12 MATERIAL ASSETS; TRAFFIC, WASTE AND UTILITIES

12.1 Traffic

12.1.1 Introduction

Transport Insights has been commissioned by Milford Quarries Limited to prepare an Environmental Impact Assessment Report (EIAR) Traffic and Transport Chapter in relation to demolition of existing derelict buildings and the development of a quarry at a site at Old Leighlin, Co. Carlow. The quarry shall have a projected lifetime of ca. 12 years with an additional 1-year permission sought to allow for restoration of the site.

12.1.1.1 Competency of Chapter Authors

The Traffic and Transportation Chapter of the EIAR was prepared by Eoin Munn as Project Director and Garret Murphy as Consultant Transport Planner (both of Transport Insights Limited). Details of their experience and qualifications are provided within the following table (Table 12-1).

Table 12-1: Competency of Chapter Authors

Reviewer	**Eoin Munn**
Title	**Director (Project Director)**
Relevant Experience and Qualifications	Experience Over 12 years' experience working within Transport Planning and Engineering, including project management of a variety of small to large sized projects from feasibility to detailed design stage. Recent EIAR experience includes undertaking Traffic and Transport Assessments for an anaerobic digestion facility in Co. Waterford and a composting plant in Co. Cork. Qualifications: • BSc Transport Operations, Technological University Dublin (2003-2007) • MSc Business Analytics, University College Dublin (2007-2008)
Professional Membership	• Member, Transport Planning Society (MTPS)
Principal Author	**Garret Murphy**
Title	**Consultant Transport Planner (Project Manager)**
Relevant Experience and Qualifications	Experience: Consultant Transport Planner Experience: Over 9 years' experience working within Transport Planning and Engineering, on a variety of public and private sector projects, Garret has a wealth of experience of delivering EIAR projects, with his extensive traffic engineering and road construction background invaluable to projects. Qualifications: • B.Eng (Hons) in Civil Engineering, University College Dublin (2010)
Professional Membership	• Member, Transport Planning Society (MTPS)

12.1.1.2 Contents

The remainder of the chapter is structured as follows:

- Section 12.1.2 outlines the methodology pursued in undertaking the study;
- Section 12.1.3 describes the Proposed Development's receiving environment;

- Section 12.1.4 outlined the key traffic and transport related characteristics of the Proposed Development;
- Section 12.1.5 outlines potential construction and operational phases traffic impacts arising from the Proposed Development;
- Section 12.1.6 details any avoidance, remedial & mitigation measures;
- Section 12.7 addresses any residual impacts;
- Section 12.1.8 addresses any monitoring measures;
- Section 12.1.9 states any interactions between the information presented in this EIAR Chapter and any other areas addressed as part of the EIAR;
- Section 12.1.10 states any difficulties in compiling the information set out within this chapter; and
- Section 12.1.11 provides a list of references.

12.1.2 Study Methodology

This section of the EIAR outlines the methodology followed in order to carry out the Traffic and Transport Assessment set out within this Chapter. The approach pursued in undertaking the Assessment has been guided by and is consistent with the national best practice, namely Transport Infrastructure Ireland's (TII's) Traffic and Transport Assessment Guidelines (May 2014).

The existing conditions on the surrounding road network were informed by a comprehensive site assessment undertaken on 11 January 2023 and a 24-hour classified automatic traffic count (ATC) survey of the local road located adjacent to the location of the proposed site access. The traffic survey was undertaken on Wednesday 23 November 2022. The survey results were then used to establish a baseline from which to predict traffic growth on the local road network. The Do-Nothing scenario, the scenario in which the Proposed Development does not proceed was established for the YoO (Year of Opening), YoO +5 years and YoO + 15 years. This was then compared to Do Something scenario which applies the potential development traffic to the local road network in the YoO, YoO+5 and YoO +15 assessment years.

A first principles approach to development traffic generation was completed, taking into consideration the quantum of material extracted from the site, in addition to anticipated staffing levels. The results of this analysis were then used to predict the impact of the Proposed Development on the local road network.

A comprehensive list of guidance documents that have informed specific parts of the Assessment is set out in Section 12.1.11 of this EIAR Chapter.

12.1.3 The Receiving Environment

12.1.3.1 Site Location

The Proposed Development site is located to the west of the L3036 (that connects Old Leighlin to the north, with Paulstown to the south), ca. 1.5 kilometres (straight line distance) to the south of Old Leighlin, Co. Carlow. The M9 motorway is located approximately 750 metres (straight line distance) to the east of the subject site. The M9 can be accessed at junctions 6

(to the north) and 7 (to the south), both via the R448. The area surrounding the site is primarily agricultural in nature. The site's location is shown at Figure 12-1.

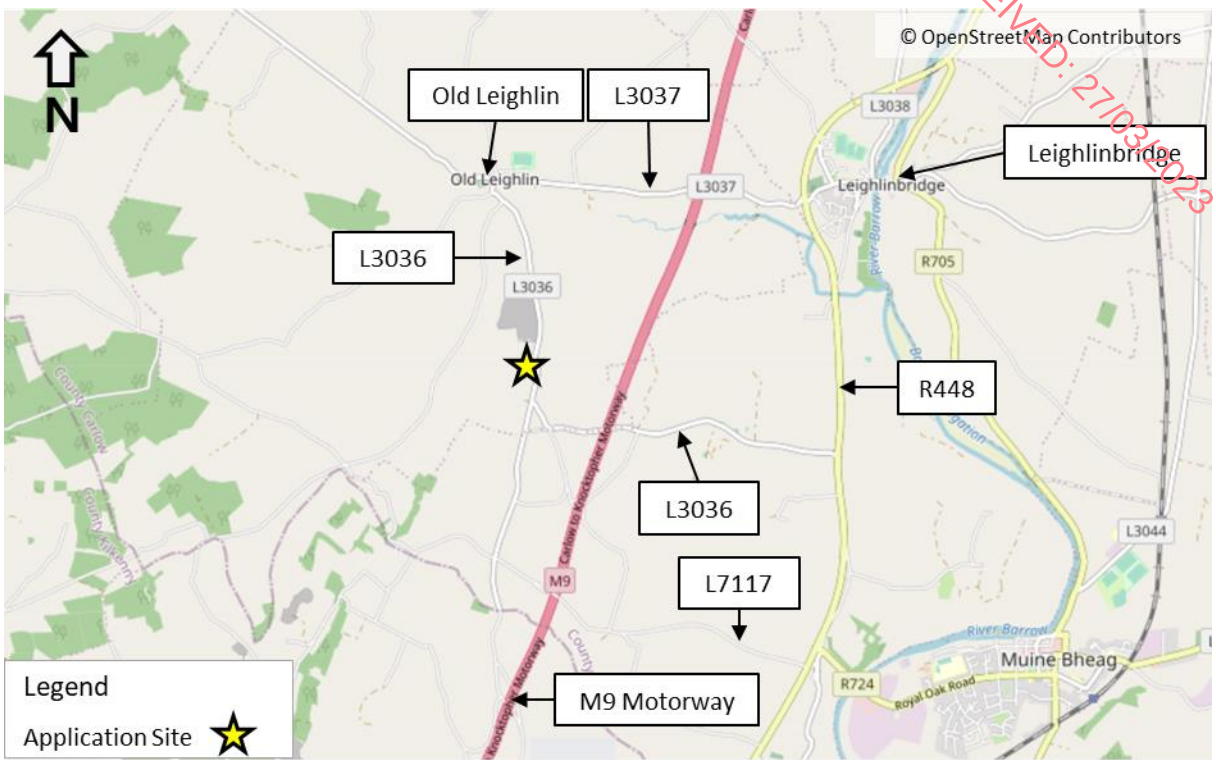

Figure 12-1: Proposed Development Site Location

12.1.3.2 Existing Site Access

The site is currently accessible at 1 no. location as illustrated in Figure 12-2 which follows.

Figure 12-2: Existing Site Access Arrangements

The existing established access is via an existing agricultural access from the L3036 to the east of the subject site (illustrated in Figure 12-3). The site access is ca. 4.9 metres wide where it interfaces with the public road. The access is currently unpaved and accommodates vehicular movements to /from the existing field for agricultural purposes only.

Figure 12-3: Existing Site Access Gate (facing north)

12.1.3.3 Existing Site Layout

The site is understood to comprise of agricultural fields and forested lands. There are 3 no. existing (derelict) buildings within the red line boundary of the Proposed Development to be demolished.

12.1.3.4 Local Road Network

The layout of the local road network in the proximity of the Proposed Development site is shown in Figure 12-1. The technical characteristics, layout and operation of these roads are described further in the following sections.

12.1.3.4.1 L3036 Local Road

The L3036 is a two-way local road that runs in an approximately north-south alignment to the east of the subject site between Old Leighlin to the north and the R448 to the southeast. In the vicinity of the subject site, the carriageway of L3036 is ca. 4.5 metres wide (it is noted to be wider to the south of the existing access gate – ca. 5.5 metres wide, and narrows to 4.0 metres wide to the north of the access gate).

In the vicinity of the subject site, the L3036 has a relatively straight horizontal alignment toward the north, with a straight alignment initially to the south followed by a series of bends in the road that begin approximately 60 metres to the south of the existing gated access. In terms of vertical alignment, the road falls slightly from south to north. The posted speed limit on L3036 is 80 km/h, however as part of the 24 hour ATC traffic survey undertaken on the L3036

(November 2022) adjacent to the site access, it is noted that the effective speed limit is 52.2 km/h in the northbound direction, and 56.9 km/h in the southbound direction.

There are no road markings, footpaths or public lighting present on the L3036 in the vicinity of the existing (and proposed) site access. Overhead powerlines are noted to be in place adjacent to the site along the L3036.

Figure 12-4: L3036 (Facing north)

12.1.3.4.2 L7117 Local Road

L7117 is a two-way local road that runs in an approximately east-west alignment, located ca. 1.7 kilometres to the south of the subject site. L7117 is ca. 5.0 metres wide (although its width is noted to vary throughout its length).

L7117 is noted to feature numerous changes to both its vertical and horizonal alignment throughout its length. The posted speed limit on L3036 is 80 km/h, however its effective design speed is likely much lower than this.

Figure 12-5 L7117 (Facing east)

12.1.3.4.3 L3036/ L3036 3-arm Stop-controlled Junction

The L3036/ L3036 stop-controlled junction is a 3-arm junction located ca. 400 metres to the south of the application site entrance (straight line distance).

The junction includes stop signage on the minor (eastern) arm, however no road markings were observed at the junction. On approach to the junction, the minor arm is ca. 4.5 metres wide and the major (L3036) arm is ca. 5.0 metres wide.

Figure 12-6: L3036/ L3036 3-arm Stop-controlled Junction (major arm to right, minor arm to left)

12.1.3.4.4 L3036/ R448 3-arm Stop-controlled Junction

The R448/ L3036 stop-controlled junction is a 3-arm junction located ca. 2.6km metres to the southeast of the application site entrance (straight line distance). The major arm of the junction is the R448, with the minor arm formed by the L3036. The junction includes stop signage on the minor arm, with appropriate road markings in place on the junction also noted. On approach to the junction, the minor arm is ca. 4.5 - 5.0 metres wide and the major arm is ca. 13 metres wide (including 2 no. cycling lanes, and 1 no. right turn filter lane).

Figure 12-7: R448/ L3036 3-arm Stop-controlled Junction (Facing south)

12.1.3.4.5 R448

The R448 road is two-way regional road (formerly the N9 national primary road and subsequently bypassed by the M9 motorway). It traverses a number of counties across it's length, from Naas Co. Kildare in the north, to Waterford City to the south. In the vicinity of the application site, the R448 is ca. 12-13 metres wide with a single lane in each direction divided by a dashed white centre line. The edge of the vehicular carriageway is, for the most part, delineated by broken yellow lines on both sides of the vehicular carriageway. It is also noted that the R448 accommodates ca. 1.5 metres wide cycle lanes on both sides of the carriageway. In the vicinity of the junction with the R448/ L3036 there is a right hand turning lane, with associated median strip and line marking. The R448 carriageway in the vicinity of R448/ L3036 3-arm stop-controlled priority junction is relatively flat in terms of its vertical alignment. The posted speed limit on the R448 is 100km/hr in the vicinity of the subject site. No pedestrian footpaths or street lights are noted to be present on the R448 in the vicinity of the R448/ L3036 junction.

Figure 12-8: R448 (facing north)

12.1.3.4.6 M9 Motorway

The M9 motorway runs from the M7/M9 motorway junction near Hillsborough, County Kildare at its northern end and to the M9/N24/N9 Roundabout at its southern end at Grannagh, ca. 600 metres from the County Kilkenny/ County Waterford border. It is the primary motorway route between Kilkenny and Kildare/ Dublin. The nearest access to the M9 to the north from the subject site is Junction 6 of the M9 (R448/ M9 interchange), ca. 10 kilometres (straight line distance) to the northeast of the application site without the need to pass through Oldleighlin village or Leighlinbridge. To the south of the subject site, nearest M9 access is via Junction 7 (via the R448 and R712). At these locations, the M9 features 2 no. general traffic lanes and a 'hard shoulder' in each direction which are divided by a low barrier median.

12.1.3.5 Existing Traffic Flows

To determine baseline traffic conditions in the vicinity of the site, a 24-hour automatic traffic count (ATC) survey was undertaken on the L3036 adjacent to the Proposed Development site on Wednesday 23 November 2022.

Full traffic survey data is included in Appendix H of this document. A summary of the survey results for the AM and PM peak hours and total survey period as ascertained from the survey data is presented in the following Table 12-2.

Table 12-2: ATC Survey Results Summary (Approach Flows)

Time Period / Direction	L3036 (Northwest bound)		L3036 (Southeast bound)		Total (Two-way)	
	Total	Of which HV	Total	Of which HV	Total	Of which HV
AM Peak Hour (09:00 – 10:00)	30	2	24	3	54	5
PM Peak Hour (16:00 – 17:00)	12	1	25	2	37	3
Total 24-hour	199	15	204	18	403	33

Based on the results of the traffic surveys set out in the preceding Table 12-2, the local road network peak hours, in terms of maximum flow were identified to be 09:00-10:00hrs (AM Peak), and 16:00-17:00hrs (PM Peak).

The results of the traffic survey have been used to establish a baseline from which to predict traffic volumes on the local road network for the Proposed Development's assumed YoO, YoO +5, and YoO +15.

12.1.3.5.1 Annual Average Daily Traffic (AADT)

In order to further understand the existing traffic flows on the local road network and establish a baseline to assess the traffic impact of the development proposals, it is first necessary to establish future levels of background traffic. The survey data summarised in preceding sections was expanded in accordance with TII's Project Appraisal Guidelines for National Roads Unit 16.1 – Expansion Factors for Short Period Traffic Counts – PE-PAG-02039 (October 2016), to derive Annual Average Daily Traffic (AADT) on the local road network.

The following Table 12-3 outlines the expansion factors used in expanding the survey data to AADT using data for the South-East (Carlow County) Region.

Table 12-3: 24-hour, WADT and AADT factors – South-East (Carlow County)

Variable	Day of Week	Month of Year
Data Recorded	Wednesday	November
Factor	0.96 (WADT factor)	1.01 (AADT factor)

Based on the recorded two-way 24-hour traffic flows, weekly average daily traffic (WADT) and AADT have been calculated using the factors in Table 12-3 above. AADT data for roads in the vicinity of the site are presented in the following Table 12-4.

Table 12-4 – AADT Traffic Data

Road Link	AADT		
	Total Vehicles	Of which Heavy Vehicles	% HGV
L3036	391	32	8.19%

The data set out in Table 12-4 above is used in Section 12.1.5 as a baseline in order to assess the impact of the Proposed Development under the different prescribed scenarios.

12.1.4 Characteristics of the Proposed Development

12.1.4.1 Site Access

The Proposed Development will be accessed at the existing site access location outlined in the preceding Section 0. The proposed site access road will connect the site access junction to the main body of the site and will also provide access to a weighbridge located at its eastern end.

The existing site access gate shall be set back ca. 19.7 metres from the L3036 road carriageway, so that it provides adequate space for a HV to egress the public carriageway before turning and to also ensure that the public carriageway is not blocked. Stop signage and stop lining shall be provided at the interface between the site access and the public road. The site access junction has been designed to ensure it interfaces perpendicularly with the adjoining carriageway of the public road to ensure adequate visibility and safe access and egress arrangements for vehicles.

It is proposed to widen the site access gate to 6.0 metres in order to accommodate two-way concurrent HV traffic. Corner radii will be increased and visibility shall be improved so that it accords with the *TII's Rural Road Link Design DN-GEO-03031* visibility requirements of 90 metres (based upon the effective speed limit of the L3036 being determined as less than 60km/h). An assessment of visibility at the proposed site access junction is included in Appendix H of this document. The access will also be surfaced in order to provide an appropriate road surface for vehicles.

The proposed site access junction arrangements are illustrated in Figure 12-9.

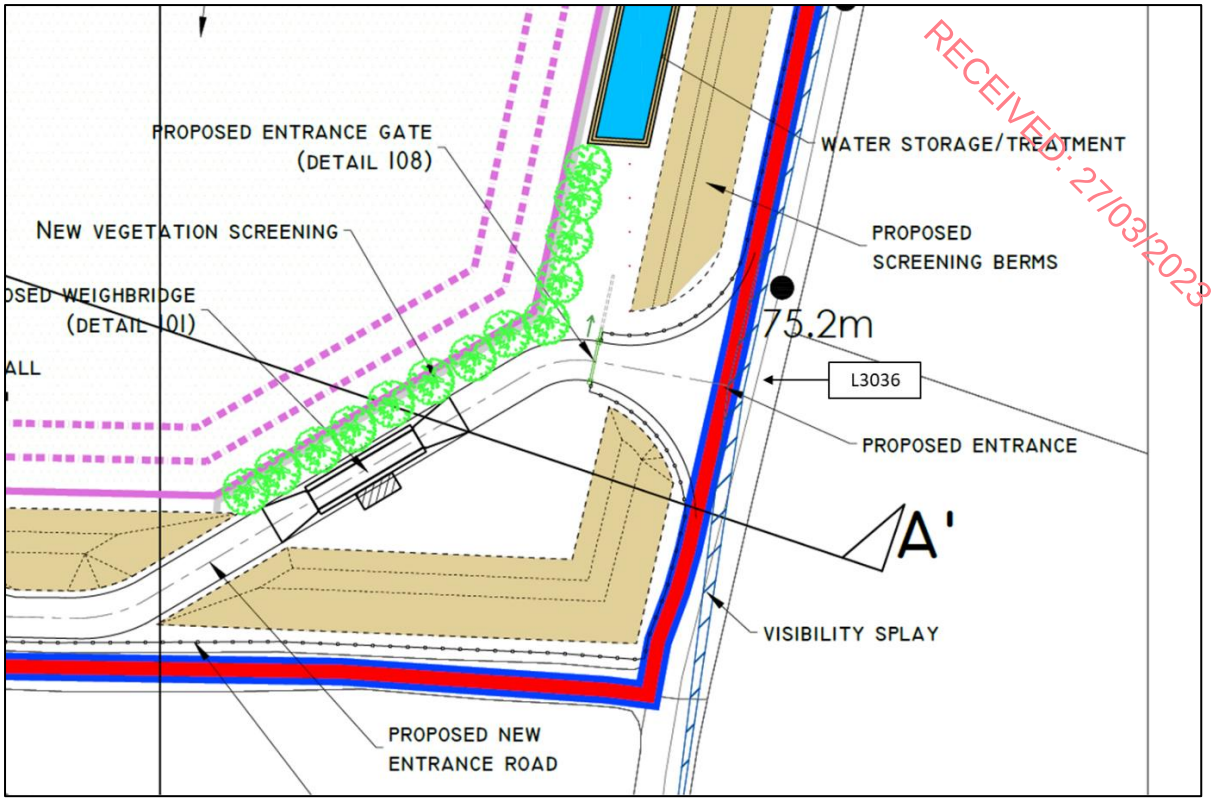

Figure 12-9: Proposed Site Access Arrangements

12.1.4.2 Proposed Site Layout

An illustration of the proposed site layout is provided in Figure 12-10 along with additional annotation from Transport Insights. The Proposed Development will include the following;

- Site access;
- New access gate;
- New access road;
- Quarry extraction area;
- Access ramp;
- Soil storage area;
- Welfare/office unit; and
- 5 no. car parking bays.

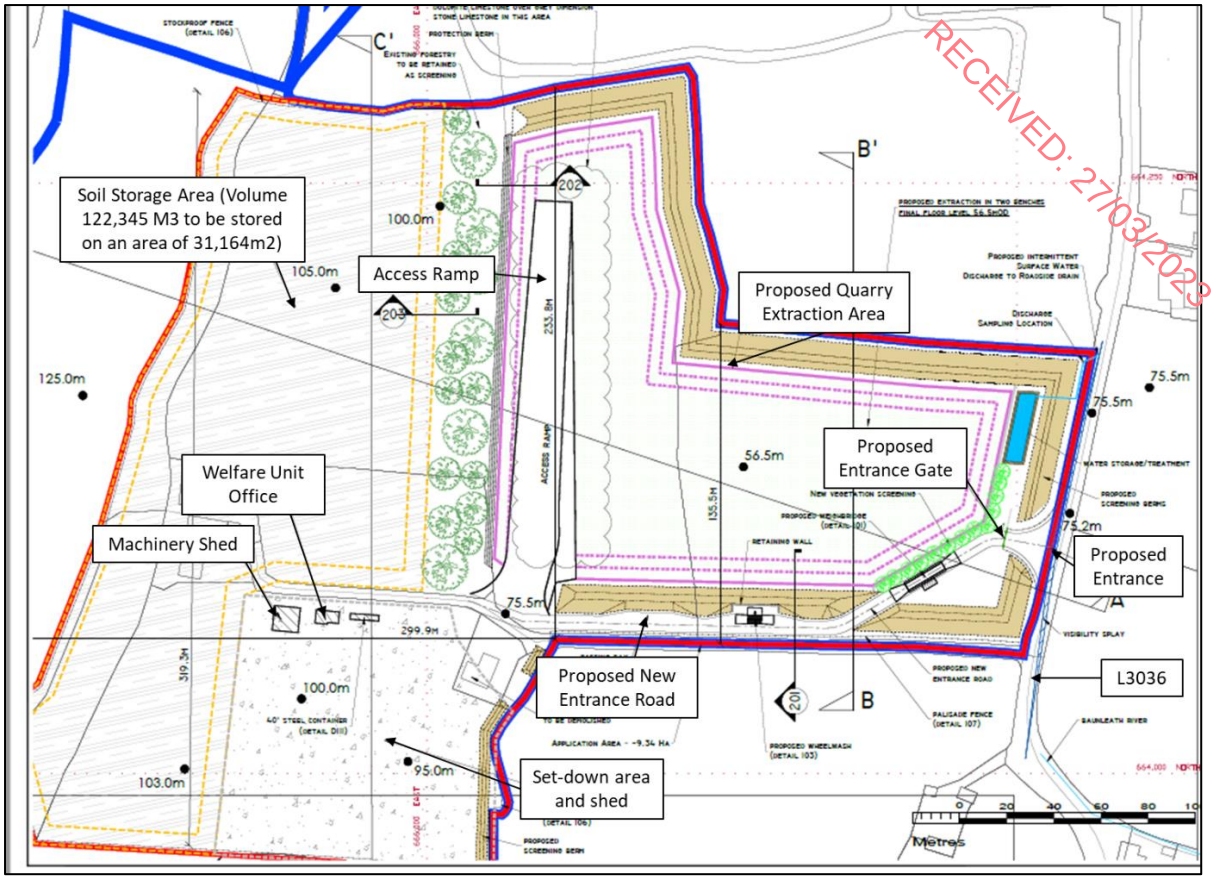

Figure 12-10: Proposed Site Layout

As part of the Proposed Development, all staff and visitor parking will occur within a designated parking area to be delineated within reasonable proximity to the welfare unit office.

Heavy vehicles will access the site through the proposed site access and proceed to the weighbridge before proceeding to the quarry area via the access ramp. Once within the quarry extraction area, the HVs shall be loaded by relevant machinery, before egressing the access ramp, proceeding once again to the weighbridge via the internal access road and then egressing the site in a southbound direction on the L3036.

12.1.5 Potential Impact of the Proposed Development

12.1.5.1 Construction Phase

As noted in the preceding section, the Proposed Development is expected to be constructed over a period of up to 6 months.

The construction phase shall include the construction of earthen screening berms to a height of c. 3 m, a wheelwash facility, installation of surface water attenuation and settlement ponds for the treatment of suspended solids in the floor of the quarry, soil storage area with an average storage depth of c. 3.85 m and other site development works.

Based on figures provided by the design team, it is estimated that on average 5 no. construction workers will be based on site each day. This would likely equate to a daily average of 2 no. contractor staff vehicle trips (assuming a vehicle occupancy of 3 no. contractors per vehicle) or a peak of 5 no. contractor staff vehicle trips. In regard to construction related

deliveries, it is estimated a daily average of 5 no. HV trips (e.g., excavated materials off-site, import materials, delivery HGVs, etc.) and 2 no. LV trips (delivery vans) will occur during construction. Given the temporary nature of the construction related traffic, the impact of the estimated construction traffic is expected to be minimal.

Construction traffic activity is expected to take place between 07:00hrs and 18:00hrs, Monday to Friday, and between 08:00hrs and 13:00hrs on Saturdays. Construction related traffic will access/ egress the site from the access point at the eastern boundary of the site. Construction traffic shall use the same haul routes (separate access and egress routes) utilised for the operational phase and illustrated in Figure 12-11.

During site clearance, the site shall be cleared to allow for parking of all staff and construction vehicles within the boundary of the Proposed Development site in order to ensure that no construction related parking takes place on the adjoining local road network.

12.1.5.2 Operational Phase

12.1.5.2.1 Assessment Scenarios and Years

The potential traffic impacts of the Proposed Development is assessed by reference to the number of vehicle trips that it is envisaged to generate, and for the purposes of this assessment, two separate scenarios will be analysed and their impacts reported. These scenarios are as follows;

- The **Do-Nothing scenario** will reflect traffic on the surrounding road network factored up to reflect forecast background growth over time.
- The **Do-Something scenario** builds on the Do Nothing scenario and includes the assessment of expected development related traffic on the surrounding road network. This is considered the 'worst case' scenario.

These scenarios will detail the traffic impacts for the following years;

- YoO (2024);
- YoO + 5 (2029) and
- YoO +15 (2039).

Background traffic is factored up as per TII's Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections - PE-PAG-02017 (October 2021) central growth factors for Co. Carlow. These factors are set out in the following Table 12-5.

Table 12-5 - Annual traffic growth factors – Carlow

Central Growth Rates			
2016-2030		2030-2040	
LV	HV	LV	HV
1.0133	1.0324	1.0047	1.0144

12.1.5.2.2 Operational Period

During the operational period, 3 no. staff are expected to be present on site with core work hours as follows;

- 07:00hrs to 18:00hrs - Monday to Friday
- 07:00hrs to 13:00hrs - Saturday

This equates to an estimated approximately 275 no. operational days per year (taking into account anticipated annual leave of staff).

12.1.5.2.3 Development Traffic Generation

The Proposed Development is expected to generate a limited number of additional traffic movements on the local network. Based on the number of staff expected to work on site i.e. 3 no., a total of 6 no. staff trips are generated i.e. two LV trips per staff member.

Regarding HV movements, the subject application is for the dispatch of up to 84,000 tonnes of material. It is noted that a typical payload departing site will be 25 tonnes. This equates to an average of 15 no. HVs arriving and 15 no. HVs departing the site each day (including ad hoc HV trips).

The expected operational vehicle movements at the subject site are outlined in the following Table 12-6.

Table 12-6: Proposed Development Traffic

	One-way Flow	Two-way Flow
Staff (LVs)	3	6
HV's	15	30
Total	18	36

12.1.5.2.4 Haulage Routes

All heavy vehicles will access the site via L3036 and egress the site via L7117 (as illustrated in Figure 12-11). This results in travel to and from the site via one of the following routes:

- From R448 – access to the site shall be via L3036, with vehicles either approaching the L3036 from the north or the south. After travelling west along L3036 for ca. 2.7 kilometres, traffic shall then head north along L3036 for ca. 400 metres before reaching the site access junction.
- To R448 – egressing the site towards south on the L3036 initially, vehicles shall travel ca. 1.7 kilometres before turning east on L7117. Vehicles will travel east along the L7117 for ca. 2.8 kilometres before reaching a stop-controlled priority junction with R448.
- From M9 (originating from south) – vehicles accessing the site from M9 northbound shall join the R448 at M9 Junction 7.
- From M9 (originating from north) – vehicles accessing the site from M9 southbound shall join the R448 at M9 Junction 6.
- To M9 – egressing vehicles shall access the M9 in the reverse of the route they used to access the site.

12.1.5.2.5 Trip Distribution

It is anticipated that all traffic will access and egress the site via the routes outlined in Section 12.1.5.2.4 above under the following assumed distribution patterns:

To the site (inbound):

- 100% will arrive at the subject site via the L3036;
- 50% will access the identified haul route via the R448 from the north; and
- 50% will access the identified haul route via the R448 from the south.

From the site (outbound):

- 100% will leave the site via the L3036 (southbound) initially and will then join the L7117 after ca. 1.7 kilometres. After travelling along L7117 (eastbound) for ca. 2.8 kilometres:
- 50% will egress onto the identified haul route via the R448 to the north; and
- 50% will egress onto the identified haul route via the R448 to the south.

Figure 12-11 provides a graphical representation of HV haulage routes and trip distribution patterns to/ from the Proposed Development.

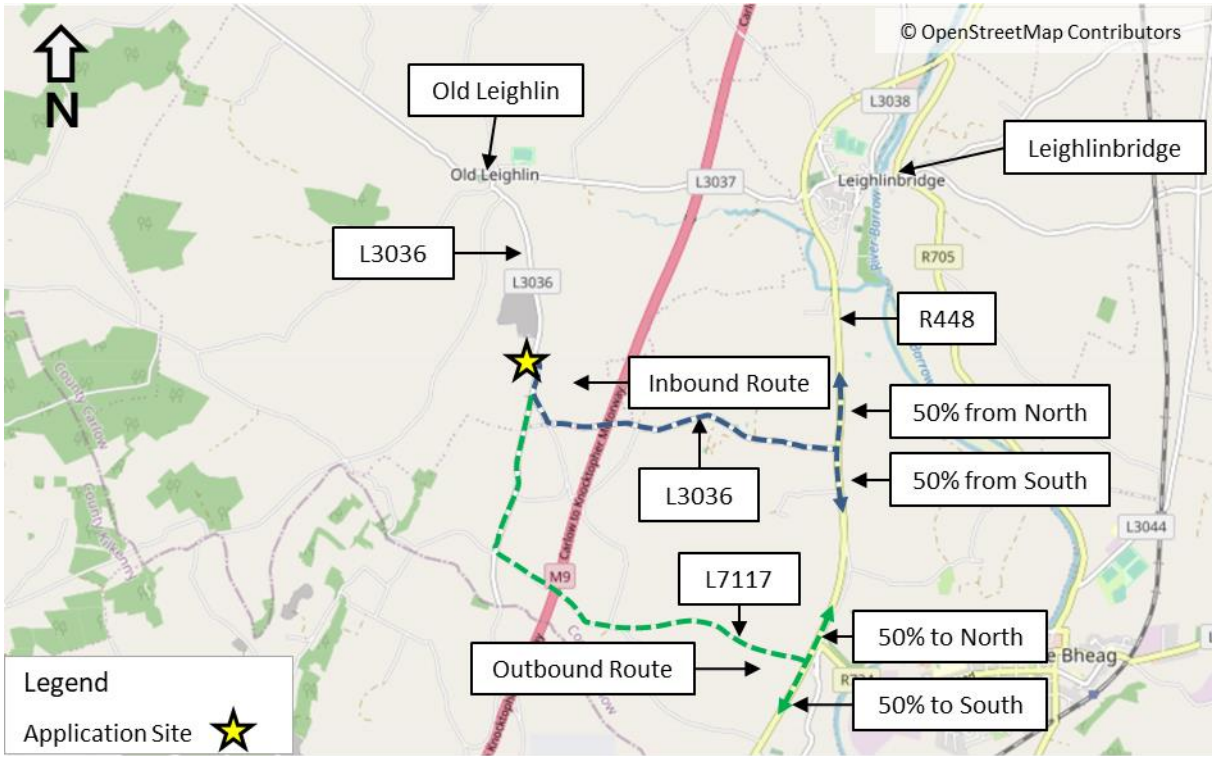

Figure 12-11: - Haulage Routes and Trip Distribution

An on-site assessment of the local road network carried out on 11 January 2023 (described in Section 12.1.3.4) indicates that the local and regional roads and motorway which are proposed to form the haul routes to site are appropriate to accommodate traffic associated with both the construction phase and operational phase of the Proposed Development.

12.1.5.3 Do-Something Traffic Forecast

Table 12-7 details the total AADT and proportion of which comprises HVs on L3036 for the Do-Something scenario. The Do Something scenario considered the worst case scenario, whereby the Proposed Development traffic outlined in Section 12.1.5.2.3 are assessed in addition to the factored up background traffic for the year of opening (2024), year of opening _5 years (2029), and year of opening + 15 Years (2039).

Table 12-7 – Do-Something Scenario Forecast Traffic Volumes on L3036

Year	Total AADT	Of which, HV	%HV	% AADT Increase over Do-Nothing Scenario within Table 12-8
2024	451	65	14.45%	8.7%
2029	483	71	14.75%	8.1%
2039	513	78	15.28%	7.6%

The figures set out in Table 12-7 above show that within the Do-Something scenario, traffic volumes on the L3036 in the development's assumed year of opening (2024) are expected to increase by 8.7%. This will decrease to 7.6% to the Year of Opening +15 (2039). It should be noted that the percentage AADT increases outlined above demonstrate the percentage impact of the Proposed Development at a point to south of the site access junction, as 100% of operational site traffic is to access to/ from the L3036 to the south.

Section 2.1 of TII's Traffic and Transport Assessment Guidelines (May 2014) sets out thresholds for production of a Traffic and Transport Assessment, with thresholds for developments provided in Table 2.1. It is noted from Table 2.1 that where "traffic to and from the development exceeds 10% of the traffic flow on the adjoining road", more detailed analysis of a Proposed Development's traffic impacts may be required. The Proposed Development will result in a 7.6% increase on the L3036 in year 2039, below the 10% threshold. It is also noted that the figure of 7.6% is based off the low existing volume of vehicle flows that the L3036 currently experiences.

12.1.5.4 Do Nothing Impact

The Do-Nothing impacts of the Proposed Development are based on the appropriately factored up background traffic. In this scenario, the site remains in its current state and thus generates no additional traffic.

Table 12-8 details the total AADT and proportion of which comprises HVs on the L3036 Glenville Road in the Do-Nothing scenario for the year of opening (2024), year of opening + 5 Years (2029) and year of opening + 15 Years (2039).

Table 12-8 – Do-Nothing Scenario Forecast Traffic Volumes on L3036

Year	Total AADT	Of which, HV	%HV
2024	415	35	8.47%
2029	447	41	9.23%
2039	477	48	10.15%

The above table provides a baseline from which the Proposed Development's traffic impacts have been determined, with the outputs of that analysis presented in Table 12-7.

12.1.6 Avoidance, Remedial & Mitigation Measures

12.1.6.1 Construction Phase

As part of the construction phase, a number of mitigation measures are proposed. These are as follows;

- In order to minimise the potential impact on the local road network surfaces, road cleaning is proposed to be implemented on site during the earliest construction phase (e.g. earth extraction) to mitigate against material such as dust, earth, debris etc. from entering the local road network, as required.
- Furthermore, as outlined in Section 12.1.5.1, the site shall be cleared to allow the parking of all construction vehicles including staff vehicles within the bounds of the subject site.
- Haul routes outlined within 12.1.5.2.4 will be strictly adhered to by construction vehicles so as not to have an undue impact on the town of Old Leighlin. Construction vehicles are proposed to access and egress the town from the south and only as far as the 3-arm L3036/ L3036 junction. These haul routes shall be strictly controlled by the client or the appointed main constructor during the duration of the construction phase with all construction vehicle operators employed being issued maps of sanctioned haul routes to and from the site and under strict instructions to follow these routes.

12.1.6.2 Operational Phase

As part of the operational phase, several mitigation measures are proposed, which are as follows;

- The site access arm of the junction shall be aligned so that in interfaces with the adjoining L3036 in a perpendicular fashion and to ensure adequate visibility for vehicles egressing the site of oncoming traffic to both the east and west.
- it is proposed to ensure that the required sightlines of 90 metres (based upon the effective speed limit of 60km/h on the L3036 in the vicinity of the site access junction, based upon findings of an ATC speed survey undertaken in November 2022) are achievable in both directions to ensure adequate visibility of drivers egressing the site of oncoming traffic. See Appendix I of this document.
- The site access junction will also be provided with stop road markings and signage to ensure that vehicles egressing the site are mandated to come to a full stop before turning onto the L3036.
- In order to mitigate against the undue impact of heavy vehicles on the town of Old Leighlin, haul routes have been proposed which access and egress the town from the south and only as far as the 3-arm L3036/ L3036 junction. These haul routes shall be strictly controlled by the client during the duration of the operational phase with all heavy vehicle operators employed being issued maps of sanctioned haul routes to and from the site and under strict instructions to follow these routes.

12.1.6.3 "Worst Case" Scenario

The worst case scenario in terms of traffic and transportation, is the scenario in which operations at the Proposed Development site have the capacity to generate the greatest amount of traffic on the surrounding road network. To provide a robust basis for this assessment, the Do-Something scenario analysed above represents the worst case scenario.

12.1.7 Residual Impacts

The predicated residual impact of the Proposed Development in terms of traffic and transportation is that there will be a marginal increase in LVs and HVs on the adjoining road network due to the operation of the Proposed Development.

12.1.8 Monitoring

12.1.8.1 Construction Phase

The potential impact of construction traffic on the local road network in the vicinity of the site will be monitored during the construction phases, with regular observations of the local road network. Should monitoring indicate any excess mud or debris on the road, a road sweeper can be organised (if required) to clean the surface.

Compliance with haul routes to site will be monitored for the duration of the construction phase with spot checks carried out at Old Leighlin to ensure that any construction vehicles follow the haul routes prescribed.

12.1.8.2 Operational Phase

Compliance with haul routes to site will be monitored continuously during the operational phase with spot checks carried out at Old Leighlin to ensure that all heavy vehicles follow the haul routes prescribed. Only pre-approved sources, authorised collection companies, sign up to agreed haulage routes as part of approval process.

12.1.9 Interactions

The analysis contained within this chapter interacts with the Noise Assessments contained within this EIAR. This is primarily due to the potential for an increase in HV traffic movements on the surrounding road network due to development.

12.1.10 Difficulties Encountered When Compiling

No difficulties were encountered when compiling this EIAR Chapter.

12.1.11 References

The EIAR Traffic and Transport Assessment has been prepared taking into account the following policy and technical guidance documents:

- The requirements of EU Directives and national legislation (primary and secondary) concerning Environmental Impact Assessment (especially having due regard to the revised provisions of Directive 2014/52/EU);
- EPA (2003) Advice Notes on Current Practice in the Preparation of Environmental Impact Statements;
- EPA (August 2017) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports;
- DHPCLG (May 2017) Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems: Key Issues Consultation Paper;
- Carlow County Development Plan 2022 - 2028
- Transport Infrastructure Ireland (TII) (2014) Traffic and Transport Assessment Guidelines;

- Transport Infrastructure Ireland (TII) Project Appraisal Guidelines for National Roads Unit 16.1 - Expansion Factors for Short Period Traffic Counts (October 2016);
- Transport Infrastructure Ireland (TII) Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (October 2021);
- Transport Infrastructure Ireland (TII) Rural Road Link Design Standards (April 2017); and
- Transport Infrastructure Ireland (TII) Guidance on Minor Improvements to National Roads (including Erratum No. 1, dated April 2013 and Erratum No. 2, dated June 2013) (March 2013).

12.2 Material Assets, Waste and Utilities

12.2.1 Introduction

Material Assets have been defined as '*Resources that are valued and that are intrinsic to specific places, they may be either human or natural origin and the value may arise for either economic or cultural reasons*' (EPA 2002).

The definition of Material Assets was further expanded by the EPA in 2022 in *'Guidelines on the information to be contained in Environmental Impact Assessment Reports'* which states:

'In Directive 2011/92/EU this factor included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes roads infrastructure. Sealing of agricultural land and effects on mining or quarrying potential come under the factors of land and soils.'

This Chapter of the Environmental Impact Assessment Report (EIAR) provides an assessment of the potential impacts of the Proposed Development on Material Assets or physical resources in the environment of human origin including built services and infrastructure comprising:

- Electricity Supply,
- Gas Supply,
- Information and Communications Technology,
- Surface Water Drainage Infrastructure,
- Water Supply and Demand,
- Wastewater Management, and
- Waste Management

Natural resources (water, land, biodiversity, air, etc) are addressed in their respective chapters. Architectural and Archaeological Heritage is addressed in Chapter 11.

12.2.1.1 Quality Assurance and Competence

This Chapter was prepared by Enviroguide Senior Environmental Consultant Mairéad Foran. Mairéad Foran, has a B.A. (Moderatorship) in Environmental Sciences from Trinity College Dublin, and an Advanced Diploma in Planning and Environmental Law from King's Inns College, Dublin. Mairéad has over 4 years professional experience as an Environmental Consultant and experience working on a large number of EIARs and EIA Screening Reports for projects of a similar scale to that of the Proposed Development.

12.2.2 Study Methodology

The methodology adopted for the assessment takes cognisance of the relevant guidelines the following:

- Environmental Protection Agency (EPA) (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)
- EPA (2003) Advice Notes on Current Practice in the preparation of Environmental Impact Statements.

- EPA (2002) Guidelines on the information to be contained in Environmental Impact Statements.

The scope of work undertaken for the assessment included a desk-based study of material assets, namely built services, utilities and infrastructure associated with the existing site and the Proposed Development. All phases of the Proposed Development were considered in the assessment of potential impacts on material assets.

Information on built assets in the vicinity of the site of the Proposed Development was assembled by the following means:

- A desktop review of ESB Networks Utility Maps, Irish Water Utility Plans, Gas Networks Ireland Service plans, EIR E-Maps.

12.2.2.1 Prediction and Assessment of Impacts

Impacts were predicted and assessed based on EPA guidance and by using the definitions detailed in Tables 12-9, 12-10 and 12-11. Impact will vary from negative to neutral or positive, and also will vary in significance on the receiving environment. The terminology and methodology used for assessing the impact significance and corresponding effects throughout this chapter are described in Tables 12-9, 12-10 & 12-11:

Table 12-9: Terminology used to assess the quality potential impacts & effects

Quality of Effects / Impacts	Definition
Negative	A change which reduces the quality of the environment.
Neutral	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Positive	A change that improves the quality of the environment.

Source: EPA, 2022

Table 12-10: Terminology used to assess the significance of potential impacts & effects

Significance of Effects / Impacts	Definition
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.

Source: EPA, 2022

Table 12-11: Terminology used to assess the duration of potential impacts/effects

Duration of Effects / Impacts	Definition
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting one year or less
Short-term	Effects lasting one to seven years
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration

Source: EPA, 2022

Where significant potential impacts were identified, mitigation measures are proposed to minimise impacts.

In line with the EPA Guidelines (EPA, 2022), the terms in Table 12-12 are defined when quantifying the extent and context of effects, and the terms in Table 12-13 are defined when quantifying the probability of effects.

Table 12-12: Definition of the Extent and Context of Effects

Quality	Definition
Extent	Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)

Source: EPA, 2022

Table 12-13: Definition of the Probability of Effects

Quality	Definition
Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.

Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.

Source: EPA, 2022

Figure 12-12 (extracted from the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 2022) shows how the character of the predicted impact in relation to the sensitivity of the receiving environment can determine the significance of the impact.

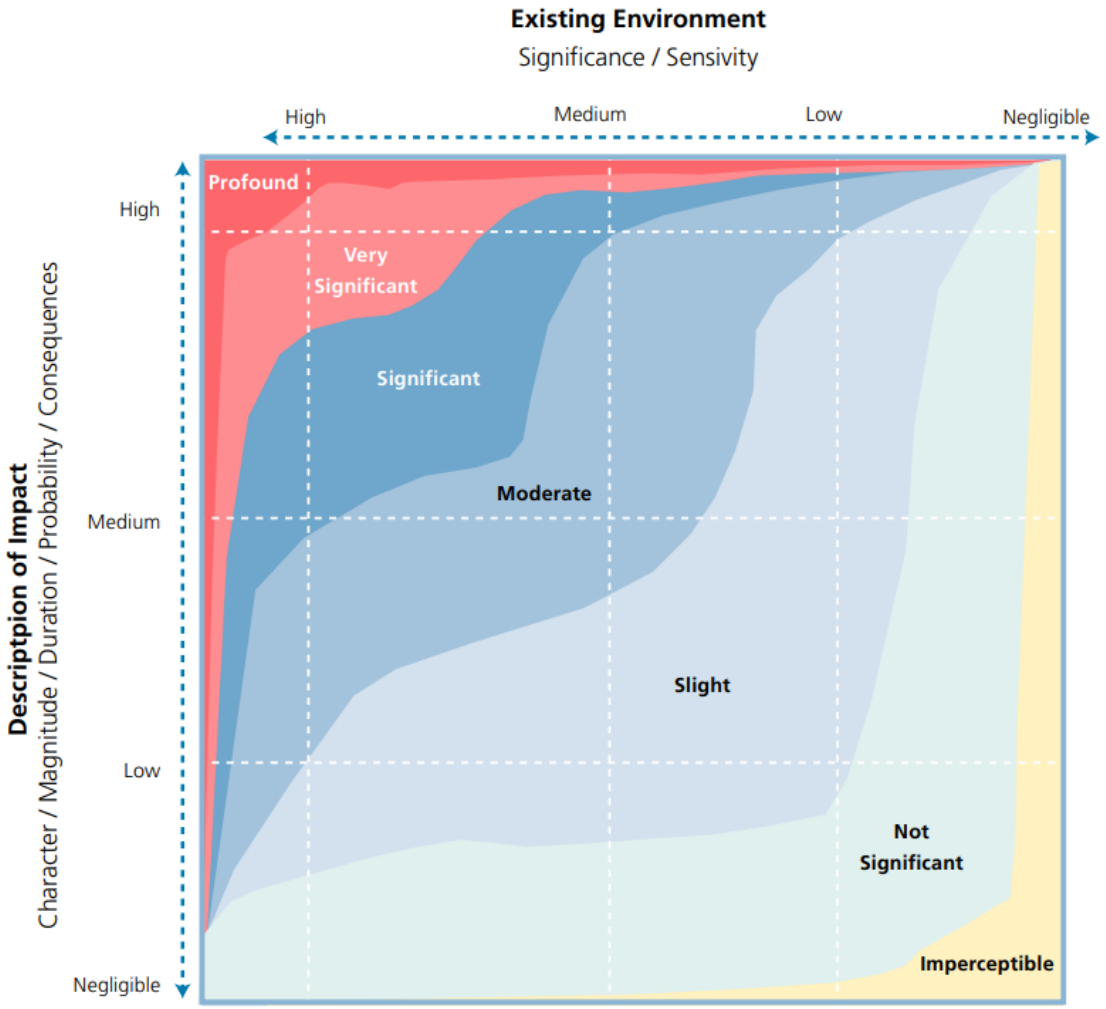

Figure 12-12 Chart showing typical classifications of the significance of impacts (EPA, 2022, Guidelines on the Information to be Contained in Environmental Impact Assessment Reports)

12.2.3 The Existing and Receiving Environment (Baseline Situation)

12.2.3.1 Site Location

The Proposed Development site is located to the west of the L3036 (that connects Old Leighlin to the north, with Paulstown to the south) and 1.15 kilometres to the south of Oldleighlin, Co. Carlow. Leighlinbridge is located 2.55km northeast of the site, with the M9 motorway located approximately 750 metres to the east of the subject site. The area surrounding the site is primarily agricultural in nature. The site itself consists of agricultural fields and forested lands.

The quarry shall have a projected lifetime of ca. 12 years with an additional 1-year permission sought to allow for restoration of the site. proposed site. The application site occupies a total area of approximately c. 9.43 *hectares a*nd the proposed extraction area is 2.44ha. The proposed quarry will use diamond wire cutting to extract the limestone.

12.2.3.2 Land Use History

Historical mapping and aerial photography available from the Ordnance Survey of Ireland website (OSI, 2021) were reviewed and key observations on-site and off-site are summarised in Table 12-14.

Table 12-14 Historical Land Use

Date	Information Source	Site Description
1837-1842	**OSI map 6 inch**	**On-site:** The site is shown as agricultural pastures **Off-site:** Agricultural pastureland
1888-1913	**OSI map 25 inch**	**On-site:** The site is shown as agricultural pastures **Off-site:** Agricultural pastureland
1830-1930	**OSI Cassini map 6 inch**	**On-site:** The site is shown as agricultural pastures **Off-site:** Agricultural pastureland
1995	**OSI Arial photography**	**On-site:** The site is comprised of agricultural pastures and areas of coniferous forestry. Hedgerows are also present throughout the site, delineating local field boundaries. The site is accessed via a small lane-way from the L3036 which extends into the site. **Off-site:** Quarry adjacent to the northern boundary of the Proposed Development Site
2005	**OSI Arial photography**	**On-site:** No significant changes. **Off-site:** No significant changes.
2013-2018	**OSI Arial photography**	**On-site:** No significant changes. **Off-site:** No significant changes.
2022	**Google Maps photography**	**On-site:** No significant changes. **Off-site:** No significant changes.

12.2.3.3 Immediate Surroundings

The area immediately surrounding the site is characterised by one-off dwellings and farmlands. A quarry (Kilkenny Limestone Quarries Ltd.) is adjacent to the northern boundary of the Proposed Development Site.

12.2.3.4 Local Settlement and Land Use

The site of the Proposed Development is located in Bannagagole, Old leighlin, Co. Carlow. The area surrounding the site is primarily agricultural in nature.

The existing established access is via an existing agricultural access from the L3036 to the east of the subject site.

The Proposed Development site is located to the west of the L3036 (that connects Old Leighlin to the north, with Paulstown to the south), ca. 1.5 kilometres (straight line distance) to the south of Old Leighlin, Co. Carlow. The M9 motorway is located approximately 750 metres

(straight line distance) to the east of the subject site. The M9 can be accessed at junctions 6 (to the north) and 7 (to the south), both via the R448.

12.2.3.5 Electricity Supply

12.2.3.5.1 Local Supply & Grid Connection

EirGrid develop and operate the national electricity grid and are responsible for taking electricity from the power generators and delivering it to the distribution network, which is operated by ESB Networks. The high-voltage Irish electricity transmission grid comprises 6,800 km of power lines and operates at 400 kV, 220 kV and 110 kV. Substations provide entry points to, and exits from, the transmission grid. The Proposed Development will operate oof the national gird.

12.2.3.6 Onsite Supply and Consumption

There is no onsite electricity supply and there is no demand for electricity onsite at present.

12.2.3.7 Gas supply

There is no onsite gas supply and there is no demand for gas onsite at present.

12.2.3.8 Information and Communications Technology (ICT)

The site currently has no fixed connection to any telecommunications infrastructure. There are no landline telephones or broadband facilities and there is no demand for such infrastructure onsite at present. There are a number of derelict building onsite, which will be demolished upon grant of planning permission.

12.2.3.9 Water Supply and Demand

The site of the Proposed Development is not connected to a municipal water supply and there is currently no demand for potable water at the site.

12.2.3.10 Local Hydrology and Hydrogeology

The Proposed Development site is located to the west of the L3036 (that connects Old Leighlin to the north, with Paulstown to the south), ca. 1.5 kilometres (straight line distance) to the south of Old Leighlin, Co. Carlow. The M9 motorway is located approximately 750 metres (straight line distance) to the east of the subject site. The M9 can be accessed at junctions 6 (to the north) and 7 (to the south), both via the R448.

Within the Old Leighlin Stream_020 river sub-basin, the Baunleath stream (EPA Code: 14B95) originates to the southeast of the site along the L3036. This stream flows to the east before veering northwards and discharging into the Old Leighlin stream (EPA Code: 14O02) (also known as the Madlin River) ~2km northeast of the site. The Old Leighlin stream then flows to the southeast, discharging into the Barrow River (EPA Code: 14B01) to the south of Leighlinbridge.

Site walkover surveys have also revealed the presence of a second drain and culvert which enters a small ditch and flows eastwards along a hedgerow north east of the norther corner of the proposed site. This drainage pathway crosses the L3036 via a culvert and flows to the east before discharging into the Bauleath stream.

12.2.3.11 Wastewater management

The site of the Proposed Development is currently a greenfield site and therefore has no foul loading.

12.2.3.12 Waste Management

The site of the Proposed Development is currently a greenfield site and therefore has no waste management requirements.

12.2.4 Characteristics of the Proposed Development

Milford Quarries Limited intend to apply for a planning permission for the demolition of existing derelict buildings and the development of a quarry.

The proposed quarry void will be extracted to a depth of 2 no. benches of c. 10m from top of bedrock, with a final floor level of c. 56.5m AOD with a proposed rate of rock extraction of c.30,000 cubic metres (84,000 tonnes) per annum. A proposed working area of c. 1.2 hectares to the south of the extraction zone will provide for the crushing / processing of the unusable stone and storage of dimensional stone and will include machinery storage shed, staff welfare, wastewater holding tank, weighbridge and parking area.

The Proposed Development will also include for earthen screening berms to a height of c. 3 m, a wheelwash facility; Installation of surface water attenuation and settlement ponds for the treatment of suspended solids in the floor of the quarry; soil storage area with an average storage depth of c.

3.85 m and all other site development works above and below ground including the restoration of the final quarry void (extractive area).

Access to the Proposed Development will be facilitated by a HGV site entrance from the Local Road to the east of the proposed site via a proposed access haul road.

12.2.5 Potential Impact of the Proposed Development

This section assesses the impact of the Proposed Development on Material Assets of the area during the Construction and Operational Phase of the Proposed Development. The Proposed Development is for the development of a quarry with a projected lifetime of c. 12 years with an additional 1 year permission to allow for the implementation of a restoration plan

Construction will involve all site infrastructure required for the Proposed Development including site access, haul roads, office and truck wheel wash.

Once the importation is complete the applicant will commence a restoration plan to render it suitable for agriculture.

12.2.5.1 Settlement

It is noted that specific issues relating to Population and Human Health associated with the Proposed Development are set out in Chapter 4 of this EIAR.

12.2.5.1.1 Construction Phase

There will be dust generation during earthworks associated with the Construction Phase at the site. However, it is considered that there will be no significant impact on the local population

associated with dust arising from the extraction and processing at the site given the distances to nearby residential properties and the screening provided by the existing forestry and trees. Soil from the limited excavations will be handled in accordance with documented procedures that will be set out in order to minimise airborne dust.

12.2.5.1.2 Operational Phase

12.2.5.1.2.1 Dust Generation

There will be dust generation during the normal quarrying operations at the Proposed Development site. The potential for the local population to be exposed to dust can arise from the quarrying activities. The normal measures required to prevent airborne dust emissions and associated nuisance arising from extraction activities will be in place including measures to prevent wind pick up of dust and mud being spread onto the local road network and adjoining properties. This will require additional wetting at the point of dust release, dampening down during dry weather and wheel cleaning for any vehicles leaving the site.

However, given the distances to nearby residential properties, it is considered that there will be no significant impact on the local population associated with dust arising from the extraction and processing at the site. It is likely that the local terrain and natural features between the source and the receptors will variously act as barriers, reduce airborne concentrations due to impaction, lengthen pathways, affect air flow, and increase or inhibit dispersion and dilution.

Soil from the limited excavations will be handled in accordance with documented procedures that will be set out in order to minimise airborne dust.

12.2.5.1.2.2 Visual Impact

The proposed changes to the site will alter the character of its immediate setting. The Operational phase of the Proposed Development will cause some negative landscape impact in the short to medium-term within the site. These impacts will be less significant since four phases are predicted. The visual assessment, as detailed in Chapter 10 of this EIAR, show that the Proposed Development and mitigation measures proposed, will result in a neutral landscape impact in the long term.

There are no protected views within this area that could be affected by the operation of the Proposed Development.

12.2.5.1.2.3 Noise and Vibration Impact

The impact assessment of noise and vibration has been assessed in Chapter 9 of this EIAR. The assessment has concluded that in terms of the effects of noise and vibrations, no significant impacts are predicted; good construction practice, which incorporates the implementation of the identified mitigation measures, will be employed at the Proposed Development site. Due to the implementation of good construction practices deployed for the Proposed Development and for these offsite permitted developments, it is not anticipated that significant cumulative noise and vibration impacts will occur.

12.2.5.1.2.4 Property Prices

The site of the Proposed Development is a greenfield site in a predominantly rural area with surrounding land uses of agriculture, forestry and a number of one-off residential dwellings. There is an active quarry north of the site of the Proposed Development. It is unlikely that the

Proposed Development will further impact on property prices given the proximity of this type of development in the local area.

12.2.5.2 Water Environment

It is noted that specific issues relating to Hydrology associated with the Proposed Development are set out in Chapter 7 of this EIAR.

12.2.5.2.1 Construction Phase

There is the potential for the generation of suspended sediment in surface water runoff during the construction phase. Earthworks, the removal of vegetation and the stripping of soil/subsoil and the stockpiling of such material (berms surrounding the proposed extraction area, with all excess soil to be stored in the proposed soil storage area) which will be a potential source of sediment laden water. All excess surface water within the site will be directed to temporary settlement pond within the quarry void. The retention time within the settlement pond will be at least 24hrs and this will allow enough time to remove fine silts. After settlement, water will be directed to a roadside drain which in turn discharges into the Baunleath Stream. Construction phase activities can result in the release of suspended solids to surface waters which could affect the water quality of downstream receptors including the Baunleath stream, the Madlin River and the River Barrow and their associated aquatic ecosystems.

The pre-mitigation impact of suspended solids entrainment in downstream surface waters will be a negative, significant, indirect, temporary, likely impact.

12.2.5.2.2 Operational Phase

In the context of the Proposed Development the operational phase is taken to be the extraction of limestone bedrock to a final proposed depth of ~56.5mOD.

Any unmitigated and uncontrolled increases in discharge has the potential to adversely impact local hydromorphology, water quality and increase flood risk downstream of the site. The pre-mitigation impact on surface water quantity is considered to be a negative, moderate, direct, medium-term, likely impact.

During the operational phase runoff from the proposed extraction area will be directed to temporary settlement ponds on the quarry floor. En-route to the ponds, surface water will likely increase in turbidity due to the collection of sediment particles. Surface waters may also be contaminated with any leaked hydrocarbons on the quarry floor. This will reduce the quality of surface water runoff from the site and will have an adverse impact on local downstream receiving watercourses (Baunleath stream, Madlin River and River Barrow) and their associated aquatic ecosystems.

The pre-mitigation impact on surface water quality is considered to be a negative, moderate, direct, medium-term, likely impact.

12.2.5.3 Foul Water

It is noted that specific issues relating to Hydrology associated with the Proposed Development are set out in Chapter 7 of this EIAR.

12.2.5.3.1 Construction Phase

The welfare facilities that will be installed for the Construction Phase and Post-Construction Phase (Operational Phase) will include a welfare unit office within the centre of the site. The welfare unit will be emptied by an approved contractor as part of a maintenance contract in accordance with relevant waste management legislation.

are powered by diesel engines and operate using hydraulics. Unless carefully managed such plant and machinery have the potential to leak hydraulic oils or cause fuel leaks. The accidental release of these compounds into the environment have the potential to negatively impact the groundwater quality in the underlying bedrock aquifer and the downstream surface watercourse which are linked to the proposed extraction area via groundwater flowpaths.

As part of the Proposed Development it is proposed to intermittently discharge surface water to a roadside drain located immediately to the east of the Proposed Development site. This drain discharges into the Baunleath Stream which in turn discharges into the Madlin River further downstream. Accidental release of hydrocarbons or oils into the local surface water environment will have a negative impact on downstream surface water quality and associated aquatic habitats and ecosystems.

The pre-mitigation potential impact on surface and groundwater quality will be a negative, slight, indirect, unlikely, long-term impact on surface and groundwater quality.

12.2.5.3.2 Operational Phase

A wheel wash will be installed at the Proposed Development. All trucks exiting the site will be required to pass through the wheel wash. Water from the wheel wash will be recycled and will not enter the settlement ponds or be discharge to the Baunleath stream.

12.2.5.4 Water supply

There is no mains water connection required for the Proposed Development during either the Construction or Operational Phase, therefore there will be no impact on any water mains infrastructure as a result of this development. The drinking water supply for the site will be provided by bottled water.

12.2.5.5 Electricity Supply

The electricity requirement is small in scale and it is not considered that there will be any impact on electrical infrastructure or supply in the area.

12.2.5.6 Gas Supply

The project does not rely on gas supply for processing activities onsite, therefore no impacts are anticipated to the existing gas supply in the area.

12.2.5.7 Information and Communications Technology (ICT)

The Proposed Development will not create any additional ICT demand or infrastructure development in either the Construction or Operational Phase. Impacts on ICT infrastructure are not therefore anticipated as a result of the Proposed Development.

12.2.5.8 Waste Management

12.2.5.8.1 Construction Phase

The Proposed Development will involve demolishing and removing the existing buildings onsite. All wastes generated during the Construction Phase onsite will be sent for recycling, recovery, or disposal to a suitably licensed or permitted waste facility.

12.2.5.8.2 Operational Phase

During the Operational Phase, a small quantity of non-hazardous waste will be generated by the proposed site operations. Any food waste, will be stored in wheelie bins on site and it will be collected by an appropriately authorised waste collector. All wastes generated on site will be sent for recycling, recovery, or disposal to a suitably licensed or permitted waste facility. As the quantity of waste that will be generated is small in scale, it is not considered that there will be any impact on waste management facilities in the area.

12.2.5.9 Potential Cumulative Impacts

The cumulative effects of Proposed Development on Material Assets have been assessed taking other planned, existing, and permitted developments in the surrounding area into account.

When considered in conjunction with other permitted, planned and existing development in the vicinity of the site, it is predicted that the cumulative effects the Proposed Development on surface water, foul water disposal, potable water supply, natural gas supply, electrical supply, telecoms, and municipal waste will be negligible.

12.2.5.10 "Do Nothing" Impact

If the Proposed Development is not advanced, the site would remain as agricultural pastureland. The risks to the environment would therefore be from those associated with agriculture.

12.2.6 Avoidance, Remedial & Mitigation Measures

As the use of material assets for the Proposed Development is considered to be minimal, it is not foreseen that any avoidance, remedial or mitigation measures will be required for the Proposed Development.

Specific avoidance, remedial and mitigation measures have been detailed in other Chapters of the is EIAR to ensure that there will be no significant impact on the surrounding environment and associated sensitive receptors.

12.2.6.1 "Worst Case" Scenario

The worst-case scenario would be if the development were not permitted and stone resource was left in the ground, potentially necessitating the development of another quarry in an area that is less suitable or a valuable resource remaining not used.

12.2.7 Residual Impacts

Residual Impacts are defined as '*effects that are predicted to remain after all assessments and mitigation measures'*. They are the remaining '*environmental costs'* of a project and are the final or intended effects of a development after mitigation measures have been applied to

avoid or reduce adverse impacts. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment.

Having regard to the mitigation measures proposed within this and other chapters of the EIAR, no significant residual impacts are anticipated. The increased vulnerability to the water environment, land and soil will be mitigated with the restoration of the quarry post extraction. Once extraction activities have ceased, the site will be subject to a long term restoration plan, which will be subject to an additional application in the future. The implementation of best environmental practice will ensure that there will be no significant adverse residual impacts on Material Assets associated with the Proposed Development.

12.2.8 Monitoring

An environmental monitoring programme will be developed and implemented for the operational lifetime of the Proposed Development. The monitoring programme will verify (i) that implemented controls prevent and minimise emissions from the Proposed Development and (ii) that there is no negative impact on the receiving environment via uncontrolled releases of pollutants, sediment, dust, noise or vibration. Monitoring will also assess the effects of the quarrying activities on the environment so that operational changes and improvements can be made where appropriate. The monitoring programme and sampling frequency will be agreed with Carlow County Council.

12.2.9 Interactions

Material assets, utilities and waste interact with other environmental receptors as follows:

- Population and Human Health: In the event of uncontrolled releases of dust, noise or vibration, this could negatively impact on the surrounding human population and their overall health. Potential impacts on population and human health are addressed in Chapter 4. Additional potential impacts and interactions with the local population are addressed in detail in Chapters 8 (Air Quality), 9 (Noise and Vibrations) and 10 (Landscape and Visual Impact)
- Land and Soil: In the event of spillage/ leaks from waste storage areas, this could negatively impact on the land and soil. Potential impacts on land and soils are addressed in Chapter 6.
- Water (Hydrology & Hydrogeology): The Proposed Development has the potential to increase volumes of water being discharged from the site to the Baunleath stream, which in turn discharges into the Madlin River. This increase in surface water discharge will be as a consequence of the increased volumes of surface and groundwater being generated within the proposed quarry void. Quarrying activities below the water table have the potential to impact on local groundwater levels in the vicinity of the Proposed Development. Once the quarrying operations extend below the groundwater table, groundwater levels in the surrounding area will be lowered as the groundwater flows towards the newly created void. Drawdown may have a negative impact on local private groundwater wells. Potential impacts Hydrology & Hydrogeology addressed in Chapter 7.
- Biodiversity: The improper handling and storage of waste could negatively impact on biodiversity. Potential impacts on biodiversity are addressed in Chapter 5.

- Traffic: The Proposed Development has the potential to impact upon traffic movements in the Old Leighlin area. Potential impacts on traffic are addressed in Chapter 12.1.

12.2.10 Difficulties Encountered When Compiling

No difficulties were encountered in the preparation of this Chapter.

12.2.11 References

- Environmental Protection Agency (EPA) (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)
- EPA (2003) Advice Notes on Current Practice in the preparation of Environmental Impact Statements.
- EPA (2002) Guidelines on the information to be contained in Environmental Impact Statements
- EPA Maps Online https://gis.epa.ie/EPAMaps/ Consulted on 08/06/2022.
- https://siteviewer.comreg.ie/#explore (ComReg, 2021). Commission for Communications Regulation Mast Viewer. Consulted on 08/09/2022.
- Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (European Communities 1999)
- https://myplan.ie/ (DHLGH, 2021) Zoning and National Planning Applications Map Viewer. Consulted on 08/09/2022.
- National Townland and Historical Map Viewer (2023) https://geohive.maps.arcgis.com/apps/webappviewer/index.html?id=9def898f708b47f19a8d8b7088a100c4