

GENERAL LEGEND

LAND OWNERSHIP BOUNDARY	ACTIVITY BOUNDARY
PUBLIC ROAD	EXISTING INTERNAL HAUL ROAD
EXISTING SITE STRUCTURES	EXISTING HARDSTAND
DUST MONITORING POINT	NOISE MONITORING POINT

- NOTES**
- 1 FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
 - 2 ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
 - 3 ENGINEER TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
 - 4 ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD
 - 5 OS DISCOVERY SHEET NO 43

Scale: 0 50m 100m 150m

Issue	Date	Description	By	Chkd
B	27 05 11	ISSUED FOR LICENCE REVIEW	MN	JU
A	28 03 11	ISSUED FOR PERMIT REVIEW	MN	JU



Client: **Roadstone WOOD**

Project: **MULLAGHCRONE WASTE LICENSE APPLICATION**

Title: **ENVIRONMENTAL MONITORING LOCATIONS**

Scale @ A3: **1:5,000**

Prepared by: M. Nolan
Checked: J. Dillon
Date: March 2011

Project Director: D. Grehan



Drawing No: **FIGURE 8.1 B**

8.1.3 Potential Impacts

The nature and particle size of the materials being handled at the site have a fundamental influence on their tendency to be broken down and to generate fugitive dust emissions. It is also dependent on material density and to some extent particle shape.

Experience of soil recovery and C&D facilities indicate that mechanical activity is the most significant factor in material erosion and dust generation. However, the effect of wind and high ambient temperatures are also important factors in dust generation and migration. Problems may arise when all these factors arise simultaneously.

Potential sources of dust from the proposed facility can be categorised under the following headings. These are:

- Point Source – where dust is generated by activities such as loading, dozers, earth-moving plant, processing screens, crushers and conveyor transfer points.
- Line Source – where dust is generated by activities identified above along well-defined haul roads and open conveyors.
- Dispersed Source – where dust is generated by activities such as exposed surfaces, uncontrolled placement of these soils and general activity. Stockpiles are also considered to be a dispersed dust source.

The amount of dust capable of being dispersed to a particular location during windy conditions is related to several factors including:

- Distance from source to receptor.
- Prevailing weather conditions.
- Intervening topography between source and receptor.

As dust travels downwind from the source it initially disperses outwards and upwards and then progressively falls to the ground surface. Larger particles will fall first and therefore will not migrate as far as the smaller particles. The concentration of dust therefore reduces very quickly from the emission source. Most emitted dust is in fact deposited close to its source, generally within a distance of a few tens of metres.

Predicted Dust Emissions

It is anticipated that with the implementation of the suggested mitigation measures, dust emissions will continue to be within the recommended limit value of 350mg/m²/day at all dust monitoring locations when measured using the TA Luft/VDI 2119/Bergerhoff Method.

8.1.4 Mitigation Measures

Dust emissions from the proposed development will be kept within the recommended limit value at all monitoring locations and all reasonable steps will be taken as far as is practical to minimise dust emissions.

In summary the following mitigation measures are proposed:

- Heavy Goods Vehicles (HGV's) exiting the site will pass through the established wheelwash. This ensures that dust emissions are not generated from the tyres of vehicles emanating from the quarry and proposed waste licence area. It also ensures that they do not carry excess soil and material onto the public road network.
- The provision of on-site speed limits will prevent unnecessary generation of fugitive dust emissions.
- An on-site water sprinkler system will be used to ensure that all internal hauls roads and access routes are sprayed with water in periods of dry weather to help suppress dust emissions.
- Minimising drop heights of material.
- Access routes will be regularly inspected and cleaned when necessary.
- A complaints register is maintained on-site and any complaints relating to dust emissions will be immediately dealt with.

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9 CLIMATE

9.1.1 Introduction

In this section a general overview of the climate in the Meath region and more specific meteorological data for the lands at the Mullaghcrone Quarry, Donore, County Meath is outlined. Information on rainfall and potential evapotranspiration for the area is provided. This is based on information obtained from the Meteorological Service. Wind speed and orientation is also detailed.

All meteorological data contained in this report has been received from Met Éireann. This information is adjusted when necessary to take into account the proposed site's location and elevation. All calculations detailed in the report are advised methods as described by Met Éireann personnel.

9.1.2 Existing Environment

Over the summer months the influence of anti-cyclonic weather conditions results in dry continental air interspersed by the passage of Atlantic frontal systems. During much of the winter period the climate is characterised by the passage of Atlantic low-pressure weather systems and associated frontal rain belts from the west. Occasionally the establishment of a high-pressure area or anticyclone over Ireland results in calm conditions and during the winter months these are characterised by clear skies and the formation of low-level temperature inversions with light wind conditions at night time. Long spells of dry weather are relatively rare but should continental air masses or anticyclones persist over Ireland a period of drought conditions may occur which could last up to two or three weeks.

Rainfall Stations

There are a number of rainfall measuring stations throughout the country. These stations measure the daily rainfall in millimetres (mm). A number of these also measure additional parameters such as soil moisture, temperature, humidity, etc.

Synoptic Stations

Synoptic stations are those, which observe and record all the surface meteorological data. These observations include rainfall, temperature, wind speed and direction, relative humidity, solar radiation, clouds, atmospheric pressure, sunshine hours, evaporation and visibility. They report a mixture of snapshot hourly observations of the weather known as synoptic observations, and daily summaries of the weather known as climate observations. There are 15 synoptic stations located throughout Ireland.

9.1.2.1 Rainfall

There is no meteorological data specific to the existing site. In order to give reliable climatic data on a particular area a weather station should be within 10km of the site and in operation for at least 30 years. A climate station is located at Duleek (Duleek Gauging Station) approximately 3.5km south of the proposed site. This climate station has been in operation since 1949. The nearest synoptic station is at Dublin Airport Synoptic Station and this is located approximately 30km south of the waste licence site.

Specifics of these measuring stations relative to the proposed site are outlined in Table 9.3.

Table 9.1 Designated Meteorological Stations for Mullaghcrone Quarry

Location	Grid Reference	Elevation (m O.D. MH)	Rainfall	Distance from site
Mullaghcrone Quarry	O 048 686	79		-
Duleek (G.S.)	O 047 682	29	792	3
Dublin Airport Synoptic Station	O 169 434	71	733	30

In the site area, approximately 53% of the total annual rainfall is recorded during the winter period (October – March). This amount of precipitation (including snow) will normally be associated with more prolonged Atlantic frontal weather depressions passing over the region compared to the summer.

Table 9.2 Average Monthly and Annual Precipitation (mm)

Location	Duleek (G.S.)
January	79
February	57
March	61
April	55
May	58
June	58
July	55
August	69
September	71
October	78
November	71
December	81
Annual mm	793

Evapotranspiration and Effective Rainfall

The nearest meteorological station with evapotranspiration measuring equipment is located at the Dublin Airport Synoptic Station. Evapotranspiration is the return of water vapour to the atmosphere by evaporation from land and by the transpiration of plants, generally measured from a short-grass covered surface (such as a permanent pasture) adequately supplied with water. Evaporation is the return of water vapour to the atmosphere by evaporation from a free water surface such as a pan of water, known as a “Class A Pan”, fitted with a depth measuring gauge. The evapotranspiration figures for the Dublin Airport Synoptic Station are detailed in Table 9.2.

It can be noted that evapotranspiration is very low during winter months, when plant growth is minimal. The vast majority of evapotranspiration during winter months is attributable to direct evaporation from ground surfaces. During summer months the rate of evapotranspiration increases and often exceeds

the monthly rainfall. This is due to increased free evaporation from the surface and from transpiration from leaves and plants.

Using the rainfall data calculated for the proposed site in Table 9.3 and the potential evapotranspiration data for the nearest synoptic station, i.e. Dublin Airport Synoptic Station, the effective rainfall for the subject site can be calculated. Table 9.3 shows the effective rainfall to the site. Any rain falling on the site will infiltrate to the ground, evaporate from the surface or become surface water runoff.

Table 9.3 Hydrological Data for the Site

Month	Rainfall (mm)	Potential Evapo-transpiration (mm)	Actual Evapo-transpiration (mm) (PE x 0.92)	Effective Rainfall / Potential Recharge(mm)
January	79	9.1	8.2	70.8
February	57	20.9	18.8	38.2
March	61	39.1	35.2	25.8
April	55	60.8	54.7	0.3
May	58	82.7	74.4	-16.4
June	58	93.8	84.4	-26.4
July	55	90.8	81.5	-26.5
August	69	73	65.7	3.3
September	71	50.1	45.1	25.9
October	78	25	22.5	55.5
November	71	9.9	8.9	62.1
December	81	5.5	5.0	76
Total	792	560.4	504.4	358

The surface water runoff drainage system is discussed in more detail within the water section of this report.

Wind

The closest synoptic weather station with the capability of measuring wind and that has been in operation for at least 30 years is the Dublin Airport Synoptic Station, which is approximately 30km south of the existing quarry.

The wind rose for the Dublin Airport Synoptic Station shows that the prevailing winds are from the southeast (Refer to Appendix 9.1). The mean wind speed at the Dublin Airport Synoptic Station is 10 knots (5.4m/s). This value is also applied to the proposed site.

9.1.3 Potential Impacts

On a local, regional and global scale, the climate will not be altered by the activities of the waste licence. The waste licence industry (soil and stones, C&D) is not a significant industrial generator of greenhouse gases. There will be no net contribution to greenhouse gas emissions. Therefore, this industry will not be impacted by the limits of greenhouse emissions under the Kyoto protocol.

The waste licence area will not create any temperature inversions, alter any current wind circulation patterns nor affect the sunshine or any other climatic factors in the area beyond the site boundaries of the proposed site.

9.1.4 Mitigation Measures

As there will be no significant impact on the local or global climate, there are no mitigation measures proposed other than the operation of the facility to DoEHLG and EPA guidelines.

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10 NOISE & VIBRATION

10.1 INTRODUCTION

This section deals with the noise and vibration impacts for the proposed development at Mullaghcrone Quarry, Donore, County Meath. TOBIN Consulting Engineers carried out an environmental noise assessment survey on 18th August 2010. The purpose of the study is to:

- Establish the existing noise levels generated;
- Project and assess future noise levels generated by continuing Waste License activity and the proposed waste license; and
- Specify appropriate ameliorative measures where deemed necessary.

Acoustic Terminology

Sound is simply the pressure oscillations that reach our ears. These are characterised by their amplitude, measured in decibels (dB), and their frequency, measured in Hertz (Hz). Noise is unwanted or undesirable sound, it does not accumulate in the environment and is normally localised. Environmental noise is normally assessed in terms of A-weighted decibels, dB (A), when the 'A-weighted' filter in the measuring device elicits a response, which provides a good correlation with the human ear.

The criterion for environmental noise control is one of annoyance or nuisance rather than damage. In general a noise level is liable to provoke a complaint whenever its level exceeds by a certain margin the pre-existing noise level or when it attains an absolute level. A change in noise level of 3 dB (A) is 'barely perceptible', while an increase in noise level of 10 dB (A) is perceived as a twofold increase in loudness.

Typical ranges of noise levels are presented in Table 10.1 overleaf to compare against the baseline noise levels measured.

Table 10.1 Typical ranges of noise levels

Sound levels in decibels dB (A)	Description of Activity
0	Absolute silence
25	Very Quiet room
35	Rural night time setting with no wind
55	Day time, busy roadway 0.5km away
70	Busy Restaurant
85	Very busy pub, voice has to be raised to be heard
100	Disco or rock concert
120	Uncomfortably loud, conversation impossible
140	Noise causes pain in ears

10.2 EXISTING ENVIRONMENT

Mullaghcrone Quarry is located in a semi-rural to industrial area in the townland of Cruicerath and Platin, which is approximately 600m to the east southeast of Donore Village. Donore is located approximately 40km north of Dublin City Centre, between the M1 National Motorway and the N2 National Primary Routes. The Village is situated approximately 18km from Navan, 4km from Drogheda and 18km from Balbriggan. Mullaghcrone Quarry is accessed from local county roads (L1061 & L5612) and the quarry lies approximately 1km to the east of the village of Donore.

The Mullaghcrone site has been operated for rock extraction since the original planning permission was granted by Meath County Council in 1978. The effects of noise and vibration as pertain to the proposed activities, are examined in this assessment.

Noise monitoring at N1 to N4 was conducted as part of the waste permit, previously granted by Meath County Council at Mullaghcrone Quarry, demonstrated that all noise levels measured were below 55LAeq over that past 6-7 years.

10.2.1 Baseline Noise Survey

A baseline noise survey was carried out on 18th August 2010 in order to quantify the noise climate in the area of the existing Mullaghcrone Quarry, County Meath. Six noise monitoring locations were assessed in this regard. The noise survey was undertaken so as to quantify existing noise levels in the area, and to quantify potential impact of the waste license, on the local noise climate.

10.2.2 Methodology

A Larson Davis 824 Type 1 sound level meter was used to monitor noise levels. Monitoring and interpretation of acquired data was carried out in line with the following standards:

The following conditions were adhered to in undertaking the survey:

- Measurement of noise levels was undertaken using Type 1 instrumentation;
- Cognisance was taken of the EPA's 'Environmental Noise Survey Guidance Document' 2003;
- The survey was carried out in accordance with ISO 1996 Acoustics - Description and Measurement of Environmental Noise: Parts 1/2/3.
- British Standard: BS 7445 Part 1: (ISO 1996-1: 1982) *Description and measurement of Environmental Noise Part 1. Guide to quantities and procedures.*
- British Standard: BS 7445 Part 2: (ISO 1996-2: 1987) *Description and measurement of Environmental Noise Part 2. Guide to the acquisition of data pertinent to land use*
- British Standard: BS 7445 Part 3: (ISO 1996-3: 1987) *Description and measurement of Environmental Noise Part 3. Guide to application of Noise limits.*

30 minute noise surveys were carried out during the daytime period at all noise monitoring locations described below. Night period noise was not assessed, as there is no existing/expected requirement for night period operations.

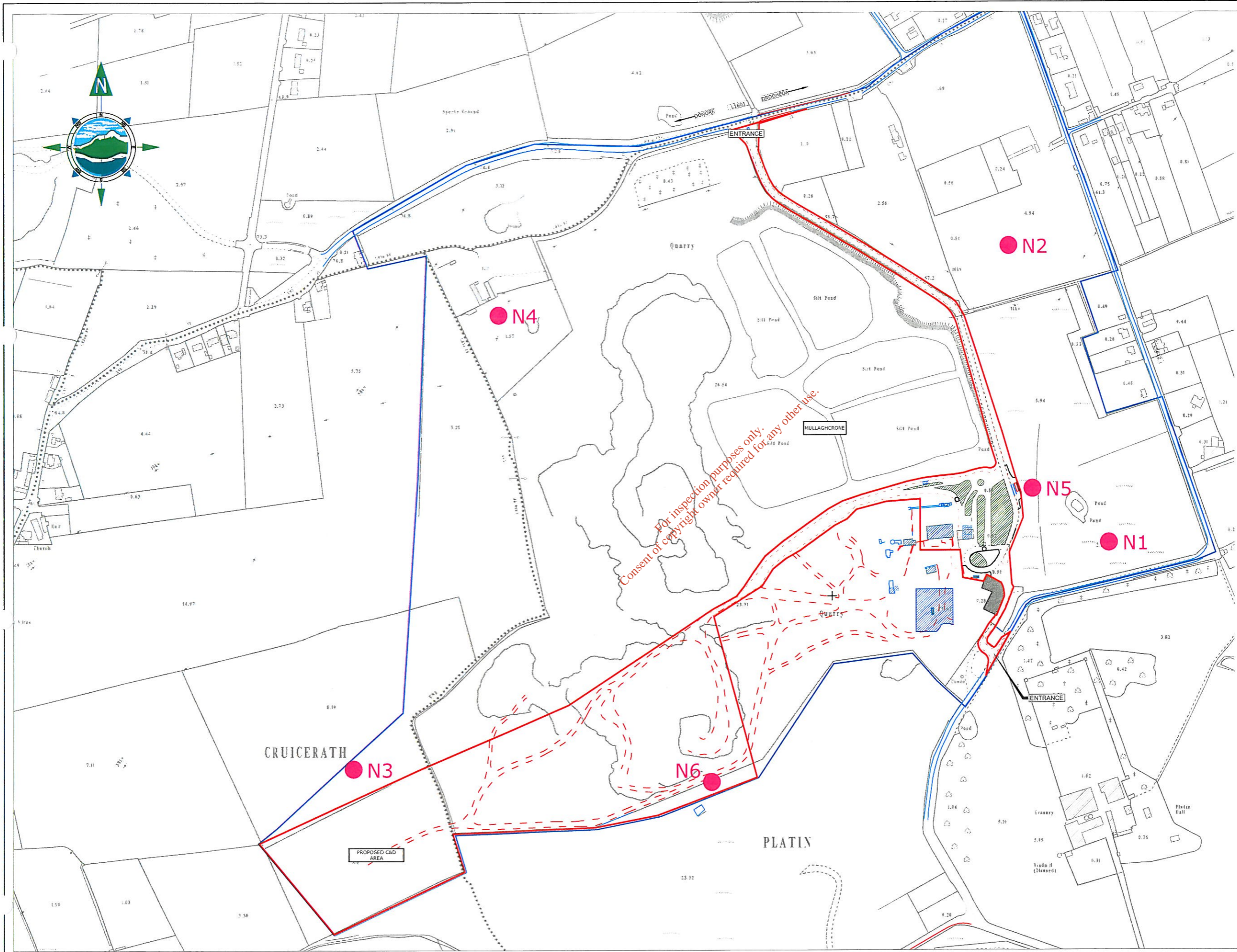
10.2.3 Noise Monitoring Locations

Six noise monitoring locations were assessed. These are N1 to N6 as per Figure 10.1.

- N1 is located at the southeast section of the site.
- N2 is located in the northeast section of the site.
- N3 is located in the southwest section of the site.
- N4 is located in the northwest section of the site.
- N5 is located adjacent to the weighbridge and operations offices within the site. (As per Fig 10.1)
- N6 is located along the southern site boundary, adjacent to the proposed C&D site.

At each of the monitoring locations the following data was recorded.

- $L_{(A)eq}$: Equivalent Continuous A-weighted Sound Level. The continuous steady noise level, which would have the same total A-weighted acoustic energy as the real fluctuating noise measured over the same period of time.
- $L_{(A)10}$: The noise level that is equalled or exceeded for 10% of the measurement period.
- $L_{(A)90}$: The noise level that is equalled or exceeded for 90% of the measurement period.



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A	28 03 11	ISSUE D1 CR PERMIT REVIEW	MN	JD



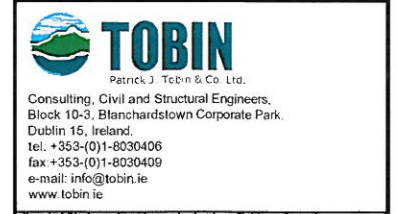
Project: **MULLAGHCRONE WASTE LICENSE APPLICATION**

Title: **NOISE MONITORING LOCATIONS**

Scale @ A3: **1:5,000**

Prepared by: **M. Nolan** Checked: **J. Dillon** Date: **March 2011**

Project Director: **D. Grehan**



Drawing No: **FIGURE 10.1** Issue: **B**

10.2.4 Baseline Survey Results

The results of the baseline survey are as described in Table 10-2 below.

Table 100-2 Mullaghcrone Quarry Noise Monitoring Results 2010

Location	Time	L _{Aeq} dB	L _{A10} dB	L _{A90} dB	Weather	Notes
N1	09:11	46.5	49	42.4	Calm/dry	Passing road traffic, aircraft overhead, foliage noise, birdsong, quarry occasionally audible.
N2	09:52	44.3	46.8	37.8	Calm/dry	Distant Traffic, quarry workings and haul road traffic audible.
N3	11:21	41.9	43.7	36	Calm/dry	Quarry audible, slight breeze, distant traffic and adjoining Irish Cement activities audible.
N4	10:39	45.4	47.2	40	Calm/dry	Quarry, breeze, distant agricultural machinery and house alarm audible.
N5	08:35	54.8	56.7	49.3	Calm/dry	Trucks at weighbridge & internal haul road, Quarry operation audible.
N6	11:57	49.5	52.4	40.3	Calm/dry	Activities on adjoining Irish Cement site audible, Breeze audible.

10.3 TARGET CRITERIA

10.3.1 Noise:

The waste license operation will be a daytime activity with no Sunday work. For outdoor noise at residential properties the basic criterion for day-time noise levels normally lies in the range of 45 - 55 dB (A) (Ref. EPA's *Guidance Note For Noise In Relation to Scheduled Activities*, 1995). For this proposed operation the day-time noise levels shall be kept below an L_{eq} 1 hour value of 55 dB (A) at all sensitive residences.

10.4 POTENTIAL IMPACT

For deposition operations such as the soil and stones restoration; noise predictions for the operational phase of the activity have been made by using the BS 5228 standard. By using typical plant (earth movers, HGV's) as input for these calculations and taking local geography into account accurate noise impact assessments have been compiled.

The plant considered and the predicted noise impact at the closest sensitive receptors (domestic dwellings) arising from the proposed works are as described in Table 10-3 below.

Table 10-3 Mullaghcrone Quarry predicted noise impact

BS5228 Calculations	Estimated Waste license noise levels at varying distances LAeq 1 hour		
	400m	525m	800m
Plant			
Dump Truck	51	48	43
Road Lorry	32	29	24
Crusher	52	49	44
Tracked Excavator	47	44	39
Combined Level LAeq 1hour	52	49	45

Predicted noise levels have been assessed using the methodology described in BS: 5228: Noise and control on construction and open sites, 1997. Predictions are based on typical equipment used during expected activities on site. Predictions are based on a LAeq1hour value with all machinery listed above operating for a continual period of 1 hour.

This may be considered a worst-case scenario as machinery may operate for shorter periods and may not work simultaneously. Additionally, calculations are based on minimum distances between site activities and the nearest noise sensitive locations.

The closest sensitive receptors to the proposed area of works are a row of newly build detached homes to the northwest of the quarry. These houses are closest to noise monitoring location N3.

Noise levels at location N3 are as per Table 10-2 and are inclusive of noise from all current activity on site at present. The cumulative worst case scenario noise impact at the closest sensitive receptor to this point will be 52dB LAeq. This is below the target criterion of 55dB LAeq for day time activity. No night period works are proposed.

Noise monitoring at N1 to N4 was conducted as part of the waste permit, previously granted by Meath County Council at Mullaghcrone, demonstrated that all noise levels were below 55LAeq over that past 6-7 years.

10.5 MITIGATION MEASURES

With regard to construction activities, all plant items used during the construction phase should comply with standards outlined in 'European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations, 1998. Reference should be made to BS5228: Noise control on construction and open sites, which offers detailed guidance on the control of noise from construction activities.

It is proposed that various practices be adopted during construction, including:

- Appointing a site representative responsible for matters relating to noise;

- Establishing channels of communication between the contractor/developer, Local Authority and residents;

Furthermore, it is envisaged that a variety of practicable noise control measures will be employed. These may include:

- Selection of plant with low inherent potential for generation of noise and/or vibration;
- Siting of noisy plant as far away from sensitive properties as permitted by site constraints.
- Anti vibration mounts on reciprocating plant.

10.6 RESIDUAL IMPACT

Noise levels are predicted to be comfortable within the applicable target criterion of 55dB L_{Aeq} daytime. There is no significant vibration impact associated with the proposed activities. As such the predicted residual impact is expected to be a slight, long term noise impact. Site activities will be effectively managed to ensure that all potential noise and vibration impacts are minimised to acceptable levels. There are no significant adverse or unacceptable noise or vibration impacts predicted at local sensitive receptors or on local livestock in the vicinity of the site as a result of the proposed waste license.

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11 MATERIAL ASSETS

11.1 INTRODUCTION

Material assets are those resources available to the local community. This section focuses on the impact of the working of the Mullaghcrone Waste Licence application on waste production, treatment and disposal.

The use of the local road network, which is a significant consideration on material assets, is dealt with specifically in Section 13 of this EIS.

11.2 WASTE PRODUCTION, TREATMENT AND DISPOSAL

11.2.1 Introduction

This section considers the solid waste that will be generated during the operation of the site.

11.2.2 Characteristics of the Proposed Development

This section summarises the characteristics of the site that are relevant to the consideration of waste management.

Waste Acceptance Procedures

The proposed waste acceptance procedures are outlined in Section 2 of the Environmental Impact Statement. Prior to any material being accepted at the site, a contract will have to be entered into by the developer/builder and Roadstone Wood Ltd to ensure that the following is agreed between the parties:

1. Only segregated waste is delivered to the site;
2. Only wastes of the classes specified are to be delivered to site; and
3. Penalties and actions should the above conditions not be met.

The material delivered to the site for recycling will be examined on entry into the site. This will ensure that only segregated waste as per the waste permit is brought to the site. If this is not the case, it will be returned to its source for segregation or sent to a licensed landfill. The cost of this will be charged to the customer at a premium price to ensure that this does not occur again.

Following inspection, the material will be stockpiled according to type. Once sufficient volume of material is on-site a mobile crusher, already operating on-site, will be used to process the material.

All customer records are kept on file for 5 years as per Roadstone Wood ISO 9001:2000 certification.

A record of all material arriving at the facility, including the following information:

- Date;
- Time;
- Owner Truck;
- Truck Licence Plate No.;
- Type of Material;

- Origin of Material;
- Quantity of Material

All imported materials will be inspected as it enters the site. It will also be inspected when tipped in the C&D Processing Area and Soil and stones area.

On arrival, the haulage trucks will inspected at the weighbridge. As discussed in Section H.2 above, The Deputy Facility Manager/Machine Operative will inspect each load, as it is being deposited, to ensure the material is fully compliant with the Waste Licence. If the material is non-compliant, the Deputy Facility Manager/Machine Operative will insist that the material is reloaded onto the haulage truck and removed from the site, for authorised disposal elsewhere.

Once the haulage trucks deposit their material, the excavator will shift the inert material, from where it is deposited by the haulage trucks, and spread it over the area of the deposition site, in compliance with the Waste Licence Application Drawings. If waste objects are identified within the inert material, whilst moving/reclaiming the material, which are not compliant with the Waste Licence they will be removed and transported to the Waste Quarantine area.

Waste Handling

The Waste Facility proposed under this Licence Application, is a very simple 'Material Recovery Facility. The proposed works involve the acceptance of inert Construction & Demolition material and the importation of soil and stones for restoration/reclamation.

Waste Quarantine Areas

If inappropriate material is identified during inspection, it will be removed to a waste quarantine area before removal from site to an appropriate waste licence facility. It is proposed to use skips on an existing hardstand area for storage of quarantine rejected waste.

Laboratory Testing

Laboratory testing of soil, surface water and groundwater will be undertaken off-site at an ILAB/UKAS accredited laboratory. Any validation testing and laboratory testing required to confirm classification of waste as inert will also be undertaken by the same laboratory. All samples taken on-site will be forwarded to the laboratory and test results will typically be forwarded to site within ten working days.

11.2.3 Potential Impact of the Proposed Development

There is the potential for impacts to arise from importation of inappropriate materials and accidental spills on site. Examples of this would be poor housekeeping, or loss of containment. The impacts in any event are unlikely to be significant. A good environmental management system is already in place to prevent and to react to any potential situations that may arise.

The loss of containment of fuel presents a potential impact on soil and or ground water. Due to the small quantities and types of fuel to be used at the site coupled with over 40 years of experience at Mullaghcrone quarry, the risk of loss of containment or oil spill is considered to be low.

12 CULTURAL HERITAGE, ARCHAEOLOGY & ARCHITECTURAL HERITAGE

12.1 INTRODUCTION

The application area is located within the existing Roadstone Wood quarry site at Mullaghcrone, Donore, Co. Meath. The existing site is located in the townlands of Platin and Cruicerath, which is approximately 1.15km south-east of Donore Village, County Meath. The site boundary is within the south-western area of Mullaghcrone Quarry (see Figs. 12.1 and 12.2). The application area consists of a large rectangular area (11.8 hectares), bordered by a soil and stones landscaping/restoration area to the south (Irish Cement area) and by quarry activities to the north. Agricultural land forms the western boundary of the site. The proposed application is for a 1,200,000 m³ waste license (soil and stones,) to restore the area to a maximum elevation of 83mOD. Material will be transported to the site along two local access routes. The northern route, the Donore Road, extends from the M1 Rathmullan interchange west to the quarry entrance. The southern route extends from the M1 Platin interchange, south along the Duleek road and then along the Platin to Cruicerath road to the southern entrance.

An established waste permit facility operation is already in place at Mullaghcrone Quarry under the previous waste permits, with all the necessary infrastructure and environmental management measures in place to minimise the environmental impacts of such an operation.

Outline of Scope of Works

This report has been undertaken to assess impacts on the cultural heritage of the proposed waste licence facility described above. A wide variety of paper, cartographic, photographic and archival sources were consulted. All the lands of the proposed development and the surrounding area were visually inspected.

This study is an assessment of the known or potential cultural heritage resource within a specified area consisting of a collation of existing written and graphic information in order to identify the likely context, character, significance and sensitivity of the known or potential resource using an appropriate methodology (EPA 2002 and 2003). The items of cultural heritage assessed in this study are confined to material assets.

The study involved detailed investigation of the cultural heritage including the archaeological, structural and historical background of the proposed development site and the surrounding area up to 500m from the development (see Fig. 12.1). This area was examined using information from the:

- Record of Monuments and Places (RMP) of County Meath;
- Meath County Development Plan 2007-13, including the Record of Protected Structures;
- Topographical and Correspondence files and finds list of the National Museum of Ireland;
- Aerial photographs;
- Previous excavation reports;
- Cartographic; and
- Documentary sources.

A field assessment was carried out on the 5 October 2010 to identify and assess any known archaeological sites and structures and previously unrecorded features and possible finds within the proposed application area and local access routes.

An impact assessment and mitigation strategy has been prepared. An impact assessment is undertaken to outline potential adverse impacts that the proposed development may have on the cultural resource, while a mitigation strategy is designed to avoid, reduce or offset such adverse impacts.

Consultations

In the course of producing this document consultations were carried out with the National Monuments Section of the Department of the Environment, Heritage and Local Government and all issues raised have been addressed by the assessment.

12.2 BASELINE DATA: THE EXISTING CULTURAL HERITAGE ENVIRONMENT

The Landscape

The site is situated in north-east Co. Meath to the south-east of the village of Donore and directly south of the Rathmullan to Donore road. It is situated between 60-90m in flat to undulating lowland. The soil of the development area is a grey brown. The bedrock is limestone and calcareous shale (Gardiner and Radford 1980; McConnell and Gatley 2006).

Historical and archaeological development of the study area

The following is a brief summary of the archaeological and historical development of the study area and the main types of sites and monuments that are known from the surrounding landscape. The information is drawn from the assessment. It is intended to indicate the types of sites and monuments known to be present in the study area as well as the pattern of landholding and to place this material in its cultural heritage context. The development is situated in the parishes of Donore and Duleek and the barony of Lower Duleek.

Prehistoric Period

There are no prehistoric sites or monuments known from the study area. However a Neolithic house (Ref 04E1551) was found to the south in Carranstown townland during archaeological monitoring in 2003. The site consists of a rectangular area measuring 7.6m x 4.8m defined by foundation trenches for wooden walls.

Bronze Age material has been found to the south of the proposed development in Carranstown where a series of Fulachta Fiadha (03E0790 and 05E1324) have been found along the northern bank of a stream. North of this a Bronze Age barrow (03E1347) and additional Fulachta Fiadha (02E1306) have been found and a Ring-ditch was uncovered in 2004 (04E0714). This indicates substantial prehistoric activity in the study area.

Early Medieval Period

By the eighth century AD the Southern Ui Neill had become overlords of the Kingdom of Brega, extending over Meath, North Dublin and South Louth and ruled the vassal septs of the Luigni, Gailenga

and the Ciannachta, who occupied the study area (Byrne 2001, 68-9). The Ciannachta occupied land on both sides of the River Boyne and are noted in the Annals from the sixth century. Byrne suggests that they had come from Co. Derry and had been settled on lands conquered by the Ui Neill.

Classically settlement in the Early Medieval period is indicated by the presence of enclosed farmsteads known as ringforts. However, there are no definite ringforts recorded in the study area. An unclassified earthwork in Cruicerath townland (ME027-002---) is the only site that could plausibly be a ringfort.

Medieval Period

The first appearance of the Anglo-Normans in the study area was in 1171 when Milo de Cogan plundered Duleek but was driven off by the Vikings of Dublin. In the following year King Henry II granted the Kingdom of Meath to Hugh de Lacy to hold as King Murrough O Melaghlin, King of Meath, had held it (Otway-Ruthwen 1980, 52). De Lacy established a manor at Duleek and constructed a motte castle. In 1182 de Lacy granted the church of St. Cianan of Duleek and its lands to the Priory of Llanthony Secuna of Gloucester. The lands of Duleek Abbey included Platin townland in which the application area is situated.

Sir John D'Arcy was appointed Lord Chief Justice of Ireland by King Edward II in 1328. He married Lady Jane Burke (De Burgo), daughter of the Earl of Ulster and his son William D'Arcy, made his seat at Platten (Platin). The Darcy's occupied Platin until c.1690. When Simon Flemmyng, Baron of Slane, died in 1370 he possessed the manor of Dyuelek (Duleek) which was inherited by his son Stephen Flemmyng (*Calendar of Patent Rolls A.D. 1370-1374*, 247).

Medieval Settlement

The process of sub-infeudation is normally associated with the construction of timber castles, known as Motte and Baileys. These earthwork fortifications were used to house and defend the Norman lords and their retinues while they set about the process of pacifying and organizing their new fiefs. Hugh de Lacy's motte castle was situated in Commons townland to the north-east of Duleek, but does not survive.

Manorialism describes the organisation of the feudal rural economy and society characterised by the vesting of legal and economic power in a Lord supported economically from his own direct landholding and from the obligatory contributions of a legally subject part of the peasant population under his jurisdiction. In Ireland the Lord's Manor House was also sometimes enclosed by a rectangular moat and these sites are referred to as moated sites. They are a useful indicator of Anglo-Norman settlement. However, there are no moated sites known within the study area.

The Later Medieval Period

The fifteenth century was characterised by the decline of Anglo-Norman power in Ireland which had been ebbing since the early fourteenth century. Part of the response to this was the construction of masonry Tower Houses which sprang up after King Henry VI introduced a building subsidy of £10 in 1429 (Sweetman 1999, 137). There are no surviving tower houses in the study area but the Darcy castle at Platin was presumably a tower house.

The Post-Medieval Period

Until 1540 the manor of Newton (Newtown) comprising the manors of Carreston (Carranstown) and Platen (Platin) was part of the Monastery of Duleek which belonged to Llanthony Abbey. Carreston was let to Richard Bysset and Platen was let to William Darcy (MacNiocaill 1992, 31, 32). The Civil Survey of 1656 records that in 1640 Nicholas Darcy of Platten had Great Carranstowne (Carranstown), and Platen (Platin) which contained a castle. Cruicerath was held by Stephen Cormacke and Staleing (Stalleen) was held Charles Lord Viscount Moore (Simington 1940). On 19 December 1641 the Old English of the Pale met at Nicholas Darcey's house at Platin to write a petition of grievances to King Charles I and a statement of why they had risen in rebellion (Clarke 2000, 188-9). By the later nineteenth century Cruicerath was held by the Netterville family and Platin was held by the Gradwell family (Source, Co. Meath Landowners 1873-5).

Structures

Protected Structures

The Record of Protected Structures in the Meath County Development Plan 2007-13 was examined. There are three Protected Structures in the study area.

1. MH020-113 R 14402003 Donore Parochial House
Cruicerath Donore Parochial House Detached three-bay two-storey parochial house, built c.1840, with gabled bay and gablet. Pitched slate roofs with red brick chimney stacks. Square limestone walls with carved limestone plaque.
2. MH020-114 R 14402002 Saint Mary's Roman Catholic Church
Cruicerath Donore Church (R.C) Detached gable-fronted church, built c.1840, flanked by recessed bays. Four-bayside elevations to the nave. ashlar limestone gate piers surmounted by cast-iron finials, with pair of cast-iron gates. Former school to site.
3. MH020-112 R 14402001 Detached House Stalleen Donore House (detached)
Detached four-bay two-storey house, built c.1880, with gabled porch. Hipped slate roof with render brick chimneystacks. Rubble limestone walls with dressed stone quoins having red walls to porch.

The closest Protected Structure, the Donore Parochial House, is situated more than 490m north-west from the proposed development. The structures are too distant to be directly or indirectly impacted by the proposed development.

National Inventory of Architectural Heritage (NIAH)

The NIAH prepared by the DEHLG was examined at www.buildingsofireland.ie. There are no additional structures in the study areas listed in the Inventory.

Non-designated Structures

Non-designated structures within 100m of the application area and along the site access road indicated on the 1909 edition of the OS six inch map were visited. There are no structures on the 1909 edition within 100m of the application area. There are two access roads that lead to and from the site. The northern access road, the Donore Road, extends from the M1 Rathmullan interchange west to the quarry entrance. The southern access extends from the M1 Platin interchange, south along the Duleek

road and then along the Platin to Cruicerath road. There are no structures situated along the southern access route. There are four structures along the Donore Road that are indicated with numbers and arrows on Fig. 12.3 and are described below.

1. Single storey L-shaped cottage with five visible windows and three chimneys. Close to the road but protected by a stone wall (see Fig. 12.4).
2. One storey cottage with five windows, two chimneys and a porch. Set back from the road and protected by a concrete wall (see Fig. 12.5).
3. Two storey four bay house with two chimneys. Close to the road but protected by a stone wall (see Fig. 12.6).
4. Two storey two bay house with entrance porch. Set well back from the road (see Fig. 12.7).

Structures 2, 3 and 4 are situated close to the road but are within a 50km speed limit zone and are protected by stone or concrete walls. Structure 1 is within the 80km zone and is protected by a concrete wall.

Impacts

Direct impacts

There are no designated or non-designated structures situated in the application area.

Indirect impacts

There are no impacts on designated structures. There are four non-designated structures indicated on the 1909 OS mapping along the Donore road site access route. However these structures are within either 50km or 80km speed limit zones and are protected by stone or concrete walls, so that traffic does not represent a potential indirect impact.

Archaeological Assessment

Cartographic Sources

The Down Survey of 1654, Ordnance Survey 1st and 3rd edition six inch maps of the area were examined. This analysis did not indicate any previously unrecorded archaeological sites or monuments in the application area.

Place name evidence

Carranstown *Originally Curranstown, town of the Currans*
 Cruicerath *Fort of the Cruise family.*
 Donore *The fort of pride*
 Platin *A small plateau or green*
 Stalleen *Little overhanging rock, craggy steep, precipice*

The English translations of the townland names of the study area presented above are based on Joyce 1870 and the Placenames Database of Ireland. The fort of Cruise family may be the earthwork site ME027-002---- in Cruicerath townland. There are no other cultural heritage sites indicated.

Aerial Photographs

Examination of the Ordnance Survey 1995, 2000 and 2005 series orthophotos as well as imagery from Google Earth did not indicate any additional sites.

National Museum of Ireland

Examination of the finds registers and topographical files held by the National Museum of Ireland revealed that no artefact discoveries from the study area have been reported to the National Museum.

Other sources

Examination of archaeological corpus works on prehistoric artefacts (Harbison 1969, Eogan 1965, 1983, 2000, Kavanagh 1991, Simpson 1990), and pottery (O'Riordain and Waddell 1993) and Iron Age material (Raftery 1984) did not reveal any additional material.

Previous excavations

Examinations of the *Excavations Bulletin* indicated that there have been two archaeological excavations carried out in the study area. They are summarised.

1. Cruicerath/Donore/Platin/Stalleen

Possible prehistoric landscape
304650 272519
07E1028

The bundled wastewater collection system is a development by Meath County Council to upgrade the sewerage network in Donore and seven other towns and villages in County Meath. Donore will have 3320 linear metres of network pipe trench excavated through four townlands over approximately seven months. A total of c. 3185m of trench will be excavated along existing roads, with the remaining 135m running along a gravel road. The wastewater treatment plant in Stalleen will also be extended and an outflow pipe will be constructed to the Boyne River. The development area is considered archaeologically significant because it is located within the Archaeological Ensemble of the Bend of the Boyne UNESCO World Heritage Site (UNESCO WHC No. 659).

Monitoring in 2007 consisted of a single engineer's test-pit; nothing of archaeological significance was observed. Works will continue in 2008.

2. Cruicerath

Medieval
30540 27140
03E0264

A programme of excavation was undertaken within the proposed westward extension of Platin Quarry in the townland of Cruicerath, located in north-east Co. Meath. The site is to the west of the present Irish Cement Ltd quarry at Platin, 5km to the south-west of Drogheda and 3km north-north-east of Duleek.

Topsoil removal was monitored (licence number 02E1716). The site was identified as a series of linear features associated with several pits. These features were associated with sherds of medieval pottery. It is suggested that the site comprises a truncated medieval settlement. The entire site is contained within a rectangular area 50m east-west by 20m and is located on a level area at the top of a south-facing slope.

Excavation was carried out between February and April 2003. Approximately 530 sherds of medieval pottery were recovered from ten features. No stratigraphic relationship can be formed between many of the features recorded. The depth of topsoil overlying this site was very shallow (maximum 0.2m), which has undoubtedly led to disturbance/truncation due to modern agricultural practices. However, the features all respect a common orientation. Two structures, three ditches, three irregular pits and a fulacht fiadh-type trough were excavated.

Structure 1 encloses a rectangular area c. 20m north-south by c. 9.5m. The main element of this feature has been interpreted as a 'drip trench', measuring 0.6-1.3m in width and c. 0.5m in depth. The trench contained five fills, which in turn contained various artefacts (iron, pottery and flint are all represented), the majority of which are medieval pottery sherds. No structural evidence was identified, therefore it is suggested that the feature has been heavily truncated by agricultural activity. It is possible that the structures constructed on this site comprise turf/sod-built walls, which have not been preserved. A shallow hearth (0.14m) to the north of this structure was also identified.

Structure 2 consists of a linear feature similar to the 'drip trench', comprising part of Structure 1; it is F-shaped in plan and is aligned east-west. It measures 14.2m east-west by c. 7m. Two phases have been identified. The first is a U-shaped cut (6m by 0.5m by 0.2m maximum) aligned east-west and forming the small bar of the 'F' shape. This is cut by a later, less regular, shallow cut (1.2-0.1m in width and 0.18-0.06m in depth). The fills of this feature contained medieval pottery.

Also found were ditches filled with various silts and the very occasional sherd of medieval pottery. The profile of these ditches was predominantly V-shaped, and measured c. 1.5m maximum in width and c. 0.5m in depth. They formed boundaries between the structures and also formed the northern limit of the site.

Three features provisionally interpreted as pits have been recorded. They contained stone, charcoal and pottery. They had a maximum length of c. 8.2m and depth of c. 0.4m.

A fulacht fiadh-type trough measuring 1.7m by 0.52m by 0.21m was aligned north-east/south-west. It had vertical edges and a flat base and contained burnt-spread material. No other burnt-spread material was identified on-site.

Initial analysis of the morphology of the features recorded shows some similarities with other medieval rural settlement sites, although detailed comparisons have not yet been undertaken. The material recovered from the site, in particular the pottery sherds, has been provisionally dated to the 13th/14th centuries. No earlier or later pottery has been recovered from the sealed

contexts on the site. This indicates the strong possibility that the site fell into disuse after the 14th century.

Field Inspection

Field inspection was carried out on the 5 October 2010. This involved an inspection of all the lands included within the application area and the immediate surrounding area. The application area consists of a sub-rectangular field (area 1, see Fig. 12.2) at south-west and the quarry void (Area 2) at east. The surface of area 1 has been raised by the addition of 5-10m depth of soil and stones (see Figs. 8 and 9). There is no cultural heritage material visible at ground level in area 1. Area 2 is the large quarry void which has been partially filled with inert material (see Figs 12.10 and 12.11). There is no cultural heritage material visible at ground level in area 1.

12.3 SIGNIFICANT IMPACTS

Direct impacts

The development will have no direct impact on any known items of cultural heritage, archaeological sites, monuments or artefacts or designated or undesignated structures.

Indirect impacts

The development will have no indirect impacts on any known items of cultural heritage, archaeological sites, monuments or artefacts or designated or undesignated structures.

Interaction with other impacts

No interactions were identified during the assessment.

'Do nothing' impact

If the proposed development were not to proceed there would be no negative impact on the cultural heritage.

'Worst case' impact

In the worst case scenario, the proposed development might disturb previously unknown deposits or artefacts without preservation by record taking place.

12.3 MITIGATION MEASURES

Direct impacts

No direct impacts warranting specific mitigation were identified during the course of the cultural heritage assessment

Indirect Impacts

No indirect impacts warranting specific mitigation were identified during the course of the cultural heritage assessment

List of References Consulted

- Byrne, F.J. 2001. *Irish Kings and High Kings*. Dublin.
- Clarke, A. 2000. *The Old English in Ireland, 1625-42*. Dublin.
- DAHGI 1996. Recorded Monuments Protected under Section 12 of the National Monuments (Amendment) Act, 1994. County Meath.
- DAHGI 2009. Code of Practice between the Irish Concrete Federation & the Minister for the Environment, heritage and Local Government.
- Eogan, G. 1965. *Catalogue of Irish Bronze Swords*. Dublin.
- Eogan, G. 1983. *Hoardings of the Irish Later Bronze Age*. Dublin.
- Eogan, G. 2000. *The Socketed Bronze Axes in Ireland*. Prähistorische Bronzefunde, abteilung IX, band 22.
- EPA 2002. *Guidelines on the information to be contained in Environmental Impact Statements*.
- EPA 2003. *Advice Notes on Current Practice in the preparation of Environmental Impact Statements*.
- Gardiner, M.J. and Radford, T. 1980. *Soil Associations of Ireland and Their Land Use Potential*. *Soil Survey Bulletin No. 36*. Dublin. An Foras Taluntais.
- Harbison, P. 1969. *The axes of the Early Bronze Age in Ireland*. Prähistorische Bronzefunde, abteilung IX, band 1.
- Heritage Council 1999. *The role of the Heritage Council in the Planning Process*. Kilkenny.
- Joyce, P.W. 1870. *Irish Local Names Explained*. Dublin.
- Kavanagh, R.M. 1991. A reconsideration of razors in the Irish earlier Bronze Age. *Journal of the Royal Society of Antiquaries* 121, 77-104.
- MacNiocaill, G. 1992. *Crown Surveys of lands 1540-41*. Dublin.
- Meath County Council 2007. *Meath County Development Plan 2007-13*. Meath.
- Moore, M. 1987. *Archaeological Inventory of County Meath*. Dublin.
- Morrin, J. 1861. *Calendar of Patent and Close Rolls, Vol I -II*. London.

- O'Flaherty, R. 1995. "An analysis of Irish Early Bronze Hoards containing copper or bronze objects." *Journal of the Royal Society of Antiquaries* 125, 10-45.
- O'Riordain, B and Waddell J. 1993. *The Funerary Bowls and vases of the Irish Bronze Age*. Galway.
- Orpen, G.H. 1911-20. *Ireland under the Normans*. 4 Vols. Oxford.
- Otway-Ruthven, A.J. 1980. *A History of Medieval Ireland*. London.
- Raftery, B. 1984. *La Tene in Ireland*. Marburg.
- Simpson, D.D.A. 1990, The stone battle axes of Ireland, *Journal of the Royal Society of Antiquaries* 120, 5-40.
- Simington, R.C. 1940. The Civil Survey A.D. 1654-56 County of Meath Vol. V, Dublin.
- Sweetman, H.S. 1875. *Calendar of Documents Relating to Ireland in her majesty's Public Record Office, London, 1171-1251*. London.
- Sweetman, D. 1999. *The Medieval Castles of Ireland*. Dublin.
- Topographical Files, Co. Meath. National Museum of Ireland.
- Waddell, J. 1990. *The Bronze Age burials of Ireland*. Galway
- Waddell, J. 1998. *The Prehistoric Archaeology of Ireland*. Galway.
- White. N.B. 1943. *Extents of Irish Monastic Possessions 1540-41*. Dublin.

13 TRAFFIC AND ROAD ASSESSMENT

13.1 INTRODUCTION

TOBIN Consulting Engineers Ltd. has been appointed by Roadstone Wood to carry out a road and traffic assessment for a proposed waste license for an existing waste permit area within Mullaghcrone Quarry, Donore, Co. Meath. This assessment forms part of an Environmental Impact Statement (EIS) for the site which is being submitted for the purposes of acquiring a waste license.

In preparing this report, TOBIN Consulting Engineers has made reference to

- The National Roads Authority (NRA) 'Traffic and Transport Assessment Guidelines' 2007;
- The NRA 'Future Traffic Forecasts 2002 to 2040';
- Geometric Design Guidelines RT180 (Classification, Alignment, Cross Section);
- Meath County Development Plan 2007-2013;
- NRA TD 9/07; and
- NRA TD 41 - 42/09.

13.1.1 Objectives

The objective of this section of the EIS is to assess the impact the proposed waste licence facility at Mullaghcrone Quarry has with respect to traffic and the local road network. This section will calculate the expected volume of traffic that will be generated by the proposed facility and assess the impact that this traffic will have on the operational capacity of the road network in the vicinity of the development. In this case the quarry entrance onto the L1601, the quarry entrance onto the L5612 and the junction between the L5613 and R152 were analysed.

13.1.2 Methodology

An estimate of the number of truck movements into and out of the site was generated based on the quantities of materials that are proposed to be taken into the waste licence facility. The increase in vehicles leaving/arriving at the site were added to the existing flows and distributed onto the network. An analysis of the junctions referred to in paragraph 13.1.1 was undertaken based on these flows. The junctions have been analysed using the Transport Research Laboratory (TRL) computer program PICADY, a widely accepted tool used for the analysis of priority junctions.

The key parameters examined in the results of the analysis are the Ratio of Flow to Capacity Value (RFC value – desirable value should be no greater than 0.85 for PICADY, values over 1.00 indicate the approach arm is over capacity), the maximum queue length on any approach to the junction and the average delay for each vehicle passing through the junction during the modelled period.

PICADY requires the following input data:

- Basic modelling parameters (usually peak hour traffic counts synthesised over a 90 minute model period)
- Geometric parameters (including lane numbers & widths, visibility, storage provision etc)
- Traffic demand data (usually peak hour origin/destination table with composition of heavy goods vehicles input).

The results of the PICADY analysis are presented in section 13.3.2.2. The origin/destination traffic demand tables for all the different scenarios tested for the analysed junction are provided in Appendix 13.1 of this report.

13.2 EXISTING ENVIRONMENT

13.2.1 Site location

The existing Mullaghcrone Quarry is located in the townlands of Platin and Cruicerath Co. Meath. The quarry is less than 1km south east of Donore village and approximately 4km west of Drogheda, the two largest towns in the vicinity. Access to the quarry is provided by means of two priority entrances, one onto the Local Road L1601 and the other onto the Local Road L5612. The location of the quarry entrances is shown in Figure 12.1 below.

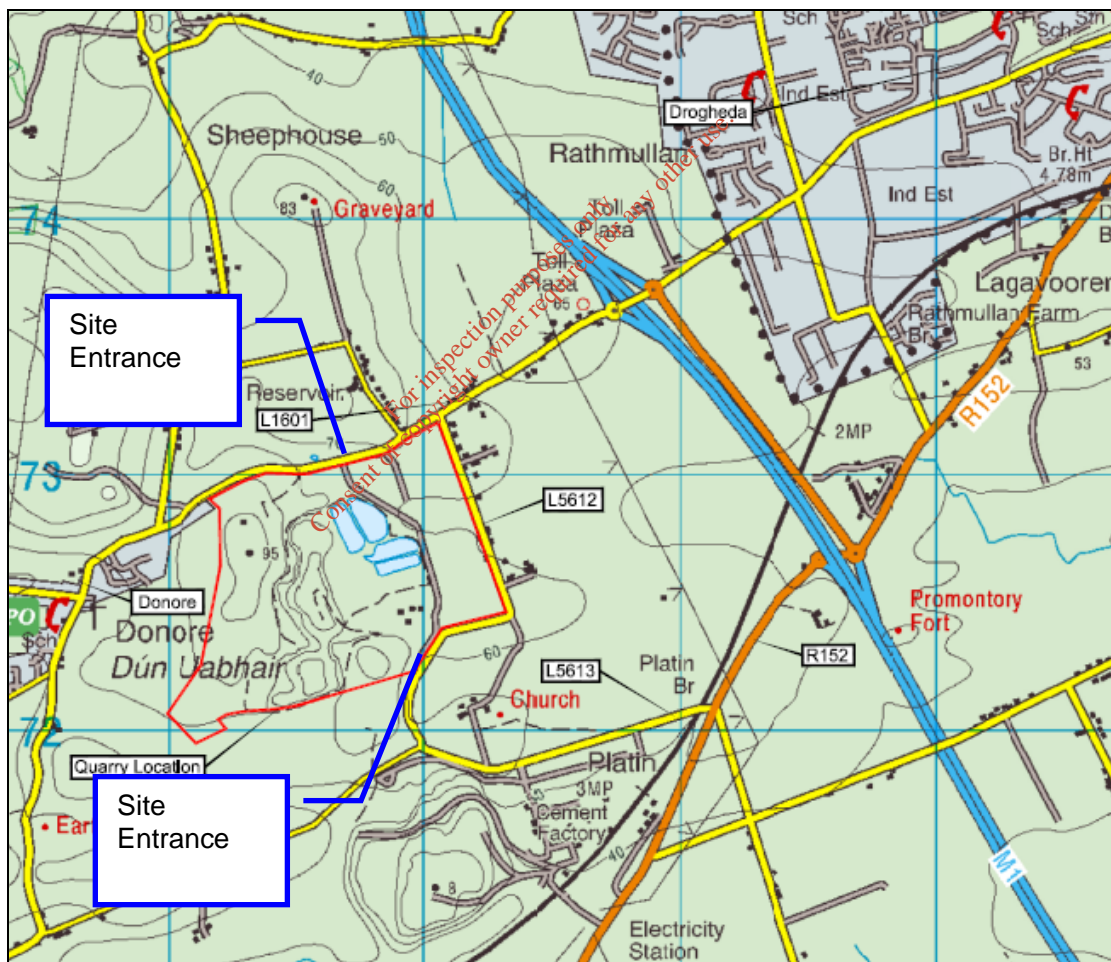


Figure 13 – Site Location

13.2.2 Description of Existing and Proposed Development

The Mullaghcrone Quarry is located on a land holding of approximately 94.8ha with a proposed activity area of approximately 15.3 ha. The planning permission allows for the extraction of 500,000 tonnes of material per year; however, the amount of material that is extracted depends on demand. This often results in an extraction rate lower than the permitted volume. The quarry previously had a waste permit, WMP 2006/19, which allowed for approximately 66,000 tonnes of soil and stones to be accepted per annum and has an existing waste permit, WFP/MH/11/003/01, which allows for 30,000 tonnes of construction and demolition waste material to be accepted per annum.

The waste licence being applied for is seeking to allow for an increase in the amount of waste that can be accepted by the quarry. The proposed waste licence is to allow for the acceptance of 100,000 tonnes per annum of soil and stones materials and 50,000 tonnes of construction and demolition waste materials.

13.2.3 Traffic Survey

In order to determine the magnitude of the existing traffic flows, TOBIN used the results of Manual Classified Traffic Surveys that were carried out by Abacus Transportation Surveys Ltd. The survey was carried out between the hours of 07.00 to 19.00 and distinguished between cars, buses, light good vehicles and heavy good vehicles. The count was carried out on Thursday 2nd September 2010 at the entrance to the quarry on the L1601 and the crossroads between the R152, L5613 and Gaffney Road.

The count indicated that the peak hours of flow occur between 8.30 and 9.30 in the morning and 14.15 and 15.15 in the afternoon at the quarry entrance. The percentage of HGV's using this junction was 9.3%. The peak hours of flow at the R152, L5613 and Gaffney Road Crossroads were between 8.00 and 9.00 in the morning and 17.45 and 18.45 in the evening. The percentage of HGV's at this junction was 8.5%.

Traffic Flows at the quarry entrance were determined using the count undertaken at the R152, L5613 and Gaffney road crossroads. It was assumed that all traffic turning onto the L5613 at this junction will follow the road to the entrance with HGV's turning into the entrance and light vehicles travelling past it in a northbound direction. Similarly, HGV flows emanating from the L5613 at the crossroads are assumed to have originated at the quarry entrance with light vehicles travelling past the entrance in a southbound direction. As a result the peak hours at this junction are the same as per the crossroads and the HGV percentage is 15.3%.

Details of the results of the survey are provided in Appendix 13.2 of this report.

13.2.4 Existing Road Network

The L1601 is a local road which links Donore to Drogheda. One of the two entrances into the quarry is located on the L1601 and quarry products destined for Drogheda use this entrance. The road has a carriageway width of approximately 7.4m in the vicinity of the entrance. This entrance is located within an 80km/h zone and, based on the standards set out in the NRA DMRB, a visibility splay of 2.4m x 160m is appropriate for this design speed. There is adequate visibility available to the left of the entrance however visibility to the right is somewhat restricted by vegetation. There are no pedestrian facilities or street lighting present at the entrance.

The alternative entrance to the quarry is located on the L5612. This entrance is generally used by vehicles travelling to/from destinations other than Drogheda. The L5612 has a carriageway width of approximately 5.6m and is located within an 80km/h speed zone. At the entrance, visibility to the right is in accordance with the NRA DMRB for this speed zone however visibility to the left is restricted by the L5612's horizontal and vertical geometry. Footpaths & street lighting are not present at this location.

The L5613 forms part of the same road as the L5612, and joins up with the R152 which provides access for vehicles wishing to use the M1 Motorway. The L5613 has a similar width to the L5612, generally being between 5 and 6m in width. The section of this road that is used by quarry traffic is within an 80km/h speed zone. There are no pedestrian facilities or street lighting present along this road.

The R152 is a regional road which connects Drogheda to Kilbrev (N2) and generally has a speed limit of 80km/h. This road is used by quarry vehicles to access the M1 Motorway to the north and the N2 to the south. The section of the road used by quarry vehicles is approximately 7m wide with 1m wide hardshoulders on each side and verges of varying width. At the junction between the L5613 and the R152, the appropriate visibility splay of 3m x 160m is currently not available to the right or left of the junction. The left visibility splay is restricted by a crest in the R152's vertical alignment visibility to the right is restricted by vegetation.

13.2.5 Proposed Road Improvements

No proposed road improvements were identified as being planned for the area.

13.3 POTENTIAL IMPACTS

13.3.1 Traffic Generation

The additional volume of traffic that will be generated by the proposed waste licence facility has been derived from the additional quantities of waste materials for which the waste licence is being sought. Permission is being sought for the acceptance of 150,000 tonnes of materials per annum. This quantity is broken down into 100,000 tonnes of soil and stones material and 50,000 tonnes of construction and demolition waste. The earthwork materials will be retained on site while the construction and demolition materials will be processed and subsequently leave the quarry.

The quarry is currently permitted to accept 30,000 tonnes of waste per annum under waste permit WFP/MH/11/0003/01 and this will be reflected in the traffic counts. As such the increase in quantities being accepted per annum are 100,000 tonnes of earthwork materials and 20,000 tonnes of construction and demolition waste.

Table 13.1 quantifies the number of additional trips expected to be generated by the acceptance of waste at the quarry.

ESTIMATED ADDITIONAL ONE WAY TRIPS GENERATED BY QUARRY				
Task	Quantity of Material (tonnes)	Trucks Per Annum	Trucks Per Day*	Trucks Per Hour*
Inert Soil and stones Materials	100,000	5,000	20	2.5
Construction and Demolition Waste Materials	20,000	1,000	4	0.5
Total		6,000	24	3

Table 13.1 – Estimated One Way Trips Generated by Quarry

* Rounded up to nearest whole number

Notes

20 tonnes per truckload assumed for quarry materials

48 operational weeks assumed for quarry

5.5 days per week assumed

9 hour day assumed

Additionally, the trips estimated in Table 13.1 above are one-way trips only. For every vehicle delivering waste to the quarry there will be a corresponding return trip. Construction and demolition waste will be processed and subsequently leave the site however it is expected that this process will make use of trucks that would otherwise be leaving empty. Taking account of this, the actual number of additional trips that are expected to be generated at the quarry entrances during the AM and PM peak hours are detailed in Table 13.2 below.

	AM Peak Hour		PM Peak Hour	
	Arriving	Departing	Arriving	Departing
Quarry Output	3	3	3	3

Table 13.2 – AM and PM Peak Hour Traffic Generated

No additional staff are to be employed as a result of the increase in accepted materials.

13.3.1.1 Trip Distribution

Vehicles travelling to and from Drogheda and other local markets will use the entrance onto the L1601. All other vehicles will use the entrance onto the L5612 / L5613 to reach the R152, where they will either turn south towards the N2 or north towards the M1. The proportions of the vehicles following these routes vary based on current demand. The additional trips being generated have been apportioned to

the two entrances based on the distribution surveyed by the traffic counts. Subsequent to their leaving the development, quarry vehicles are assumed to distribute as per the flows of HGV traffic identified by the traffic survey.

Figures 13.1 – 13.2 below show the distribution of traffic to and from the site and Figures 13.3 – 13.4 show the generated traffic volumes in both the AM and PM peaks.

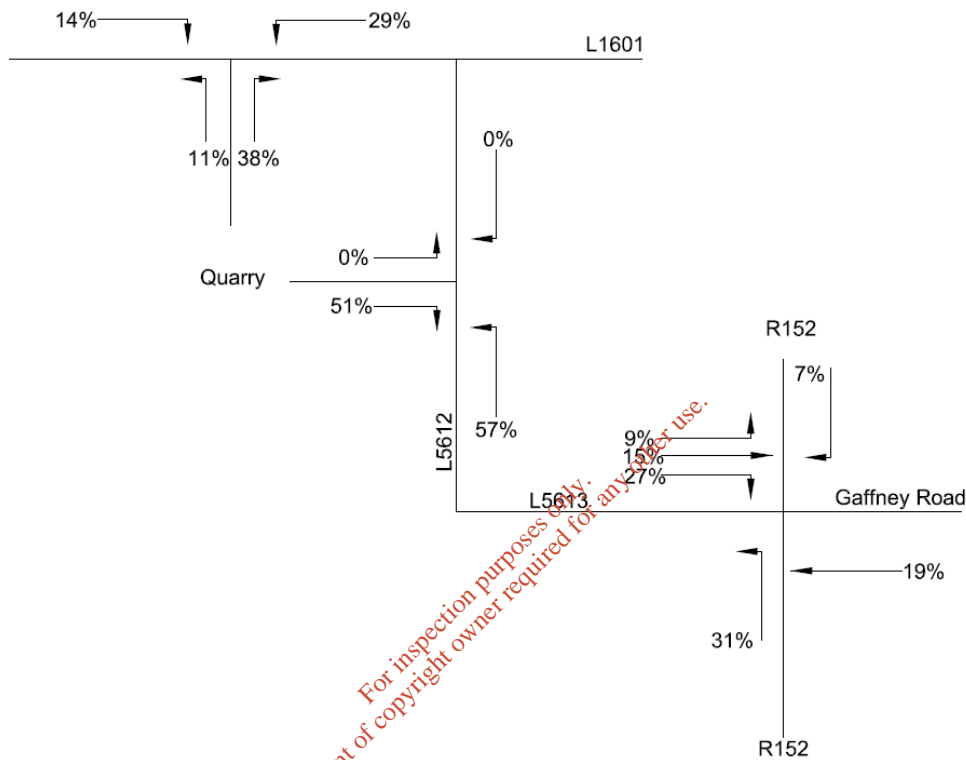


Figure 13.1 – AM Distribution

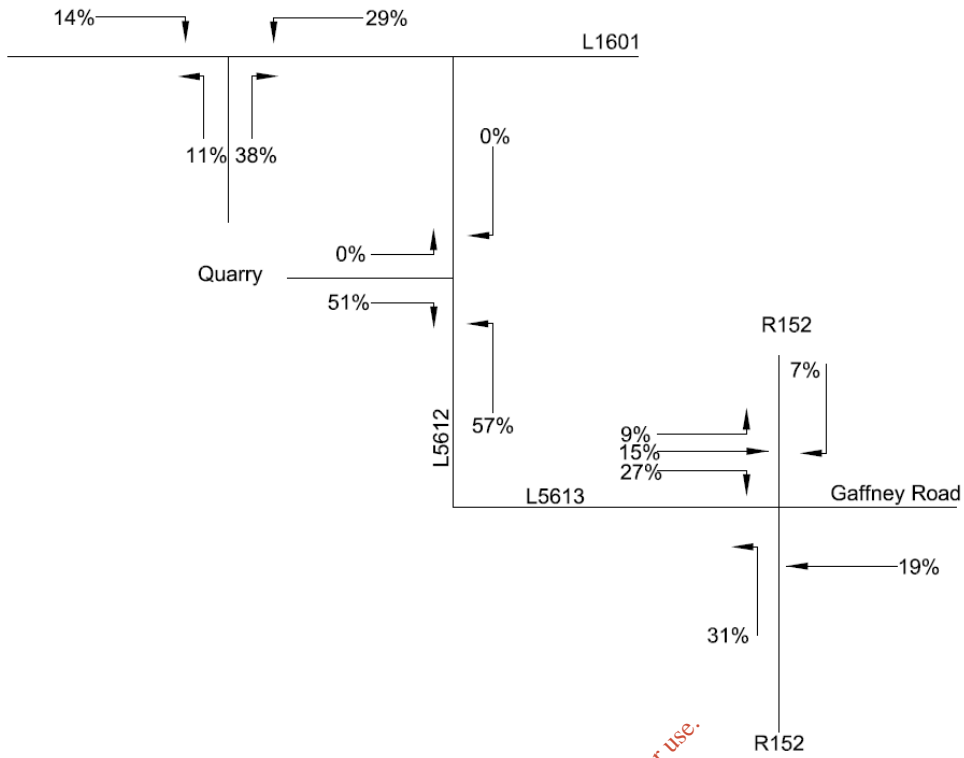


Figure 13.2 – PM Distribution

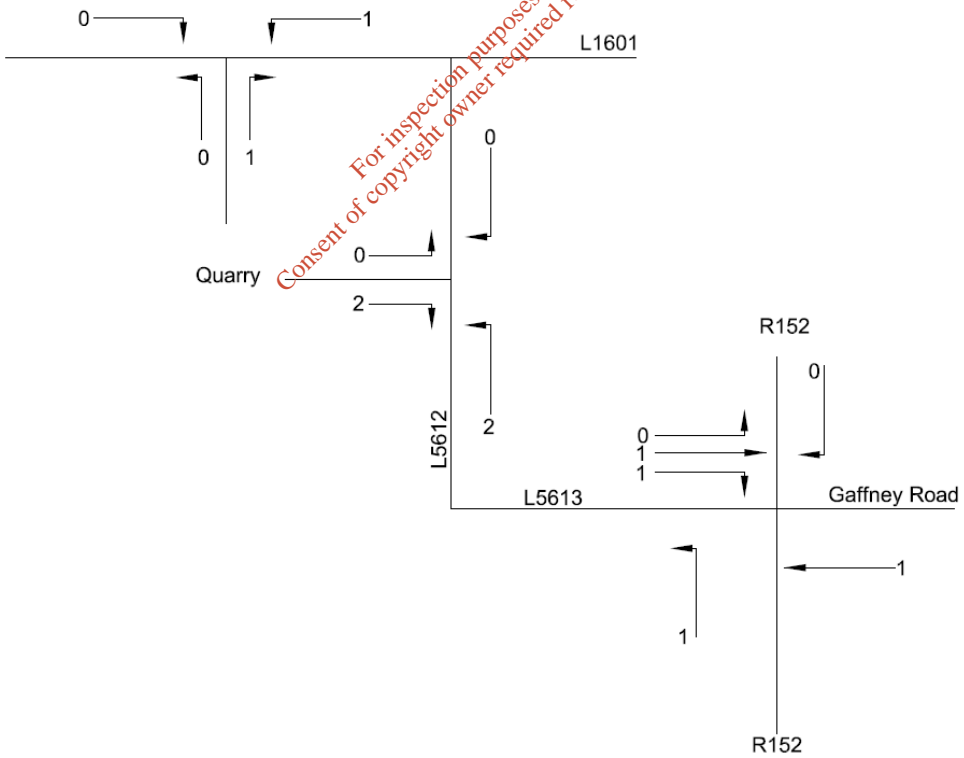


Figure 13.3 – AM Generation

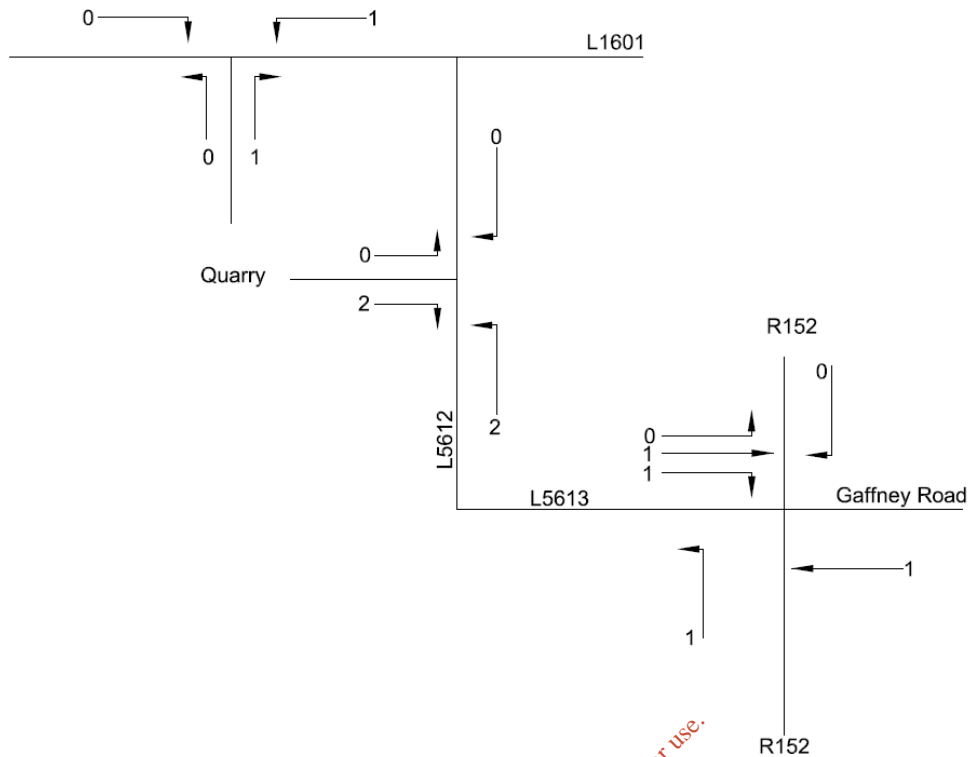


Figure 13.4 – PM Generation

13.3.1.2 Seasonal Adjustment

In order to undertake an analysis of the traffic flows, it may be necessary to apply a correction factor to convert the surveyed traffic flows into seasonally adjusted traffic flows to take account of the seasonal variation that is experienced with traffic surveys. These seasonally adjusted conversion factors were calculated from data taken from a fixed automatic traffic counter located on the M1 to the south of Dunleer during 2008. It was found that traffic volumes were higher during September than the average peak flows over the course of a year. Despite this, in order to produce a robust assessment, no correction factor has been applied. The seasonally adjusted traffic flows for the AM and PM Peaks are depicted in Figures 13.5 and 13.6 respectively. The percentage of HGV's is shown in parentheses.

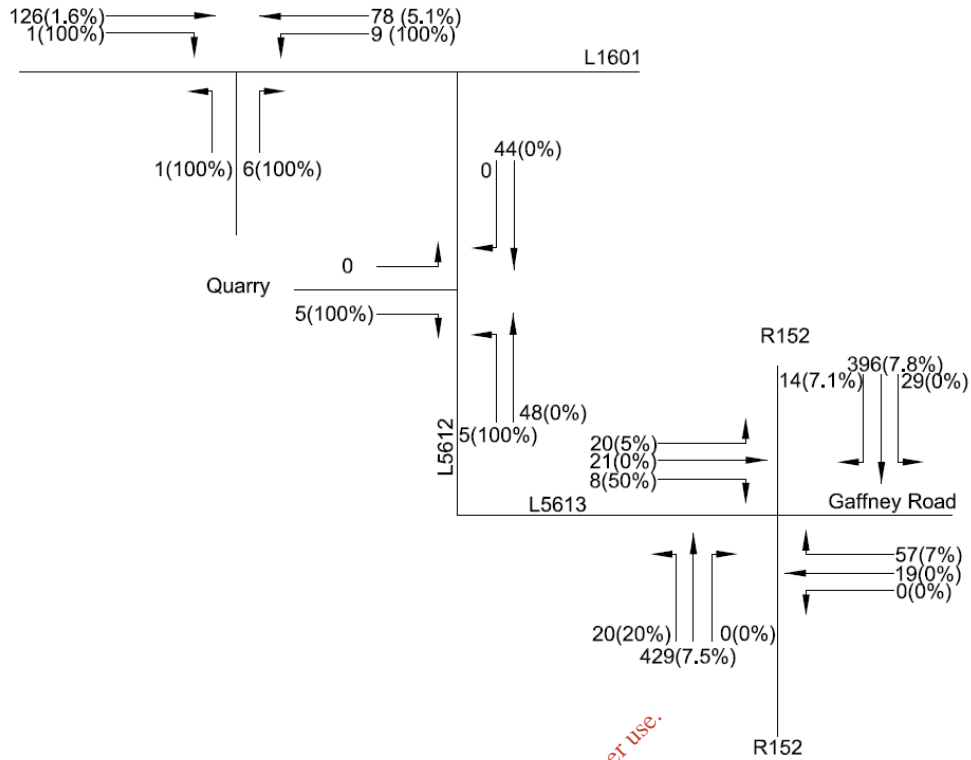


Figure 13.5 – 2010 AM Baseflow Traffic Volumes

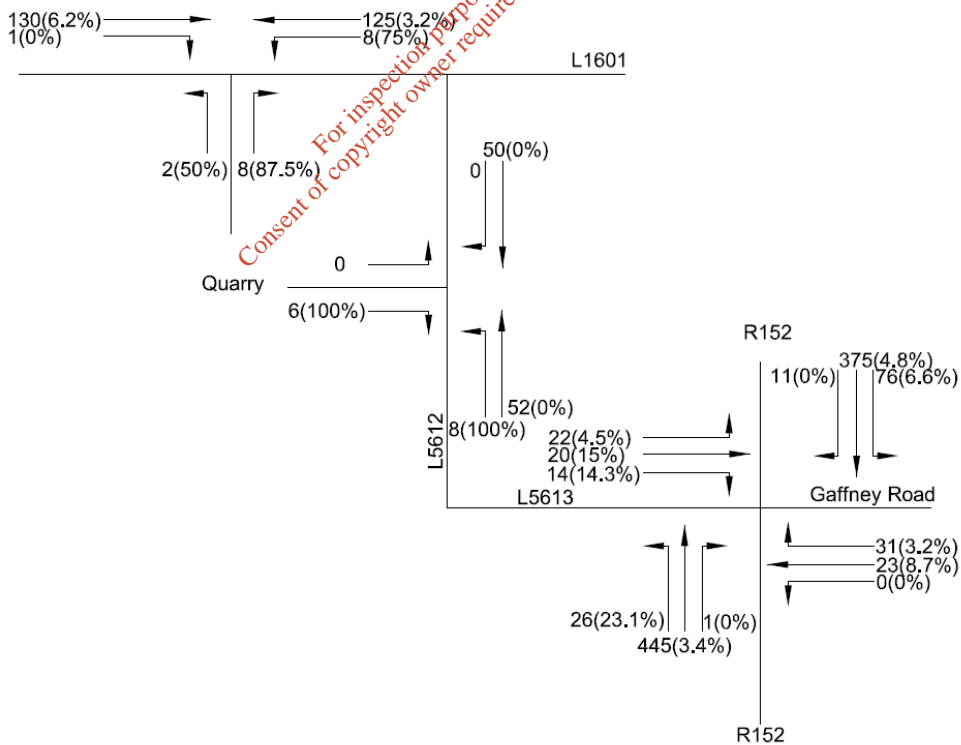


Figure 13.6 – 2010 PM Baseflow Traffic Volumes

13.3.1.3 Traffic Growth

The background traffic growth factors used in the analysis in this report are those provided by the NRA for the non-national road network (Published August 2003 for years 2002 – 2040). The quarry is expected to receive the waste licence in 2011 and with an expected lifespan of 20 years i.e. 2031. Growth factors used to account for the potential increase in both light and heavy vehicle traffic for the years analysed are as follows:

2010 - 2011

- Light Vehicles - 1.018
- Heavy Vehicles - 1.009

2010 – 2031

- Light Vehicles – 1.188
- Heavy Vehicles – 1.237

The baseflow traffic for the AM and PM peaks is shown below in Figures 13.7 – 13.10, for the opening year 2011 and the design year of 2031. The percentage of HGV's is shown in parentheses.

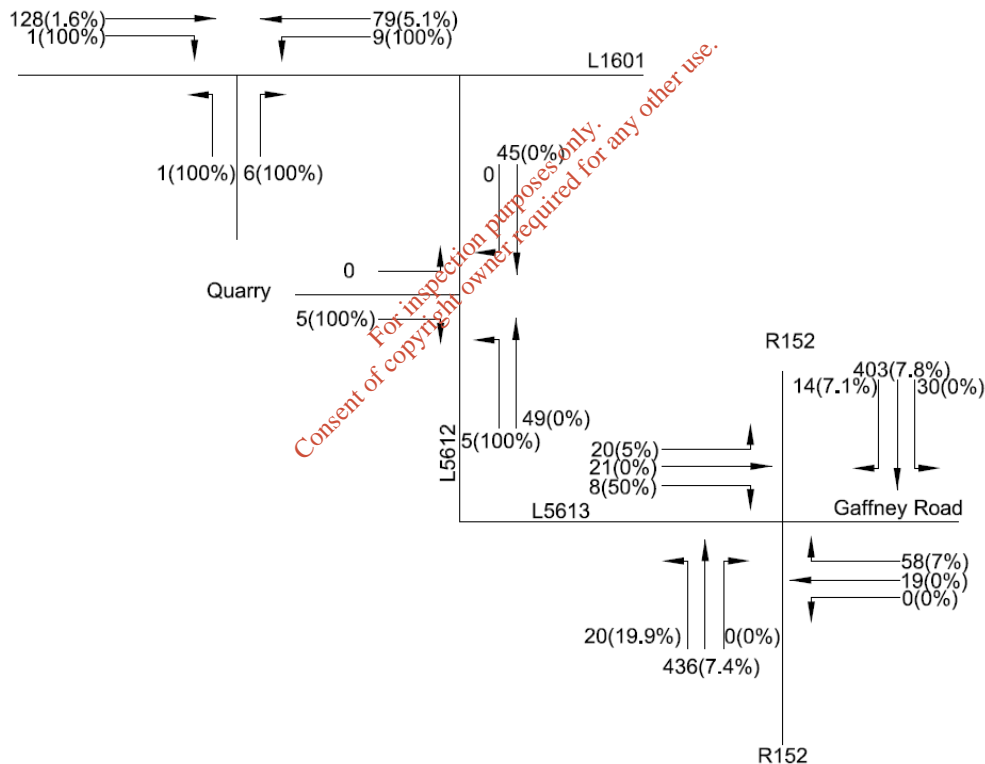


Figure 13.7 – 2011 AM Baseflow Traffic Volumes

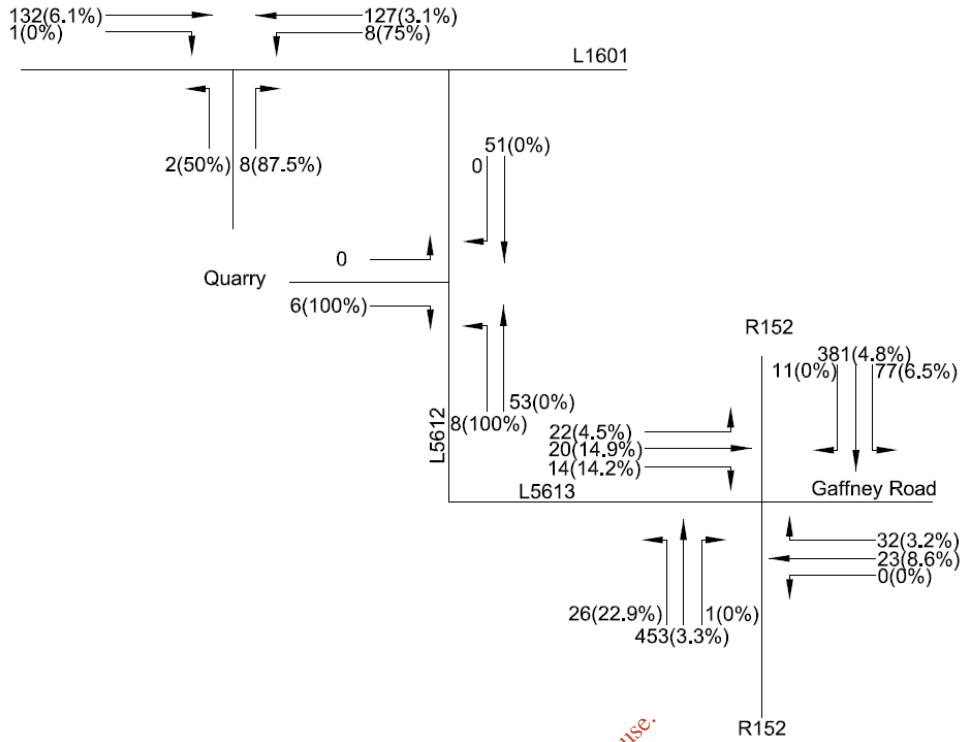


Figure 13.8 – 2011 PM Baseflow Traffic Volumes

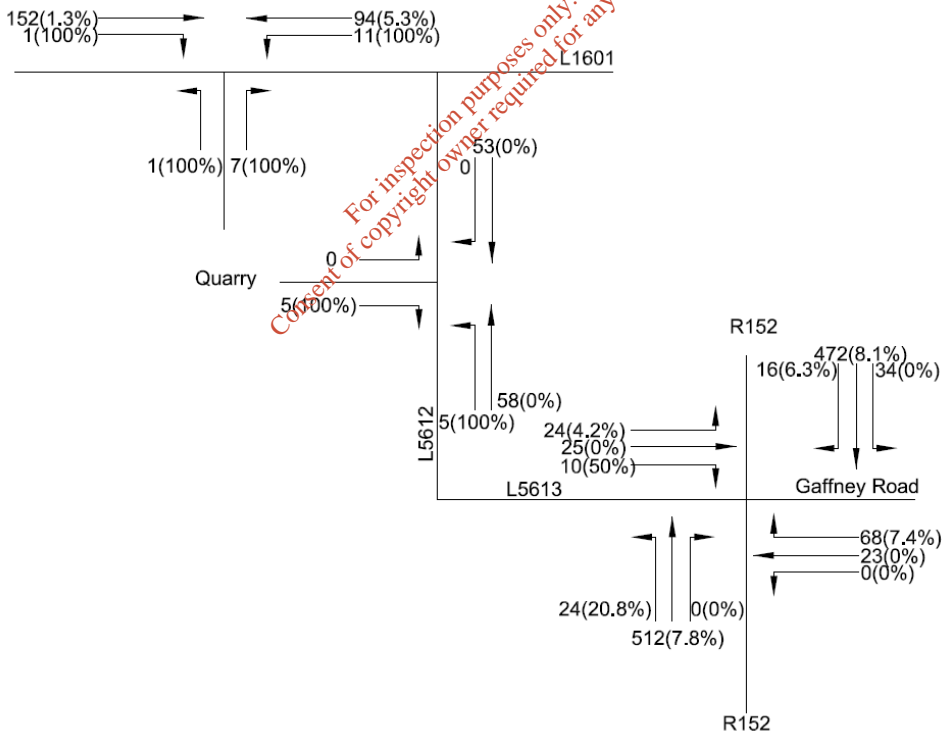


Figure 13.9 – 2031 AM Baseflow Traffic Volumes

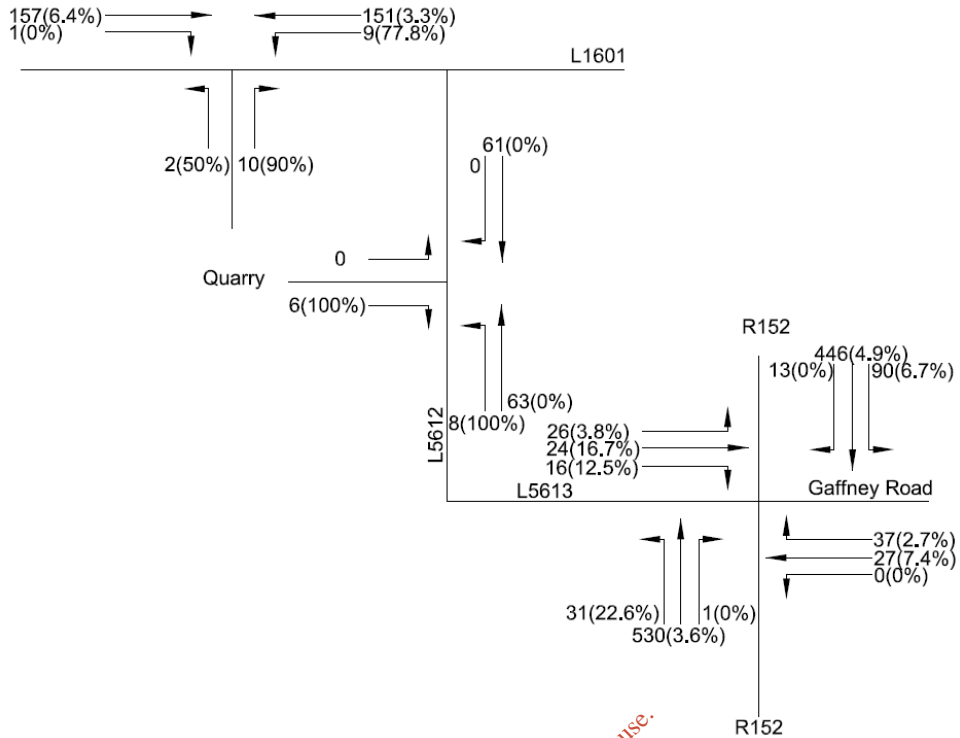


Figure 13.10 – 2031 PM Baseflow Traffic Volumes

The baseflow traffic with the additional generated traffic for the AM and PM peaks is shown below in Figures 13.11– 13.14, for both the opening year of 2011 and the design year of 2031. The percentage of HGV's is shown in parentheses.

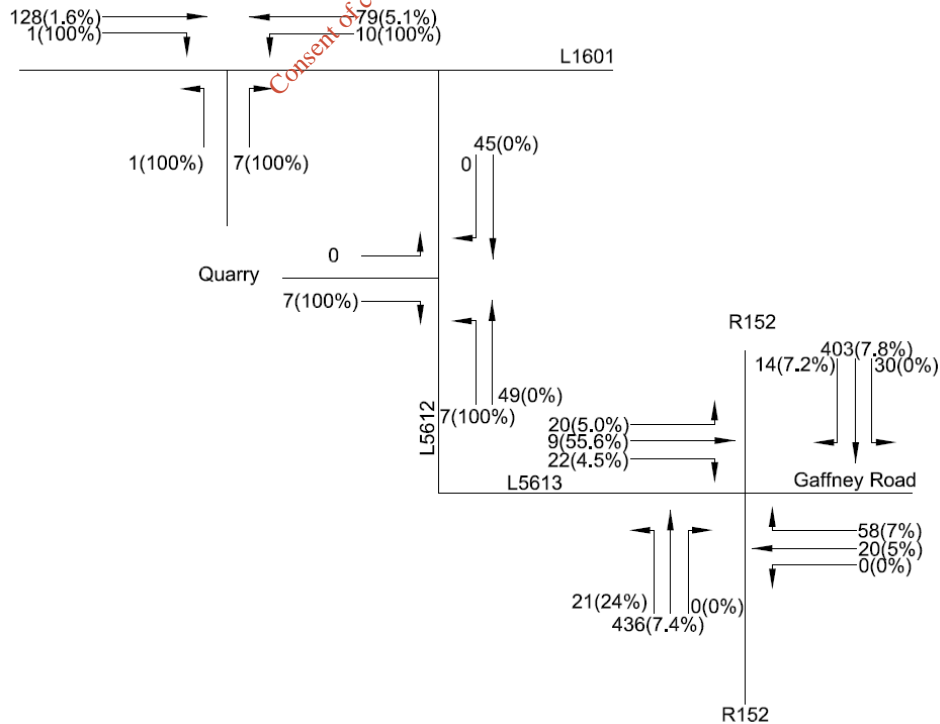


Figure 13.11 – 2011 AM Baseflow + Generated Traffic Volumes

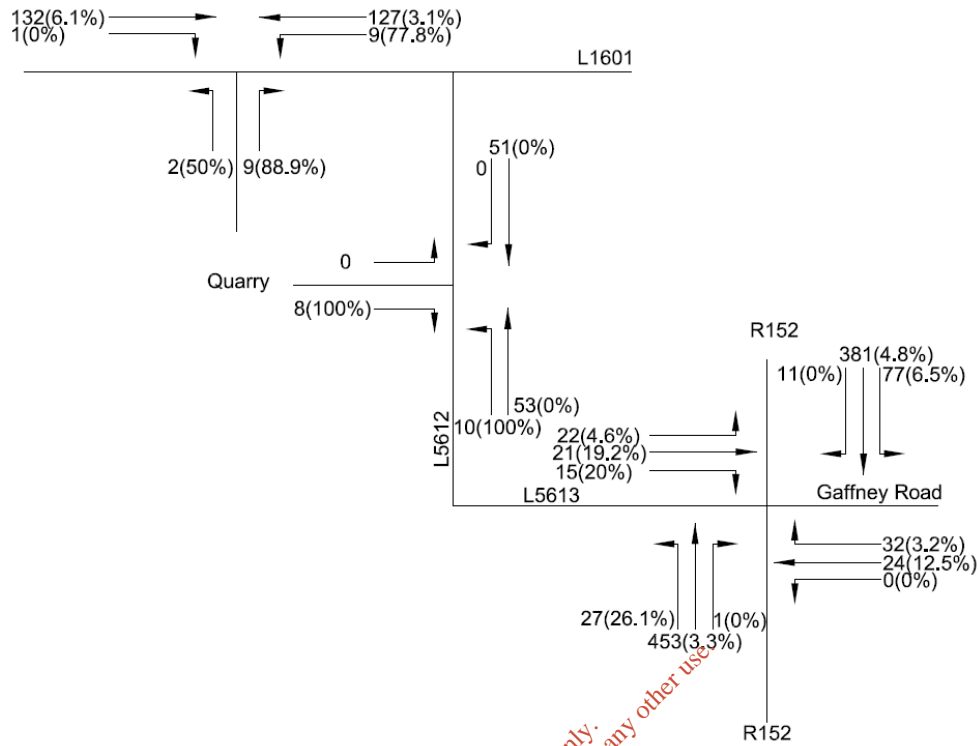


Figure 13.12 – 2011 PM Baseflow + Generated Traffic Volumes

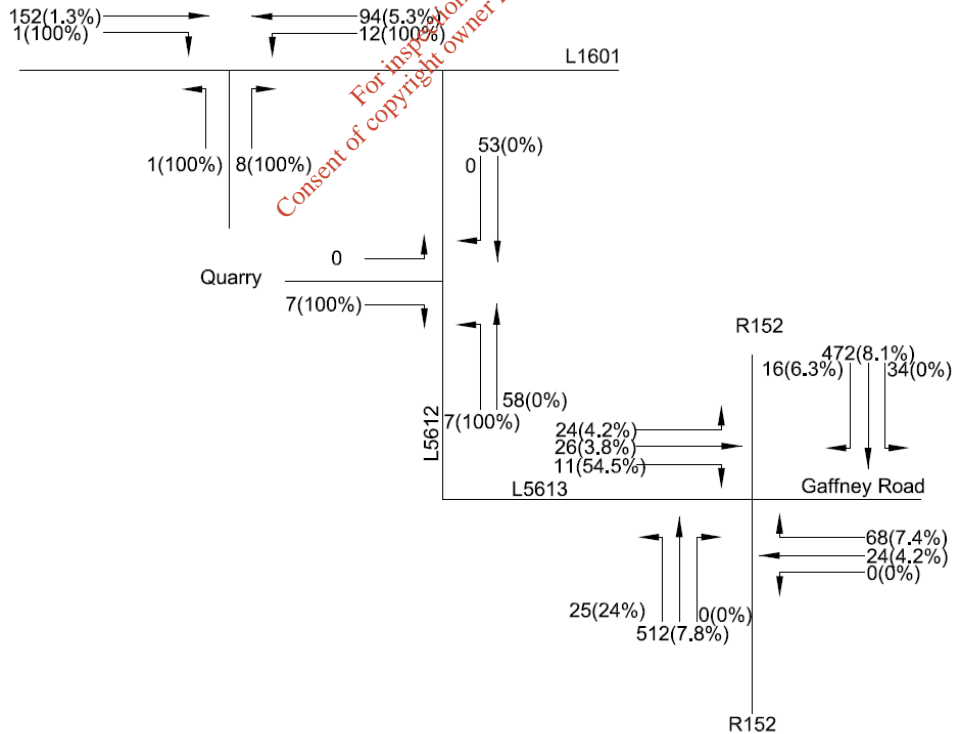


Figure 13.13 – 2031 AM Baseflow + Generated Traffic Volumes

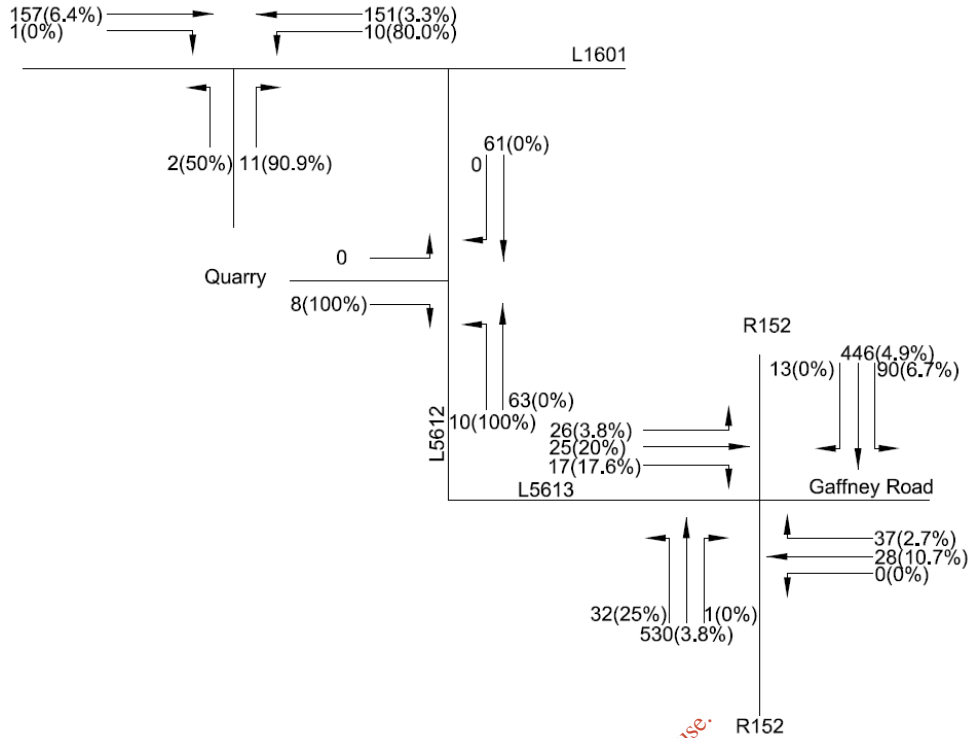


Figure 13.14 – 2031 PM Baseflow + Generated Traffic Volumes

13.3.2 Junction Analysis

13.3.2.1 Assessment Years

The performance of each junction has been analysed for the critical AM and PM peak hours detailed in section 13.2.3, for the baseflow, the baseflow in 2011 with the additional generated traffic, and the design year of 2031.

13.3.2.2 Analysis Results

The analysis results for the Quarry Entrance onto the L1601 for both the AM and PM peak hours are provided below in Table 13.3. Full PICADY outputs are provided in Appendix 13.3.

Run Information	Arm A – L1601 East		Arm B – Quarry Entrance		Arm C – L1601 West		Average Delay (min/veh)
	RFC Value	Max Queue Length	RFC Value	Max Queue Length	RFC Value	Max Queue Length	
2010 AM	-	-	0.024	0.02	0.004	0.00	0.01
2010 PM	-	-	0.031	0.03	0.002	0.00	0.01
2011 AM + Generated Traffic	-	-	0.028	0.03	0.004	0.00	0.01
2011 PM + Generated Traffic	-	-	0.035	0.04	0.002	0.00	0.01

2031 AM + Generated Traffic	-	-	0.033	0.03	0.004	0.00	0.01
2031 PM + Generated Traffic	-	-	0.035	0.5	0.002	0.00	0.01

Table 13.3– PICADY Results: Quarry Entrance onto the L1601AM and PM Peak Hours

The above results indicate that the Quarry Entrance onto the L1601 will operate below its capacity up to and including 2031 and is capable of handling the traffic that will be generated by the proposed increase in operations.

The analysis results for the Quarry Entrance onto the L5612 for both the AM and PM peak hours are provided below in Table 13.4. Full PICADY outputs are provided in Appendix 13.3.

Run Information	Arm A – L5612 South		Arm B – Quarry Entrance		Arm C – L5612 North		Average Delay (min/veh)
	RFC Value	Max Queue Length	RFC Value	Max Queue Length	RFC Value	Max Queue Length	
2010 AM	-	-	0.022	0.02	0.000	0.00	0.01
2010 PM	-	-	0.027	0.03	0.000	0.00	0.01
2011 AM + Generated Traffic	-	-	0.031	0.03	0.000	0.00	0.02
2011 PM + Generated Traffic	-	-	0.036	0.04	0.000	0.00	0.02
2031 AM + Generated Traffic	-	-	0.036	0.04	0.000	0.00	0.02
2031 PM + Generated Traffic	-	-	0.040	0.04	0.000	0.00	0.02

Table 13.4– PICADY Results: Quarry Entrance onto the L5612 AM and PM Peak Hours

The above results indicate that the Quarry Entrance onto the L5612 will operate below its capacity up to and including 2031 and is capable of handling the traffic that will be generated by the proposed increase in operations.

The analysis results for the junction between the R152, L5612 and the Gaffney Road for both the AM and PM peak hours are provided below in Table 13.5. Full PICADY outputs are provided in Appendix 13.3.

Run Information	Arm A – L5612 South		Arm B – Quarry Entrance		Arm C – L5612 North		Arm D – L5612 North		Average Delay (min/veh)
	RFC Value	Max Queue Length	RFC Value	Max Queue Length	RFC Value	Max Queue Length	RFC Value	Max Queue Length	(min/veh)

2010 AM	0.038	0.05	0.301	0.42	0.000	0.00	0.072	0.08	0.03
2010 PM	0.028	0.04	0.213	0.27	0.003	0.00	0.081	0.09	0.02
2011 AM + Generated Traffic	0.038	0.05	0.309	0.44	0.000	0.00	0.077	0.08	0.03
2011 PM + Generated Traffic	0.028	0.04	0.220	0.28	0.003	0.00	0.090	0.10	0.02
2031 AM + Generated Traffic	0.051	0.08	0.410	0.67	0.000	0.00	0.103	0.11	0.04
2031 PM + Generated Traffic	0.036	0.05	0.283	0.39	0.003	0.00	0.115	0.13	0.03

Table 13.5– PICADY Results: R152, L5612 and Gaffney Road Crossroads AM and PM Peak Hours

The above results indicate that the crossroads between the R152, L5612 and the Gaffney Crossroads will operate below its capacity up to and including 2031 and is capable of handling the traffic that will be generated by the proposed increase in operations.

13.3.3 Link Capacity

A link capacity assessment has been carried out for the R152, the L1601 and L5612/5613 with reference to the Geometric Design Guidelines RT180. In order to undertake the link capacity assessment, it was necessary first to convert the raw traffic survey data, which consisted of cars and heavy vehicles, into a common index known as passenger car units (PCU's). This was undertaken by applying a factor to all surveyed traffic movements to take account of the composition of the different types of vehicle. This factoring calculation assumes 1 car / light vehicle = 1 PCU, 1 heavy vehicle = 2.3 PCU's and 1 bus = 2 PCU's.

The R152 is approximately 7.0m wide and with 0% visibility greater than 460m. Assuming level of Service D⁷ is to be provided, this means the two way capacity of the road is 1300 vehicles per hour. The maximum two way flow that is expected to occur is during the PM peak in 2031 with a flow volume of 1332 PCUs. This means that the R152 will be operating approximately 2% above capacity by 2031.

The L1601 is approximately 7.5m wide and with 0% visibility greater than 460m with lateral clearance of 0m to obstructions on both sides. Assuming level of Service D is to be provided, this means the two way capacity of the road is 1058 vehicles per hour. The maximum two way flow that is expected to occur is during the PM peak in 2031 with a flow volume of 376 PCUs. This is below the capacity of the road meaning that the local road will operate within capacity up to and including 2031 where there will be approximately 64% spare capacity.

The L5612 / L5613 are approximately 5.5m wide and with 0% visibility greater than 460m with lateral clearance of 0m to obstructions on both sides. Assuming level of Service D is to be provided, this means the two way capacity of the road is 748 vehicles per hour. The maximum two way flow that is

⁷ Level of Service D is defined as traffic conditions where passing is extremely difficult with very high demand and limited opportunity. Driver delay up to 75% due to slower vehicles.

expected to occur is during the PM peak in 2031 with a flow volume of 172 PCUs. This is below the capacity of the road meaning that the local road will operate within capacity up to and including 2031 where there will be approximately 77% spare capacity.

13.3.4 Other Considerations

13.3.4.1 Road Safety

As referred to in section 13.2.4, visibility to the right at the entrance onto the L1601 is restricted by vegetation. A telecom pole is also obstructing visibility to the right. It is recommended that vegetation be cut back to provide a visibility splay of 2.4m x 160m. Road markings and signage at this junction are not present. A stop layout in accordance with the most up to date chapter 7 of the traffic signs manual should be installed and a stop sign should be erected in a location that does not hinder visibility splays. A warning sign should be re-installed to the east L1601 200m from the quarry entrance, warning traffic of the presence of slow moving quarry vehicles.

Visibility to the left at the entrance onto the L5612 is restricted by vegetation and the geometry of the L5612 adjacent to the entrance. It is recommended that the visibility splay be improved as much as possible by cutting back vegetation in order to allow exiting vehicles to see further around the bend. Road markings and signage at this entrance are not present. A stop layout in accordance with the most up to date chapter 7 of the traffic signs manual should be installed and a stop sign should be erected in a location that does not hinder visibility splays.

At the junction between the R152, L5613 and Gaffney Road, visibility from the L5613 onto the R152 is restricted to the left by the vertical geometry of the R152 and to the right by vegetation. It is recommended that visibility to the right be improved by trimming back vegetation so that a 3.0m x 160m visibility splay is provided. The road markings at this junction are worn and should be reinstated and the stop sign has been rotated out of position and should be put in its correct position. Visibility from the Gaffney Road along the R152 is severely hampered by vegetation and should be improved by trimming vegetation on both the left and right of the junction.

13.3.4.2 Parking

All parking is currently accommodated within the quarry. In order to ensure public roads remain clear from obstruction, this will remain the case.

13.4 MITIGATION MEASURES

The following measures are proposed:

- Adequate parking for both cars and HGV's should continue to be provided within the quarry.
- Appropriate warning signs indicating the presence of both quarry entrances for traffic approaching from both directions should be erected

- Vegetation at both quarry entrances and the R152, L5613 and Gaffney Road crossroads be cut back to increase visibility splays as described in section 13.3.4.1.
- Road markings and signage be provided at the quarry entrances and road markings at the R152, L5613 and Gaffney Road crossroads are reinstated.

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14 LANDSCAPE AND VISUAL IMPACT

14.1 INTRODUCTION

The Landscape and Visual Impact Assessment was undertaken by Mitchell and Associates Ltd., who are appropriately qualified and experienced landscape architects.

This section of the Environmental Report summarises the landscape and visual impact of the proposed Waste License facility to aid in the restoration of an existing excavated quarry to revert back to agricultural land. It describes the impact on the visual and landscape amenity of the subject site itself and the contiguous area. It also describes the landscape character of the subject site and its hinterland.

The application site is located within the existing Mullaghcrone Quarry site at Donore, Co. Meath. The existing site is located in the townlands of Platin and Cruicerath, which is approximately 1km south-east of Donore Village, County Meath. The site boundary is within the south-western area of Mullaghcrone Quarry. The site consists of a large rectangular area (11.8 hectares), bordered by a soil and stones recovery area to the south (on lands owned by Irish Cement) and to the east and north by quarry activities. Agricultural land forms the western boundary of the site (See Figure 14.1 Site Context).

14.2 EXISTING ENVIRONMENT

The basis for the assessment follows the guidance utilised for Environmental Impact Statements:

- Guidelines on the information to be contained in Environmental Impact Statements, the Environmental Protection Agency (EPA) 2002
- Advice Notes on Current Practice in the preparation of Environmental Impact Statements, the Environmental Protection Agency (EPA) 2003

The analysis of the site environment, taken together with its hinterland, was based on a site visit, an examination of available aerial photography, Ordnance Survey mapping data, and a detailed topographical survey of the site itself.

The significance criteria used for the visual and landscape assessment are based on those given in the 'EPA Guidelines on the information to be contained in Environmental Impact Statements - 2002 - 5. 'Glossary of Impacts', and are as follows:

Imperceptible Impact: An impact capable of measurement but without noticeable consequences.

Slight Impact: An impact which causes noticeable changes in the character of the environment without affecting its sensitivities.

Moderate Impact: An impact that alters the character of the environment in a manner that is consistent with existing and emerging trends.

Significant Impact: An impact which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.

Profound Impact: An impact which obliterates sensitive characteristics.

The quality of potential visual and landscape impacts are assessed according to EPA guidelines as follows:

Positive: A change which improves the quality of the environment

Neutral: A change which does not affect the quality of the landscape

Negative: A change which reduces the quality of the environment

Potential impacts arising from a proposed development may also be considered in terms of duration as described in the EPA Guidelines:

Temporary: Impact lasting one year or less

Short-term: Impact lasting one to seven years

Medium-term: Impact lasting seven to fifteen years

Long-term: Impact lasting fifteen to sixty years

Permanent: Impact lasting over sixty years

Topography

Given the nature of the site and its associated activities the topography varies in correlation with the excavation works being carried out a particular time. The proposed waste licence area encompasses a worked out quarry area with partial restoration under the previous waste permits. The most recent site survey indicates ground levels at a low point of approximately 40 metres O.D. in the eastern portion of the site. From this low point the ground slopes steeply to the east and west to a high point of approximately 72 metres O.D. along the eastern boundary and a high point of 78 metres O.D. along the northern boundary and falling again to approximately 72 metres O.D. along the western boundary. (See Fig.14.1 Topography Map).

Slope Regime

Similar to topography the slope regime on the site is determined by the excavation works carried out over the lifetime of the quarry. The nature of the work results in very steep slopes being formed along the edges of the areas been excavated.

Vegetation

The general ground cover of the subject site has been removed as a result of the excavation works and therefore vegetation consists of the invasive scrub planting and grasses that have colonised the spoil heaps and side slopes of the excavated pits. The majority of the woody plants – i.e. trees and shrubs are confined to the hedgerows outside the site boundary forming the agricultural fields, which consist of species such as Ash and Sycamore and small tree species such as Hawthorn, Blackthorn etc., interspersed with shrubs such as Bramble.

Land Use

The general land-use in this area to the southwest of Drogheda is one of agriculture with a concentration of extractive land uses in the immediate vicinity of the application site. (Fig.14.4). The village of Donore is located approximately 1.15 kilometres to the north-west with small pockets of low-density residential development scattered throughout the landscape, a pattern typical of much of rural Ireland. Immediately to the south of the subject site there are significant areas of industrial and extractive land-uses – in the form of the Platin Cement Plant, and its associated stone quarrying

activities to the west. A railway line serving the Platin plant also runs 1km to the south-west of the site. (See Fig. 14. 3. Land Use Map)

Visual Analysis

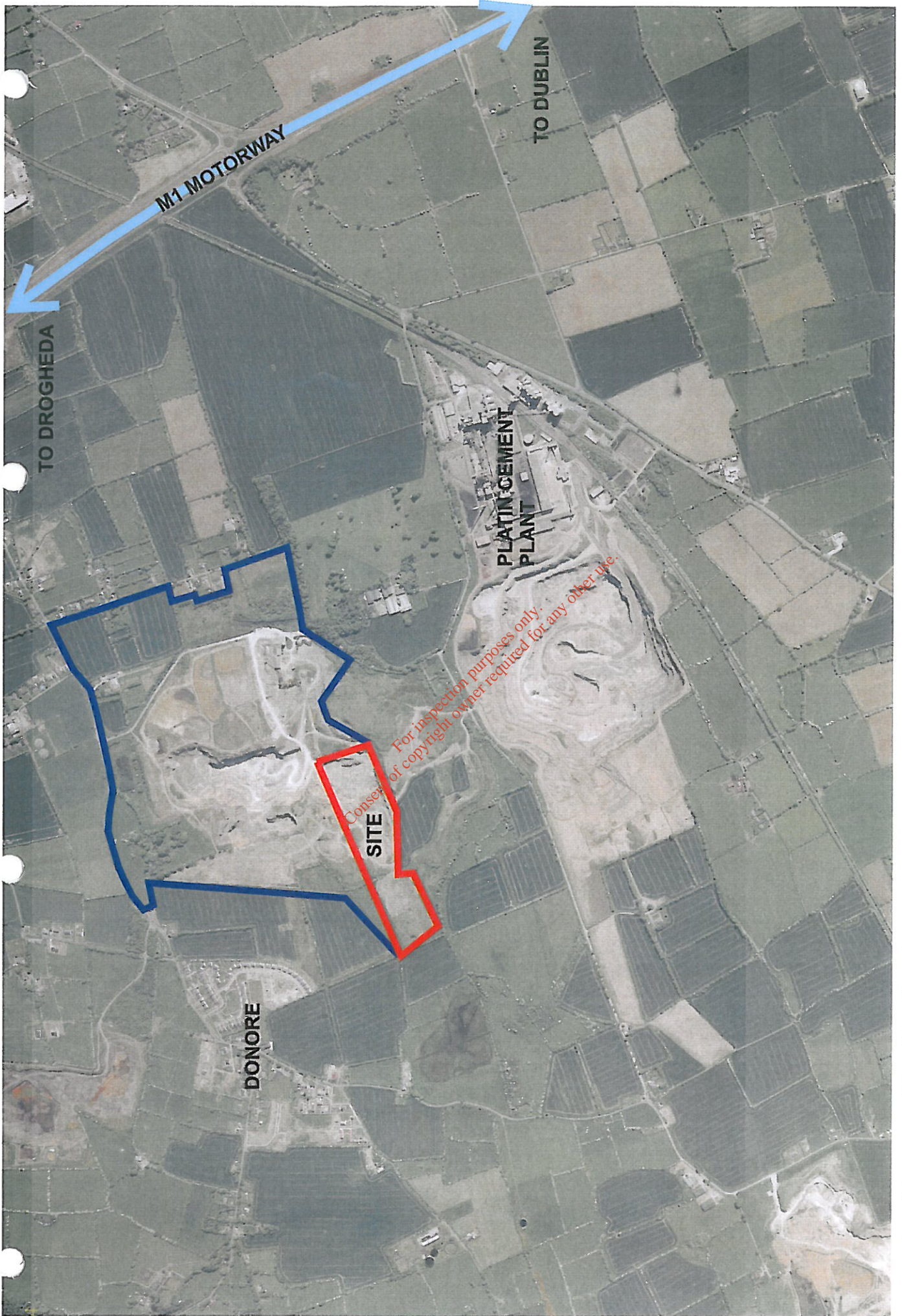
The subject site itself is visually unremarkable being part of a much larger site used for extractive purposes. The visual character is typical of a quarry of this nature with the primary visual feature being the screening berms colonised by recolonising vegetation, access tracks for machinery and the steep side slopes of the quarried areas. The surrounding landscape outside the boundary of the quarry generally consists of a series of small-scaled agricultural paddocks with hedgerows typical of much of the landscape of this part of County Meath. Immediately to the south of the application site is a portion of land which has been previously filled and restored by Irish Cement Ltd.

Views in towards the site are obstructed by the existing topography and hedgerows of the surrounding agricultural land. Views out from the application site are also limited being confined to views towards the agricultural land to the west and views to the south-east towards Platin Cement Plant where the red and white striped chimney stacks of the Plant are visible (See Plate 1 and Plate 2). The immediate site hinterland is visually dominated by the industrial complex at Platin Cement works, which consists of an array of tall silos and associated industrial sheds. (See Fig.14.4 Visual Analysis Map).

Do Nothing Scenario

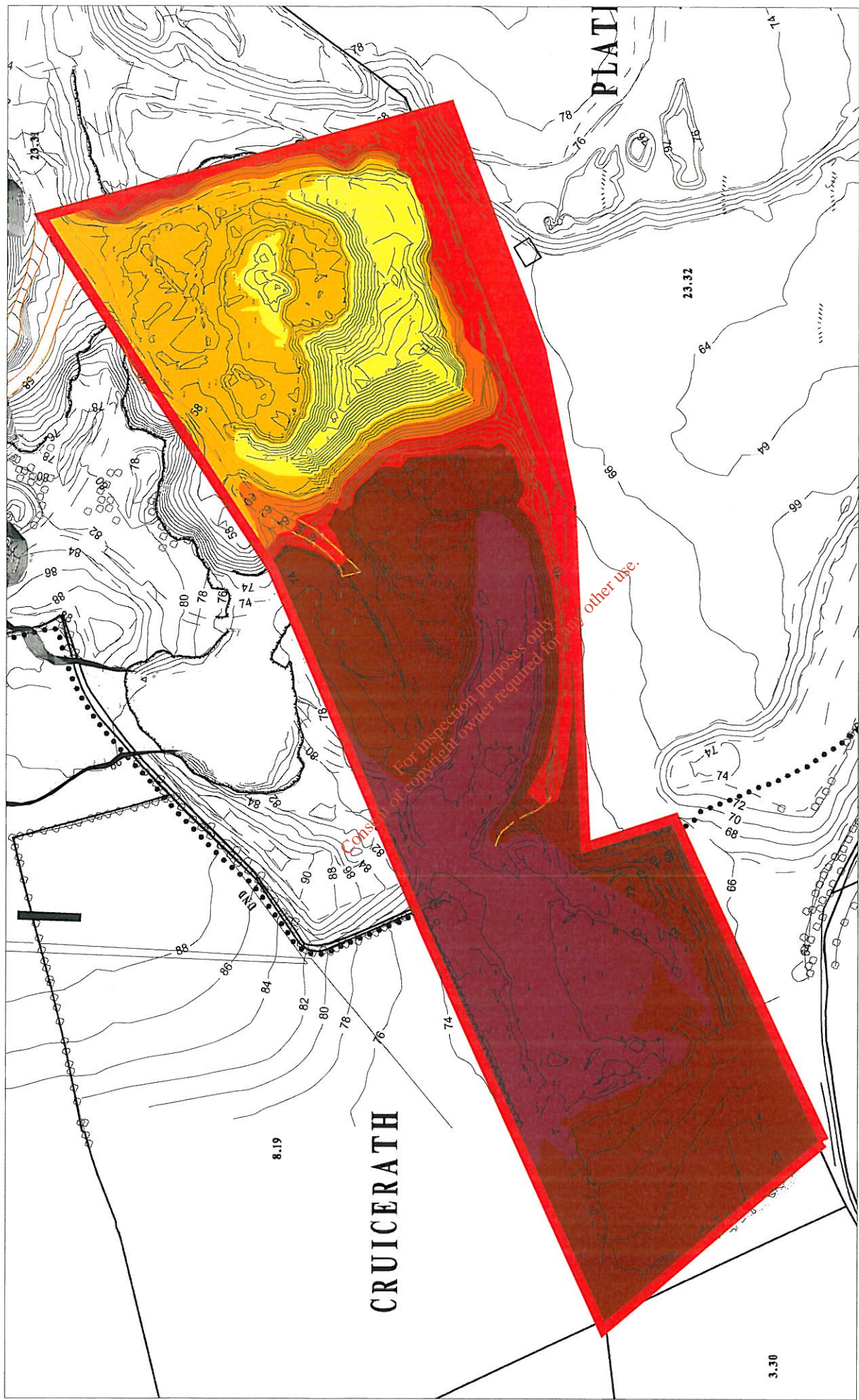
Should the Waste Licence not be granted for the proposed development and the quarry remain unfilled, the site will remain in its present state as an open quarried area which will in time become overgrown with invasive scrub vegetation.

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Land in ownership of applicant
Application Site

Fig. 14.1 SITE CONTEXT



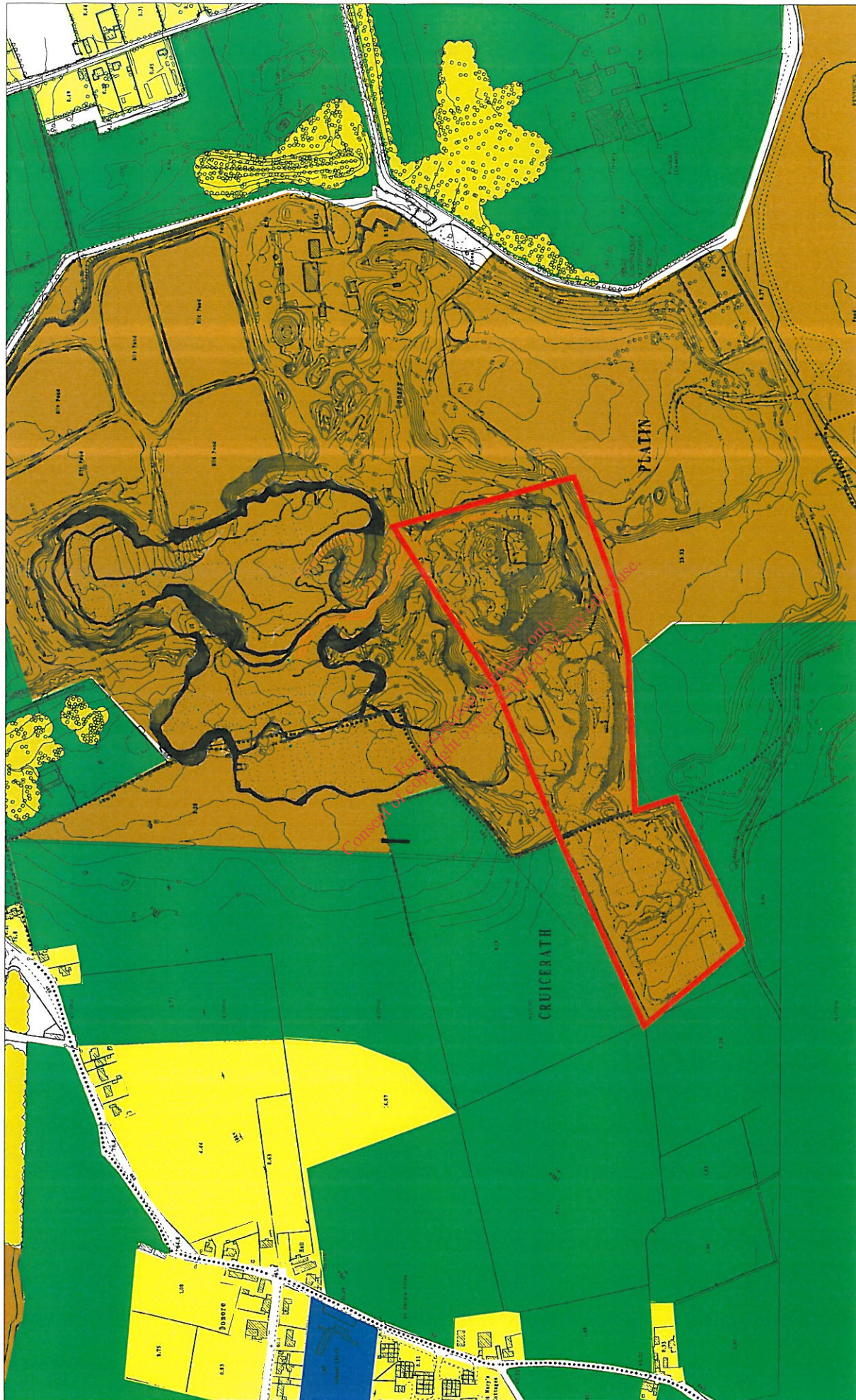
Legend:

	55 metres O.D. and under		65 to 70 metres O.D.
	55 to 60 metres O.D.		70 to 75 metres O.D.
	60 to 65 metres O.D.		75 metres O.D. and over

 application boundary

 north

FIG. 14.2 TOPOGRAPHY MAP



Legend:

- agricultural land
- residential
- quarry / extractive use
- institutional
- scrub woodland
- application boundary

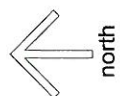
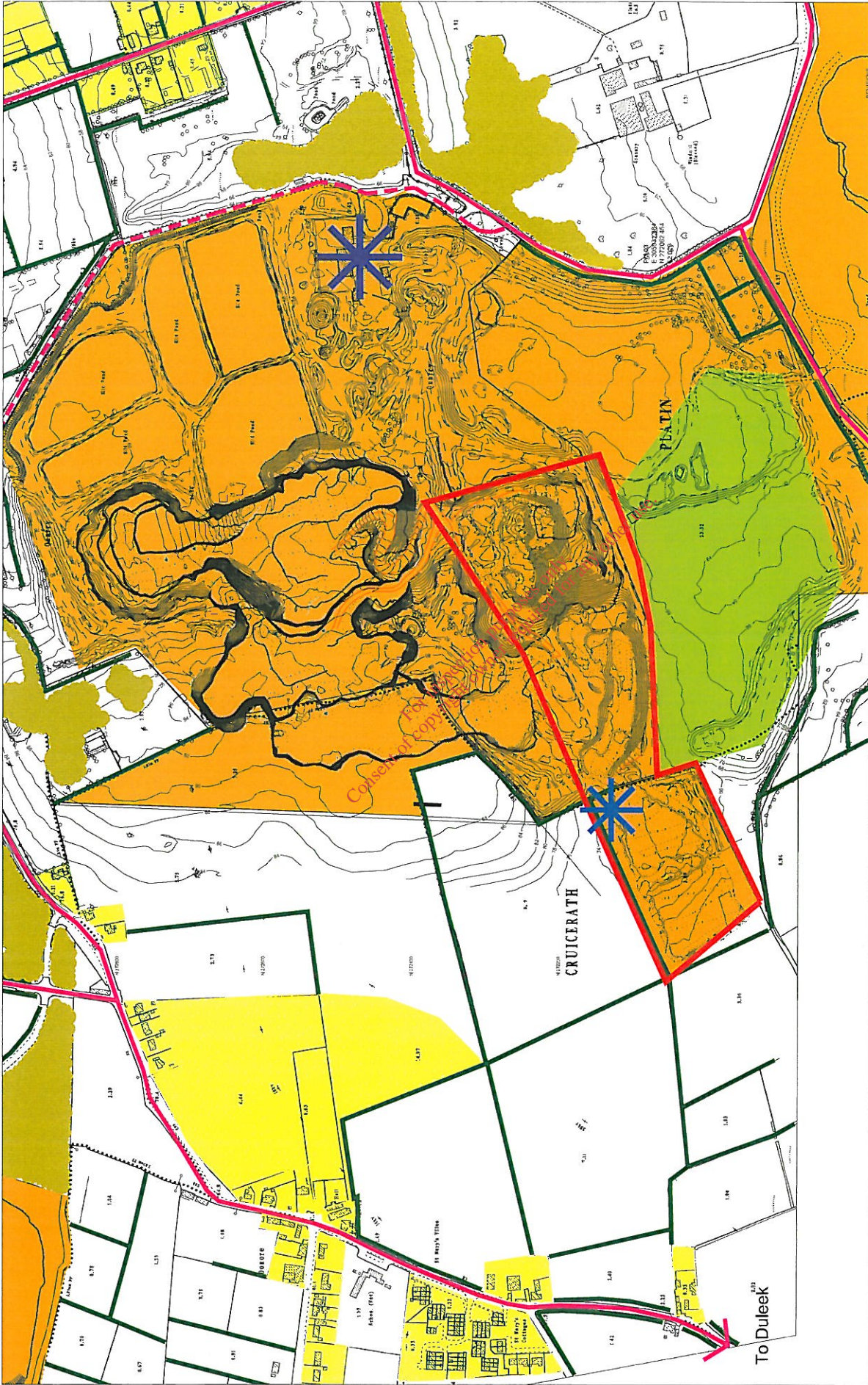


FIG. 14.3 LAND USE MAP



- Legend:
- disturbed ground
 - Irish Cement Waste Permit Area
 - residential development
 - existing hedgerow
 - scrub woodland planting
 - primary vehicular movement
 - Quarry office, admin buildings etc.
 - access road to Quarry admin area
 - high point
 - application boundary

FIG. 14.4 VISUAL ANALYSIS MAP

14.3 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development will consist of the filling of the quarried area with fill material from the adjacent excavated ground which will be graded to imitate a naturally formed 'hillock', to a maximum elevation of 83m O.D., to blend with the surrounding undulating agricultural landscape. It will revert back to agricultural use with new hedgerow planting installed along the boundary utilizing native tree species.

(See Landscape Restoration Plan Drawing. in Appendix 14.1)

14.4 POTENTIAL IMPACTS

In landscape and visual terms the proposed development will have a positive impact in varying degrees upon the inter-related aspects, as follows:-

- The perceived character of the area;
- The existing views; and
- Its visual and recreational amenity.

Impact on Landscape Character

The application site presents as an area of disturbed ground due to the quarrying activities which forms part of a larger area of disturbed ground. This portion of the quarry will now be restored to agricultural land similar to the existing agricultural land surrounding the site.

The restoration will have a positive visual impact on the existing landscape character of the area.

Impact on Views

As the application site is not visible from the surrounding road network the impact on views in towards the restored landfill will be imperceptible. However, there will be a positive and significant impact on views from within the quarry lands themselves with the open quarried area being replaced with grassland.

Impact on Visual/Recreational Amenity

The subject site, at present has a low level of visual amenity and no level of recreational amenity. The proposed restoration will constitute a significant and neutral impact on the visual amenity of the area and will have no impact on the recreational amenity of the area.

14.5 MITIGATION MEASURES

The overall visual impact of the development will be reduced in the following important ways:-

- Through the grading of the restored landfill to mimic a natural mound in the agricultural landscape.
- Through insertion of hedgerow planting along the boundary of the application site using similar tree species to the existing hedgerows in the area.

14.6 PREDICTED IMPACT

The development will have a significant and neutral impact on the visual amenity of the area. The existing low visually amenity value of the quarry will be replaced by an agricultural field similar to the

surrounding agricultural land with hedgerow planting to provide a new ecological habitat to the wildlife in the area.

14.7 RESIDUAL IMPACT

The proposed hedgerow planting will be subject to on-going maintenance strategies and monitoring, to ensure the satisfactory establishment of the planting installation and therefore the effectiveness of its screening potential over time.

14.8 SUMMARY

The application site presents as small portion of a larger tract of land containing deep excavations and disturbed ground due to the ongoing quarrying activities in the area. The proposed restoration will form part of an ongoing restoration plan over the lifespan of the quarry when all the disturbed land will eventually be restored to agriculture or similar usage. The restoration to agricultural land will have a moderate and positive landscape and visual impact on the receiving environment.

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15 INTERACTION OF THE FOREGOING

This Environmental Impact Statement (EIS) has been prepared by TOBIN Consulting Engineers on behalf of Roadstone Wood for a waste licence facility at Mullaghcrone Quarry and will accompany a waste licence application to the EPA.

The potential environmental impacts of the proposed waste licence, including the measures proposed to mitigate these impacts have been outlined in this report. This section discusses the potential for interaction between impacts of the different environmental aspects.

15.1 HUMAN BEINGS / SOCIO ECONOMIC

Human Beings will interact with other environmental topics given the nature of the waste licence facility.

There will be minimal loss of wildlife habitat if the application is granted. The majority of habitat within the waste licence infilling footprint is comprised of recolonising bare ground and spoil and bare ground. The restoration planting proposals will provide a quantity and a range of habitats in excess of that present in the existing environment. Furthermore, natural recolonisation of flora and fauna will occur from surrounding areas. After use strategies have been detailed within this document. See Landscape Restoration Plan in Chapter 14.

Noise and dust control will be in accordance with the EPA guidelines and the applicant will ensure compliance with any specific conditions imposed by the EPA. There will be no changes to the microclimate.

Social and travel patterns, pedestrian or otherwise, will not be disrupted by the use of the waste licence facility as no roads or pedestrian ways will be altered.

The operations within the site will secure employment already in place from the previous and existing waste permits.

15.2 FLORA AND FAUNA

The subject lands largely comprise of recolonising bare ground and spoil and bare ground. Dust impacts on adjacent habitats and fauna are expected to be minor as dust control will be in accordance with EPA guidelines.

15.3 SOIL / GEOLOGY AND HYDROGEOLOGY

There will be an impact on soils due to the proposed waste licence of the quarry. However over the lifetime of the previous soil and stones permits and existing C&D waste permits there has been an alteration to the geological environment and such current conditions are envisaged to continue. The impact of the existing facilities is considered to be low. The infilled area will be used to restore the former quarry area and to screen the site from its surrounding environment.

Dust mitigation measures are identified to mitigate the potential for dust generation from the proposed waste licence facility.

15.4 WATER

The proposed waste licence area will not go below the water table and will remain a dry working area. The proposed waste licence facility will not result in the generation of additional impacts on the wider environment.

15.5 AIR QUALITY AND CLIMATE

The proposed waste licence facility will have no effect on the microclimate in the immediate vicinity of the site. Dust impacts on adjacent habitats and fauna are expected to be minor as dust control will be in accordance with strict EPA guidelines.

Dust suppression measures and an established vehicle wheel wash are proposed to mitigate the impact of wind blown dust around the site. These measures will reduce the impact on human beings and material assets in the community. The waste licence area will adhere to a dust control regime in accordance with the demands of the EPA.

15.6 NOISE AND VIBRATION

Noise will emanate from the working of the machinery as a result of the continuing works, operation of the infilling process, and from the associated vehicular movements.

Noise level thresholds shall be in adherence with the DoEHLG guidelines and EPA standards.

15.7 LANDSCAPE & VISUAL ASSESSMENT

A number of landscape & visual impacts interact with both the local human population, and flora and fauna. These interactions are discussed in Section 14 above.

15.8 CULTURAL HERITAGE & ARCHAEOLOGY

No direct or indirect impacts warranting specific mitigation were identified during the course of the cultural heritage assessment.

15.9 TRAFFIC AND ROAD ASSESSMENT

Traffic generated from the site will not have a significant impact on traffic on the R152 or the local roads at the quarry entrance. The traffic assessment illustrates that the junction between the R152 and the roads leading to the waste licence facility can accommodate the continued operation of the quarry up to and including 2031. Mitigation measures have been included in section 13. . These measures will ensure that road safety for all road users is maintained.

Dust control measures have been proposed with respect to the access route.

15.10 CONCLUSION

While there is potential for the above impacts to interact and result in a cumulative impact, it is unlikely that any of these cumulative impacts will result in significant environmental degradation.

It should be noted that throughout the EIS potential interaction between various environmental criteria are discussed. The baseline assessment for this project was completed prior to the design of the waste licence facility, which allowed for the optimisation of the site layout design, within the overall application

area. Avoidance of impacts was used throughout the design of the proposed facility. The impact and mitigation measures proposed are designed to further ameliorate the impact of the continuing works and the proposed waste licence facility on the wider environment.

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16 EXPLANATION OF TECHNICAL TERMS

AADT: Average annual daily traffic

Aggregates: Particles of rock which, when brought together in a bound or unbound condition, form part or whole of a building or civil engineering structure.

Ambient Noise: The total sound in a given situation at a given time usually made up of sound from many sources.

A-weighting: Normal hearing covers the frequency (pitch) range from about 20 Hz to 20,000 Hz. but sensitivity is greatest between about 500Hz and 5,000 Hz'. The 'A-weighting', is an electrical circuit built into noise meters to mimic this characteristic of the human being.

Barony, Parish, Townland: These terms refer to land divisions in Ireland. The barony is the largest land division in a county, which is formed from a number of parishes. These parishes are in turn made up of several townlands, which are the smallest land division in the county. The origins of these divisions are believed to be in the Early Medieval/Christian Period (AD500-AD1000), or may date earlier in the Iron Age (500BC-AD500)

BAT: Best Available Techniques

BH: Borehole

Blast Ratio: The amount of work per unit of explosive measured in tonnes of rock per kilogram of explosives detonated

BOD: Biological Oxygen Demand

Burden: The distance measured at right angles between a row of holes and the free face, or between rows of holes.

COD: Chemical Oxygen Demand

CSO: Central Statistics Office

cSPA: Candidate Special Area of Conservation

Decibel (dB): The logarithmic measure of sound level. 0dB is the threshold of normal hearing; 140dB is the threshold of pain. A change of 1 dB is detectable only under laboratory conditions.

dB(A): Decibels measured on sound level meter incorporating a frequency weighting (A-weighting) which, differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessments of loudness. A change of 3dB(A) is

the minimum perceptible under normal conditions, and a change of 10dB(A) corresponds roughly to doubling or halving the loudness of a sound.

DED: District Electoral Division

Delay Interval: The time between successive detonation of detonators.

DoEHLG: Department of the Environment, Heritage and Local Government

DMRB: Design Manual for Roads and Bridges

EIA: Environmental Impact Assessment

EIS: Environmental Impact Statement

EMS: Environmental Management System

EPA: Environmental Protection Agency

Frequency (Hz): the number of cycles per second of vibration usually expressed in Hertz (Hz)

ghg: Greenhouse Gas

gph: Gallons per Hour

GSI: Geological Survey of Ireland

Hertz (Hz): Unit of a frequency (pitch) of a second. Formerly called cycles per second.

HGVs: Heavy Goods Vehicles

ICF: Irish Concrete Federation

IDA: Industrial Development Agency

Impulsive noise: A noise, which is of short duration (typically less than one second), the sound pressure level of which is significantly higher than the background.

ISO: International Standards Organization

Km: Kilometres

L₁₀: The sound level exceeded for 10% of the time over a given period; similarly L₉₀ = 90%

LAP: Local Area Plans

L_{AeqT} : The equivalent continuous sound level - the sound level of a steady sound having the same energy as a fluctuating sound over a specified measuring period (T). Used to describe many types of noise and can be measured directly with an integrating sound level meter.

L_{ArT}: The equivalent continuous sound level corrected for tonal or impulsive character where these are present. The measurement time intervals typically used are one hour by day or 15 minutes by night.

LEA: Local Electoral Area

Material Assets: In the context of this document, refers mainly to property, architectural and archaeological heritage.

mbgl: Meters Below Ground Level

MIC: Maximum Instantaneous Charge

MM: Millimetres

mOD: Metres above Ordnance Datum

Mitigation: reduction, making less severe; in the context of this document, lessening the impact of the quarry on the environment.

MW: Monitoring Well

NDP: National Development Plan

NHA: Natural Heritage Area

NPWS: National Park and Wildlife Services

NRA: National Roads Authority

NSAI: National Standards Authority of Ireland

NSS: National Spatial Strategy

OPW: Office of Public Works

OS: Ordnance Survey

Peak Particle Velocity (PPV): the maximum rate of change of particle displacement, measured in millimetres per second (mm/sec).

pHNA: Proposed Natural Heritage Area

QHNS: Quarterly National Household Survey

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RFC: Ratio of Flow to Capacity Value

RPG's: Regional Planning Guidelines

RMP: Record of Monuments and Places

Scaled Distance: The blast/receiver separation distance divided by the square root of the maximum instantaneous charge weight.

Shot: is a borehole complete with primed charge and stemming.

SLM: Sound Level Meter

SPA: Special Protection Area

SPG's: Strategic Planning Guidelines

SW: Surface Water Monitoring Point

TA: Transport Assessment

Tonality: The degree to which a noise contains audible pure tones. Broad-band noise is generally less annoying than noise with identifiable tones.

TRL: Transport Research Laboratory

UKAS: United Kingdom Accreditation Service

Vibration: A rapid linear motion of a particle or of an elastic solid about an equilibrium position

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