mOD. The main quarry floor currently stands at 29mOD as permitted within the existing permission. The elevation of the stream to the east of the quarry ranges from ~39.5mOD in the south to ~36.7mOD in the north.

Water Balance

Long term rainfall and evaporation data was sourced from Met Éireann. The long-term average annual rainfall (AAR) (1981 - 2010) recorded at Cappoquin (Station House), approximately 7.6km northwest of the quarry, is presented in Table *0-4*.

Station		X-Coord		Y-Coord		HT(mOD)		Year start		Year end		Total
Cappoquin		210200		100000		70		1981		2010		
Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Total
123	87.1	91.9	77.4	73.6	78.7	75.3	89.4	85.9	130	112	115	1,141.2

Table 0-4: Local Average long-term Rainfall Data (mm)

The closest synoptic station1 where the average potential evapotranspiration (PE) is recorded is at Cork Airport, approximately 55km to the southeast of the quarry. The long-term average PE for this station is 513.2mm/yr. This value is used as a best estimate of the site PE. Actual Evaporation (AE) at the site is estimated as 487.6mm/yr (which is 0.95 × PE).

The effective rainfall (ER) represents the water available for runoff and groundwater recharge. The ER for the site is calculated as follows:

$$\text{Effective rainfall (ER)} = \text{AAR} - \text{AE}$$

$$= 1{,}073 \text{ mm/yr} - 516 \text{ mm/yr}$$

$$\text{ER} = 557 \text{ mm/yr}$$

Due to the removal of soil/subsoil at the site it is expected that the majority of the effective rainfall landing on the working area percolates (recharges) into the bedrock aquifer.

Regional Hydrology

On a regional scale, the quarry is located in the Blackwater (Munster) surface water catchment within Hydrometric Area 18. This catchment includes the area drained by the Blackwater River and all streams entering the tidal waters between East Point and Knockaverry, Youghal, Co. Cork. The total area of this catchment is 3,310km^2. The Blackwater rises in the Mullaghereirk Mountains and flows south to Rathmore before continuing east to Banteer and flowing through Mallow and eastwards towards Fermoy. The Blackwater becomes tidal before abruptly turning south at Cappoquin, approximately 7km northwest of the quarry. The Blackwater then flows to the south, with the estuary located ~4.4km west of Kereen quarry. The Blackwater flows past Youghal and out to sea through Youghal Harbour.

Local and Site Hydrology

On a more local scale, the site and the overall quarry landholding are located in the Finisk River surface water sub-catchment (Finisk_SC_010) and the Finisk_030 WFD River Sub-Basin. The EPA map a stream, referred to as the Clashnadarriv stream (EPA

[1] *A station at which meteorological observations are made for the purposes of synoptic (large spatial scale) analysis*

Code: 18C34) (Note that local maps often refer to this watercourse as the Glenkereen stream) to flow to the north along the eastern boundary of the quarry. This watercourse discharges into the Finisk River (EPA Code: 18F02) ~1.6km north of the site and ~1km north of the overall quarry landholding. The Finisk River then flows to the northwest and discharges into the Blackwater River ~4.8km northwest of the site.

The current floor level in the north of the quarry is operating at ~29mOD. Here quarrying activities are operating below the local groundwater table and therefore dewatering is required. Water is pumped from the extraction areas to the settlement pond located in the northeast of the quarry pit. Water leaves the settlement pond via pumping and is discharged to the Clashnadarriv stream via a stone filled drainage channel. The purpose of this channel is to restrict the flow into the local stream.

A local hydrology map is shown as Figure 7. 1 below.

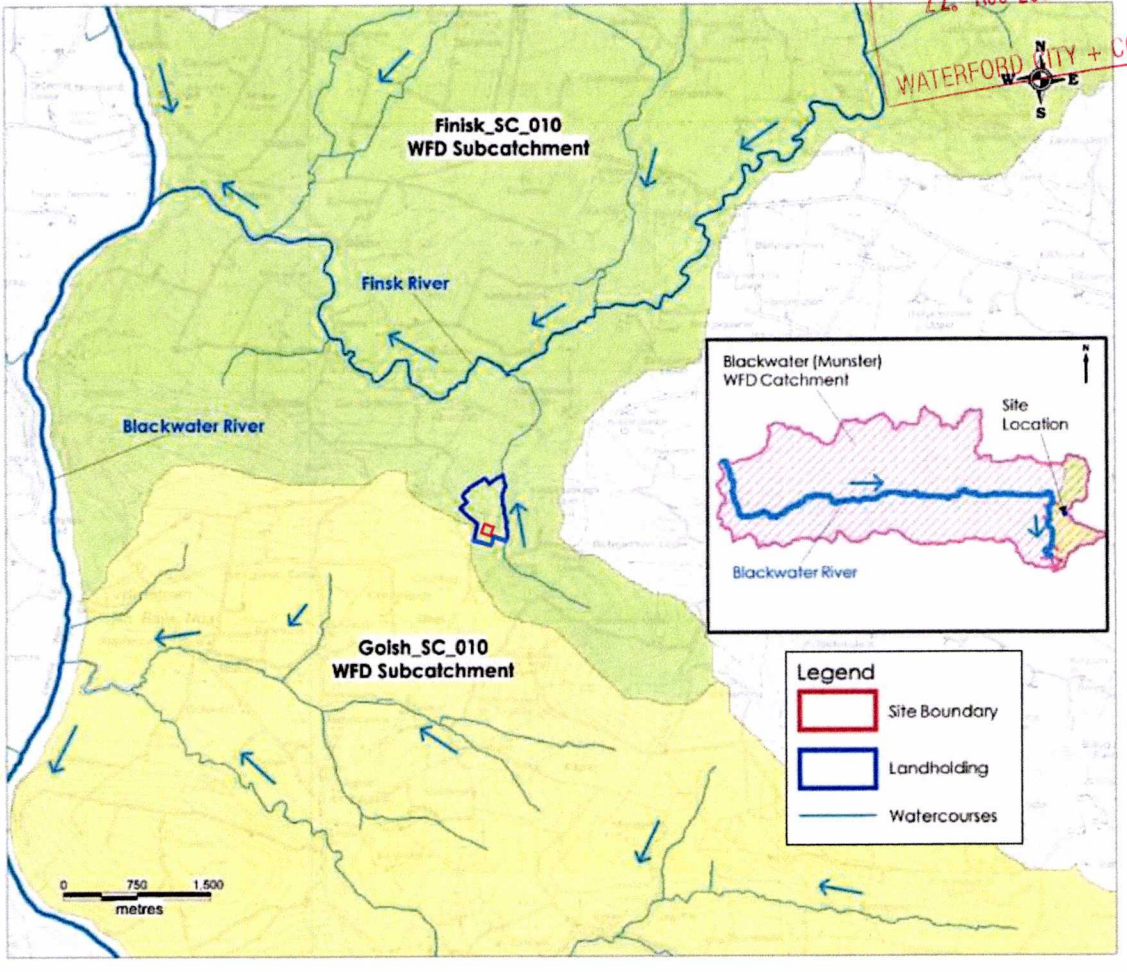

Figure 7. 1: Local Hydrology Map

Flood Risk Assessment

The OPW Flood Hazard Mapping as well as OPW's Catchment Flood Risk Assessment and Management (CFRAM) maps were used to identify areas at risk of flooding.

The OPW's Flood Hazard Map does not record any historic or recurring flood incidents in the vicinity of the site or the quarry. The closest recurring fluvial flood events are mapped ~3km northwest of the site in the townlands of Monyvroe (Flood ID:3846) and Quarter (Flood ID: 3845) on the Finisk River. Further downstream several recurring flood events are located along the Blackwater River Estuary.

CFRAM mapping shows that the site is located in Fluvial Flood Zone C (low risk). The closest mapped fluvial flood zones are located along the Finisk River to the north of the site.

The GSI Historical 2015/2016 Surface Water Flood Map shows the extent of surface water flooding during the winter of 2015/2016 which was in most areas one of the largest floods on record. The site is not mapped within a historic flood extent, with the closest flood zone located on the townland of Cloghbog ~500m southwest of the site (refer to **Error! Reference source not found.**).

Similarly the site is not mapped in any historic groundwater flood zone (www.gsi.ie). The closest mapped predictive groundwater flood zones are located ~3.8km northeast of the site near Cappagh Quarry.

The site is therefore not at risk of flooding and is located in Flood Zone C.

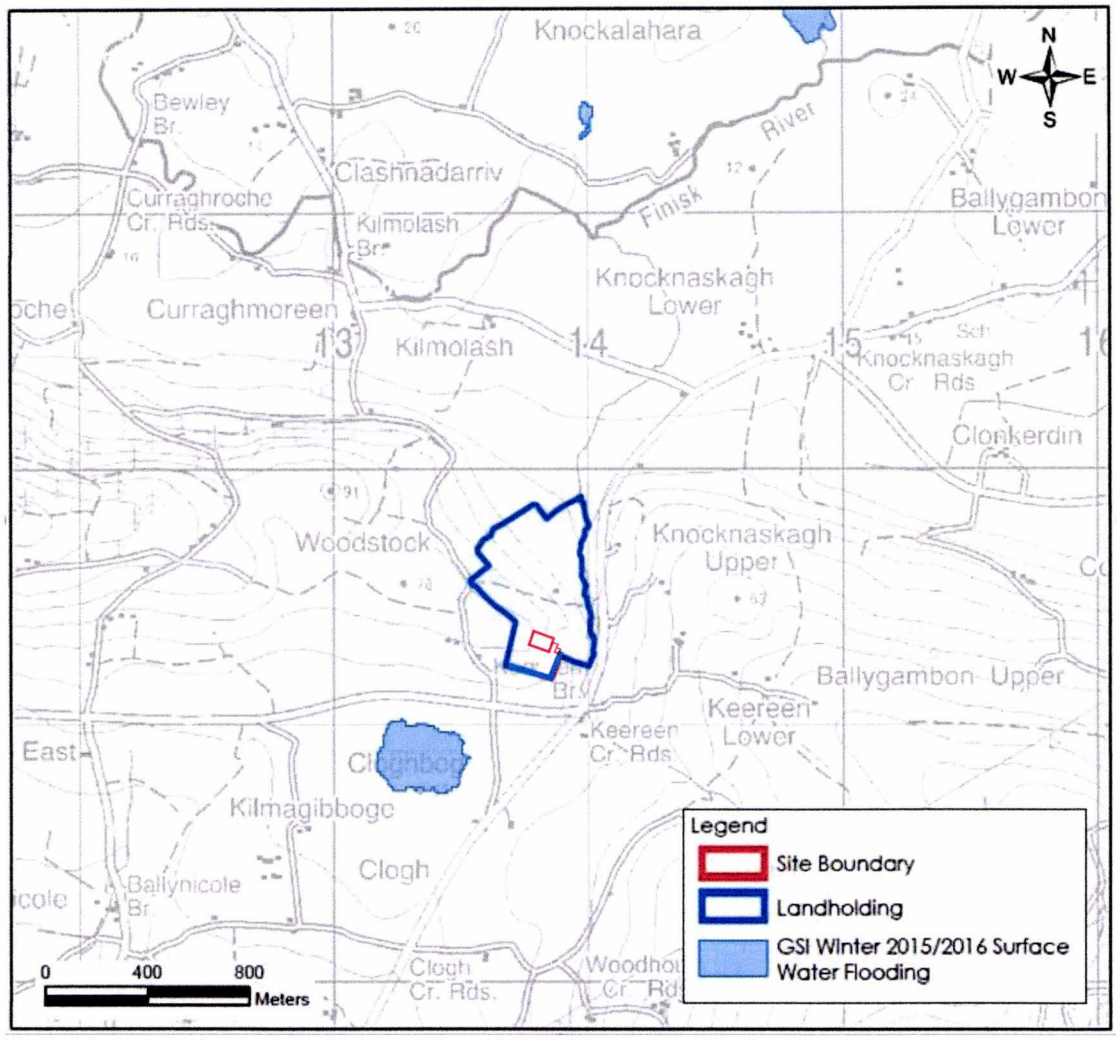

Figure 7. 2: GSI Historical 2015/2016 Surface Water Flood Mapping

Surface Water Hydrochemistry

Biological Q-rating data for EPA monitoring points on the Finisk and Blackwater Rivers are shown on Table *0-5* below. The Q-Rating is a water quality rating system based on both the habitat and the invertebrate community assessment and is divided into status categories ranging from 0-1 (Poor) to 4-5 (Good/High). No Q-ratings are available for the Clashnadarriv stream.

Upstream of the confluence of the Finisk River and the Clashnadarriv stream, the Finisk River achieved a Q-rating of Q4-5 (High status) at Modelligo Bridge in 2018. Downstream of the confluence the Finisk River achieved a Q-rating of Q4 (Good status) at Kilmolash Bridge.

The closest EPA monitoring point on the Blackwater River is located at a bridge 2km downstream of Lismore town. Here the Blackwater River achieved a Q-rating of Q4 (Good status) in 2018. No EPA monitoring points are located downstream of the

confluence of the Finisk and Blackwater rivers due to the estuarine nature of the waters.

Station Code	Station Name	Waterbody	Year	Q-Rating
RS18F020300	Modelligo Br.	Finisk_020	2018	Q4-5
RS18F020500	Kilmolash Br.	Finisk_030	2018	Q4
RS18B022700	2km downstream Lismore	Blackwater (Munster)_220	2018	Q4

Table 0-5: EPA Q-ratings for Waterbodies upstream and downstream of the site

While the Blackwater River is listed in the Salmonid River Regulations (S.I. 293), this does not include the tidal sections of the river in the vicinity and downstream of Cappoquin. Similarly large areas of the Blackwater surface water catchment are mapped as containing designated freshwater pearl mussel populations. However the watercourses in the vicinity of the site and directly downstream are not known to contain any freshwater pearl mussel populations.

Measurements of suspended solid concentrations were taken at the discharge location on the Clashnadarriv stream on 3 no. occasions in late April 2021. The results are shown in Table *0-6* below with suspended solid concentrations being below the limit of detection (5mg/l) in all three samples. These values were well below the relevant environmental quality standard value of ≤25mg/l as outlined in the Salmonid Water Regulation (1998). pH was recorded as 6.7 in Sample A which falls within the acceptable range of 6-9 as outlined in the Salmonid Water Regulations.

Sample	pH	Suspended Solids (mg/l)
EQS	≥6 and ≤9	≤25
Sample A	6.7	<5
Sample B	-	<5
Sample C	-	<5

Table 0-6: Surface Water Sampling Results (29/04/2021)

Regional Hydrogeology

The Old Red Sandstones underlying the site and much of the quarry are classified as being a Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones (Ll). The Dinantian Sandstones, Shales and Limestones of the Lower Limestone Shale Formation, which underlie the north of the overall quarry

landholding, is classified as a Poor Aquifer – Bedrock which is Generally Unproductive except for Local Zones. Meanwhile the Dinantian Sandstones, Shales and Limestones of the Crows Point Formations are classified as a Locally Important Aquifer (Ll).

The site and the overall quarry landholding is mapped to be underlain by the Glenville Groundwater Body (GWB) (EU Code: IE_SW_G_037). This GWB is characterized by poorly productive bedrock with the old red sandstone being the dominant bedrock aquifer lithology. These aquifers are of low transmissivity (2-20m^2/day) and low storativity. However some excellent yielding wells are associated with fault zones. Recharge occurs to this GWB through rainfall percolating through the subsoil, however the lack of aquifer permeability will restrict recharge. These rocks are devoid of intergranular permeability and groundwater flow will be restricted to faults and joints and in the upper shallow weathered layer of the aquifer. Groundwater will discharge to rivers and streams crossing the GWB (GSI, 2004).

A map of local bedrock aquifers is shown as **Error! Reference source not found.** below.

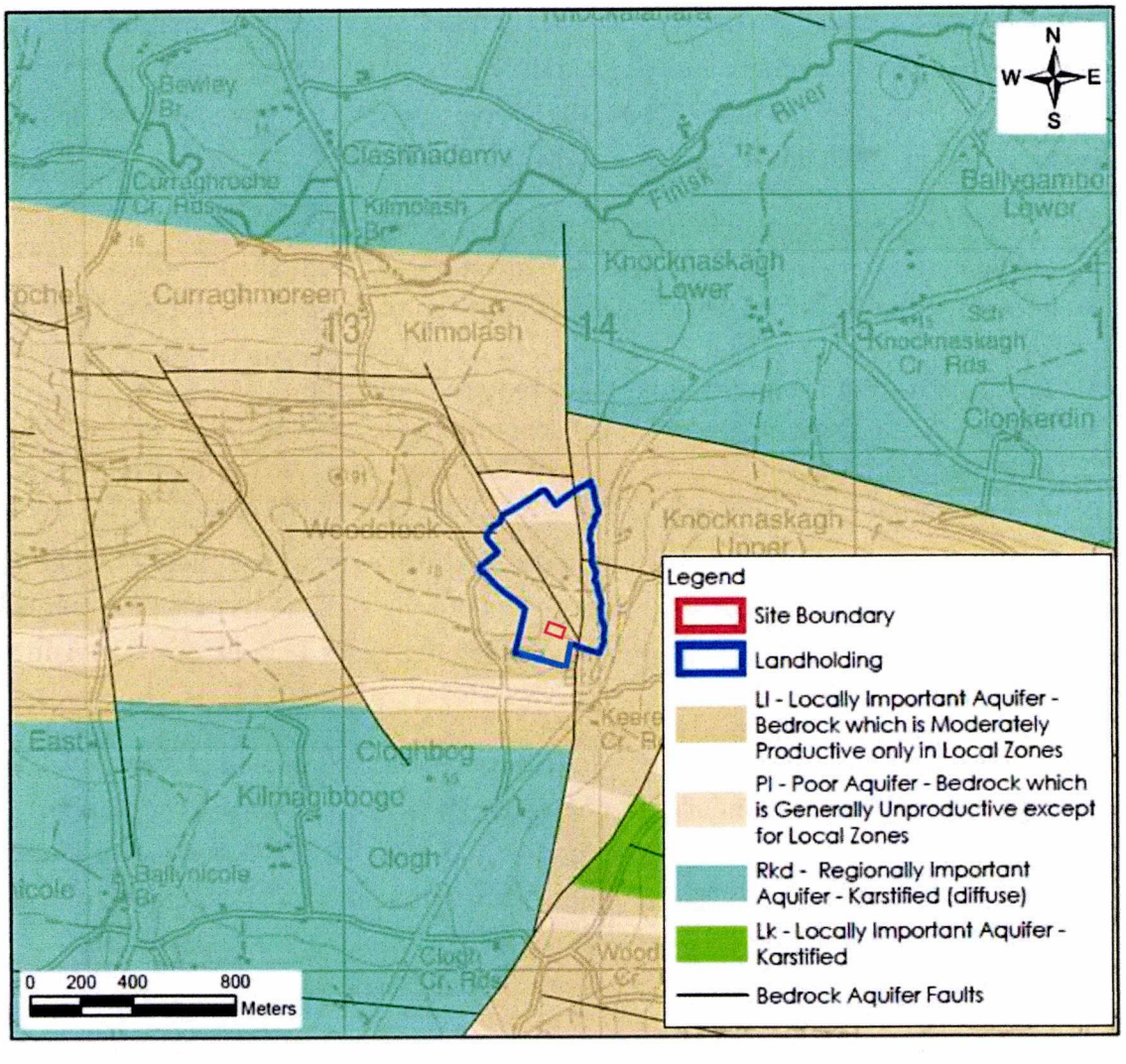

Figure 7. 3: Bedrock Aquifer Map

Groundwater Vulnerability

Groundwater vulnerability is mapped at the site by the GSI as being Extreme-X in areas of bedrock outcrop and Extreme-E where glacial subsoils are present.

Groundwater Hydrochemistry

No groundwater quality data is available for the site and groundwater sampling would generally not be undertaken for this type of development in terms of EIA reporting as groundwater quality impacts would not be anticipated.

The GSI (2004) state that the Old Red Sandstone formations largely contain calcium bicarbonate water. Conductivities are relatively low ranging from 125 to 600µS/cm. Iron and manganese also commonly occur in groundwater derived from sandstone and shale formations.

Water Framework Directive

The River Basin Management Plan was adopted in 2018 and has amalgamated all previous river basin districts into one national river basin management district. The River Basin Management Plan (2018 - 2021) objectives, which have been integrated into the design of the development, include the following:

- Ensure full compliance with relevant EU legislation;
- Prevent deterioration and maintain a 'high' status where it already exists;
- Protect, enhance and restore all waters with aim to achieve at least good status by 2021;
- Ensure waters in protected areas meet requirements; and,
- Implement targeted actions and pilot schemes in focused sub-catchments aimed at (1) targeting water bodies close to meeting their objectives and (2) addressing more complex issues that will build knowledge for the third cycle.

Our understanding of these objectives is that surface waters, regardless of whether they have 'Poor' or 'High' status, should be treated the same in terms of the level of protection and mitigation measures employed, i.e. there should be no negative change in status at all.

Strict mitigation measures in relation to maintaining a high quality of surface water runoff from the development and groundwater protection will ensure that the status of both surface water and groundwater bodies in the vicinity of the site will be at least maintained (see below for WFD water body status and objectives) regardless of their existing status.

Groundwater Body Status

Local GWB status and risk results are available from www.catchments.ie and are shown in Table *0-7* for the Glenville GWB.

The Glenville GWB achieved 'Good' status in the latest WFD monitoring round (2013-2018). This status applies to both chemical and quantitative aspects of the GWB. The Glenville GWB has been deemed to be 'At Risk' of not meeting its WFD objective. No significant pressures have been identified to be impacting this GWB.

GWB Code	GWB Name	Chemical Status	Quantitative Status	Overall Status	Risk Status	Pressure Category
IE_SW_G_037	Glenville	Good	Good	Good	At risk	-

Table 0-7: Summary WFD Information for Groundwater Bodies

Surface Water Body Status

A summary of the WFD status and risk result for Surface Water Bodies (SWBs) upstream and downstream of the site are shown in Table *0-8*. Local SWB status and risk results are available from www.catchments.ie.

In the vicinity of the site the Finisk_030 SWB, which includes the Clashnadarriv stream to the east of the quarry, achieved 'Good' status in the latest WFD monitoring round (2013-2018). This water is 'not at risk' of failing to meet its WFD objectives.

Upstream of the confluence of the Finisk and Blackwater Rivers the Upper Blackwater Estuary achieved 'High' status. The risk status of this transitional waterbody is currently under review while anthropogenic pressures have been identified to be impacting on this SWB.

Further downstream the Lower Blackwater Estuary achieved 'Moderate' status. The risk status of this transitional waterbody is under review while agricultural activities in its catchment are listed as a significant pressure.

SWB Code	SWB Name	Overall Status	Risk Status	Pressure Category
IE_SW_18F020500	Finisk_030	Good	Not at Risk	-
IE_SW_020_0500	Upper Blackwater Estuary	High	Under Review	Anthropogenic
IE_SW_020_0100	Lower Blackwater Estuary/Youghal Harbor	Moderate	Under Review	Agriculture

Table 0-8: Summary WFD Information for Surface Waterbodies

Designated Sites

In the Republic of Ireland, designated sites include proposed National Heritage Areas (pNHAs), National Heritage Areas (NHAs), Special Areas of Conservation (SAC) and Special Protection Areas (SPAs). The site is not located within any designated site.

The closest mapped designated site is the Blackwater River (Cork/Waterford) SAC (Site Code: 002170) which is located along the Finisk River ~1km north of the overall quarry landholding. This designated site is therefore located directly downstream of the site with a direct hydrological linkage. The Blackwater River SAC is designated for the several aquatic habitats and species listed in Annex I/II if the E.U. Habitats Directive.

The Blackwater River and Estuary is also designated as a pNHA (Site Code: 000072) ~3km northwest of the quarry.

The Blackwater Estuary SPA (Site Code: 004028) exists ~9km southwest of the site and is a moderately sized, sheltered south facing estuary, extending from Youghal New Bridge to the Ferry Point peninsula. The site is designated under the E.U. Birds Directive with the Blackwater Estuary being of particular importance for wintering waterfowl.

A map of local designated sites is shown as **Error! Reference source not found.** below.

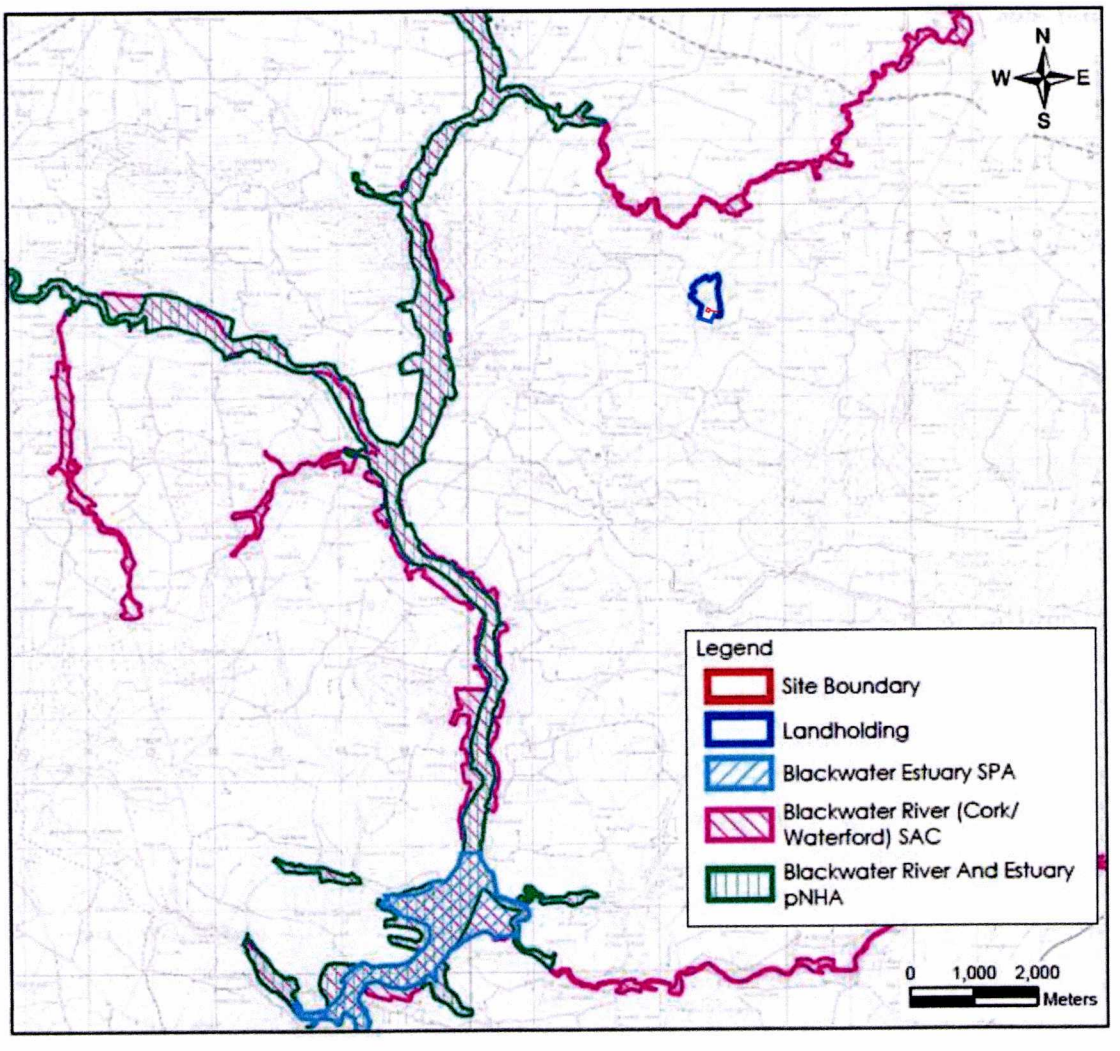

Figure 7. 4: Local Designated Sites

Water Resources

There are no mapped Public Water Supply Schemes (PWS) or National Federation Groundwater Schemes (NFGWS) in the area of the site.

The closest mapped PWS is the Lismore Cappoquin Ballyduff PWS. The mapped source protection area (SPA) for this PWS is located ~3.7km north of the quarry landholding. The Dungarvan PWS SPA is mapped ~5.5km northeast of the site while the Cappoquin PWS SPA is located 5.8km northwest of the quarry. There are no other PWS or GWS within 10km of the site.

A search of private well locations (accuracy of 1 – 50m only) was undertaken using the GSI well database (www.gsi.ie). The GSI record the presence of a borehole (GSI Name: 2009SWW083) ~150m to the northeast of the quarry in the townland of Knocknaskagh and this borehole is listed as being a public supply. A second borehole (GSI Name: 2009SWW053) also listed as being a PWS and owned by Waterford Co Co is located ~330m southeast of the site in the townland of Kereen. This borehole is listed as

having a poor yield class (35m^2/day). These boreholes form the Kereen PWS which does not currently have a delineated SPA. Due to the poor permeability of the bedrock aquifer these wells are likely fed by flow through local fault zone to the east of the quarry.

A map of local groundwater supplies is attached as **Error! Reference source not found.** below.

No downstream surface waterbodies are listed in European Communities (Drinking Water) Regulations 2007 (S.I. 278 of 2007).

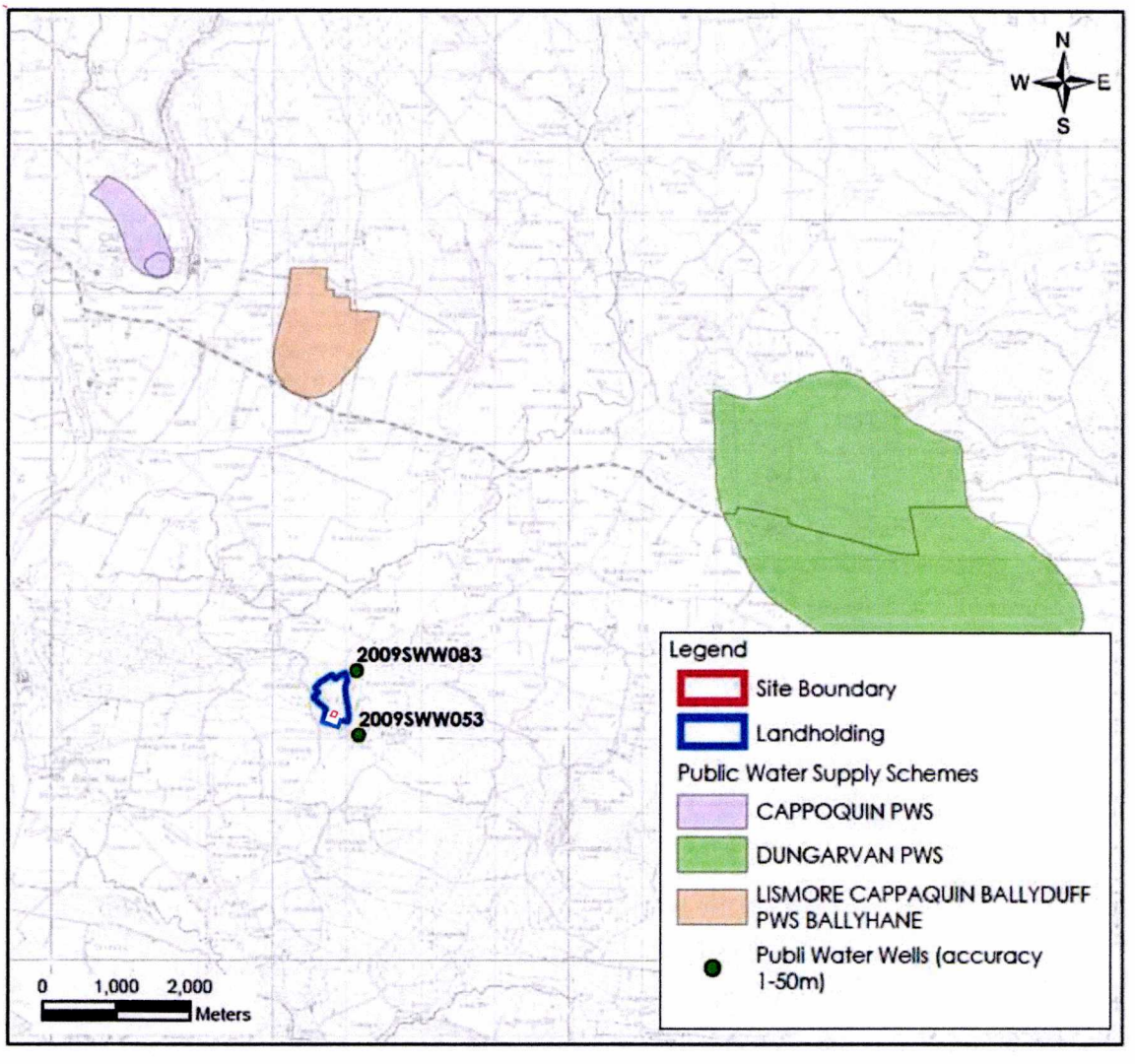

Figure 7. 5: Locally Mapped Public Water Supply and Groundwater Wells

Sensitive Receptors

Based on the criteria set out in Table *0-1* above, the downstream surface watercourses are of extremely high importance due to their designation as a Special Areas of Conservation i.e. Blackwater River (Cork/Waterford) SAC. This designated site is located ~1km downstream from the site and can be classed as very sensitive to pollution due to the presence of aquatic habitats and species listed in Annex I/II of the

E.U. Habitats Directive. The primary potential source of contamination is from the accidental release of contaminants into local watercourses.

Based on the criteria set out in Table *0-2* above, the Locally Important and Poor Aquifers in the vicinity of the site can be classed as being of medium and low importance respectively. The primary risk to groundwater would be from hydrocarbon spillages and leakages and potential contamination of the Kereen PWS to the east of the quarry. The risk of groundwater contamination is common to all construction sites and can be omitted by way of mitigation.

Impact Assessment -Methodology

The proposed development consists of the import, processing and export of construction materials (>25,000 tonnes per annum). Therefore the proposed development has the potential to impact local surface and groundwater quality.

The release of sediment laden waters, the accidental spillage of hydrocarbons and the use of unsuitable imported material have the potential to contaminate both surface and groundwaters in the vicinity of the site.

This EIAR Chapter assesses the potential effects that the proposed development may have on the water environment. In combination effects with other developments and land-uses in the area are also considered.

Assessment Impacts

Recycling of Aggregates – Assessment

The sources and processes associated with the proposed development and its potential to impact on the hydrological and hydrogeological environment is detailed in Table *0-9*.

Activities associated with the aggregate recycling process will require large volumes up to 50,000 tonnes per annum) of material to be imported, processed and exported from the site. This movement of materials is a potential source of sediment laden water. These activities have the potential to release suspended solids to surface watercourses, increasing the sediment load and turbidity in downstream watercourses which in turn could affect the water quality and fish stocks in these watercourses. However, the site is located within the footprint of the existing quarry and due to the bowl-shaped nature of the quarry, overland flow of sediment laden water will be towards the lowest ground level within the quarry and the existing water treatment system. Sediment laden water will gather in a settlement pond which currently exists in the northeast of the quarry where suspended solids are allowed settle out of solution prior to discharge to the nearby stream. Water is pumped from the settlement pond and is discharged via a stone filled drainage channel which allows restricted flow to the Clashnadarriv stream.

No dewatering will be required for the proposed development and therefore there will be no potential effects on groundwater levels or groundwater supply to the local Kereen PWS. Pumping will likely continue in the north of the quarry to facilitate quarrying activities however these activities are not subject of this EIAR.

Accidental spillage and leakages of mobile plant with petroleum hydrocarbons is a significant pollution risk to groundwater and surface water at all construction sites. The accumulation of small spills of fuels and lubricants during routine plant use is a pollution risk. Hydrocarbons have a high toxicity to humans and all flora and fauna and is persistent in the environment. Hydrocarbons are also a nutrient supply for adapted micro-organisms, which can rapidly deplete dissolved oxygen in waters resulting in the death of aquatic organisms. Such risks are already present at this site due to its location within an operating quarry.

Due to the hydrological linkage between the site and the Clashnadarriv stream and the Finisk river, the proposed development has the potential to affect several downstream designated sites. The River Blackwater SAC, the Blackwater River and Estuary pNHA and the Blackwater Estuary SPA are located ~1km north, ~3km northwest and ~9km southwest of the site respectively. These designated sites contain sensitive aquatic species and habitats may be adversely impacted by any deterioration in local surface or groundwater quality. However the proposed development is located within an existing quarry and all risks associated with the development are already present at the site due to the quarrying operations.

Predicted Impacts (Source)	Pathway	Receptor	Pre-Mitigation Risk
Siteworks Resulting in Suspended Solids Entrainment in Surface Waters	Drainage routes and overland flow	Downstream watercourses (Clashnadarriv stream, Finisk and Blackwater rivers)	Negative, direct, imperceptible, likely effect on downstream watercourses
Potential Impacts on Groundwater Levels and Local Well Supplies	Groundwater flowpaths	Groundwater levels	None
Potential Release of Hydrocarbons	Groundwater and surface water flowpaths	Local groundwater quality and downstream surface water quality	Negative, indirect, slight, short term, likely impact to local groundwater quality and negative, indirect, significant, short term, likely impact to surface water quality
Potential Hydrological Impact on Designated Sites	Groundwater and surface water flowpaths	Down gradient water quality in the Blackwater River SAC and pNHA	Negative, imperceptible, indirect, short term, likely effect on Blackwater River SAC and pNHA.
Potential Impacts on Downstream Water Quality	Surface water flowpaths	Surface Water Bodies	Negative, imperceptible, indirect, short-term, likely impact on local surface water quality

Table 0-9: Potential Impacts, Pathways and Receptors

Cumulative impacts

Due to the nature of the proposed development and the local hydrogeological regime, surface runoff from the site will be directed towards the existing quarry floor and the existing surface water treatment system prior to discharge. Similarly the local groundwater regime will remain unchanged.

No significant hydrological and/or hydrogeological cumulative effects will occur.

Interactions with other impacts

The proposed developments potential impacts on the hydrological and hydrogeological environment has been assessed in this chapter. Potential interaction with other environmental attributes may include impacts on ecological conditions and ecologically designate sites (Chapter 5: Biodiversity).

Mitigation Measures

A range of mitigation measures to mitigate against any potential adverse effect on the local hydrology and hydrogeology regimes is detailed in Table *0-10*.

Predicted Impacts (Source)	Mitigation Measures	Residual Effect
Siteworks Resulting in Suspended Solids Entrainment in Surface Waters	No specific mitigation required. The proposed development site is contained within the existing quarry void and will not directly release surface water to the environment. Any surface water will be directed towards the existing quarry water treatment system prior to discharge. Water from the site will be directed towards the existing settlement pond in the northeast of the quarry. Water is then pumped to stone filled drainage channel which allows restricted flow to the Clashnadarriv stream.	Negative, direct, imperceptible, likely effect on downstream watercourses
Potential Impacts on Groundwater Levels and Local Well Supplies	No specific mitigation required	No significant effects
Potential Release of Hydrocarbons	Mitigation measures proposed to avoid release of hydrocarbons at the site are as follows: • Minimal refuelling or maintenance of construction/operation vehicles or plant will take place within the site. Refuelling will occur at an existing bunded and covered fuel tank within the operational quarry; • Onsite refuelling will be carried out by trained personnel only; • The plant used during construction will be regularly inspected for leaks and fitness for purpose; and, • An emergency plan for the construction phase to deal with accidental spillages will be contained within a Construction and Environmental Management. Spill kits will be available to deal with and accidental spillage in and outside the refuelling area.	Negative, indirect, imperceptible, short-term, unlikely impact on groundwater and surface water quality
Potential Impacts on Downstream Water Quality	Management of surface water runoff at the site will remain unchanged with all surface water runoff entering the existing quarry water treatment system: • Runoff from the site will be directed towards the existing water treatment system and settlement pond in the northeast of the quarry; • Water is pumped from the settlement pond to a stone filled drainage channel which allows restricted flow into the Clashnadarriv stream; and, • There will be no net change in runoff/recharge rates from the site.	Negative, imperceptible, indirect, long-term, unlikely impact on downstream surface water quality
Potential Hydrological Impact on Designated Sites	The proposed mitigation measures outlined above to protect downstream surface water quality will provide the necessary protection to the downstream hydrologically sensitive designated sites.	No significant effects

Table 0-10: Mitigation Measures and Residual Effects

Residual Impacts

The residual effects are summarised in Table *0-10* above and discussed in the following paragraphs.

The potential for the release of hydrocarbons to groundwater (locally important bedrock aquifer) and downstream surface watercourses (the Clashnadarriv stream, Finisk and Blackwater rivers) is a risk to surface and groundwater quality, and also the aquatic quality of the surface water receptors (Blackwater River SAC). Proven and effective measures to mitigate the risk of releases of hydrocarbons have been proposed above and will break the pathway between the potential source and each receptor. The residual effect is considered to be - Negative, indirect, imperceptible, short term, likely impact to local groundwater quality. Negative, indirect, imperceptible, short term, unlikely impact to surface water quality.

The potential for the release of suspended solids to watercourse receptors is a risk to water quality and the aquatic quality of the receptor. Proven and effective measures to mitigate the risk of releases of sediment are already in existence at Kereen Quarry and will break the pathway between the potential sources and the receptor. The residual effect is considered to be - Negative, imperceptible, indirect, long term, unlikely impact on local surface waters.

Monitoring

No significant impacts on the water environment are envisaged and no monitoring will be required.

CHAPTER 8

AIR

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INTRODUCTION

This chapter forms part of the Environmental Impact Assessment Report prepared in support of a Planning application for the continued importation and recycling of inert material. This chapter relates to the potential impacts the proposed development could have on air in the vicinity of the quarry.

Information was gathered from various online sources and from onsite field studies.

Monitoring locations

The closest air quality monitoring location in operation to the site is located in Waterford City.

This monitoring station provides automated results for particulate matter, PM_{10} and $PM_{2.5}$.

The most recent results indicate that there have been no exceedances at the monitoring site in 2019 to date.

Background

Due to the nature of the activities carried out at the site, the potential effects of the proposed development on air relate to dust. Odorous emissions are and will not be an issue on the site due to the nature of activities taking place.

In relation to rural areas i.e. Kereen Lower, the primary source of PM10 would be residential solid fuel emissions and local agricultural or rural based activities for deposited dust.

Impact Assessment

Fugitive dust emissions and particulate matter arising from the application site extraction and restoration activities has the potential to affect existing sensitive receptors in the area due to a potential increase in airborne dust deposition.

Combustion emissions from plant machinery may also impact the local air quality

Scope of works

This chapter of the report is to assess the potential impact on the local amenity from increases fugitive emissions and particulate matter from the proposed development.

Mitigation measures and identified where required to eliminate or reduce any potential impacts.

Contributors/ Authors(s)

NRGE Ltd carried out the impact assessment presented in this chapter on behalf of Kereen Quarries Ltd. The lead author for the study was Liam McEniry BSc, PGDip Chem Eng.

Legislation

The Government's policy on air quality within Ireland is set out in the Air Quality Standards (AQS) Regulations 2011 and sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met in Ireland.

The AQS set standards and objectives for pollutants. The pollutants monitored and controlled are: Nitrogen oxides, Sulphur dioxide, Carbon monoxide, Ozone, Particulate matter (PM10, PM2.5 and black smoke), Benzene, VOC's, Heavy metals, polycyclic aromatic hydrocarbons.

These pollutants are monitored at 32 stations across the country.

Existing limit values

As per condition No. 5 of the Planning Permission Ref: 17160, dust emissions from the site shall not exceed 130 mg/m2 per day averaged over a continuous period of 30 days, measured as deposition of insoluble particulate matter at any position along the site boundary

Dust monitoring is carried out, the locations of which are indicated as N1 to N6 on the location maps attached.

If dust levels exceed 350 mg/m2/day, water is sprayed from a tanker to mitigate possible impacts

It should be noted that the 130mg/m2/day is related to outdated methodology. Current guidelines now recommend a limit of 350mg/m2/day.

EPA released a report in 2019 Air quality in Ireland 2019. Table 8.1 describes the monitoring and exceedance of the WHO guideline values for Ozone, PM10, PM2.5, NO_2, SO_2, PAH, Dioxins, All other pollutants.

Pollutant ($\mu g/m^3$)	WHO Air Quality Guideline level (AQG) in 24hrs	Number of exceedances
PM10	45	14/30
PM2.5	15	25/30
NO_2	25	1/30
SO_2	40	1/30
CO	4	No data
Ozone	100 (in 8hrs)	2/30

Table 8. 1 monitoring of WHO air quality guidance

Receiving environment

Study Area

The site is located in the townland of Kereen Lower, approximately 3Km from Aglish, Co. Waterford off the R671.

The proposed development is in relation importation of inert material and the recycling of aggregates. The quarrying area to the north of the site is not part of the application. This application relates only to the area where recycling of aggregates and inert material takes place.

Baseline Study Methodology

The closet monitoring station to the site is Clonmel, Co. Tipperary. PM10 of 23.36 $\mu g/m^3$ AND Pm2.5 of 12.31 $\mu g/m^3$ was used as baseline values. As this is the closest data set to the proposed development it is selected for the assessment of air quality baseline concentrations.

Dust monitoring was carried out on the site in August 2020. Total dust deposition was measured at the site using the bergerhoff gauges specified in the german engineering institute VDI 2119 document entitled *'measurement of dust fall using the Bergerhoff instrument (standard method).*

Dust Deposition Monitoring

Dust deposition monitoring was carried out in August 2020, 4 locations along the site boundary were used for monitoring locations. Figure 8.1 details the locations of the monitoring locations.

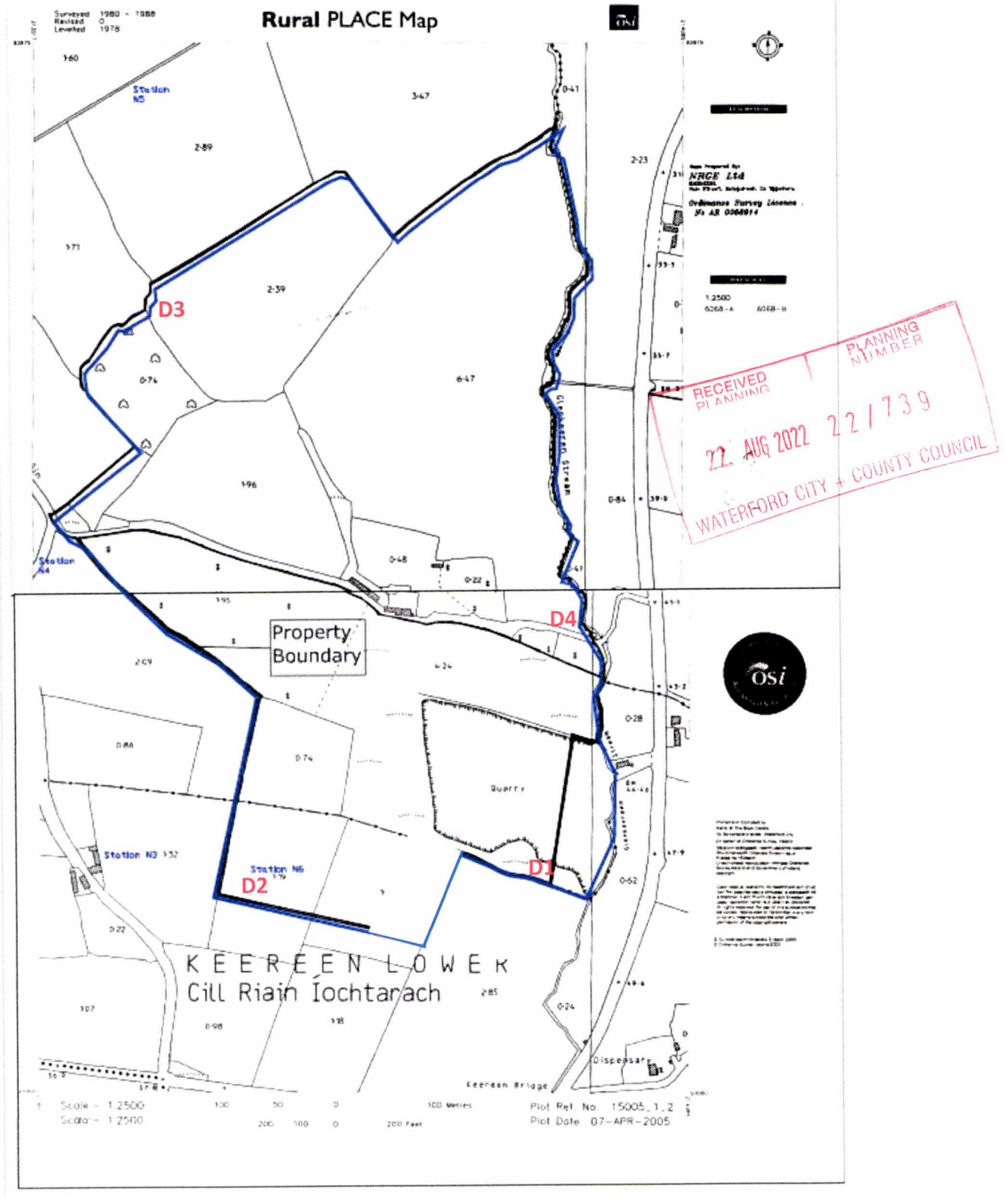


Figure 8. 1 Dust Monitoring Locations

Table 8.2 details the results from the monitoring points in August 2020.

Monitoring Location	**D1**	**D2**	**D3**	**D4**	**Limit Value**
Dust Depositiong mg/m²/day	111	247	177	203	350
ITM Co-ordinates for station	613938, 593288	613622, 593248	613578, 593808	613926, 593521	

Table 8. 2 Dust monitoring values and locations

All of the monitoring points recorded dust deposition rates of less than the recommended 350 mg/m²/day.

Sensitive Receptors

There are no sensitive Ecological receptors located in the vicinity of the proposed development. The closest sensitive receptor is the Blackwater River (Cork/Waterford) SAC is located 1.4Km to the North and 4.1Km to the West of the site.

Sensitive locations also include areas were humans may be exposed to dust from either the existing or proposed development. There are no high sensitivity areas located in the vicinity of the proposed development. There are 10 sensitive receptors within 500m of the proposed development.

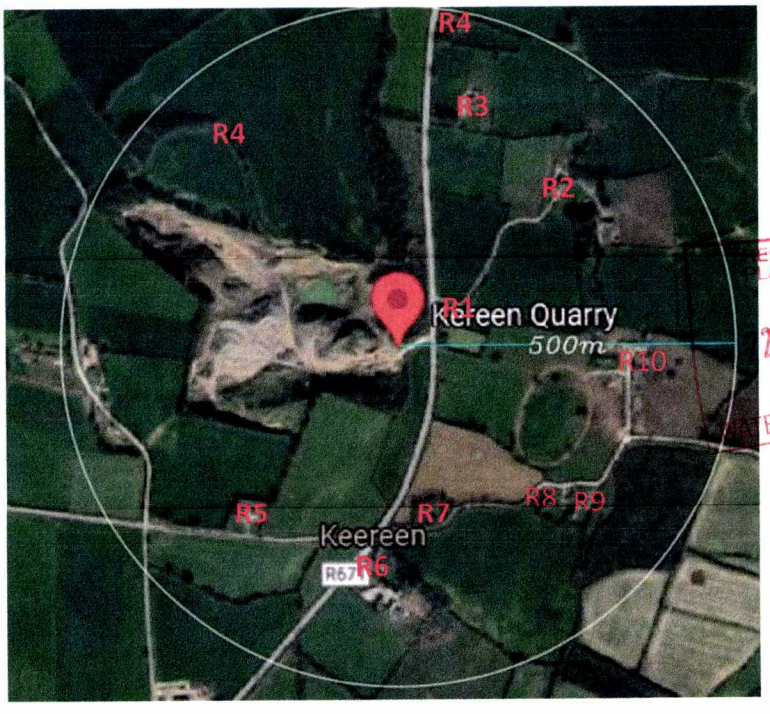


Figure 8. 2 Sensitive receptors

Impact Assessment -Methodology

Fugitive dust emissions from the site has the potential to result in the impairment of, or interference with amenities or environment surrounding the site.

Given the proposed development is a continuation of current activities and as previous dust monitoring indicates dust emissions form the site are well below limit values. The magnitude of release will be low.

Combustion emissions from site machinery has the potential to contribute to local air pollution.

This assessment makes comparisons of baseline data against air quality impacts results from the development. In combination effects with other sources of air pollution in the area are also considered.

Assessment Impacts

Restoration & Recycling of Aggregrates – Assessment

The sources and processes associated with the proposed development and its potential for dust deposition is detailed in Table 8.3

Activity	Source	Emission Potential	Comments
Recycle of aggregates	Crushers, conveyors, Excavators	High- Dry material may emit fugitive emissions during windy weather	Variable weather conditions will effect the potential emission impacts.
		Low- Large material during wet, calm weather	

Table 8. 3 Potential dust deposition sources.

During recycling process traffic will leave the paved areas, this time is minimal, however vehicles have the potential to emit dust as a result.

Although the risk is deemed to be negligible, given ideal meteorological conditions there is the potential for fugitive dust emissions to potentially cause nuisance in the locality. As such mitigation measures must be put in place.

Cumulative impacts

Desktop research of Waterford Co. Co planning files indicated there are no site within the vicinity of the proposed development which has the potential for significant cumulative impacts on air quality in the area.

Dust monitoring carried out at the site boundary in August 2020 indicated that all monitoring locations has deposition values well below the limit values. As the proposed development is a continuation of the existing development it is not envisaged to have any negative in combination effect on air quality.

Interactions with other impacts

The proposed developments potential impacts on air quality effecting sensitive receptors including ecological receptors has been assessed in this chapter. The overall impact of the development on these receptors is also considered and assessed in Chapter 4 & 5.

Mitigation Measures

A range of mitigation measures to mitigate against any potential adverse effect on the air quality in the area is detailed in table 8.4

Source	Emission Potential	Mitigation Measure
Excavators	High- Dry material may emit fugitive emissions during windy weather	Minimise drop heights when handling material. Avoid working in windy conditions
	Low- Large material during wet, calm weather	
Site Vehicles	High- when travelling off-road in dry conditions	Restrict traffic speeds
		Minimise time of haulage vehicles travelling off road
		Use water sprays/ tractor and bowser to moisten surfaces where necessary.
Haulage Vehicles	Low/moderate on paved surfaces	Restrict traffic speeds
		Ensure maintenance of paved road to recycling area.
Stockpiles	High- dry of fine material being stored/ handled in windy weather.	Minimise mechanical disturbances to fine particles stockpiles.
Processing Equipment	High-during dry/ windy weather.	Locate plant equipment in low lying area to shelter from wind.
		Ensure proper maintenance of equipment
		Avoid working in adverse weather conditions where possible.

Table 8. 4 Mitigation Measures

Residual Impacts

From the range of mitigation measures detailed in Table 8.4 it is determined that the risk of dust impact at sensitive receptors to be negligible.

As a result of the assessment of potential adverse effects of the development, it is determined there will be no adverse effect on air quality for humans and or ecological

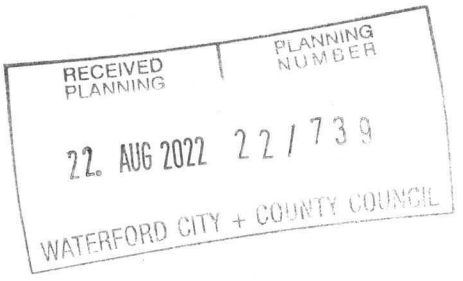
receptors. The overall effects of the proposed development on air quality in the Kereen Lower are negligible.

Monitoring

Dust monitoring locations will be reviewed as appropriate. The results of dust monitoring will be submitted to Waterford County Council on regular basis for review and recording.

CHAPTER 9

CLIMATE



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Background

This chapter forms part of the Environmental Impact Assessment Report prepared in support of a planning application for the continued importation and recycling of inert material. This chapter was prepared by NRGE Ltd. It relates to the potential impacts on the climate from the proposed development.

Information was gathered from various online sources and from onsite field studies.

The development site is confined to 0.42 hectares. This holding is used for the recycling of construction aggregates.

Scope of Works

Subsequent sections of this chapter detail the potential climatic impacts which may be caused by the proposed development. The following sections will be assessed.

- Climate change legislative frameworks
- Analysis of baseline trends
- Identification of climate change concerns in relation to the proposed development
- Assessing effects
- Identify mitigation measures

Contributors/ Authors

NRGE Ltd carried out the impact assessment presented in this chapter on behalf of Kereen Quarries Ltd. The lead author for the study was David Wynne BSc (Env Sci).

Legislative Framework

The production of recycled aggregates from construction and demolition wastes/ mineral exploration sector was not included under the National Adaptation Framework to prepare adaptation plans in line with the requirements of the Climate Action Plan 2019.

Paris Agreement

A global agreement on climate change was agreed in Paris in 2015. The aim of the agreement is to prevent global temperature rise 2°C above pre-industrial levels and aim for 1.5°C increase. The Paris agreement aims to tackle 95% of global emissions. The EU target of a minimum 40% reduction in greenhouse gas emissions by 2030.

Kyoto Protocoal

The EPA holds responsibility for national greenhouse gas inventory in Ireland's national system, which was established in 2007 under the Kyoto protocol. The EPA undertakes all aspects of inventory preparation and management, as well as reporting Ireland's submissions annually.

Catchment Flood Risk Assessment and Management Programme (CFRAM)

The CFRAM programme is the method through which climate change actions will be implemented. The future scenario floodmaps modelled under the CFRAM programme will facilitate this approach, inform all parties and provided information for local adaptation of planning and sustainable land use management.

Receiving Environment

Global temperatures have risen by 0.8°C since pre-industrial times for land and sea. Observations of global temperature increases include; melting of snow and ice caps, regression of glaciers and rising sea levels. The likely cause of these changes is increases in greenhouse gas emissions.

Ireland has a typical oceanic climate, mild, wet winters and cool summers. The prevailing wind is from the south west. The climate is influenced by warm air generated by the gulf stream. The eastern coast receives the least rainfall due to rain shadow from Wicklow mountains.

Local context

The closest weather stations to the site is located in Moorepark which is 42Km from the site. This is not considered representative of the conditions experienced on site.

Impact Assessment

The aim of the vulnerability assessment is to identify the relevant climate hazards for the project at the foreseen location. Table 9.1 details the vulnerability assessment for the proposed development.

	Extreme rainfall, flood, flash flood	Heat	Drought	Wildfire	Storms & Wind	Landslides	Cold Spells and snow	Freeze-thaw damage	Rising Sea Levels
Rare		X	X	X		X		X	X
Unlikely							X		
Moderate	X				X				
Likely									
Almost Certain									

Table 9. 1 Likelyhood of climate hazards at quarry

The proposed development has been determined to be moderately effected by Extreme rainfall, flood, flash flood, storm & wind. All other aspects will no be effected by climate changes.

Table 9.2 details the hazard impact of the proposed development. It is determined that climate hazards have the potential to have major impacts on health and safety, the environment, asset damage, and financial areas.

Risk Areas	Insignificant	Minor	Moderate	Major	Catastrophic
Asset damage, engineering, operational			X		
Health and Safety				X	
Environment				X	
Financial				X	
Reputation			X		
Social			X		

Table 9. 2 Hazard impacts

Table 9.3 details the proposed developments current and future exposure to climate change without mitigation measures. The project is assessed to have the most sensitivity to extreme rainfall, flood and flash flood.

	Extreme rainfall, flood, flash flood	Heat	Drought	Wildfire	Storms & Wind	Landslides	Cold Spells and snow	Freeze-thaw damage	Rising Sea Levels
Current Climate	Medium	Low	Low	Low	Medium	Low	Low	Low	Low
Future Climate	High	Low	Low	Low	High	Low	Low	Low	Low

Table 9. 3 Current and Future exposure to climate change.

Based on the assessment of the vulnerability of the development to climate change, mitigation measures are required to improve the projects ability to withstand extreme rainfall, flood, flash food, wind & Storm.

The quarrying sector in Ireland contributes less than 0.5% of the total CO_2eq produced in Ireland. The quantity of emissions produced is relative to the size of the installation. The proposed development occupies 0.42Ha and is a continuation of current practices.

Based on the scale of the site, the quantities of material currently being recycled the proposed development is determined to have negligible impact on GHG emissions from the installation.

Mitigation

Based on the development vulnerability assessment mitigation measured are deem necessary to increase the resilience of the proposed development to extreme rainfall, flood, flash food, wind & Storm. Table 9.4 details the mitigation measures for the quarry.

Main Concerns related to:	Proposed mitigation measures/ alternative.
Extreme Rainfall, Flood, Flash flood	Ensure adequate drainage from the recycling area to settlement pond.
	Routine maintenance of drainage system to ensure flow-path is free from debris
Storms and winds	Ensure equipment is designed to withstand high winds and storms
	Ensure all equipment is well maintained and all loose items are secured.
Risk Reduction mechanism	Secure insurance for damage of assets.
Increase energy demand	Consider renewable energy sources/ suppliers.
GHG Emissions	Ensure equipment is well maintained and operating at maximum efficiency.
GHG emissions from transport	Avoid idling machinery. Consider alternative fuel sources for HGV's when available.

Table 9. 4 Mitigation measures

CHAPTER 10

Noise

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INTRODUCTION

This chapter forms part of the Environmental Impact Assessment Report prepared to accompany a planning application to Waterford City and County Council submitted by NRGE Ltd, on behalf of Kereen Quarries Ltd, in relation to the existing quarry at Kereen Lower, Cappoquin, Co. Waterford.

The proposed development site has a total area of 0.42 acres and is being applied for under this application. The proposed development will consist of the import, processing and export of construction materials with all processing activity to be contained within the redline site boundary.

This chapter relates to the potential likely and significant impacts the development could have on noise in the vicinity of the site.

Information was gathered from various online sources and from onsite field studies. The noise impact assessment presented describes and assesses the baseline noise levels in the area. Noise mitigation measures, where necessary, are applied to eliminate or minimise potentially adverse effects.

Scope of works

The following sections of this chapter describe the potential noise impacts associated with this development. The following issued are addressed within this report:

- Methodology uses to assess noise impacts
- Baseline noise conditions existing in the vicinity of the site.
- Assessment of severity and likelihood of impacts
- Identification of mitigation measures
- Residual impacts associated with the development.

A site visit and walkover survey was completed by NRGE on 09th December 2021.

The data presented and reviewed in this chapter incorporates observations made during the site walkover survey. Operations do not take place during night-time hours, therefore only daytime noise monitoring was carried out.

Contributors/ Authors(s)

NRGE Ltd carried out the impact assessment presented in this chapter on behalf of Kereen Quarries. The lead author of this chapter was Liam McEniry BSc, PGDip Chem Eng. Liam has several years' experience working as a consultant Engineer with a variety of industrial and agricultural clients.

Legislation & Guidance Documents

Currently there is no national legislation specifically relating to extractive industries, however several guidance documents have been published which are relevant.

- Waterford County Council Development Plan 2017 states ' it is the objective of the council to prevent public noise and light nuisance through the regulation of industrial, construction and commercial activities'
- The EPA published guidelines on 'Environmental management in the extractive industry.'
- EPA Noise Guidance of Scheduled Activities (NG4)
- BS5228-1 Code of practice for noise and vibration control on construction and open sites.

Emission Limit Values

The site is located within the footprint of an existing quarry which is operating in accordance with its planning conditions. EPA noise guidance of scheduled activities (NG4) sets out typical limit values for noise. The limit values are described in Table 10.1.

Time	Description	Limit dB
07.00-19.00	Daytime	55 dB $L_{Ar,T}$
19.00-23.00	Evening	50 dB $L_{Ar,T}$
23.00-07-00	Night-time	45 dB $L_{Aeq,T}$

Table 10.1 Noise Limit Values

In order to maintain good housekeeping practices the following measures are implemented.

- All machinery to be regularly serviced. Including exhausts
- Where appropriate install noise reducing modification.
- Maintain haul routes in good condition.

Receiving environment

Study Area

Kereen Quarry is located ~10km south of the village of Cappoquinn and ~13km west of the town of Dungarvan. The quarry is located in the townland of Kereen Lower, approximately 3Km from Aglish, Co. Waterford.

The proposed development site ('the site') which is being applied for under this application has a total area of 0.42ha and lies in the south of the overall quarry landholding. Historically soil and subsoil have been removed from the site and bedrock extracted. However, no extraction is currently taking place within the site boundary, although quarrying in other parts of the landholding continues as per previous planning applications. Quarrying operations are continuing elsewhere in the quarry with material being processed using mobile plant. These quarrying operations are not dealt with in this EIAR, aside from the incombination effects with the proposed

development. The proposed development relates to the import, processing and export of construction materials within the site boundary. Current facilities existing at Kereen Quarry include offices, weighbridge, canteen, bunded fuel storage area all of which are located near the quarry entrance in the southeast of the overall landholding.

Access to the quarry is via the R671 located along the eastern boundary of the quarry. All site traffic enters via the access road and weighbridge located at the entrance. It is proposed that this entrance will continue as the sole access point to the site.

Baseline Noise assessment

A noise survey was carried out to capture typical background noise levels at noise sensitive receptors in the vicinity of the site. The dominant noise source is passing traffic associated with the R671. The numbers of vehicles on the R671 can be described as moderate. The weather conditions were moderate winds with light to moderate rain showers.

Noise measurements were made according to the requirements of ISO 1996; Acoustics- Description and Measurement of Environmental Noise and in addition, with reference to the IEMA: Guidelines for Environmental Noise Assessment, November 2014 and EPA: Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4), April 2012. The measurement was made using a Bruel & Kjaer 2235 Data logging integrating sound level meter.

For Each of the sensitive receptors the following measurements were recorded:

1. $LA_{eq,T}$ is the A-weighted equilivant continuous noise level over the measurement period.
2. $LA_{90,T}$ is the average weighted noise level exceeded for 90% of the measurement period.
3. La_{max} is the maximum recorded noise level over the measurement period.

The noise survey was carried out by Liam McEniry of NRGE Ltd at sensitive noise receptors in the vicinity of the site on the 09th December 2021. The monitoring period is considered to be representative of the daytime noise levels.

Noise monitoring Locations

The noise monitoring locations used for the purposes of the baseline noise survey are shown in Table 10.1. These locations take into consideration the sensitive receptors surrounding the site and their location relative to the centre of the development.

Co-ordinates of Receptors from Proposed Facility (ITM Co-ordinates)				
Ref		X	Y	Distance from Centre of Proposed Unit (m)
	Centre of development	613777.65	593417.42	
N-00		614019.92	593435.70	230
N-01		614005.47	593137.63	369
N-02		613906.82	593077.51	352
N-03		613938.74	593022.45	428
N-04		613717.24	593142.69	277
N-05		613522.79	593271.23	294
N-06		614007.29	593744.21	449

Table 10. 1 Location of sensitive receptors

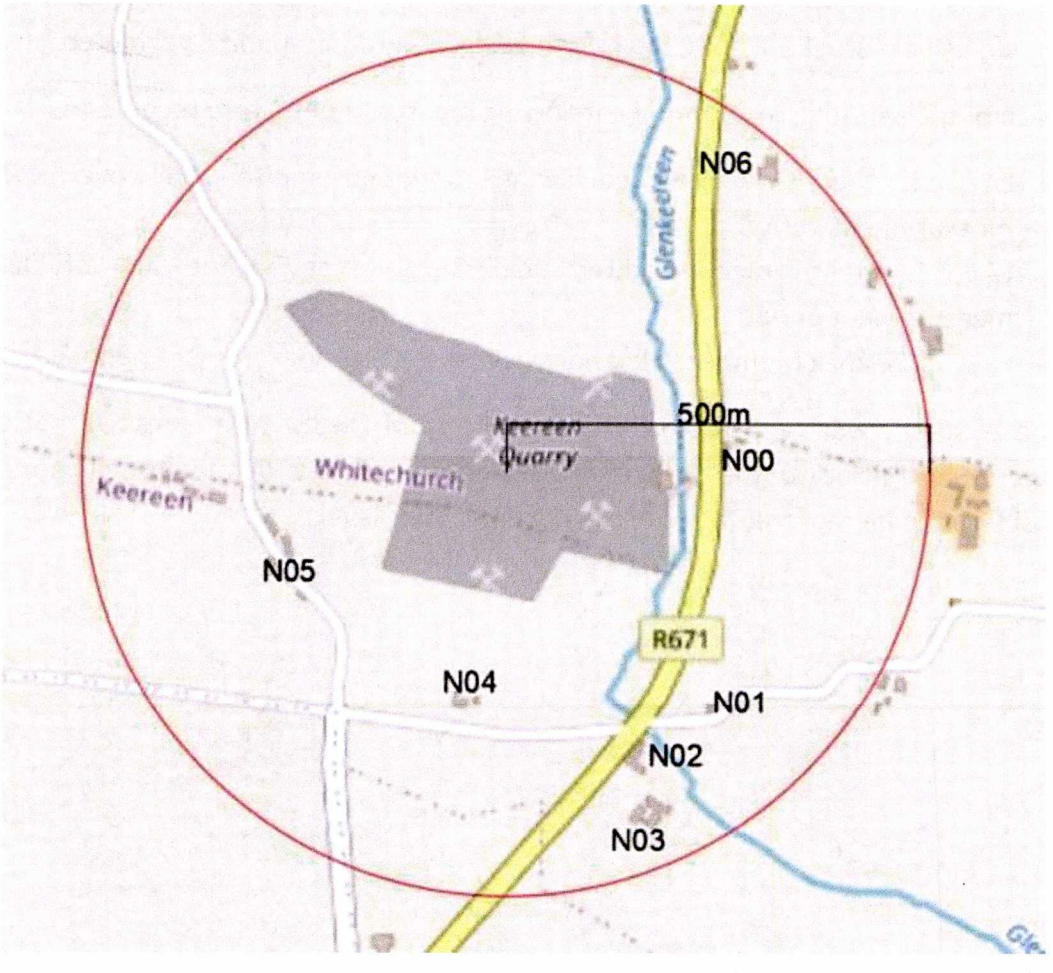

Figure 10. 1 Location of Sensitive receptors

Baseline assessment Results

The results of the baseline noise assessment are presented in Table 10.2. The following observations can be made in relation to the results.

- Centre of the development: major noise source was rock breaking, crushing and equipment associated with the site activities.
- N00: The measured baseline noise was dominated by noise associated with passing traffic on the R671.
- N01: The measured baseline noise is associated with passing traffic on the R671.
- N02: The measured baseline noise is dominated by passing traffic on the R671. Speed limits on the road is 80km/h.
- N03: The measured baseline noise is was associated with passing traffic on the R671. When traffic noise ceased, rustling of the trees in the breeze was underlying noise.
- N04: Passing traffic associated with the R671 was audible in the distance. There is some traffic movements on the unnamed road during the assessment.
- N05: Agricultural equipment was the dominant noise during the assessment. Farm machinery was in operation in the area.
- N06: The measured baseline noise is dominated by passing traffic on the R671. Speed limits on the road is 80km/h.

Ref	Monitoring Location	Time	LAeq	LAFmax	LaF90	Major Noise Source
	Centre of Proposed Unit	14.15-14.30	65.6	85.7	61.2	Noise from farm vehicle in nearby farm yard
N00	3rd Party Dwelling	14.30-14.45	68.8	87.5	64.1	Noise from passing traffic on R671.
N01	3rd Party Dwelling	14.00-14.15	62.7	78.1	58.4	Passing traffic on R671 audible.
N02	Local lounge Bar	13.30-13.45	73.9	93.7	68.9	Noise from passing traffic on R671.
N03	3rd Party Dwelling	13.45-14.00	70.2	88.4	65.4	Passing traffic on R671 audible.
N04	3rd Party Dwelling	13.05-13.20	62.9	85.8	58.6	Passing traffic on R671 audible.
N05	3rd Party Dwelling	12.45-13.00	55.0	69.8	51.7	Agricultural machinery working in vicinity of the assessment site.
N06	3rd Party Dwelling	14.50-15.05	71.6	89.8	66.7	Noise from passing traffic on R671.

Table 10. 2 Daytime Noise monitoring Results

Baseline noise levels in the vicinity of the site were higher than those recorded in the centre of the site. This indicates the noise emanating from the development will not adversely effect the local population as background noise from passing traffic and agricultural activities are

greater than the noise recorded within the development site at centre of the development site.

Impact Assessment

The development will be a continuation of activities currently taking place on site. There will be no new noise generating activities taking place. There will be no new overburden removal or stripping taking place within the development site. The main noise generating activities will continue with this development. These include excavators, dumpers, trucks, crushers and screens.

Baseline data described in Table 10.2 can be considered indicative of noise levels to be expected with this development.

Although noise levels at the centre of the site are above daytime threshold levels the noise was lower than that recorded along the R671 at sensitive receptors. This indicates that the development is not the dominant source of noise at the sensitive receptors. The dominant noise was that of passing traffic and agricultural activities.

Cumulative Impacts

The cumulative noise impact associated with this development must be considered in conjunction with the existing mining practices on site. Noise levels associated with this development will not increase the baseline noise levels within the quarry as this development is a continuation of existing operations.

Do Nothing scenario

Should the project not proceed ambient noise levels would remain unchanged, extraction will continue within the.

The dominate noise at sensitive receptors is associated with passing traffic with general mining activities associated with this development being inaudible at all sensitive receptors. Some rock breaking noise was audible intermittently at N05, however this was secondary to the noise associated with agricultural activities taking place in the vicinity of the survey.

Interactions with other impacts

The potential for noise to impact on sensitive receptors including Human and ecological receptors are discussed in detail in Chapters 4 & 5.

Mitigation Measures

Results of the noise survey indicate mitigation measures are not necessary. Notwithstanding this, best practices will be implemented where practicable to do so these can include the following:

Screening: Screen planting and berms can be used as acoustic barriers.

Equipment: All equipment should be adequately maintained and employ noise reducing equipment where practicable.

Traffic: Equipment should not be left idling when not in use.

Haul route: Haul routes are to be maintained in good condition to avoid unwanted rattling of heavy equipment

Residual Impact

There is no residual noise impact envisaged in relation to this activity.

Monitoring

Noise monitoring will take place around the site. Noise monitoring locations will be reviewed periodically.

CHAPTER 11

MATERIAL ASSETS

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Introduction

Background

This chapter forms part of the Environmental Impact Assessment Report prepared in support of a planning application for the continued importation and recycling of inert material. This chapter relates to the potential impacts the proposed development could have.

Information was gathered from various online sources and from onsite field studies.

Scope of Works

This chapter of the EIAR details existing resources relating to the application area which have no be discussed elsewhere. This section will address; built services and waste management.

As per schedule 6 of the planning and development regulation (2001) material assets also refers to architectural heritage, archaeological heritage and cultural heritage. These topics are discussed in detail in chapter 12.

Contributors/ Autor(s)

This section of the EIAR was prepared by Michael McEniry, who is a chartered member of the Institute of Waste Management who has previous experience in numerous extractive industry planning applications.

Receiving Environment

Study Area

The site is located in the townland of Kereen Lower, approximately 3Km from Aglish, Co. Waterford off the R671.

The proposed development is in relation to the recycling of aggregates. The quarrying area to the north of the site is not part of the application. This application relates only to the area where recycling of aggregates takes place.

Methodology

The baseline study includes a desktop study, information provided by the applicant and information contained in other sections of the EIAR.

Sources of information

Information to carry out baseline assessment was obtained from the following sources:

- OS Maps
- Waterford County Council County development Plan
- Myplan.ie
- Openstreetmap.org

Built Services

Electricity is supplied to the site via mains power. The principle use of this is for the supply of energy for office lighting and equipment.

Site staff are contactable via mobile phone whilst at the site office. Elsewhere on-site staff use satellite phones for communication due to poor network signal in the area.

Waste Management

Potential waste sources produced on site area as follows:

- Metal: This material is produced during the maintenance of equipment and separated from construction waste during the recycling process. A designated scrap metal area is provided to allow the build up of sufficient quantities for removal by licenced contractor.
- Used Oil: This material is produced during the maintenance of equipment. It will be removed from site by licenced contractor.
- Used Batteries: This material is produced during maintenance of equipment. It will be removed from site by licenced contractor.
- Domestic waste: Food waste from site facilities will be routinely collected by licenced contractor.
- Domestic waste: effluent waste from treatment system will be routinely emptied by licenced contractor.
- All materials recycled on site have an intrinsic value, much of the recycled aggregates are used in the construction sector.

Sensitive receptors

The development site is in a rural area with sparsely dispersed residential developments.

There are no schools, churches or shops in the area surrounding the site.

Impact Assessment

Build Services

Operation Phase

The operational phase of the development is the recycling of aggregates from the construction industry for the production of recycled aggregates.

No significant effects are anticipated in relation to built services and waste management.

Post-operation phase

During the post operational phase of the development all works would be ceased and the site restored.

No significant effects are anticipated in relation to built assets or waste management.

Waste

Operational stage impacts

During the operational phase, aggregate will be recycled from the construction industry. Following the cessation of operations the quarry void will be reinstated to agricultural uses.

As described previously, existing waste management arrangements are in place to deal with all aspects of the operation.

Post-Operation Stage impacts

During post-operation phase, aggregate recycling will cease. The waste generated will be limited to general waste generated by employees. This waste will be handled in accordance with best practice and collected by licenced contractor.

Any waste generated during this period will be limited in size and duration. The effects associated will be negligible.

Unplanned events

The risks associated with unplanned events in relation to the proposed development are limited. This is due to the simplicity of the activities taking place at the development site.

Unplanned events associated with the proposed developments could be caused by:

- Spills from accidents involving onsite equipment
- Flooding

Chapter 14 & 9 detail the mitigation measures associated with the above-mentioned risks.

It is determined that the material assets as outlined are not adversely at risk from unplanned events.

Interactions with other impacts

It is not predicted that the proposed development will interact significantly with other impacts.

'Do nothing' Scenario

In a 'do nothing' scenario there would be no continuation of the aggregate recycling.

A 'do nothing' scenario would result in adverse impact on the environment as there would be a requirement to increase the output of virgin material to meet demand.

In the medium term there would be increases in costs to extract virgin material. This has the potential to effect the long-term viability of the quarry and employment associated with it.

Mitigation measures

As there is no envisaged impact of the proposed development no specific mitigation measures are proposed.

Waste generated on site will continue to be collected and disposed of in an appropriate manner

Residual impact

As there is no significant effects envisaged from the development there is no residual impacted anticipated.

CHAPTER 12

CULTURAL HERITAGE

Table of Contents

Introduction

Background

This chapter of the EIAR addresses the impacts on the archaeological, architectural and cultural heritage of the application.

Information was gathered from various online sources and from onsite field studies.

Scope of the works

This chapter of the EIAR details baseline archaeological, architectural and cultural heritage and the potential impact of the proposed development on the archaeological, architectural and cultural heritage of the area.

Contributors/ Authors

NRGE Ltd carried out the impact assessment presented in this chapter on behalf of Kereen Quarries Ltd. The lead author for the study was Liam McEniry BSc (Biological Science) & PGDip Chemical Engineering. Daniel Noonan of Daniel Noonan Archaeological consultancy was initially engaged and it was determined; due to all the material from the site being previously removed there is no possibility of an impact on archaeological, architectural and cultural heritage.

Receiving Environment

Study Area

The study area involves the area within the site boundary. An area of 3163m^2 shown in Figure 12.1.

Baseline methodology

This involves desktop research of the site. No monuments or sites are identified in within the site boundary.

The area of study has been significantly modified through quarrying practices over the lifetime of the quarry. All material has previously been removed from the site. The proposed development is to increase the recycling of aggregates from current levels. There will be no impact on the archaeological, architectural and cultural heritage from the proposed development.

Assessment of Potential Impacts

Direct Impacts

There will be no direct impact on any known items of archaeological, architectural or cultural heritage.

Indirect Impacts

There will be no direct impact on any known items of archaeological, architectural or cultural heritage.

Interactions with other impacts

No interactions with other impacts has been identified.

Do Nothing Impacts

If the proposed development does not proceed there would be no negative impact on the archaeological, architectural & cultural heritage

Worst Case Impact

There will be no risk of impact from the development as all material has previously been removed from the site.

Recommendations/ Mitigation Measures

No mitigation measures are proposed as no impacts from the proposed development are envisaged.

CHAPTER 13

LANDSCAPE

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Introduction

Background

This chapter of the EIAR assesses the landscape and visual effects arising from the proposed development.

The lands which are the subject of this application comprise c. 0.42 hectares and is located in the townlands of Kereen Lower, Cappoquin, Co. Waterford.

Landscape effects relates to changes to the landscape and character of the area as a result of the development.

Contributors/Authors

NRGE Ltd carried out the impact assessment presented in this chapter on behalf of Kereen Quarries Ltd. The lead author for the study was Michael McEniry BEng, with over 30 years experience in planning, environmental and waste management compliance in a variety of industries.

Receiving Environment

Study Area

The site is located in the townland of Kereen Lower, approximately 3Km from Aglish, Co. Waterford off the R671.

The proposed development is in relation to the continued imporation, processing and export of inert material for use as recycled aggregates. The quarrying area to the north of the site is not part of the application. This application relates only to the area where recycling of aggregates takes place.

Baseline Landscape assessment

The site and the surrounding landscape can be characterised as rural. Residential dwelling are sparsely distributed in the area. The main route passing the site is the R671 located to the east of the site entrance.

The landscape surrounding the site comprises largely of farmland with varying topography.

Dromona Hill and Woodhouse wind farm lie on the West and Eastern sides of the site respectfully.

The site is located at a lower elevation than the surrounding area.

The site has been in operation for a number of years with all material from the proposed site previously extracted. The proposed development will not involve any adverse impacts to the landscape character of the area.

Impact Assessment

Magnitude of Landscape change

The proposed development for the importation, processing and export of inert material for use as recycled aggregates will not impact on the landscape character of the area. This is a continuation of current onsite activities.

Construction Stage Impacts

The proposed application concerns the continuation of current activities within the subject site. The operations consist of recycling of aggregates.

Operation Stage Impacts

The proposed development (existing quarry, aggregate recycling and proposed aggregate recycling expansion) would be visible from elevated lands surrounding the quarry.

The receiving landscape would not be significantly adversely effected by the proposed development, as it comprises wholly of current activities onsite and is confined to the area detailed in the site plan.

There are no scenic routes or protected views in the vicinity of the proposed site

Do Nothing Scenario

If no further works were carried out within the site boundary the current landscape of the quarry would remain..

Mitigation Measures

As there will be no additional land take, no negative impact on the current landscape and no adverse impact on the receiving area. No mitigation measures are proposed. The Site is currently well screened from the public road.

Residual Impacts

There is no residual negative effects envisaged as a result of the proposed development.

CHAPTER 14

TRAFFIC

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List of photographs

1.0 Introduction.

TPS M Moran & Associates as specialists traffic and transportation consultants have been retained by NRGE Ltd Project Managers to prepare a Traffic Report relating to the importation of construction aggregates into the existing Kereen Quarry at Kereen Lower, Cappoquin, County Waterford.

At present the existing quarry imports and recycles construction aggregates, made up of stone material and construction aggregates which is crushed on the site, recycled and exported as fill material for the construction of farm road ways throughout the south Munster area.

It is proposed to annually import up to 50,000 tonnes of similar materials.

2.0 Background Information.

The former National Roads Authority now, Transport Infrastructure for Ireland published the 'Traffic and Transport Assessment Guidelines' in September 2014 which provided specific advice when a Traffic Impact Assessment should be undertaken.

These guidelines identified thresholds for land use development based on land use trip attraction or land use trip generation which impact on adjacent road links or junctions receiving the proposed development.

These guidelines also provided advice on acceptable traffic modelling programs, traffic data sources, road safety issues to be considered and pre planning discussions with the relevant Local Authority. These thresholds are set down below.

Thresholds.

This section considers the thresholds at which the production of Traffic and Transport Assessments in relation to planning applications is recommended.

It is important to identify proposals that will affect National Roads, and which may have other transport implications at the earliest stages of development planning and design.

This will help to ensure that additional costs and delays to the developer are avoided and facilitate best practice evaluation by planning authorities, the NRA and other transport agencies.

Table 1.4 of the Traffic Management Guidelines (DoT/DoEHLG/DTO, 2003) gives the thresholds above which a Transport Assessment is automatically required. The thresholds concerned are reproduced below.

- *Traffic to and from the development exceeds 10% of the traffic flow on the adjoining road.*
- *Traffic to and from the development exceeds 5% of the traffic flow on the adjoining road where congestion exists, or the location is sensitive.*
- *Residential development in excess of 200 dwellings.*
- *Retail and leisure development in excess of 1,000m2.*
- *Office, education and hospital development in excess of 2,500m2*
- *Industrial development in excess of 5,000m2*
- *Distribution and warehousing in excess of 10,000m2*

While the proposed quarry development is well below these thresholds which will be discussed further within this report, we consider it worthwhile to outline the likely trip generation and traffic impact of this quarry development.

3.0 Scope of the Traffic Impact Assessment.

In this report we will identify the existing traffic conditions and assess the relative level of impact the proposed quarry development is likely to have on the adjacent road network.

The methodology used within this TIA complies with best practise for Traffic Impact Assessments indicated within key publications, which include:

- 'Traffic and Transport Assessment Guidelines' National Roads Authority (May 2014)
- 'Guidelines for Traffic Impact Assessments' The Institution of Highways and Transportation.

In this report comment will also be made on the existing vehicular site access arrangements to serve the existing quarry development operation.

In addition, this report, which addresses the likely traffic impact of the proposed development, will generally be structured as follows:

- Assessment of the existing roads and traffic conditions and public transport on the road network in the vicinity of the proposed development site including public transport provision.
- Assessment of the trip rates associated with the proposed development.
- Technical comment on the access arrangements.
- Capacity and operational assessments of the likely impact of the proposed development on the adjacent road network.
- Car Parking Provision.

Background information used within this report has been derived from technical information and layout plans prepared by NRGE Ltd Project Managers for the scheme.

4.0 Existing Roads and Traffic Conditions.

The existing quarry is bounded to the east by the R671 which functions as an 80kph Regional Road within Waterford City and County Council's road hierarchy connecting Clonmel to the north with Youghal to the south.

In the vicinity of the existing quarry the R671 has an average road width of some 6.0 metres with solid road markings within the centre of this carriageway, verges of varying widths are located along both sides of this carriageway. High banked hedgerows, treed or fenced site boundaries are also located along both sides of this carriageway.

In the vicinity of the existing quarry site the vertical alignment of the R671 ascends gradually approaching and southwards past the existing site access and has a series of slow road bends within the horizontal alignment of this section of the R671.

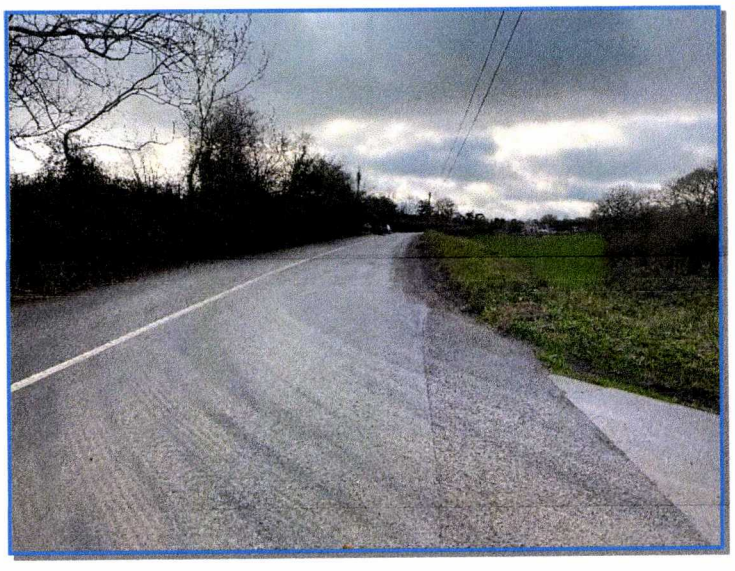
It should also be noted that the R671 has developed from the historic Irish roads system that were not designed to any current road design standard. Typically, these roads are maintained and improved to enhance their sinuous alignment by the local authorities mainly between the adjacent land boundaries.

Nationally, motorists, cyclists and pedestrians using these roads are aware of the inconsistencies within the alignment of these roads and in the case of motorists, constantly adjust their speed to reflect the character of the road layout.

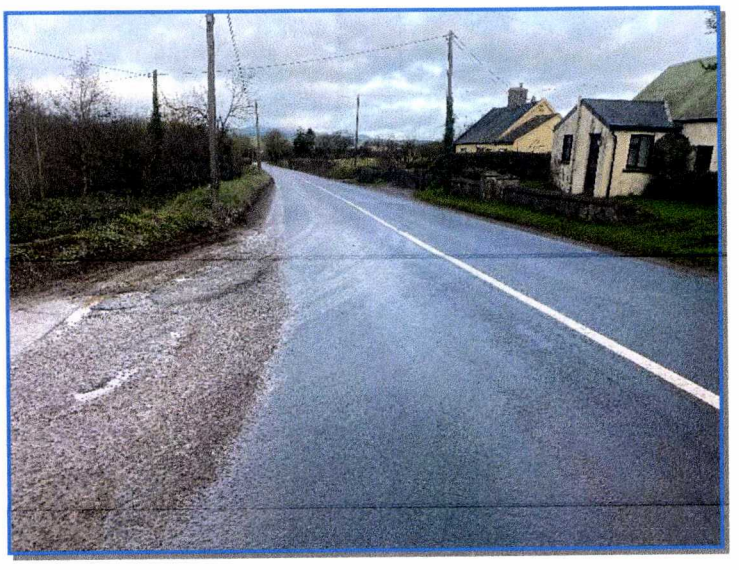
Along the length of this section of the R671 vehicular access is provided to individual residential properties, farms and agricultural farmlands with all of these access points taking the form of simple gated access points or simple priority gated type 'T' junction arrangements.

Thus, it can be considered that the principle of direct vehicular access to serve land use development along the length of this section of the R671 is well established with motorist and all road uses using this route expecting traffic turning movements into and out of the existing established access points.

The existing quarry is accessed from the section of the R671 by means of a wide simple priority gated T junction which slopes downwards into the quarry site within a concrete road surface. The layout of this existing junction is shown within Photograph 1.0, Photograph 2.0 and Photograph 3.0 below.



Photograph 14. 1: Southbound view into R671 from into R671 existing quarry site access

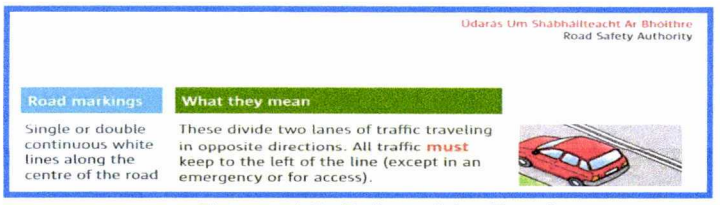


Photograph 14. 2: Northbound view Existing site access.

Photograph 14. 3 West bound View from R671 into existing site access.

As previously discussed, the centre line road markings within this carriageway is a continuous solid white in the vicinity of the existing quarry access. While this white lining restricts the overtaking of vehicles within this corridor and requires vehicles to keep to the left, this arrangement does permit the crossing of the solid white line for emergency and access purposes.

Extract 1.0 from the Road Safety Authority publication the Rules of the Rules confirms the above.



Extract 1.0: Rules of the Road.

In order to determine the existing character of traffic travelling along this section of the R671 we have undertaken vehicular speed surveys along this road in the vicinity of the application site. The speed survey only included over 100 'lead only' vehicles within an off-peak time period are shown within Table 1.0 below:

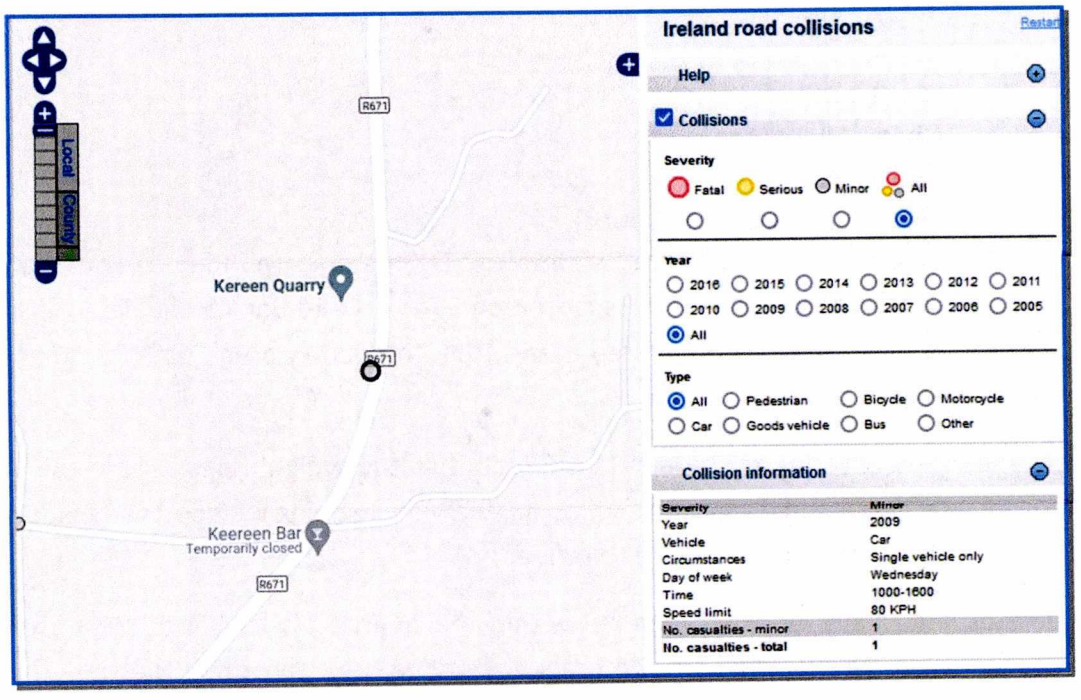
Location	Direction	Mean Speed	85%ile Speed
R671	Northbound	73.6kph	83.6kph
	Southbound	74.1kph	85.0kph

Speed Survey Summary R671. Table 1.0

From the above it is evident that vehicle speeds recorded within this survey is in line with the posted speed limit along this section of the R671.

The Road Safety Authority maintain an Accident Collision Database from 2005 to the present for all recorded accidents statistics throughout Ireland.

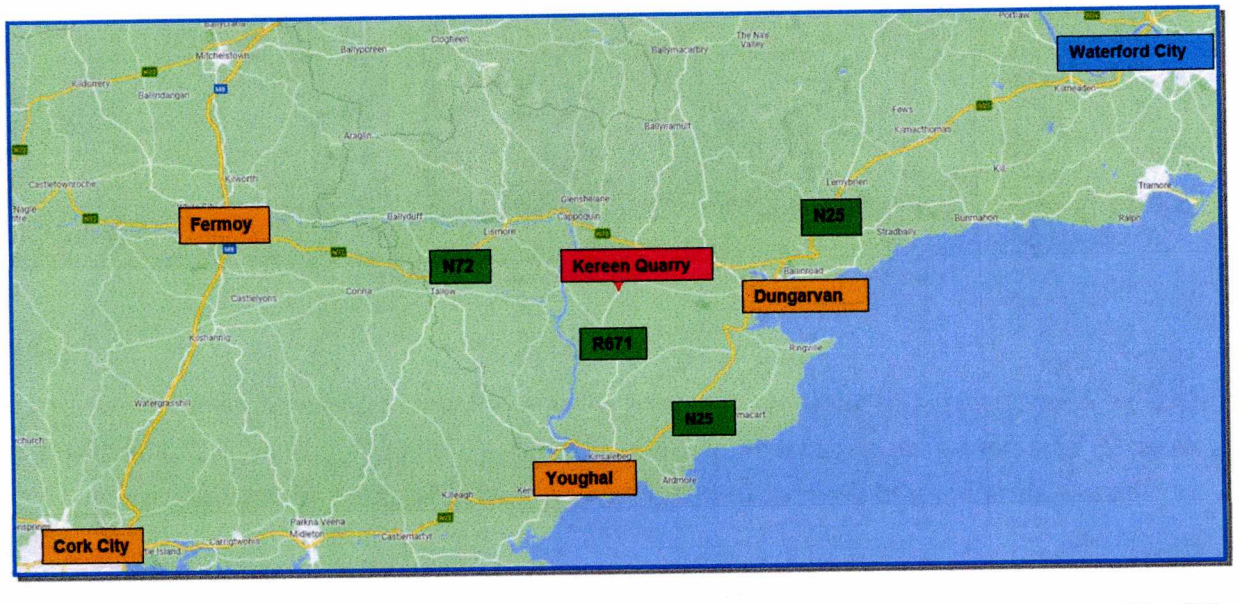
We have undertaken a review of this accident database which indicates that no recorded accidents have occurred along this section of the R671 within the last 12 years, indicating the safe operation of this section of this route in the vicinity of the application site. The recorded 2009 minor accident on the R671 which occurred in 2009 is well to the south of the existing quarry and shown within Map Extract 1.0 below.



Recorded accidents on R671. Map 1.0

5.0 Existing Quarry Operation.

Construction aggregates is mainly drawn to the quarry from the Waterford City, Dungarvan the outer parts of Cork City, Fermoy and Youghal to the south with heavy vehicles using the national primary routes shown within Map 2.0 below.



Quarry Haul Route Locations. Map 2.0

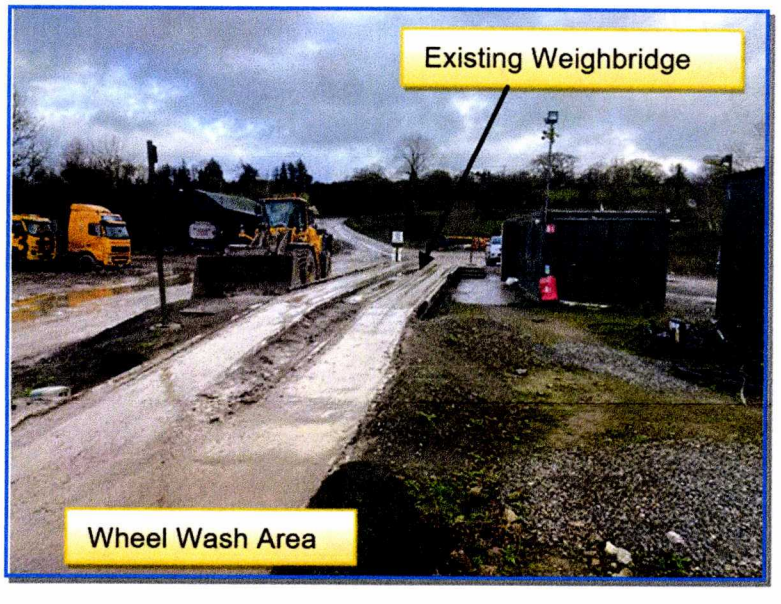
The existing quarry receives construction aggregates and supply materials to the following:

- Conor Construction Ltd
- Power Contracts
- Liam Whelan Plant Hire
- Green Valley Recycling
- Waterford City and County Council

The existing quarry operates from 0800hrs to 1700hrs on a Monday to Friday and 0800hrs to 1300hrs on a Saturday. The quarry is closed on Sundays and Bank Holidays. The site employees 10 staff who park within a designated area within the quarry area. 2 staff who are office based are employed in Dungarvan.

Heavy vehicles entering the quarry are directed to the weighbridge where the vehicle load is recorded and inspected by camera. Following the vehicle being weighed and inspected the driver is advised on the location to where to offload.

If a returning heavy vehicle is loaded within the quarry, on their exit they are instructed to precede via the wheel wash area to the weighbridge prior to exiting the site. The weighbridge and associated infrastructure is shown within Photograph 4.0 below



Photograph 14. 4 View of existing weight bridge within quarry site.

During a typical year the quarry is operating for over 48 weeks and as previously mentioned 5.5 days during a normal working week. The heavy vehicles drawing material to and from this quarry carries a 24.5tonne load which can generate 2040heavy vehicle movements over a 12-month period.

If a similar number of weekly heavy vehicles draw the 50,000 tonnes of construction aggregate materials to the quarry site a total of 44 heavy vehicles could be realised accessing the site from the adjacent road network per week.

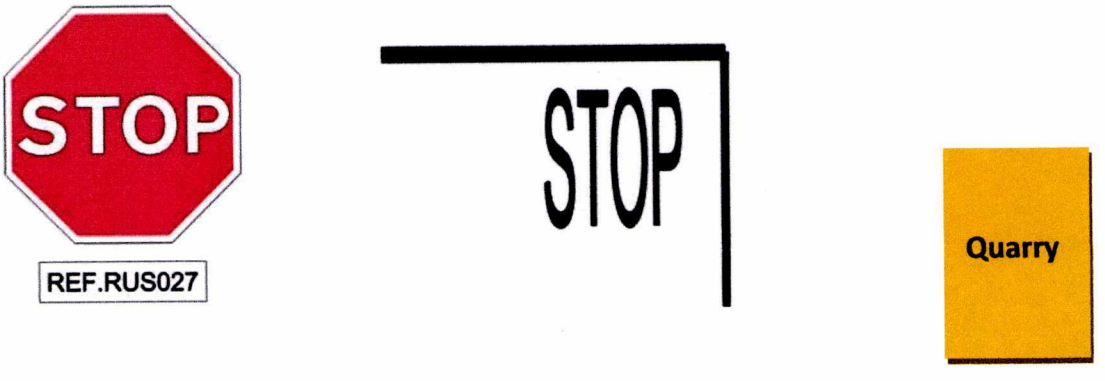
Over a typical 5.5 working week this extent of existing and new trips is projected at 8 heavy vehicles, which cannot be regarded as having impact on the operational capacity of the surrounding road network.

6.0 Mitigation Measures.

The existing site access at its junction with the R671 can be further controlled by a 750mm 8 sided STOP sign to RUS027 with road markings containing a traverse Stop Line to RRM017 to require all vehicles exiting the quarry to stop to oncoming vehicles travelling within the leading and non-leading traffic directions of the R671.

In addition, we suggest that a further series of 'plate' type advisory signage is provided at intervals within the southbound and northbound grass verges of the R671 advising motorists that a quarry entrance is ahead.

This proposed signage and road markings are shown below.



Possible Additional Signage and Road Markings.

7.0 Conclusions.

The existing quarry operation and the 50000 tonnes per annum of construction aggregates imported to the quarry site has been identified as having no material traffic impact on the operation of the site access at its junction with the R671.

It has also been established that the existing quarry importing construction aggregates gives rise to negligible daily, weekly or annual heavy vehicle trips which can readily be accommodated within the existing road network.

Therefore, these existing and future limited trips are unlikely to have any material traffic impact on the operation of the surrounding road network.

CHAPTER 15

Interactions

Table of Contents

Introduction:

In this chapter of the EIAR the potential interactions between the individual impacts discussed in previous chapters of the EIAR are examined. The interactions of these impacts on the environment needs to be addressed as part of the EIAR.

This EIAR was prepared by NRGE Ltd. on behalf of our client Kereen Quarries Ltd. The potential impacts arising from this development are discussed in detail in chapters 4-14.

Inter-relationships between factors

The inter-relationships between factors are presented in Table 15.1. The actual interactions, their significance and mitigation measures are detailed in the relevant chapters of this EIAR.

	Population & Human Health	Biodiversity	Lands, soil & Geology	Water	Air	Climate	Noise	Cultural & Heritage	Landscape	Traffic
Population & Human Health				X	X	X	X		X	X
Biodiversity				X	X	X	X		X	
Lands, soil & Geology				X				X	X	
Water	X	X	X							
Air	X	X				X				X
Climate	X	X			X					
Noise	X	X								X
Cultural & Heritage			X						X	
Landscape	X	X	X					X		
Traffic	X				X		X			

Table 15.1 Inter-relationships between factors

Potential Interactions

Populations & Human Health

The effects on population and human health can be considered in relation to the chapters addressed in this EIAR. The relevant pathways through which human health can be adversely

affected should also be considered. This EIAR shows there will be no adverse affect on human health as a result of this development nor will the development create or increase pathways through which human health may be adversely affected.

Details of the developments affects on Air, Climate, water, noise, traffic and soils are described in detail in their relevant chapters. From the mitigation measures proposed where necessary there will be no adverse affect on human health.

Biodiversity

The interactions of flora and fauna with water, traffic, air & noise are described in detail in Chapter 5 (biodiversity), 6 (water) & 7 (land, soils & Geology).

Lands Soil & Geology

The potential interactions between Lands, Soils & Geology, water and the landscape are considered. Current on site practices and the nature of the development mitigates the risk of negative environmental impacts associated with the development. Lands soils & geology are linked with the landscape character of the area.

Due to the site being in operation since 1992 there will be no impact on the landscape character of the area..

Water

The potential impact of the development in relation to water quality and the interaction with other environmental factors are described in chapters 5, 6 &7.

Air quality

The quality of air, climate, population & human health, & biodiversity can be considered to be interconnected. The mitigation measures described in Chapter 8 will limit the potential impacts of the development on flora and fauna as well as the local population. Due to the relatively modest scale of the development the impact of the development on the climate in terms of CO_2 can be seen as negligible.

Noise

The impacts of noise of the proposed development has interactions with other impacts namely, Biodiversity, population and human health & Traffic. The dominant noise characteristic in the area is associated with the R671 noise levels at sensitive receptors were above 55Db daytime levels however, this was generated by traffic on the R671. Due to quarrying operations taking place since 1992 fauna will have become accustomed to the noise from the development and that of the R671. The prosed development will not increase the noise generating activities and will therefore pose no additional adverse effects to the other impacts.

Conclusions:

The proposed development is a continuation of activities currently taking place on the site. Due to the mitigation measures proposed where necessary in each of the chapters 4-14 it is

not envisaged that this development will have any significant negative impact on the environment.

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Biodiversity				X	X	X	X		X	
Lands, soil & Geology				X				X	X	
Water	X	X	X							
Air	X	X				X				X
Climate	X	X			X					
Noise	X	X								X
Cultural & Heritage			X						X	
Landscape	X	X	X					X		
Traffic	X				X		X			

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