

Spink EIAR 2021

Section 14

Traffic & Roads

Laois County Council Planning Authority, Viewing Purposes Only

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14 TRAFFIC & ROADS

14.1 INTRODUCTION

The proposed development will consist of the continued use and operation of the existing quarry, within the currently permitted area (P.A. Ref. 10/383) including deepening of the quarry and provision of a concrete batching plant in the townland of Knockbaun, Spink, County Laois (See Figure 14.1). The existing quarry is permitted under planning permission P.A. Ref. 10/383 which allowed for a maximum output of 350,000 tonnes per annum. The proposed development will not exceed this level and the average output will be closer to c. 200,000 tonnes per annum.

This report assesses the traffic impacts of the proposed development on the road network adjacent to the quarry. The traffic assessment comprises an analysis of the following:

- traffic generated by the proposed development;
- traffic independent of the proposed development; and
- interaction of both.

This traffic impact assessment report incorporates the following main elements:

- current road and junction elements;
- current traffic receiving environment;
- impact of the traffic generated by the proposed development on the receiving environment;
- access requirements of the proposed (existing) development; and
- remedial and mitigation requirements of the proposed development.

This report has been prepared by Tony J. McNulty B.E., F.I.E.I., Chartered Engineer. Tony was formerly a Mayo County Council Senior Engineer and has more than 40 years' experience in road design, construction and maintenance, preparation of traffic studies, management and safety plans and traffic sections for EIAR's and Planning Applications.

14.2 SCOPE

This traffic assessment section of the EIAR has been prepared in accordance with:-

- *Traffic and Transport Assessment Guidelines, NRA (2014); and*
- *Project Appraisal Guidelines for National Roads Unit 16.1 - Expansion factors for Short Period Traffic Counts PE-PAG-02039. Transport Infrastructure Ireland TII (2016).*

As part of this study an analysis was carried out in accordance with the above guidelines. This analysis comprised an assessment of:

- existing road networks and traffic patterns in the vicinity of the proposed development;
- traffic that will be generated by the proposed development; and
- documents referenced above and at Section 14.10. below.

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14.3 STUDY METHODOLOGY

The approach undertaken for the traffic assessment is described in this section. It includes the details of all surveys undertaken, technical references used, and assumptions made in the study.

Table 14.1 Short Term Count Sites locations on 15/04/21

Site	Time	HGV	LGV	Cars	Cyclists	Pedestrians
R430-N77 at Abbeyleix	14.30-16.00 hrs	X	X	X	X	X
R430-N78 at Newtown Cross	11.00-12.30 hrs	X	X	X	X	X
R430 at Site Access	9.00-10.30 hrs	X	X	X	X	X
	16.30-18,30 hrs					

Note: Traffic Survey results are shown in Table 14.2 to 14.4 below.

The traffic volumes obtained from the count surveys were converted to passenger car units (PCU's) using a factor of 3 for HGV, 2 for LGV and 1 for cars respectively. The traffic volumes obtained from the count surveys were expanded to average daily traffic and further expanded to average annual daily traffic (AADT) using 'Project Appraisal Guidelines for National Roads Unit 16.1 - Expansion factors for Short Period Traffic Counts PE-PAG-02039. Transport Infrastructure Ireland TII (2016).

Traffic flows on the R430, R430/Quarry Access, R430/N77 and R430/N78 junctions were obtained by surveys carried out on 21st April 2021 (See Figure 14.2 and Figure 14.3). The future traffic growth rates were calculated from: PE-PAG-02017 Transport Demand Projection TII (2019) and are shown in Table 14.7 below. This document sets out a predicted traffic growth rates for various regions. The peak hour % volumes were also calculated. Historical traffic flows were obtained from TII automatic traffic counters in the site vicinity. These flows informed growth rates and were applied to the figures obtained by the site-specific counts. The results are shown in Table 14.2 to Table 14.5 below.

This study has been prepared with the support of additional datasets and information listed in the References Section 14.10.

14.4 RECEIVING ROAD NETWORK

This section describes the site location and the existing road network in the vicinity of the proposed development.

14.4.1 Site Location

The proposed development, which includes an existing quarry, is situated at Knockbaun, Spink, County Laois. The site access is situated off the south side of Regional road R430 which connects Abbeyleix to Carlow. This road passes through Swan village and crosses the N78 Athy to Castlecomer road at Newtown Cross.

The quarry is situated 7.5 km east of Abbeyleix, 4 km west of Swan village, and 8 km west of the R430/N78 junction at Newtown Cross. The R430 Regional road is the main access from Abbeyleix to Carlow and onwards to the rest of County Laois and Carlow.



Figure 14.1 Aerial Image showing location of Site and the Swan to Abbeyleix R430 Regional Road.

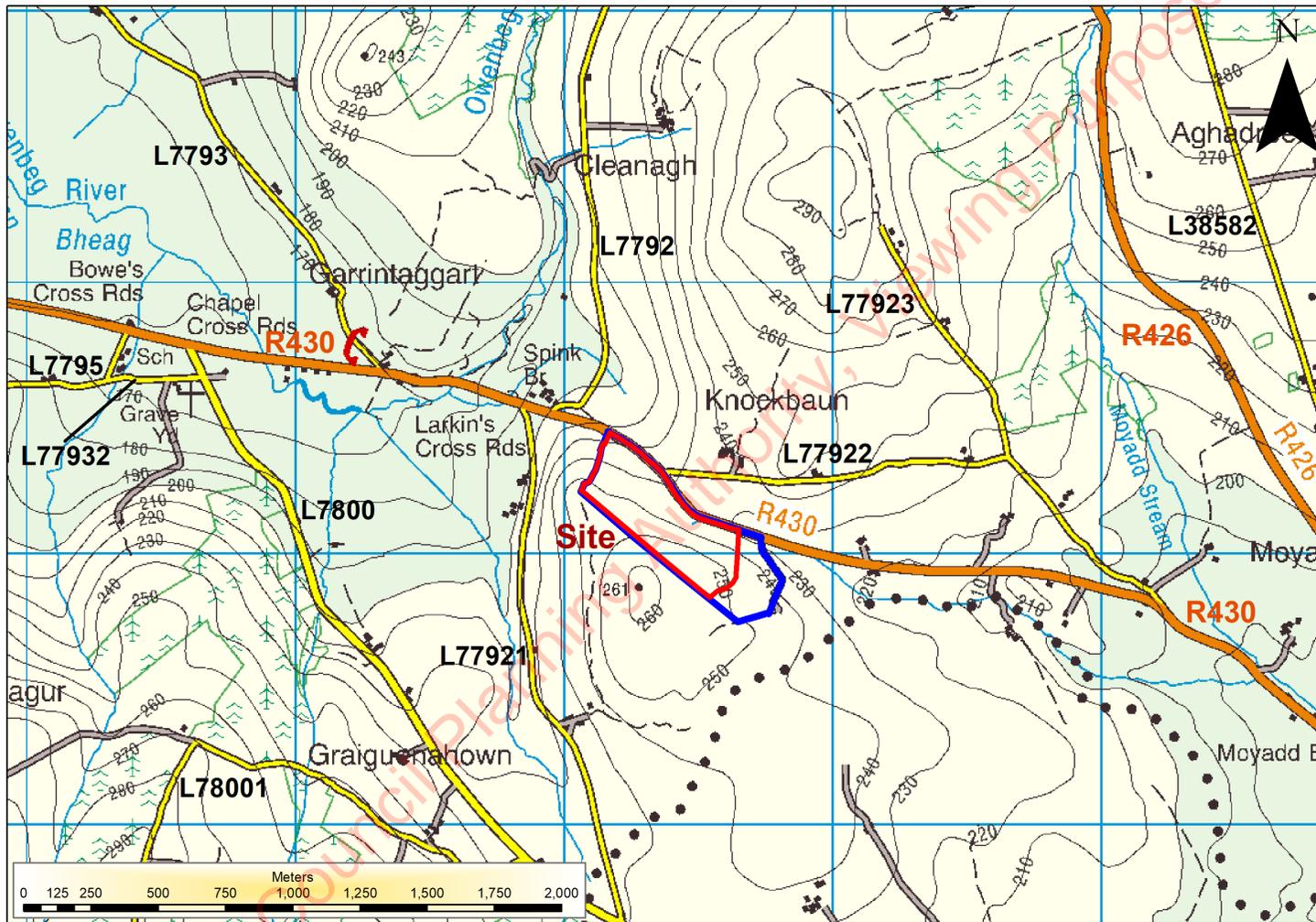


Figure 14.2 Map of Local Road Network at Knockbaun. Note R430 and local roads are all numbered.



Figure 14.3 Map of Regional Road Network at Knockbaun, with locations of traffic counts. Note R430/N78 junction at Newtown Cross just off map.

14.4.2 Network Description

The towns and villages in the area, Abbeyleix, Swan, Ballyroan, Ballinakill, Clogh and Timahoe are served by Regional and National roads. There is a school and a church 2 km and 1.5 km, respectively, west of the existing quarry. There are dispersed residences, commercial enterprises, and agriculture farms in the area. All these roads are situated within the 80 kph speed limit.

The local roads and the regional roads in the immediate area are in general unaligned 5–6 m surface dressed single carriageways with 2 No. 1.0–2.0 m sloping grass verges. Overall carriage widths are 7–9 m.

The R430 to the existing quarry entrance is an unaligned single lane 6–7 m single carriageway with 2 No. 0.5–1 m sloping grass verges. At the quarry entrance, there is a right turning lane provided on the R430 on the west side of the entrance.

The pavement is in good condition, although the line markings of the right turning lane require renewal.

This assessment will examine the effect the proposed development generated traffic will have on the R430/Access, R430/N77 in Abbeyleix and R430/N78 junctions.

The existing quarry access road forms a 90° angle at grade connection with the R430. The access road has an initial gradient of 0.5% from the regional road. The access road surface is composed of wearing course macadam. The access road is 9 m wide with 2 m high palisade double gateway. There is a steel box beam single swing barrier 3 m the roadside of the gateway. There is a dwell area of 25 m from the regional road edge to the gateway.

The cross section of the regional road west and east of the site entrance facing east is shown in Figure 14.4.

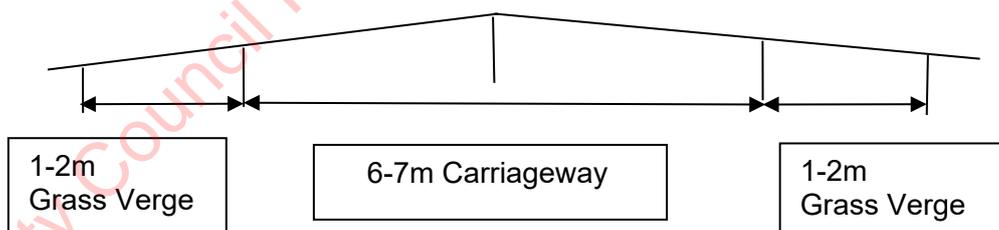


Figure 14.4 General Regional Road Cross Section.

The cross section of the regional road at the site entrance facing east is shown in Figure 14.5.

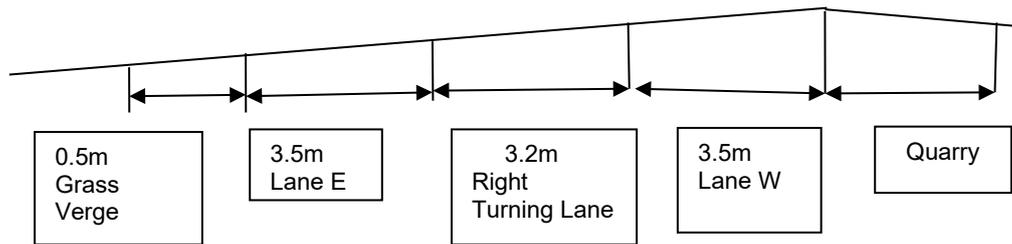


Figure 14.5 Regional Road Cross Section at Quarry Entrance.

14.4.3 Access Visibility

The site access junction has existing sight distances of 300–500 m both west and east and is located on a slightly curved section of the R430. There is an existing right turning lane for turning into the quarry on the western approach to the quarry access. The junction is located within the 80 km/hr speed limit area. The operating speed on the R430 is 80 km/hr or less. The access sight distances are set out in the DN-GEO-03060 June 2017 Geometric Design of Junctions (TII) and the Laois County Council Development Plan 2013–2019. For a design speed of 80 km/hr, the 'y' distance is 150 m and the 'x' distance is 2.4 m. The forward stopping sight distance from both directions along the R430 road is greater than the desirable minimum of 160 m. The R430 has a longitudinal grade of -4% westwards and +1% eastwards from the quarry access centreline.

14.4.4 Access Road and Drainage

The access road has generally a low longitudinal gradient away from regional road. Hence, no surface water from the site access road flows onto the public road. As a result, all surface water falling on the site access road will flow back into site and will be captured entirely by the internal site surface water management system.



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Plate 14.1 View at Site Entrance on R430 Looking West. Sightlines available.



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Plate 14.2 View at Site Entrance on R430 Looking East. Sightlines available.

14.5 EXISTING TRAFFIC FLOW CONDITIONS

The existing traffic volumes are of medium values on the regional road network in the vicinity of the quarry. There is a local road (L77922) junction to the west on the northern side of Regional road R430 (See Figure 14.2).

In order to assess the existing traffic volumes within the area of the proposed development, traffic count assessments were undertaken on 15th April 2021. These assessments comprised a series of short period traffic counts carried out on the junctions of the R430/N77, R430/N78 and R430/access to the quarry, at the locations shown in Figure 14.3. The R430/N77 junction in Abbeyleix is situated within the 50 kph speed limit area, while all the other junctions are within the 80 kph speed limit area.

The current Average Annual Daily Traffic (AADT) volumes were calculated by applying the PE-PAG-02039 Project Appraisal Guidelines - Expansion Factors for Short Period Traffic Counts October 2016 (TII).

The use of historical data from TII automatic counters which are located on National roads and record annual 24-hour traffic volumes at the nearest vicinity of the site gives a general background of the types, volumes, and growth rates in this area of County Laois. The TII automatic counters that were utilised in this study are the following:

- TMU N77.050.0 S – Between Portlaoise and Abbeyleix;
- TMU N77.030.0 S – Between Abbeyleix and Durrrow; and
- TMU N78.030.0 E – Between Athy and Castlecomer.

The data from the TII automatic counters can be used to give a background indication to which actual traffic figures obtained by the short period traffic counts carried out on the above specified R430 junctions can be referenced and which traffic volumes can be calculated for use in the traffic analysis. The flows on the R430 junctions are shown in Table 14.2 to Table 14.4.

Table 14.2 Traffic Volume Survey on R430 at Quarry Access (Vehicles) on 15/04/21

Hour Ending	10.30		17.30		18.00	
	HGV	Total	HGV	Total	HGV	Total
To Abbeyleix	4	47	1	92	5	104
To Swan	4	40	2	62	1	48
Total Vehicles	8	87	3	154	6	152
% HGV	9.2		1.9		3.9	

During the survey there was no pedestrian traffic recorded in the vicinity of the quarry access, however some pedal cycle traffic (2) was recorded.

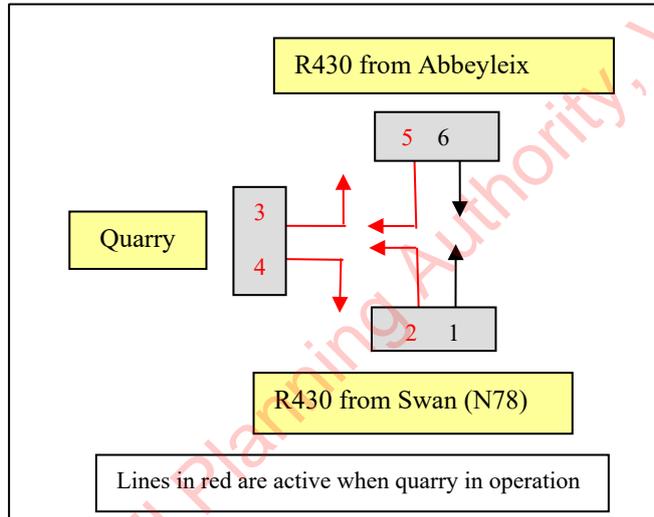


Figure 14.6 Movements on R430 at Quarry Access

Table 14.3 Traffic Volume Survey on R430/ N78 at Newtown Cross (Vehicles) on 15/04/21

Hour Ending	12.00	
Movement No.	HGV	Total
1	3	51
2	2	37
3	3	45
4	5	46
5	0	26
6	0	13
7	2	6
Overall Total	15	224

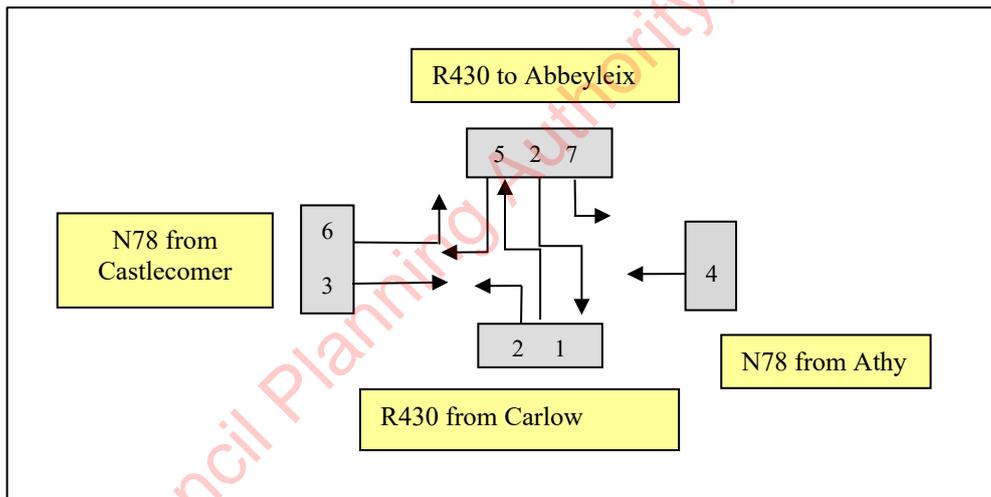


Figure 14.7 Movements on R430/N78 at Newtown Cross

Table 14.4 Traffic Volume Survey on R430/N77 at Abbeyleix (Vehicles) on 15/04/21

Hour Ending		16.00		
Road	Movements	HGV	Total	% HGV
To Portlaoise	1, 4	89	710	11.2
To Swan	5, 6	21	232	9.05
To Durrow	2, 3	88	686	12.8
Total Vehicles		198	1628	12.1

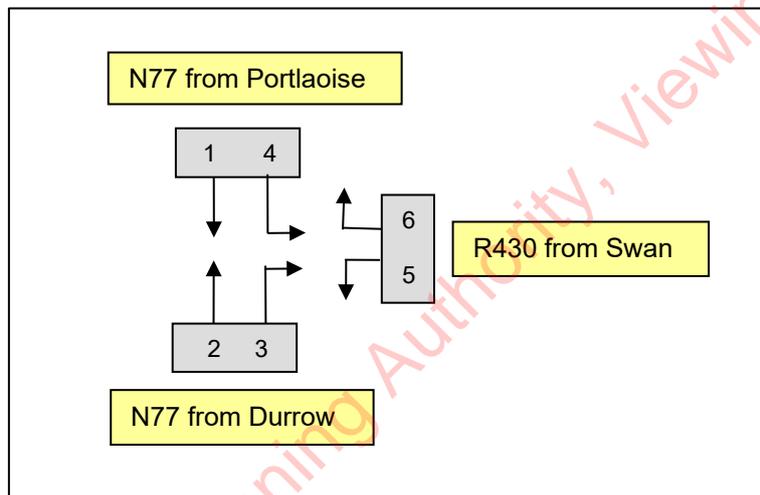


Figure 14.8 Movements on R430/N77 in Abbeyleix

The peak hours were determined from count data and historical data from TII automatic counters adjacent to the general area. The morning and evening peak flows were found to be 08.00–09.00 hrs and 17.00–18.00 hrs, respectively. The evening peak traffic generated the greatest flows. The evening peak hour was determined as the hour ending 17.00 hrs.

The R430, N77 and N78 road traffic data were obtained by manual traffic counts on the 21st of April 2021, and the traffic volumes were calculated using PE-PAG-02039 Project Appraisal Guidelines-Expansion Factors for Short Period Traffic Counts October 2016 (TII).

As shown in Table 14.5, this yielded: (1) an AADT for the R430 road of 3072 Passenger Car Units (pcu's) with a 0.4% HGV content and a peak hour flow of 284 pcu's; (2) an AADT for the N77 between Portlaoise and Abbeyleix of 8861 pcu's with a 9.4% HGV content and a peak hour flow of 824 pcu's; and (3) an AADT for the N78 road of 2756 pcu's with a 6.5% HGV content and a peak hour flow of 271 pcu's.

Table 14.5 Peak Hour Flows in 2021 (Pcu's)

Link	AADT	%HGV	Peak Hour Flow
R430	3072	0.4	284
N77 North of Abbeyleix	8861	9.4	824
N77 South of Abbeyleix	5188	12	305
N78	2756	6.5	271

Since 2015, there has been a continuous increase in traffic as economic circumstances have improved throughout Ireland, although this was interrupted in 2020 by the Covid-19 pandemic lockdowns. While there are no automatic traffic counters on the regional roads in the vicinity of the quarry, there are a number of TII automatic counters in or adjacent to County Laois. The traffic volumes recorded by these counters from the 2015 to 2019 period for the equivalent week i.e., around the 15th of April as the 2021 counts provided by the three counters were interrogated to give a picture of how traffic volumes were developing within the county.

These figures are then used as a basis to forecast the volumes on the N77, N78 and R430, which are then used to examine the impact of the traffic generated by the quarry on the existing road network and the future traffic volumes. As stated above, the automatic counters used in the study are shown on Table 14.6 and are situated on the N77 (Counters TMU N77. 050.0 S, which is situated south of Portlaoise and north of Abbeyleix and TMU N77. 030.0 S, which is situated between Abbeyleix and Durrow). The N78 Counter TMU N78.030.0 E is situated between Athy and Castlecomer. The results are shown in Table 14.6.

Table 14.6 TII Automatic Traffic Counters Flows Data (AADT)

COUNTER	Location	AADT							% Annual Increase 2015-18	% Decrease 2019-20	% Decrease 2019-21	% To Increase To 2019 Volume
		2015	2016	2017	2018	2019	2020	2021*				
TMU N77. 050.0 S	Between Portlaoise and Abbeyleix	9625	9951	10759	10528	9698	7677	9091	2.27	20.8	9.4	1.066
TMU N77. 030.0 S	Between Abbeyleix and Durrow	6113	6353	6798	6579	6551	4849	5638	1.85	26.0	8.6	1.16
TMU N78. 030.0 E	Between Athy / Castlecomer	2623	2607	2902	2760	2871	2278	2756	1.82	20.6	9.5	1.04
*estimated 2021 AADT								Average	1.98	22.5	9.2	1.09

These results show that there was a continuing increase in traffic in the County Laois area between 2015 and 2019. However, this was interrupted in 2020 by the Covid-19 pandemic lockdowns, which resulted in a drop in traffic as shown in Table 14.6. The traffic decreased on average by 22.5% from 2019 to 2020. Estimated values for 2021 show the decrease from 2019 to 2021 to be 9.2%.

Table 14.6 shows that the traffic volumes are recovering, and it is anticipated that traffic volumes should return to the 2019 volumes over a short period when the Covid-19 lockdowns are eased. The average factor obtained from the TII counts for the current volumes to reach this recovery is 1.09. The figures obtained in the short counts of 21st April 2021 will be expanded to give the comparative new values for 2021. These will be the figures that are used in the analysis of traffic.

The PE-PAG-02017 Transport Demand Projection publication outlines the various projected traffic demand for a number of future periods for light vehicles (LV) and heavy vehicles (HV). The period relevant to this assessment is 2013–2030. There are three growth rate scenarios outlined, i.e., Low, Central and High. These are shown in Table 14.7.

Table 14.7 Transport Demand Projections PE-PAG-02017 for 2016-2030 for County Laois

Projection	Low		Central		High	
	LV	HV	LV	HV	LV	HV
Growth Rate	1.0156	1.0349	1.0173	1.0365	1.0205	1.04
Average	1.0253		1.0269		1.0303	

While application of the high value increase to the traffic on the regional and local roads may be too high, it will have the effect of yielding a more robust analysis of future traffic volumes.

The effect of government policies on climate change seeking to encourage a modal shift to public transport are as yet unknown but should have the effect of slowing increasing traffic growth. However, this is not considered in this report on the traffic volumes of the proposed development, as the material exported/imported cannot be transferred to any other bulk transport mode, e.g., rail.

By applying the average increases of 1.09 and 1.0303 to the manual counts on the Regional roads, the 2021 figures for the Average Annual Daily Traffic (AADT) volumes are expanded to 2021 values. These values are shown in Table 14.8.

Table 14.8 Adjusted Traffic Volumes 2021 and 2030 (AADT)

YEAR	Count 2021	2021	2030
R430	3072	3348	3450
N77 North of Abbeyleix	8861	9658	9951
N77 South of Abbeyleix	5188	5655	5826
N78	2756	3004	3095

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14.6 TRAFFIC GENERATED BY PROPOSED DEVELOPMENT

14.6.1 Traffic Generation

The peak hour traffic from the relevant TII automatic counters shows the morning peak to be 08:00 hr. The evening peak is shown to be 17:00 hrs in all locations. The volume of peak hour traffic in all cases is greater in the evening peak.

Table 14.9 TII Automatic Traffic Counters Peak Hour Flows (AADT)

COUNTER	LOCATION	PEAK HOUR FLOWS				PEAK HOUR FLOW
		2018	2019	2020	2021	% AADT (Aver)
TMU N77.050.0 S	Between Portlaoise and Abbeyleix	962	1041	373	824	9.6
TMU N77.030.0 S	Between Abbeyleix and Durrow	537	606	234	505	9.0
TMU N78.030.0 E	Between Athy and Castlecomer	255	287	125	271	9.6
Average						9.4

The 9.4% peak hour flow shown in Table 14.9 can be applied to the rest of the network, and when applied in this manner, results in a calculated peak hour traffic flow of 313 pcu's on the R430. The resultant peak hour flow calculated from the traffic survey on 21st April 2021 was 284 pcu's on the R430, and this is the figure that is used in the analysis. The peak hour traffic generated by the proposed quarry development combined with the network peak hour traffic flow is the determining factor in the traffic impact of the development.

The proposed quarry working hours are:

Monday to Friday: 07:00 to 18:00 hours.

Saturdays: 07:00 to 14:00 hours

Sundays/Public Holidays No working except in the case of maintenance or emergency.

It is requested that the transportation of aggregates and concrete can continue to commence from site at 07:00 (Monday to Saturday). This is also in line with the planning and development Guidelines for Quarrying and Ancillary Activities issued by the DoEHLG in 2004. An early start-up is required particularly when servicing large construction projects where the concrete pour must be completed in one operation.

As previously described in the introduction, the proposed development comprises the continued use of an existing quarry for the production of aggregates and the operation of a concrete batching plant at Knockbaun, Spink, County Laois. The scale of the operation under planning permission P.A. Ref. 10/383 allowed for a maximum output

of 350,000 tonnes per annum. The proposed development will not exceed this level and the average output will be closer to c. 200,000 tonnes per annum of aggregates. In addition, the concrete batching plant will produce up to 15,000 m³ (36,000 tonnes) of ready-mix concrete per annum.

The analysis is based on a 48-week year, 5.5-day week, 11-hour weekday and 7-hour Saturday.

Using a 24-tonne average load, the aggregate export of 200,000^A, 300,000^B or 350,000^C tonnes thus equates to c. 76^A, 108^B or 124^C heavy goods vehicles (HGV) per day or 8^A, 11^B or 12^C HGV trips per hour.

The production of up to 15,000 m³ of ready-mix concrete per annum will require the importation of cement and fine aggregates to the proposed development. The coarse aggregate and water will be sourced from within the quarry itself. The annual tonnage anticipated to be imported by the operator are;

- cement: 4,500 tonnes, and
- fine aggregate (sand): 7,500 tonnes.

This results in a total import of 12,000 tonnes per annum. Using a 24-tonne average load, this is equivalent to 500 import truck movements per annum. The production and export of 15,000 m³ of concrete will be undertaken by concrete trucks with an 8 m³ capacity. This is equivalent to 1,667 export truck movements per annum.

It is anticipated that the proposed development will incorporate 3 employees. The production of stone and concrete products will amount to 6 trips per day. There will be occasional contractor, maintenance & delivery vehicles to/from supporting the needs of the quarry, which will amount to 6 trips per day.

The traffic generated by the quarry will therefore fall into a number of categories:-

- quarry aggregate haulage traffic exiting laden onto the public road network;
- quarry aggregate haulage traffic entering empty to quarry;
- cement and fine aggregate haulage traffic laden entering quarry;
- cement and fine aggregate haulage traffic empty exiting quarry;
- readymix concrete traffic laden exiting quarry;
- readymix concrete traffic laden entering quarry;
- employees' cars (6 trips); and
- occasional contractor, maintenance & delivery vehicles (3 trips).

This activity will result in the following generated traffic outlined in Table 14.10.

Table 14.10 Summary of Proposed Quarry Site Generated Traffic (Vehicles)

Traffic Type	Load Type	Total Export per Annum	Total Import per Annum	Total Loads/ Annum	Total Trips/ Annum	Number of Trips/Week	Number of Trips/Day	Number of Trips/Hr
Quarry	24T	185,000 ^A 285,000 ^B 335,000 ^C		7710 ^A 11875 ^B 13959 ^C	15420 ^A 23760 ^B 27918 ^C	322 ^A 496 ^B 582 ^C	58 ^A 90 ^B 106 ^C	6 ^A 9 ^B 10 ^C
Ready mix Concrete	8 m ³	15000		1667	3334	70	14	1
Cement & Fine Aggregates (Sand)	24T		12000	500	1000	22	4	1
Staff (3)							6	3
Others							12	2
Total HGV							76 ^A 108 ^B 124 ^C	8 ^A 11 ^B 12 ^C
Overall Total							94 ^A 126 ^B 142 ^C	13 ^A 16 ^B 17 ^C

Notes: The scale of the operation under planning permission P.A. Ref. 10/383 was up to a maximum output of 350,000 tonnes per annum. The proposed development will not exceed this level and the average output will be closer to c. 200,000 tonnes per annum of aggregates and in addition the concrete plant will produce up to 15,000 m³ of ready-mix concrete per annum. For the purpose of this assessment and to ensure a robust analysis, we have considered the proposed site traffic generated for the development based on quarry production figures ranging from 200,000^A to 300,000^B and up to 350,000^C tonnes (Note superscripted A, B and C have been used to differentiate these scenarios).

Table 14.11 Peak Daily Quarry Traffic 2021

Vehicle Type	Number of Trips	Average Trips/hr	Peak Hour (Vehicles)	Peak Hour (PCU's)
Quarry HGV	58 ^A	6 ^A	8 ^A	24 ^A
	90 ^B	9 ^B	10 ^B	30 ^B
	106 ^C	10 ^C	12 ^C	36 ^C
Ready Mix HGV	14	1	2	6
Cement & Fine Aggregates (Sand)	4	1	1	3
Staff + Others	18	2	8	8
Total	94 ^A	10 ^A	19 ^A	41 ^A
	126 ^B	13 ^B	21 ^B	47 ^B
	142 ^C	14 ^C	23 ^C	53 ^C

Note: *Superscripts have been used to differentiate traffic values for quarry production ranging from 200,000^A to 300,000^B and up to 350,000^C tonnes per annum.*

The traffic analysis uses the daily traffic numbers shown in Table 14.11 as the basis for the analysis.

The traffic impact of the proposed development is considered in the context of the impact upon the R430/Quarry Access, R430/N78 road junctions and the R430/N77. The R430/N77 junction is located within the 50 kph speed zone in Abbeyleix and the other junctions are located within 80 kph speed zones. It is anticipated that the proposed development traffic will travel 70% westwards and 30% eastwards along the R430. Then in Abbeyleix, it is anticipated the proposed development traffic will travel 90% northwards and 10% southwards along the N77. At the R430/N78 junction (i.e., Newtown Cross), it is anticipated the proposed development traffic will travel 30% northwards and 30% southwards along the N78 and 40% eastwards along the R430 towards Carlow. This annual combined tonnage will have the following traffic effect in relation to volume and road capacity and is analysed in relation to the R430/Quarry Access and R430/N78 road junctions and the N77 north and south of Abbeyleix.

Table 14.12 Increase in Traffic with Quarry in 2021 per Day

2021	R430 W	R430 E	N77 N	N77 S	N78 S	N78 N	R430 E (N78)
Cars	13	5	11	2	1	1	3
PCU's	13	5	11	2	1	1	3
HGVs	53 ^A 76 ^B 87 ^C	23 ^A 32 ^B 37 ^C	48 ^A 68 ^B 78 ^C	5 ^A 8 ^B 9 ^C	6 ^A 10 ^B 11 ^C	6 ^A 10 ^B 11 ^C	11 ^A 13 ^B 15 ^C
PCU's	159 ^A 228 ^B 261 ^C	69 ^A 96 ^B 111 ^C	144 ^A 204 ^B 234 ^C	15 ^A 24 ^B 27 ^C	21 ^A 30 ^B 33 ^C	21 ^A 30 ^B 33 ^C	33 ^A 39 ^B 45 ^C
Current AADT	3072	3072	8861	5188	2756	2756	2283
Adjusted AADT	3339	3339	9658	5654	3004	3004	2488
AADT + Site	3511 ^A 3580 ^B 3613 ^C	3413 ^A 3440 ^B 3455 ^C	9813 ^A 9873 ^B 9903 ^C	5671 ^A 5680 ^B 5683 ^C	3026 ^A 3035 ^B 3038 ^C	3026 ^A 3035 ^B 3038 ^C	2524 ^A 2530 ^B 2536 ^C
Capacity AADT	6800	6800	14000	14000	8600	8600	6800
% of Capacity	52 ^A 53 ^B 53 ^C	50 ^A 51 ^B 51 ^C	70 ^A 71 ^B 71 ^C	41 ^A 41 ^B 41 ^C	35 ^A 35 ^B 35 ^C	35 ^A 35 ^B 35 ^C	37 ^A 37 ^B 37 ^C

Note: Superscripts have been used to differentiate traffic values for quarry production ranging from 200,000^A to 300,000^B and up to 350,000^C tonnes per annum.

Table 14.13 Increase in Traffic with Quarry in 2030 per Day

2030	R430 W	R430 E	N77 N	N77 S	N78 S	N78 N	R430 E (N78)
Cars	13	5	11	2	1	1	3
PCU's	13	5	11	2	1	1	3
HGVs	53 ^A 76 ^B 87 ^C	23 ^A 32 ^B 37 ^C	48 ^A 68 ^B 78 ^C	5 ^A 8 ^B 9 ^C	6 ^A 10 ^B 11 ^C	6 ^A 10 ^B 11 ^C	11 ^A 13 ^B 15 ^C
PCU's	159 ^A 228 ^B 261 ^C	69 ^A 96 ^B 111 ^C	144 ^A 204 ^B 234 ^C	15 ^A 24 ^B 27 ^C	21 ^A 30 ^B 33 ^C	21 ^A 30 ^B 33 ^C	33 ^A 39 ^B 45 ^C
Projected AADT	3450	3495	9950	5769	3395	3395	3059
AADT + Site	3613 ^A 3691 ^B 3764 ^C	3566 ^A 3596 ^B 3611 ^C	10096 ^A 10165 ^B 10193 ^C	5786 ^A 5810 ^B 5813 ^C	3417 ^A 3426 ^B 3429 ^C	3417 ^A 3426 ^B 3429 ^C	3092 ^A 3101 ^B 3107 ^C
Capacity AADT	6800	6800	14000	14000	8600	8600	6800
% of Capacity	53 ^A 54 ^B 55 ^C	53 ^A 53 ^B 53 ^C	72 ^A 73 ^B 73 ^C	42 ^A 42 ^B 42 ^C	40 ^A 40 ^B 40 ^C	40 ^A 40 ^B 40 ^C	45 ^A 45 ^B 46 ^C

Note: *Superscripts have been used to differentiate traffic values for quarry production ranging from 200,000^A to 300,000^B and up to 350,000^C tonnes per annum.*

Traffic generated by the proposed development has been analysed in relation to the R430/Access, R430/N77 and R430/N78 junctions.

The peak hour for the proposed development does not necessarily coincide with the PM peak on the R430. However, by applying the peak hour figures for the roads to the predicted traffic generated by the quarry activity calculated above, we can generate the worst-case scenario numbers for traffic, and results in a robust, conservative analysis of the traffic.

The volume of traffic generated by the proposed development can be absorbed by the available capacity of the adjoining National and Regional roads. The proposed development would increase the total daily volume of traffic using the various roads as shown in Table 14.14.

Table 14.14 Increase in Traffic in 2021 per Day and Peak Hour

Location	Daily Increase			Peak Hour Increase		
	R430	N77 N	N78/R430	R430	N77 N	N78/R430
Vehicles	94 ^A	60 ^A	28 ^A	19 ^A	12 ^A	6 ^A
	126 ^B	79 ^B	38 ^B	21 ^B	13 ^B	6 ^B
	142 ^C	89 ^C	43 ^C	23 ^C	14 ^C	6 ^C
PCU's	228 ^A	144 ^A	75 ^A	41 ^A	26 ^A	12 ^A
	324 ^B	204 ^B	99 ^B	47 ^B	30 ^B	14 ^B
	372 ^C	234 ^C	111 ^C	53 ^C	34 ^C	16 ^C
% PCU Increase	6.4 ^A	1.5 ^A	1.1 ^A	12.6 ^A	3.1 ^A	4.24 ^A
	8.8 ^B	2.0 ^B	1.5 ^B	14.2 ^B	3.5 ^B	4.9 ^B
	10.0 ^C	2.3 ^C	1.6 ^C	15.7 ^C	4.0 ^C	5.6 ^C

Note: *Superscripts have been used to differentiate traffic values for quarry production ranging from 200,000^A to 300,000^B and up to 350,000^C tonnes per annum.*

14.6.2 Traffic Generation Distribution

The generated volume split of the proposed development traffic at the R430/N77/N78 junctions is anticipated to be 70% westwards and 30% eastwards along the R430. At the N77 in Abbeyleix, it is anticipated the proposed development traffic will move 90% northwards and 10% southwards along the N77. At the N78 at Newtown Cross, it is anticipated the proposed development traffic will move 30% northwards and 30% southwards along the N78 and 40% eastwards along the R430 towards Carlow. While these percentages may vary slightly in the future, they will not change to such a significant extent as to adversely affect the traffic distribution.

14.6.3 Traffic Assignment

The resulting assignment of the two-way traffic generated by the proposed development activity along the R430 junction road is shown in Table 14.15.

Table 14.15 Assignment of Daily Quarry Traffic (Vehicles/Day) at the R430/Quarry Access Junction

Direction	Vehicle Type		
	Car/LGV	HGV	Total
At Access West along R430—70%	13	53 ^A , 76 ^B , 87 ^C	66 ^A , 89 ^B , 100 ^C
At Access East along R430—30%	5	23 ^A , 32 ^B , 37 ^C	28 ^A , 37 ^B , 42 ^C
N77 North to Portlaoise and M7—63%	11	48 ^A , 68 ^B , 78 ^C	59 ^A , 79 ^B , 89 ^C
N77 South to Durrow and M8—7%	2	5 ^A , 8 ^B , 9 ^C	7 ^A , 10 ^B , 11 ^C
At N78 at Newtown North to Athy—10%	1	6 ^A , 10 ^B , 11 ^C	7 ^A , 11 ^B , 12 ^C
At N78 at Newtown South to Castlecomer—10%	1	6 ^A , 10 ^B , 11 ^C	7 ^A , 11 ^B , 12 ^C
At N78 at Newtown East to Carlow—12%	3	11 ^A , 13 ^B , 15 ^C	14 ^A , 16 ^B , 18 ^C

Note: *Superscripts have been used to differentiate traffic values for quarry production ranging from 200,000^A to 300,000^B and up to 350,000^C tonnes per annum.*

14.6.4 Peak Hour Quarry Traffic

The opening hours of the proposed development will be 07:00–18:00 hrs Monday to Friday and 07:00–14:00 hrs on Saturday. The evening peak has been found to be the greatest volume of traffic and is the hour ending 17:00 hrs. When an evening peak flow to/from the quarry is added to the evening peak of other vehicle daily average it yields the worst-case scenario. The evening peak flow to/from the quarry is calculated as shown in Table 14.15.

The additional peak hour site traffic from the proposed development would increase the junction movements by 41^A, 47^B or 53^C, which represents 12.6%^A, 14.2%^B or 15.7%^C, respectively, of the peak hour flow of 284 pcu's calculated in Table 14.14 above and Table 14.16 below.

The evening peak flow combination of ordinary background traffic and site traffic from the proposed development is greater and has thus been used for the assignment of traffic to the network. When these figures are combined with the evening peak flow traffic on the R430 Regional road, it will yield the worst-case scenario for assessment of the traffic.

Table 14.16 Assignment of Evening Peak Hour Quarry Traffic (Veh/hr & PCU's)

Direction	Vehicle Type					
	LGV/Car		HGV		Total	
	V/H	PCU	V/H	PCU	V/H	PCU
Quarry to R430	8 ^A	8 ^A	6 ^A	18 ^A	14 ^A	26 ^A
	8 ^B	8 ^B	7 ^B	21 ^B	15 ^B	29 ^B
	8 ^C	8 ^C	8 ^C	24 ^C	17 ^C	32 ^C
R430 to Quarry	0 ^A	0 ^A	5 ^A	15 ^A	5 ^A	15 ^A
	0 ^B	0 ^B	6 ^B	18 ^B	6 ^B	18 ^B
	0 ^C	0 ^C	7 ^C	21 ^C	8 ^C	21 ^C
Total	8 ^A	8 ^A	11 ^A	33 ^A	19 ^A	41 ^A
	8 ^B	8 ^B	13 ^B	39 ^B	21 ^B	47 ^B
	8 ^C	8 ^C	15 ^C	45 ^C	23 ^C	53 ^C

Note: *Superscripts have been used to differentiate traffic values for quarry production ranging from 200,000^A to 300,000^B and up to 350,000^C tonnes per annum.*

14.7 TRAFFIC FLOW ASSESSMENT

14.7.1 General

The 2021 traffic volumes on the road network in the vicinity of the proposed development will continue to increase. The current volumes on the R430 and other roads were obtained from traffic counts carried out on 15th April 2021. These counts were projected forward to 2021 and 2030 using figures obtained during the traffic survey undertaken on 15th April 2021. These figures are shown in Table 14.2 to Table 14.4. The flows on the R430 at the quarry entrance are shown in Table 14.2.

The evening peak flow was the greater peak flow, and this is the figure that has been utilised in the traffic assessment. Using the information outlined in Table 14.5, the evening peak hour flows have been defined as 16:30–17:30 hrs.

The impact of the traffic generated by the proposed development on the road network was assessed by examining the performance of the proposed development traffic with the R430 as outlined in Section 14.6 above.

The peak HGV movements on the R430/Quarry Access were calculated and assigned using the traffic from the proposed development. The peak hourly movements of traffic at the junction are the combination of the proposed development movements and the R430 movements. The results are shown in Table 14.16 above.

14.7.2 Junction Operation

An assessment of the R430/Quarry Access was carried out and it was found (as shown in Table 14.14) that there would be an increase of 228^A, 324^B or 372^C pcu's on the current daily 3,072 pcu's volume or 6.4%^A, 8.8%^B or 10%^C, respectively, in overall traffic using the junction as a result of these proposals. This junction is located within an 80 kph speed zone. The traffic on the Quarry leg (i.e., section of internal access road) of the junction is predicted to be 19^A, 21^B or 23^C vehicles in the evening peak hour or 41^A, 47^B or 53^C pcu's, respectively, representing an increase of 12.6%^A, 14.2%^B or 15.7%^C, respectively (Refer to Table 14.6 and Table 14.17).

Table 14.17 Increase of Peak Hour due to the proposed Quarry Traffic at R430/ Quarry Access in (PCU's)

Existing Peak Hr	Quarry Peak Hr	Peak Hr + Site	% Increase
284	41 ^A	325	12.6 ^A
284	47 ^B	331	14.2 ^B
284	53 ^C	337	15.7 ^C

Note: *Superscripts have been used to differentiate traffic values for quarry production ranging from 200,000^A to 300,000^B and up to 350,000^C tonnes per annum.*

The above results show the maximum traffic generated by the proposed development has a moderate effect on the operation of the R430 and adjoining roads. Table 14.12 and Table 14.13 show the effect on the capacity on the regional and national roads in the area.

14.8 ASSESSMENT OF IMPACTS

The following Impact Assessment matrix provides an indication of the significance of potential effects arising during the life cycle of the development not accounting for any mitigation measures.

The impact of the proposed development on the regional and national road network has been assessed for the construction, operation and restoration phases of the proposed development.

Table 14.18 Traffic – Impact Assessment			
'Do Nothing' Impacts	X		
Factors	Construction	Operation	Decommissioning
Direct Impacts	X	●	X
Indirect Impacts	X	X	X
Cumulative Impacts	X	X	X
Residual Impacts	X	X	X
'Worst Case' Impacts	X	●	X

None/imperceptible: X; Slight: ●; Moderate: ●; Significant/Very significant: ●.
Refer to Appendix 3 for definition of Significance

14.8.1 'Do Nothing' Impacts

The 'do nothing' impacts will be none or imperceptible as the quarry development will remain as it exists today. There are no impacts from the site at present with respect to traffic and this will continue if no development is carried out.

Under the 'Do Nothing' scenario, all quarrying and ancillary activities would cease. The site would be restored as per the requirements of the existing planning permission (P.A. Ref. 10/383). There would be a slight, temporary impact from the decommissioning and restoration.

If the proposed recommencement of the quarry did not proceed, the local supply of good quality aggregates and concrete products would be more restricted resulting in the need to transport aggregates from more remote locations to meet demand in the region.

14.8.2 Direct Impacts

There will be an increase in traffic volumes using the existing road networks. This increase will be primarily of HGV's. It will be most pronounced along the R430 from the site entrance to the junction with the N77 National road in Abbeyleix and the N77 north of Abbeyleix.

The capacity of the R430 at the quarry access junction is 6,800 pcu's AADT and the existing and proposed volume on the R430 falls well within this envelope of available capacity. Thus, no additional access requirements will be needed for the proposed development.

The traffic impact of the quarry site on the R430 road and on the R430/Quarry Access will result in an increase of traffic on the network, but it is considered capable of being absorbed within the existing traffic. The projected increase in traffic due to the quarry site is **12.6%^A, 14.2%^B or 15.7%^C** of the total traffic at the peak hour given the present and forecasted levels of activity at the quarry (Refer to Table 14.17).

The level of turning movements at the R430/Quarry Access are of a medium volume within the total capacity of the road network. There is a right turning lane provided on the western approach to the quarry. The volume of traffic generated by the proposed development will result in an increase in daily vehicle flow of 94^A, 126^B or 142^C, i.e., an increase of 6.4%^A, 8.8%^B or 10.0%^C, respectively, along the R430 (Refer to Table 14.14). The existing capacity of the adjacent road networks has been shown to be readily capable of absorbing this increase.

As the proposed development comprises an existing quarry with much of its infrastructure in-situ, only a brief construction phase is envisaged. Much of the earth moving machinery mobilised to site will also be used during the operational phase of the development and as such the mobilisation of plant and machinery to site will be negligible in terms of overall traffic movements on the R430.

The final restoration will require the use of earthmoving machinery for completion. This machinery will be available on-site and as such there will be no additional traffic associated with mobilising earthmoving machinery onto and off the site.

14.8.3 Indirect Impacts

The volume of traffic generated by the proposed development will result in an increase in a daily vehicle flow of 94^A, 126^B or 142^C, i.e., an increase of 6.4%^A, 8.8%^B or 10.0%^C, respectively (Refer to Table 14.14). It has been shown that this increase can be readily absorbed by the adjacent road networks. The extent of the impact from increased traffic is detailed above.

There will be no indirect impacts during the construction and decommissioning phases of the development due to the low requirement for mobilisation of earthmoving equipment to the site during these phases, as detailed above (EIAR Section 14.8.2).

14.8.4 Cumulative Impacts

There will be no cumulative impacts resulting from the proposed development during the construction, operation, or commissioning phases of the proposed development.

There are several quarries in the Abbeyleix-Ballinakill area c. 5–8.5 km to the west, while the Lagan Clay Products Facility is located c. 3 km to the east at Swan. As such, it is considered that there will be no significant cumulative impacts with respect to the operation of the proposed development given that the site is removed from any other extractive, industrial or commercial development in the locality.

14.8.5 Transboundary Impacts

The EIA Directive 2014-52-EU invokes the Espoo Convention on Environmental Impact Assessment in a Transboundary Context, 1991, and applies its definition of transboundary impacts. Given the location (c. 135 km from the border with N. Ireland), nature, size, and scale of the proposed development, it is expected that the impacts of the development would not have any significant transboundary effects on traffic and roads.

14.8.6 Residual Impacts

As a result of the proposed mitigation and enhancement measures incorporated in the design, there will be no significant, adverse residual impacts are predicted in terms of roads and traffic during the operational phase.

It is considered that following full restoration and closure of the site that there will also be no significant, long-term, adverse impacts in terms of the roads and traffic. The restored quarry will provide a change in land-use from mineral extraction currently to a beneficial after-use as a wildlife amenity.

14.8.7 'Worst Case' Impacts

It is considered that the Worst-Case Impact of the development could be the accelerated deterioration of the pavement along the R430 due to increased HGV traffic, particularly at the site entrance. This may require maintenance works during the life of the development. The mechanism for dealing with this situation can be incorporated in a planning condition to be agreed with the Road Engineering Department of Laois County Council.

Another worst-case impact would be a traffic accident involving a HGV truck associated with the proposed development. During the 2005 to 2016 period, there were 11 road collisions on the c. 13 km stretch of the R430 between Swan and Abbeyleix, which is an average of one collision per annum (See Figure 13.1; Extract from RSA 2021). Of these, only one was severe, while none were fatal. Nine of the collisions involved cars, one a pedestrian, and one a goods vehicle at the Ballypickas Crossroads, which is c. 6 km to the west of the proposed development. There were no collisions near the entrance to the quarry nor along its c. 700 m frontage, and the

nearest collision was at Spink. These data suggest that the HGV traffic from the existing quarry had no significant impact on road safety on the R430.

14.9 MITIGATION

The proposed development at the existing quarry site will generate increased traffic movements on the regional and national roads in the area. A number of mitigation measures will be put in place to reduce the impacts of these increased traffic movements. The mitigation measures proposed are as follows:-

- Wheel wash will be recommissioned at exit of the quarry;
- Weighbridge will be recommissioned on site to ensure all HGV leaving the site are weighed;
- Traffic warning sign plan will be agreed with Laois County Council for the approaches along the R430 to the quarry;
- Upgrading of road markings of existing right turning lane at the quarry access road junction;
- The R430 road in the vicinity of the entrance will be mechanically swept on a regular basis;
- The pavement of the roads in the vicinity of the existing quarry and the R430 is in good condition and will be reviewed with the Roads Section of Laois County Council at an agreed frequency;
- The adjacent Regional and National roads, i.e., R430, N77 and N78, have good quality pavements and are capable of catering for the quarry site generated traffic;
- Pavement upgrading and repair will be a mitigation of any damage caused by the increased quarry traffic. This improvement to the pavement will be enjoyed by all the road users in the area;
- The parking requirements for the proposed development mainly relate to the quarry employees and visitors. It is proposed to provide sufficient parking spaces within the quarry for employees and visitors. The maximum number of direct employees will be 3, while spaces will be provided for other contractors. Therefore, a car park provision of 8 + 25% for visitors (i.e., 10 spaces) will be provided; and
- Parking will be provided within the quarry site for HGV queuing and rest up areas.

14.10 REFERENCES

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