

Section 11.0: INTERACTIONS

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11.0 INTERACTIONS

16.1 Introduction

This section addresses the cumulative impacts, indirect impacts and main interactions between different aspects of the environment that are, or may be, impacted on as a result of the quarry and associated activities. Only topics that could be logically linked to the development have been examined in detail. Accordingly, when a topic is not mentioned, it is concluded that no potential for conflict exists.

16.2 Interactions

Inter-relationships relate to the interactions between impacts within a project and the interactions between impacts identified under one topic with impacts identified under another topic. Each of the various environmental and related topics have been discussed separately in the preceding sections of the rEIAR and the major interactions between the recorded environmental impacts are accessed within the individual chapters of the rEIAR.

On examining the interactions of the potential impacts for this existing quarry, one must investigate the combined physical, environmental, visual and socio-economic impact on the receiving environment. Table 16.1 illustrates the interaction of impacts assessed for this project.

Table 16.1: Interactions

	Population & Human Health	Biodiversity	Lands, soils & Geology	Water	Climate	Air	Noise and Vibration	Traffic	Landscape and Restoration	Material Assets	Cultural Heritage
Population & Human Health											
Biodiversity											
Land, soils & geology		X									
Water	X	X	X								
Climate	X										
Air	X	X	X	X	X						
Noise and vibration	X	X									
Traffic	X					X	X				
Landscape and Restoration	X	X	X								
Material assets	X		X					X	X		
Cultural Heritage											

16.2.1 Population & Human Health and Water

Contaminants or leakages from plant and vehicles can potentially leak into surface waters and groundwater which could impact on water quality. Procedures are in place for dispensing fuel,

servicing plant and equipment and for dealing with accidental spillages should they arise. Re-fuelling of site vehicles is done from fuel tankers that visit the site and no hydrocarbons are stored on site. Strict adherence to pollution control protocols will be for re-fuelling operations. Drip trays must be used and spill kits are available if required. Re-fuelling of plant will continue to be carried out using off-site delivery vehicles. Effluent from the processing and manufacturing area is recycled through a pair of settlement ponds. A hydrocarbon interceptor will be installed within the drainage system leading from the ponds to the St Johnstown Stream. Given that there will be no effect on water quality standards, the effects on human health from water are assessed as Imperceptible.

16.2.2 Population & Human Health and Climate

Plant associated with the operation of the development will result in emissions to air associated with the day-to-day operations undertaken at the quarry which are difficult to eliminate. Measures in place will reduce emissions in so far as possible in order to reduce the impact on climate from day-to-day operations.

16.2.3 Population & Human Health and Air

The primary interaction between air and humans would relate to potential dust emissions associated with extraction, processing, manufacturing and transport of material around and off-site. Emissions from the processing plants and exhaust emissions from vehicles and plant are also a source of air pollutants. Dust deposition monitoring will be undertaken to ensure that levels are within the recommended guideline values. Dust suppression actions are included as part of mitigation. These include water sprinkling and reduced speed within the subject site as well as additional planting on the site perimeter. Provided that dust emission limits applied to the quarry are adhered to, no residual impacts to the air quality are envisaged with the impacts assessed as imperceptible.

16.2.4 Population & Human Health and Noise & Vibration

Activities undertaken at the quarry generate noise and vibration associated with the fragmentation of rock by blasting means, extraction, processing, loading of vehicles and transportation of material within and off site. Various measures are implemented to ensure noise levels are not elevated. A projected noise and vibration survey and recorded noise levels at the quarry showed that the proposed development has result in an increase in noise levels above recommended guideline values at noise sensitive receptors. Regular noise monitoring and vibration and air overpressure monitoring associated with blasts will be undertaken to ensure levels at noise sensitive locations are below recommended guideline values. Provided that noise limits applied to the quarry are adhered to no residual impacts are envisaged with the impacts assessed as imperceptible.

16.2.5 Population & Human Health and Traffic

Approximately 5 loads of product per day are transported off site creating approximately 10 traffic movements per day. This equates to a mean flow of 1 vehicle movement/hour. It is a possibility that demand could increase over a time period which would result in an increase in machinery operating and delivering lorries on the road. Traffic on the adjacent local road was recorded as being low in the traffic surveys undertaken as part of this assessment. The surveys over 3 days (10hrs per day, 8am-6pm) show that an average of 9.7 vehicles per hour travel west along the local road where the site entrance is located while 2.3 vehicles travel east of the quarry towards St Johnstown. The quarry generated 2 car trips, 2 tractor trips and 8 truck movements during the same period. The vehicle movement from the quarry have little to significant negative effect on traffic levels with c1 movement per hour. The vehicle movements relating to workers traffic to and from the quarry is also considered as not significant as three of the staff of the quarry are family members of the operations and live close to the quarry. The impact on roads and traffic is therefore assessed as imperceptible.

16.2.6 Population & Human Health and Landscape & Restoration

The proposed landscape and restoration plan will serve to reduce the impact associated with quarrying activity. The creation of a new berms and associated planting will screen the proposed new extraction area from the western and northern approaches to the quarry. The restoration of the quarry on completion of extraction will aid in increasing the biodiversity of the area. The associated impacts have been assessed as imperceptible.

16.2.7 Population & Human Health and Material assets

Extraction of rock has and will result in the loss of a geological resource which cannot be replaced. The proposed landscape and restoration plan will mitigate the impact associated with quarrying activity. Quarry product will serve the demand for material both locally and regionally.

16.2.8 Biodiversity and Land, Soils & Geology

Remedial mitigation and proposed future mitigation measures have been included in order to minimise the potential effects on groundwater and soil quality and wildlife that could have occurred as a result of the quarrying activity. The proposed restoration plan will also offset the impact of quarrying activity and increase the biodiversity of the site.

16.2.9 Biodiversity and Water

A robust existing settlement pond and wetland system treats all runoff from the subject site. A hydrocarbon interceptor will be installed within the drainage system downstream of Settlement Pond 1 going forward to further treat all runoff before discharge offsite to the St Johnston stream. There has not, and will not, be any impact on the biodiversity of the area due to the remedial mitigation measures in place and the proposed future measures to be implemented.

16.2.10 Biodiversity and Air

Activities undertaken at the quarry have had the potential to create windblown dust which can impact on flora and fauna. Remedial mitigation and management measures as described throughout this rEIAR have been in place at the quarry to prevent dust blow. Monitoring must continue to be undertaken on a regular basis to ensure levels of dust deposition are within the recommended guideline values.

16.2.11 Biodiversity and Noise & Vibration

Extraction of the resource and related traffic could have led to noise emissions. The current noise levels for the existing quarrying activities are well within the levels recommended by the EPA Environmental Management Guidelines-Environmental Management in Extractive Industry (Non-Scheduled Minerals). Remedial mitigation has been in place to protect wildlife onsite and in the surrounding environs and it has been established that quarrying activity did not and will not result in any negative impact on the flora and fauna in the vicinity of the subject site. Noise and vibration emissions will continue to be monitored and maintained within the parameters specified.

16.2.12 Biodiversity and Landscape & Restoration

Overburden won from site clearance was used to create berms around the site boundaries. These berms have been colonised by native species and have integrated the development into the landscape. The existing berms to the North of the quarry site near the settlement ponds will be planted with native trees which will reduce the visual impact of the subject site and add to the biodiversity value of the area. The use of native species will support a wider range of insects and animals and will contribute to the connectivity and biodiversity value of the region. A landscape and restoration plan has also been compiled to offset the impact associated with quarrying activity. This includes

reinstatement of the quarry upon cessation of all activity (see chapter 15 of this rEIAR for full detail). Post mitigation the loss of habitat has been assessed as imperceptible.

16.2.13 Land, Soils & Geology and Water

The removal of overburden and bedrock has had the potential to increase the risk of contamination of groundwater in the event of accidental spillages occurring. All oils and lubricants are currently stored in a bunded area off site. All fuel must continue to be stored in bunded fuel tanks which will contain potential leaks from tanks. The water management system (settlement ponds) already in place as detailed in section 8 also protect receiving waters. A hydrocarbon interceptor will be installed within the drainage system downstream of Settlement Pond 1 going forward to further treat all runoff before discharge offsite to the St Johnston stream.

16.2.14 Land, Soils & Geology and Air

Overburden removed from the from the previously extracted areas was used to create screening berms around the site boundaries. The extraction of material and storage of material onsite could have given rise to windblown dust. Measures and procedures are currently in place and will continue to be implemented going forward to mitigate against ground and air pollution by machinery and associated activities.

16.2.15 Land, Soils & Geology and Landscape & Restoration

Within the subject site, previous landscaping works included the construction of screening berms around the site boundaries. Further planting of these berms will be undertaken. Upon cessation of all quarrying activities, a full restoration plan as detailed within chapter 15 of this rEIAR will be implemented. The impact on the geology and landscape will be mitigated in the longer term by the proposed landscape and restoration plan.

16.2.16 Land, Soils & Geology and Material Assets

Rock extracted from the quarry is used as a raw material in the construction industry which is seen as a beneficial use. The quarry has created employment in the area and currently employs 4 people with further indirect employment also created. The continuation of quarrying activity will continue to provide employment in this rural area.

16.2.17 Water and Air

Dust associated with quarrying activities has had the potential to contaminate surface water and groundwater if appropriate measures were not in place. Dust monitoring has been carried out and will continue to be carried out on a quarterly basis going forward at the designated monitoring locations (see section 10 of the accompanying rEIAR).

16.2.18 Climate and Air

Plant and machinery operating at the quarry have resulted in emissions to air and climate associated with the operations which is difficult to mitigate against. Energy conservation measures and good management practices are currently in place and will continue to be implemented moving forward which serves to reduce the emissions in so far as is possible.

16.2.19 Air and Traffic

Currently there is an average of 5 loads per day leaving the quarry, resulting in 1 vehicle movement per hour. In the early 2000's when the quarry was operating at peak trade, the quarry would have been producing approximately 20 loads per day which is significantly more in comparison to present times. As the average vehicle movement from the quarry has reduced since peak times, potential air emissions have also reduced. Quarry traffic is not proposed to increase going forward.

16.2.20 Noise & Vibration and Traffic

Traffic associated with the development has generated noise and has created a minor source of vibration. The development has not resulted in a significant increase in quarry traffic on the local road infrastructure therefore noise levels have not increased due to traffic associated with the development.

16.2.21 Landscape & Restoration and Material Assets

The proposed landscape and restoration plan will offset the impact associated with quarrying activity.

16.2.22 Material Assets and Cultural heritage

Archaeological artefacts are part of our national heritage and history. The nearest Recorded Archaeological Monuments to the quarry, a standing stone is 850m distance from the subject site, therefore the quarry is and has been within the noise and ground vibrations limits. The quarry and associated activities has not had nor will have any negative impact on the existing cultural links within the surrounding environs.

16.2.23 "Do Nothing" Scenario

If the development to extract rock and process aggregate is not granted substitute consent, then local construction end users will be forced to source quarry product and aggregate from further afield. This will result in a higher carbon footprint for these products. The provision of four local jobs and the secondary benefits that this brings to the local community will cease if the project does not achieve substitute consent.