13. MATERIAL ASSETS

13.1 Introduction

Material Assets are defined as *"resources that are valued and that are intrinsic to specific places"*, which can be of human or natural origin. Material Assets are also defined as *"built services and infrastructure"*. Most assets of natural origin are assessed elsewhere within this Environmental Impact Assessment Report (EIAR), including Biodiversity (in Chapter 6), Land & Soil (Chapter 7), Water Quality (Chapter 8), Air Quality and Climate (Chapter 9), and Landscape (Chapter 11).

This chapter of the EIAR addresses, therefore, the likely significant effects of the Proposed Development on assets which are intrinsically of human origin:

- Traffic and Transport – Section 13.2
- Utilities and Services – Section 13.3

Another material asset of human origin, archaeology and cultural heritage, is addressed in Chapter 12.

A full description of the Proposed Development is provided in Chapter 4 of this EIAR, including details on site enabling works, phasing and restoration.

13.1.1 Statement of Authority

This section of the EIAR has been prepared by Tom Madden and reviewed by Owen Cahill, both of MKO. Further information on team members can be found in Chapter 1 of the EIAR.

This chapter of the EIAR takes into the account the details and findings of the following reports and assessments, which are presented in the Appendices of the EIAR:

- Appendix 4-2: Environmental Management Plan (EMP), prepared by MKO.
- Appendix 11-1: Landscape Restoration Plan prepared by MKO.
- Appendix 13-1: Traffic and Transport Assessment (TTA), prepared by Alan Lipscombe Traffic and Transport Consultants

13.2 Traffic and Transport

13.2.1 Introduction

13.2.2 Purpose of Section

The purpose of this section is to assess the traffic effects of any additional traffic movements that will be generated on the surrounding road network due to the extraction of sand at the Proposed Quarry, located at Lomaunaghbaun, Tuam, County Galway.

13.2.2.1 Statement of Authority

This section of the EIAR has been prepared by Alan Lipscombe of Alan Lipscombe Traffic and Transport Consultants. Alan is a competent expert in traffic and transport assessments. In 2007 Alan set up a traffic and transportation consultancy providing advice for a range of clients in the private and public sectors. Prior to this Alan was a founding member of Colin Buchanan's Galway office having moved there as the Senior Transportation Engineer for the Galway Land Use and Transportation Study. Since the completion of that study in 1999, Alan has worked throughout the West of Ireland on a range of projects including: major development schemes, the Galway City Outer Bypass, Limerick Planning Land-Use and Transportation Study, Limerick Southern Ring Road Phase II, cost benefit analyses (COBA) and various studies for the NUI Galway. Before moving to Galway in 1997, Alan was involved in a wide variety of traffic and transport studies for CBP throughout the UK, Malta and Indonesia. He has particular expertise in the assessment of development related traffic and transport modelling, including for numerous quarries and sustainable energy projects.

Alan has a BEng (hons) Degree in Transportation Engineering (Napier University, Edinburgh, 1989), is a member of Engineers Ireland and of the Institute of Highways and Transportation and is a TII accredited Road Safety Audit Team Member.

Traffic counts were undertaken by Traffinomics Ltd, which is an Irish traffic survey company with a comprehensive knowledge of traffic data collection methods. The company, which is 10 years old, is headed by Simon Wheeler, who has been in the traffic survey data collection business for 35 years. Previously Simon worked with Count On Us Ltd, followed by Abacus Transportation Surveys Limited, Ireland's first lens based traffic data collection business. Clients of Traffinomics Ltd. include TII, Local Authorities and many leading retailers.

13.2.2.2 Guidance and Legislation

This section of the EIAR has been completed in accordance with the guidance set out in Chapter 1. The assessment uses standard terminology to describe the likely significant effects associated with the proposed development. Further information on the classification of effects used in this assessment is presented in Chapter 1 of this EIAR.

13.2.3 Method and Structure

The report adopts the guidance for such assessments set out by Transport Infrastructure Ireland (TII), in the document *'Guidelines for Traffic and Transport Assessments, May 2014'*.

A summary of the traffic related impacts of the Proposed Quarry is presented under the following subject headings in this Chapter 13 of the EIAR, while additional details of the assessment are provided in a Traffic and Transport Assessment Report (TTA), included as Appendix 13-1 of the EIAR, which is referred to throughout this chapter as the TTA.

The Traffic and Transport Section of this report is set out as follows:

- Section 13.2 – Receiving Environment
- Section 13.3 – Proposed Development
- Section 13.4 – Impact of the Proposed Quarry on the Study Network
- Section 13.5 – Geometric Assessment of Access Options A and B
- Section 13.6 – Provision for Sustainable Modes of Travel
- Section 13.7 – Likely and Significant Impacts
- Section 13.8 – Summary and Conclusions

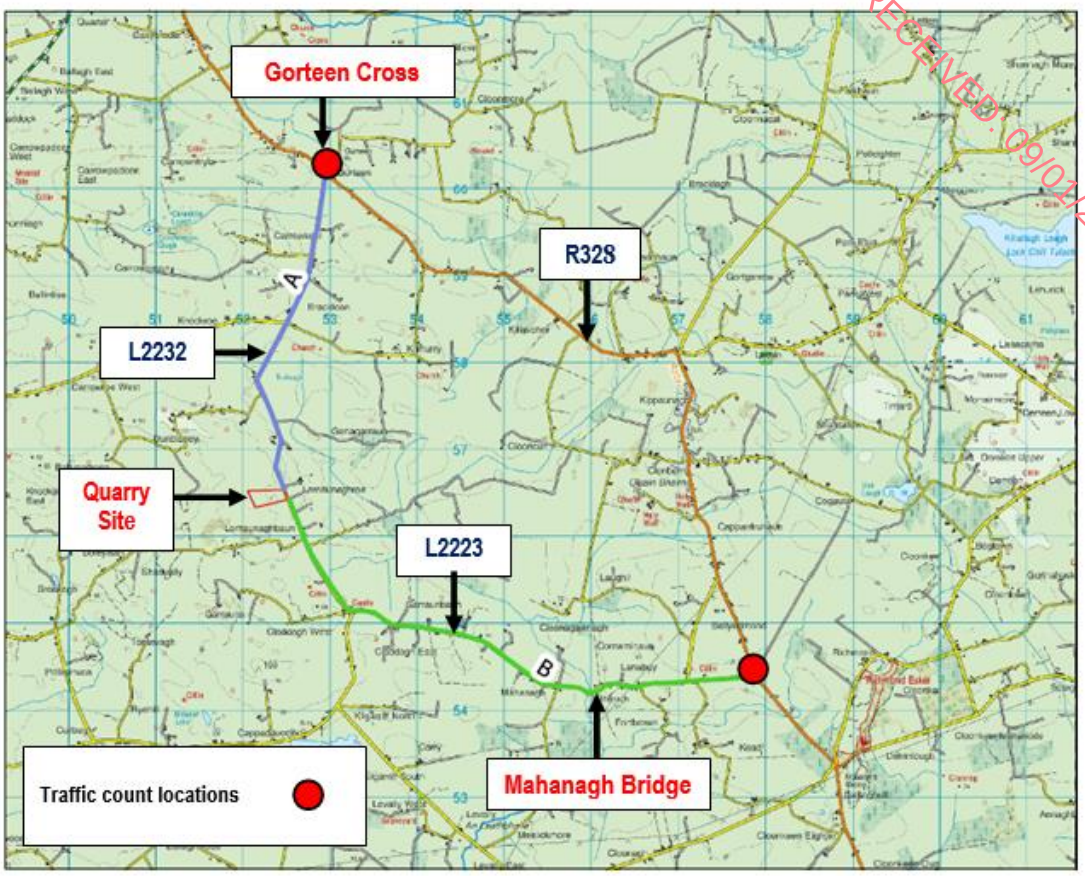
13.2.4 Receiving Environment

13.2.4.1 Site Location and Network Summary

The Proposed Quarry site is located within the townland of Lomaunaghbaun in County Galway and is approximately 8.6 kms northeast of Tuam and 4.7kms west of Clonbern.

The Proposed Quarry is situated on the west side of the L-2232 and may be accessed from 2 routes from the R328 regional road, shown as Routes A and B in Figure 13-1

Figure 13-1 Site Location and Potential Access Routes



Route Option A - From the R328, Route Option A is the most direct route to the site, which is located approximately 4.0km south on the L-2232 from the junction with the R328 at Gorteen Cross.

At the junction between R328 and the L2232 at Gorteen Cross it is noted that visibility along the R328 is constrained and is less than the 160m x 3m that would be required for the 80 km/h speed limit to be in accordance with TII requirements, as shown in Plates 1 and 2 of the Traffic and Transport Assessment (TTA) in Appendix 13-1. There is potential to improve visibility to the south by removing an existing grass mound adjacent to the junction as shown in Plate 1. Visibility to the north is particularly constrained, as shown in Plate 2. The approach on the R328 to the junction from this direction is downhill and traffic speeds were observed to be relatively fast. It is noted that remedial measures would be required to accommodate an intensification of traffic movements through this exiting junction.

Between the R328 junction and the proposed site access, over the approximately 4.0km route to the site, the L2232 narrows to a width of 3.0m at locations, but is generally between 4.0, to 5.0m wide. At locations where the carriageway is narrowest, it was noted that there were passing opportunities close by and in general, it was observed that clear forward visibility for driver was available for vehicles approaching in opposite directions to accessing passing opportunities without the need for a vehicle to reverse (See Plate 3 of the TTA in Appendix 3-1).

It was noted that there is one location located 350 metres north of the Proposed Quarry access junction where a narrow stretch of road is on an incline where the lack of forward visibility could result in 2 vehicles meeting with one requiring to reverse. This location is discussed further in Section 13-5.

Following the preliminary review a subsequent site visit was held with an Engineer from Galway County Councils Road Section on 24th February, 2023. The following points were discussed in principal;

- There was a general agreement that remedial works would be required at R328 / L-2232 junctions. It was stated that these would not form part of the current planning application.
- It was agreed that a detailed assessment of the section of the L-2232 between the R328 and the proposed site should be undertaken based on a topographical survey base and autotrack. This assessment was subsequently undertaken and is discussed in Section 13-5.

Route Option B - From the Proposed Quarry access travelling south on the L-2232 the carriageway varies in width with ample opportunities for vehicles to pass, and with good forward visibility (See Plate 7 of the TTA) all the way to the junction with the L-2232 approximately 1.5kms to the south.

The L-2232 the joins the L-2223 at a simple priority junction which has adequate geometry and good visibility.

From this junction the route travels east for approximately 3kms on the L-2223 to the Mahanagh Bridge. On this section the carriageway width also varies between 4.0 to 5.0m, with in general good forward visibility for opposing traffic and many opportunities for vehicles to pass. Travelling east on the L-2223 there is one pinch point on this route, which is the location of Mahanagh Bridge, as indicated on Figure 13-1. It is noted on site, however, that there is good forward visibility at this location for drivers to observe opposing vehicles, providing adequate opportunity for drivers to stop at a location wide enough for 2 vehicles to pass. This location is discussed further in Section 13-5.

From the Mahanagh Bridge the route heads east for a further 2 kms. Driving east from the bridge there is a series of bends in the L-2223 although this section is wide enough for vehicles to pass. From this point eastwards to the junction with the R328, the L2223 is a minimum of 5.0 metres wide and is able to accommodate 2 way traffic flow.

The junction between the L-2223 and the R328 has adequate geometry with 160m visibility splays provided in both directions for traffic accessing the regional road, as shown in Plates 8 to 10 of the TTA. It is noted that forward visibility on the R328 is constrained due to the bend, but visibility to observe oncoming traffic is relatively clear.

A detailed autotrack assessment of Route B is also discussed in Section 13-5

13.2.4.2 Existing Traffic Volumes – Year 2023

While additional details of the traffic counts undertaken for the purpose of the assessment are provided in Section 2.2 of the TTA included as Appendix 13-1, a summary of the observed traffic volumes observed on the route options is presented below.

Classified traffic counts were undertaken at the R328 / L-2232 junction at Gorteen Cross, and at the R328 / L-2223 junction, with the locations shown in Figure 13-1, in order to provide base year 2023 traffic data for the assessment. The traffic counts were undertaken over a 12 hour period between the hours of 07:00 to 19:00 by Traffinomics Ltd on Tuesday, 3rd of October 2023.

The 2-way link flows are summarised in Table 1 of the TTA, with the main points to note as follows;

- The AM peak hour was observed to be between the hours 08:00 and 09:00, with the PM peak hour determined to be 17:00 to 18:00,
- In terms of pcus (passenger car equivalent units) where HGVs are given a weighting of 2.4 in accordance with TII guidelines, in the survey month of October 2023, a maximum hourly flow of 47 pcus was observed on Route A on the L-2232 between Gorteen Cross and the Proposed Quarry site (observed during the PM peak hour comprising of 35 cars /lgvs and 5 hgvs). A 12-hour flow of 307 pcus, comprising of 230 cars/lgvs and 32 hgvs, was observed at the same location.
- For Route B on the L-2223 just to the west of the R328, a maximum hourly flow of 16 pcus was observed (observed during the AM peak hour comprising of 11 cars /lgvs and 2 hgvs). A 12-hour flow of 148 pcus, comprising of 117 cars/lgvs and 13 hgvs, was observed at the same location.

- A maximum hourly traffic volume of 115 pcus was observed on the R328 at Gorteen Cross with a 12 hour flow of 988 pcus observed at the same location
- For the R328 adjacent to the L-2223 a maximum hourly traffic volume of 105 pcus was observed with a corresponding 2 hour flow of 1,107 pcus.

Using data from the count site maintained by TII on the N83 it may be determined that the 24 hour count at that site was a factor of 1.22 times the 12 hour count observed between the hours of 07:00 to 19:00. If this is applied to the maximum 12 hour flows observed on the links in the study network the following maximum all-day flows are as follows;

L-2232 - 12 hr = 307 pcus, - 24 hr = 371 pcus

L-2223 - 12 hr = 148 pcus, - 24 hr = 179 pcus

R328 at Gorteens Cross - 12 hr = 988 pcus, - 24 hr = 1,195 pcus

R328 at Gorteens Cross - 12 hr = 1,107 pcus, - 24 hr = 1,339 pcus

While there are no link capacities set out for local roads in the TII publication Rural Road link Design DN-GEO-03031, the R328 approaches the standard of a Type 3 Single Carriageway, which has an all-day link capacity of 5,000 pcus. Based on this, and the maximum 24 hours flow of 1,339 pcus and 371 pcus on the regional and local roads respectively, it is considered that existing traffic volumes on the study network are low.

All existing traffic volumes are set out in Figures A1 to A3 of the TTA.

13.2.4.3 Future Year Traffic Volumes

The method adopted for determining the background traffic volumes on the study network in the proposed commencement year of 2024 and a future year of 2034 is also set out in Section 2.2 of the TTA included as Appendix 13-1 of this EIAR. Based on TII growth factors for cars and light vehicles for the medium growth scenario, traffic is forecast to grow by 2.6% between the years 2023 and 2024, and by 24.9% between 2023 and 2034. In terms of HGVs, background volumes are forecast to grow by 4.5% between the years 2023 and 2024, and by 46.8% between 2023 and 2034.

All background traffic volumes for the years 2024 and 2034 are set out in Figures A4 to A9 of the TTA.

13.2.5 Proposed Development

13.2.5.1 Trip Generation of Proposed Quarry

Details of the Proposed Quarry are provided in Chapter 4 of this EIAR, including the volumes of materials that will be excavated and delivered to the site during the construction and operation of the Proposed Quarry.

In terms of traffic movements, the following trips will be generated during the construction, operation and decommissioning phases;

Construction (5.5 days)

It is estimated that 15 HGV movements will travel to and from the site per day for 5.5 days (total of 83 loads), with an additional 4 car trips to and from the site per day for construction staff.

Operation (10 years)

As for the construction stage, a total of 15 HGV trips will travel to and from the site per day once the Proposed Quarry is operational. This will result in an average of 1.5 HGV movements travelling to and from the Proposed Quarry per hour between the hours of 07:00 to 18:00, with 2 HGVs movements assumed to travel to and from the site during the AM and PM peak hours.

It is also estimated that a maximum of 4 staff members will be employed on the site, with 4 car trips travelling to the site during the AM peak hour and 4 leaving the site during the PM peak hour.

The additional traffic movements that will be generated by the Proposed Quarry are shown for the AM, PM and 12 hour periods for each vehicle category in Figure A10 (cars /lgvs), Figure A11 (hgvs), and Figure A12 (pcus) of the TTA and are summarised for the study network in Table 5 of the TTA.

The "with development" flows required for the junction capacity assessments discussed in Section 13.4.2 are shown for the commencement year 2024 in Figure A13 (cars /lgvs), Figure A14 (hgvs), and Figure A15 (pcus) and for the future year 2034 in Figure A16 (cars /lgvs), Figure A17 (hgvs), and Figure A18 (pcus) of the TTA in Appendix 13-1.

13.2.6 Development Access Junction

The Proposed Quarry access is located on the west side of the L-2232 and is shown in plan in Figure 2 of the TTA.

The proposed junction designed is in accordance with TII DN-GEO-03060 guidelines for access junctions providing for HGV movements, with junction radii of 13m and 1:10 tapers provided over a distance of 25m. STOP road markings and signs are proposed in accordance with Figure 7.35 of the Traffic Signs Manual.

An autotrack of a large tipper truck (10.2m long by 2.5m wide) turning into and out of the access is shown in Figure 3 of the TTA. The figure shows that the proposed junction will accommodate the vehicle types that will be generated by the Proposed Quarry.

Visibility requirements for junctions are set out the Galway County Council Development Plan 2023 – 2028, Chapter 15 Development Management Standards Table 3. The default speed limit on the L-2232 is 80 km/h with a Y distance visibility requirement of 160m. For local roads with conditions similar to the L-2232 the Development Management Standards state that;

"On narrow local roads with poor horizontal and vertical alignment and where the 80 km/h speed limit applies, the design speed applied for access visibility requirements should be the speed (km/h) that one can drive the road in a safe manner. This can be assessed as the 85th percentile speed drivers travel on the road. The visibility will then be assessed on the 85th percentile speed for that road".

When driving the L-2232 in the proximity of the proposed access junction it is clear that the safe speed to drive taking account of local conditions is significantly lower than 80 km/h and that based on a number of trips 50 km/h was considered to be a reasonable safe speed. Based on an assumed operational speed of 60 km/h a visibility splay of 2.4m x 90m is proposed, as shown in Figure 4 of the TTA.

A vertical section of the L-2232 in the proximity of the proposed access junction is shown in Figure 5 of the TTA. The points to note are as follows;

- The location of the proposed access junction is on a local crest on the L-2232. Visibility splays of 90m taken from a 1.05m driver height to an on object height of the same are therefore available in both directions.

- With respect to forward visibility for general traffic on the L-2232, the 90m forward visibility taken from a driver height of 1.05m above ground level to an object height of the same, is shown through the crest at the location of the L-2232 in Figure 6 of the TTA. The figure shows that in order to provide forward visibility of 90m for traffic generated by the Proposed Quarry, and for existing traffic on the L-2232 the existing crest will require to be reduced by 0.6m.

Based on the above it is proposed that as part of the works that will be undertaken to provide the access junction to the Proposed Quarry, the L-2232 will be re-aligned vertically over a short section in order to provide adequate forward visibility on the L-2232. It is considered that the improvement to the vertical alignment at this location will improve traffic safety for all vehicles travelling on this section of the L-2232.

13.2.7 Impact of Proposed Quarry on the Study Network

13.2.7.1 Impact on Link Flows

The impact that the Proposed Quarry is forecast to have on link flows on the surrounding road network during the AM peak hour, PM peak hour and during the 12 hour period between the hours of 07:00 to 19:00 are shown in terms of pcus for year 2024 and 2034 in Tables 6 and 7 of the TTA which is attached in Appendix 13-1, with the percentage increase forecast by vehicle type set out for years 2024 and 2034 in Tables 8 and 9 of the TTA respectively. The main points to note are as follows;

- On the R328, in the opening year of 2024 the Proposed Quarry is forecast to have a maximum percentage increase on the study area links of;

AM peak hour = + 6%, PM peak hour = +5%, 12 hr = +4%,

- On the L-2232 adjacent to the proposed access junction, in the opening year of 2024 the Proposed Quarry is forecast to have a maximum percentage increase on the study area links of;

AM peak hour = + 23%, PM peak hour = +14%, 12 hr = +13%,

- On the L-2223 just west of the R328, in the opening year of 2024 the Proposed Quarry is forecast to have a maximum percentage increase on the study area links of;

AM peak hour = + 42%, PM peak hour = +110%, 12 hr = +23%.

Similar, but slightly lower percentage increases, are forecast for the future year 2034.

It is noted that the relatively high percentage increases in traffic forecast to result from the Proposed Quarry are due to the very low volumes of background traffic.

TII guidelines suggest that a detailed capacity assessment should be undertaken at junctions where the Proposed Quarry is forecast to result in an increase in traffic volumes of +10%, or +5% at locations where conditions are already congested. Based on this, the capacity of the R328 / L-2232 junction and the R328 / L-2223 junction are included in the junction capacity assessment presented in section 13.4.2 of this EIAR. It is clear that the small number of trips that will be generated at the development access junction will be accommodated at the proposed access junctions without the need to include in the detailed junction capacity assessment.

13.2.8 Junction Capacity Assessment

The traffic impact of the Proposed Quarry was assessed at the R328 / L-2232 junction and the R328 / L2223 junction using the industry recognised junction analysis programme PICADY5. The programme allows the capacity of junctions to be assessed with respect to existing or forecasts traffic movements

and volumes for a given time period. The capacity for each movement possible at the junction being assessed is determined from geometric data with the output used in the assessment as follows:

Queue – This is the average queue forecast for each movement and is useful to ensure that queues will not interfere with adjacent junctions.

Ratio of flow to capacity (RFC) – As suggested, this offers a measure of the amount of available capacity being utilised for each movement. Ideally each movement should operate at a level of no greater than 0.85, or at 85% of capacity.

Delay – Output in minutes, this gives an indication of the forecast average delay during the time period modelled for each movement.

Scenarios modelled

Tests were undertaken at both junctions for AM and PM peak hours for the following scenarios;

- Proposed opening year 2024, without and with the Proposed Quarry,
- Proposed opening year 2034, without and with the Proposed Quarry

Capacity assessment test results

R328 / L-2232 / Gorteen Road junction

The results of the capacity tests for the R328 / L-2232 / Gorteen Road junction is shown in Tables 10 and 11 of the TTA for the AM and PM peak hours, with the main points to note set out below;

- It is forecast that the maximum ratio of flow to capacity (RFC) for the no development scenario will be 4.4%, which will apply to the left turn from the L-2232 onto the R328 during the PM peak hour in the year 2034. With the additional traffic generated by the Proposed Quarry it is forecast that this will increase to 4.9%.
- Delays and queues are forecast to be minimal (a maximum of 0.15 mins, or 9 second, and 0.06 pcus respectively by the year 2034).

It is noted that the junction is forecast to operate well within capacity (and significantly below TII the accepted level of 85%) for all scenarios up to and beyond the future year 2034.

R328 / L-2223 junction

The results of the capacity tests for the R328 / L-2223 junction is shown in Tables 12 and 13 of the TTA for the AM and PM peak hours. For this junctions the salient points are;

- It is forecast that the maximum RFC for the no quarry scenario will be 2.1%, which will apply to the right turn from the L-2223 onto the R328 during the AM peak hour in the year 2034. With the traffic generated by the Proposed Quarry it is forecast that this will increase to 2.6%.
- Delays and queues are forecast to be minimal (a maximum of 0.14 mins, or 9 second, and 0.03 pcus respectively by the year 2034).

This junction is therefore also forecast to operate well within capacity (and significantly below TII the accepted level of 85%) for all scenarios up to and beyond the future year 2034.

Summary of junction capacity tests

The low levels of capacity forecast for both the R328 / L-2232 junction and the R328 / L-2223 junction reflect the very low volumes of traffic that are forecast for the background traffic scenarios, and with the Proposed Quarry in place.

13.2.9 Geometric Assessment of Access Routes A and B

13.2.9.1 Method

During a site visit undertaken with a representative of Galway County Councils Roads Section, it was agreed that the preliminary assessment of the routes A and B presented above should be supplemented with a detailed autotrack assessment. The purpose of the assessment would be to identify the extent of the local road network accessing the Proposed Quarry site that may accommodate 2-way traffic flow. For this purposed the following as undertaken;

- A drone survey was undertaken by MKO covering routes A and B (a total of 10.5km of local road network) and a survey base of Routes A and B was produced.
- An autotrack assessment for a large tipper truck (10.2m long by 2.5m wide) was run for the full length of routes A and B between the Proposed Quarry site access site and the R328.
- An autotrack assessment was then run for an estate car (4.7m by 1.8m) in the opposite direction at the locations it may be demonstrated that both vehicles may pass.

13.2.9.2 Results of Route Assessment

The autotrack assessment described above is included for information in Figure 6 of the TTA, while the locations where it was established that both vehicles may pass on the local road are highlighted in Figure 7 of the TTA.

In summary, the autotrack assessment largely confirmed the findings of the preliminary on-site assessment discussed in Section 13.2.1, as follows:

- While there are many sections of Route A that currently only accommodate one-way traffic flow, there are many opportunities for a large tipper truck and car to pass.
- For the narrow sections of Route A, there is adequate forward visibility for drivers of on-coming vehicles to use available passing opportunities. The exception to this is the location identified in the preliminary site visits located 350m to the north of the proposed access. At this location it is proposed that a passing bay of 50m in length is provided at the southern corner of the straight section on the L-2232, as shown in Figure 8 of the TTA.
- For Route A, there is one additional location where it would be beneficial to introduce an additional passing opportunity, which is on the L-2232 just to the south of the junction with the R328. It is suggested that this would be introduced as part of the junction improvement works to be considered at this location.

For Route B on the L-2223, the assessment shows that most of the route will accommodate 2-way traffic movements. The one significant location where this is not possible is the Mahanagh Bridge. The autotrack assessment, together with on-site observations, however, indicate that there are passing opportunities either side of the bridge and adequate intervisibility for drivers of opposing vehicles to avoid meeting on the bridge. This location is highlighted in Figure 9 and Plates 6 and 7 of the TTA.

13.2.10 Provision for Sustainable Modes of Travel

Based on the nature of the proposed development the potential for the use of sustainable modes of transport is limited for staff travelling to and from the site, as there are no public transport services passing the site, and there are no footpaths adjacent to the local road network. Where possible staff will be encouraged to car share for trips to and from the site.

13.2.11 Likely and Significant Effects and Associated Mitigation Measures

13.2.11.1 'Do-Nothing' Scenario

If the Proposed Quarry does not proceed there will be no additional traffic generated or works carried out on the road network and therefore no effects with respect to traffic.

13.2.11.2 Construction Phase

It is estimated that the traffic volumes generated during the commissioning of the Proposed Quarry will last 5 days with the additional traffic generated on the network being similar to the operational stage set out in Section 13.7.3 below. It is therefore considered that the additional traffic generated during the construction stage will have a temporary negative effect on the surrounding road network, lasting 5.5 days and it is estimated that the severity if the effects will be slight.

13.2.11.3 Operational Phase

The impact that the Proposed Quarry is forecast to have on link flows on the surrounding road network during the AM peak hour, PM peak hour and during the 12 hour period between the hours of 07:00 to 19:00 are as follows;

- On the R328, in the opening year of 2024 the Proposed Quarry is forecast to have a maximum percentage increase on the study area links of;

AM peak hour = + 6%, PM peak hour = +5%, 12 hr = +4%,

- For Route Option A - On the L-2232 adjacent to the proposed access junction, in the opening year of 2024 the Proposed Quarry is forecast to have a maximum percentage increase on the study area links of;

AM peak hour = + 23%, PM peak hour = +14%, 12 hr = +13%,

- For Rout Option B - On the L-2223 just west of the R328, in the opening year of 2024 the Proposed Quarry is forecast to have a maximum percentage increase on the study area links of;

AM peak hour = + 42%, PM peak hour = +110%, 12 hr = +23%.

Similar, but slightly lower percentage increases, are forecast for the future year 2034.

It is noted that the relatively high percentage increases in traffic forecast to result from the Proposed Quarry are due to the very low volumes of background traffic.

It is considered that 2 HGV trips that will be generated per hour, together with the 4 car trips that will be generated each day by staff, will have a long term negative effect on the surrounding road network. It is estimated that the severity if the effects will be slight.

13.2.11.4 Decommissioning Phase

On completion of the 10 years of operation of the Proposed Quarry excavation of sand from the site will stop, as will the 15 HGV movements and 4 staff car trips per day that will be generated during the operational stage Removal of all plant from the site will mirror the construction phase, with 15 HGV movements per day for 5.5 days being generated on the local road network. The effects of this will be negative, temporary and will be slight.

13.2.12 Cumulative Effects

The area selected for the cumulative assessment for the Proposed Quarry is the local road network to the north via the L-2232, and to the south and east via the L-2232 and the L-2223, and the subsequent connections from the local road network with the regional R328. The was selected on the basis that;

- Traffic counts undertaken for the proposed development has revealed that existing traffic volumes on the network are low;
- The traffic volumes that will be generated by the Proposed Quarry are also low, and,
- That capacity tests undertaken for the R328 / L-2232 and the R328 / L-2223 junctions show that less than 5% of junction capacity will be utilised with the Proposed Quarry in place, by the future year 2034, when up to 85% is permitted.

A list of all developments at varying stages in the planning process was produced by MKO for consideration with the list included in Chapter 2 of this EIAR. The potential cumulative traffic effects with the Proposed Quarry is based on the following criteria;

- Project status (pre-planning to operational)
- Degree of overlap with the Proposed Development delivery highway network (low to high)
- Traffic volumes (low to high).

It is established that there are 17 developments in the planning process located within the cumulative study area, with 15 of these developments granted planning permission and the remaining 2 being new applications. Therefore, based on the first and second criterial, project status and degree of overlap of highway networks, all 17 developments could potentially have cumulative impacts with the Proposed Quarry.

With regards to the scale of the 17 developments and the traffic volumes that each may generate, 11 were established to be for the construction of single dwellings, 4 were for the construction of extensions or garages and 2 were for modest agricultural developments (cattle shed and a milk parlour). Based on the scale of these developments it is considered that the potential for cumulative traffic related effects between all 17 developments and the Proposed Quarry will be negative, temporary and will be imperceptible.

One project that is due to be in the planning system shortly and which is located within close proximity to the Proposed Quarry, is the proposed Clonberne Wind Farm. During the construction of the Wind Farm it is proposed that material excavated from a borrow pit located within the Wind Farm site will be transported via a short section of the L-2232, with a 600m section of the road to the south of the Proposed Quarry access being common to both developments.

Current estimates for the proposed Clonberne Wind Farm are that 60 x 2-way trips per day, or 6 per hour, will be generated on this section of the L-2232 for a period of 18 – 24 months. In the event that both projects are granted planning permission, these trips will require to use this section of the L-2232 at the same time as the 15 x 2-way daily trips (or maximum of 2 trips per hour) that will be generated by the Proposed Quarry. It is noted that there are approximately 3 passing opportunities on this 600m section of the L-2232 with good intervisibility for opposing traffic. For the proposed Clonberne Wind Farm it is therefore estimated that there will be a negative cumulative traffic related impact with the Proposed Quarry, that the impact will be medium term (lasting up to 2 years) and will be slight.

13.2.13 Mitigation Measures

This section summarises the mitigation measures to minimise the effects of the Proposed Project during both the construction and operational stages (decommissioning will be same as construction).

Mitigation Measures During the Construction Stage

A detailed **Traffic Management Plan (TMP)**, will be agreed with Galway County Councils Roads Section prior to construction works and operation commencing on site. The TMP will include the following:

Identification of delivery routes – These routes will be agreed with Galway County Council and adhered to by all drivers.

Additional measures - Various additional measures will be put in place in order to minimise the effects of the development traffic on the surrounding road network including sweeping / cleaning of local roads as required.

Re-instatement works - All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers.

Co-operation with the Appllicants for the Clonberne Wind Farm – This will be undertaken in order to manage and monitor the traffic demand on the 600m section of the L-2322 common to both projects.

Mitigation Measures During Operational Stage

These will be as set out for the construction stage.

Mitigation Measures During Decommissioning Stage

These will be as for the construction stage.

13.2.14 Residual Effects

Construction Stage

During the 1 week construction stage of the Proposed Quarry, it is forecast that the additional traffic that will appear on the public road network serving the site will have a slight temporary negative effect on existing road users, which will be minimised with the implementation of the mitigation measures included in the proposed Traffic Management Plan.

Operational Stage

This will be as for the construction stage above, but will be long term, lasting for 10 year.

Decommissioning Stage

This will be as set out for the construction stage above.

13.2.15 Summary/Conclusion

It is proposed to construct and operate a quarry for the excavation of sand for a 10 year period between 2024 to 2034. The proposed site is located within the townland of Lomaunaghbaun in County Galway and is approximately 8.6 kms northeast of Tuam and 4.7 kms west of Clonbern.

The Proposed Quarry is situated on the west side of the L-2232 and may be accessed from 2 routes from the R328 regional road. From the R328, Route Option A is the most direct route to the site, which is located approximately 4.0km south on the L-2232 from the junction with the R328 at Gorteen Cross.

Route B accesses the site from the R328 to the southeast of the Proposed Quarry, providing access via the L-2223 and L-2232 local roads. This route is approximately 6.5kms from the R328 to the site

Based on traffic count surveys undertaken in 2023 it was established that existing traffic volumes on the local road network are very low. It was also established that the trip generation of the Proposed Quarry will be low during the week long construction period, and the 10 year operational phase. It is estimated that the Proposed development will generate a maximum of 4 car trips to and from the site per day, and 15 HGV trips per day, or 2 per hour. In terms of link and junction capacity it was established that the Proposed Quarry will have a slight impact on the local road network.

A detailed geometric assessment was undertaken for both routes. While both routes are considered feasible, Route Option B was established to have more passing opportunities for opposing vehicles compared to Option A.

The access junction that will serve the Proposed Quarry will be implemented in accordance with current design guidelines and will include the removal of an existing crest on the L-2232, which will benefit all traffic on the route.

It is concluded from the above assessment that Route Option B will accommodate the additional traffic that will be generated by the Proposed Quarry. It is noted that Route Option A may be considered in the future with the implementation of improvements to the R348 / L-2232 junction and a passing bay identified on the L-2232.

13.3 Utilities and Services

13.3.1 Introduction

This section of the EIAR sets out the impact assessment of the Proposed Development with regard to utilities and services, including electricity, telecommunications, gas, water supply, sewage, land-use and waste management. This section uses details and information provided in the following:

- Chapter 4 of this EIAR: Description of the Proposed Development, including Section 4.3 Construction Methodologies;
- Appendix 4-2: Environmental Management Plan(EMP), prepared by MKO;

13.3.2 Scoping and Consultation

The relevant national and regional authorities and bodies listed in Chapter 2 of this EIAR were consulted as part of this assessment. Notable responses of consultees were taken into account during preparation of this assessment, as summarised below. A response summary table is outlined in Chapter 2 of this EIAR.

Health Service Executive

The Health Service Executive (HSE) set out a number of recommendations in their scoping response, including that the EIAR should assess the impacts of the proposed development with regard to construction works, including the preparation of Site Restoration Plan, consideration of alternatives, cumulative impacts, dust, noise and emissions to surface and groundwater. The HSE correspondence suggests the appointment of a Community Liaison Officer.

13.3.3 Receiving Environment

The proposed development site is located in a rural area, currently being used for agricultural purposes, so the possible presence of underground infrastructure is limited in extent. A development of this nature has the potential to impact the following types of utilities and services:

- Electricity Network
- Telecommunications Network (including phone and broadband)
- Gas Distribution Network
- Water Supply Network
- Wastewater Drainage (Sewage Network)
- Land Use
- Waste Management.

The methodology detailed in Section 4 of this EIAR describes the manner in which the Proposed Development will be set up and operated, including any excavations and installations of services. Prior to works, the area where excavations are planned will be surveyed and any existing services present within the site will be identified. All relevant bodies i.e., ESB, Bord Gáis, EirGrid, Irish Water, Galway County Council, etc. will be contacted and all drawings contacted and drawings for all existing services sought.

If any underground services are encountered during the surveying works, they will be left in place if possible. If there is a requirement to move the service, then the appropriate body (ESB, Gas Networks Ireland, Irish Water, etc.) will be contacted, and the appropriate procedure put in place. Back fill around any utility services will be with dead sand/pea shingle where appropriate. All works will be in compliance with required specifications.

13.3.3.1 Electrical Infrastructure

Due to the nature of the site in a rural area with no existing dwellings in close proximity, there are no anticipated electrical services above or below ground within the site of the Proposed Development.

13.3.3.2 Telecommunications

There are no anticipated underground telecommunication services within the site of the Proposed Development. An overhead telephone wire passes in a north-south direction adjacent to the site's eastern boundary, however the Proposed Development is not anticipated to interfere with this. If any moving of lines are required, this will be carried out in consultation with the relevant operator and authorities.

13.3.3.3 Gas

There are no major gas lines on the site of the Proposed Development.

13.3.3.4 Water Supply

The Proposed Development site is mapped by the GSI to be inside Gallagh GWS SPA. However, hydrogeological investigations completed at the Proposed Development site have revealed that local groundwater flow is to the east towards the Levally Stream. Groundwater from the area of the Proposed Development site will not flow towards the source of the GWS which is to the southwest. Therefore, the Proposed Development site is not located inside the Gallagh GWS SPA. This is further outlined in Appendix 8-4.

Water will be supplied to the Proposed Development via a newly installed borehole well. Water usage in the site will be confined to a closed loop system where water will be continuously recycled and reused within the processing plant.

13.3.3.5 Wastewater Drainage

There is currently no existing wastewater infrastructure in the immediate vicinity of the site. The nearest public wastewater infrastructure is Tuam Wastewater Treatment Plant (WWTP).

Wastewater generated at the Proposed Development will be collected in a wastewater holding tank which will be located within the confines of the site adjacent to the site office and disposed of by an appropriately licensed contractor as required.

13.3.3.6 Land Use

The site of the Proposed Development is currently used for agricultural purposes and is subject to extensive grazing.

The Proposed Development site is bounded by agricultural lands to the north, south and west. The local L2232 road runs in a north south direction immediately adjacent to the site's eastern boundary.

Access to the site is via an entrance adjacent to the L2232 road. A new access point along the L2232 road is proposed as part of the development to allow for appropriate visibility and sightlines.

13.3.3.7 Waste Management

The site is currently used for agricultural purposes and therefore not subject to a waste management service at present.

Waste volumes generated during the operational phase of the Proposed Development are anticipated to be low and primarily in the form of sanitary and kitchen waste. Small volumes of waste generated will be disposed of as appropriate by the use of bins and collection by a licensed waste disposal contractor.

13.3.4 Likely and Significant Effects and Associated Mitigation Measures

13.3.4.1 Do-Nothing Scenario

The site currently comprises agricultural lands which are used for extensive grazing. Should the Proposed Development not proceed, the current state of the site would not change materially and there would be no impacts in terms of services or utilities.

13.3.4.2 Construction/Operational Phase

The proposed development will have no impact on services during the site enabling works and extraction/operational phases and therefore no mitigation is required.

13.3.4.3 Decommissioning Phase

Once the operational phase has ceased, it is proposed to level the site using topsoil and overburden material that would have been initially excavated during the site enabling works. Hedgerow planting is also proposed. The site will then be returned to agricultural use. There is therefore considered to be no potential for decommissioning phase impacts on non-traffic material assets.

13.3.4.4 Cumulative Impact Assessment

The potential cumulative effect of the Proposed Development and other relevant developments has been carried out with the purpose of identifying what influence the Proposed Development will have on the surrounding environment when considered cumulatively and in combination with relevant approved, proposed, and existing projects in the vicinity of the Proposed Development site.

On the basis of the assessment above, the Proposed Development will have no impact on built services and waste management. It is assumed also that all mitigation measures in relation to the other cumulative projects, as set out in Chapter 2: Background to the Proposed Development will also be implemented. It is on this basis that it can be concluded that there would be a short-term imperceptible cumulative impact on built services and waste management from the Proposed Development and other developments in the area.