Roadstone
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ENVIRONMENTAL IMPACT STATEMENT

WASTE LICENCE APPPLICATION, MULLAGHCRONE, DONORE, CO. MEATH.

March 2011

TOBIN CONSULTING ENGINEERS

TOBIN
Patrick J. Tobin & Co. Ltd.

REPORT

PROJECT: Waste Licence Application, Mullaghcrone

CLIENT:
Roadstone Wood Ltd.
Mullaghcrone, Donore
County Meath.

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DOCUMENT AMENDMENT RECORD

Client:	Roadstone Wood
Project:	Application for Waste Licence
Title:	Environmental Impact Statement (EIS)

PROJECT NUMBER: 6222				DOCUMENT REF: 6222 TR0002			
A	Issue for Submission	JD	29-05-11	ED	30-05-11	DG	30-05-11
Revision	**Description & Rationale**	**Originated**	**Date**	**Checked**	**Date**	**Authorised**	**Date**
TOBIN Consulting Engineers							

TABLE OF CONTENTS

TABLES, FIGURES & APPENDICES

TABLES

FIGURES

APPENDICES

Appendix No.	Content
5.1	Ecology Bibliography
5.2	Criteria for assessing Site Evaluation
7.1	Groundwater monitoring results
8.1	Dublin Airport Wind Rose
11.1	Archaeological References
11.2	RMP sites
13.1	Traffic Survey Results
14.1	Landscaping restoration master plan and earthworks specification

1 INTRODUCTION

1.1 GENERAL

TOBIN Consulting Engineers has prepared this Environmental Impact Statement (EIS) as part of a waste licence application to the Environmental Protection Agency (EPA) for activities within the townlands of Cruicerath and Platin, Donore, County Meath. The proposed area where these activities will take place is located in the southwest part of Roadstone Wood's Mullaghcrone Quarry.

The location of the proposed site in relation to the surrounding regional setting is shown on Figure 1.1.

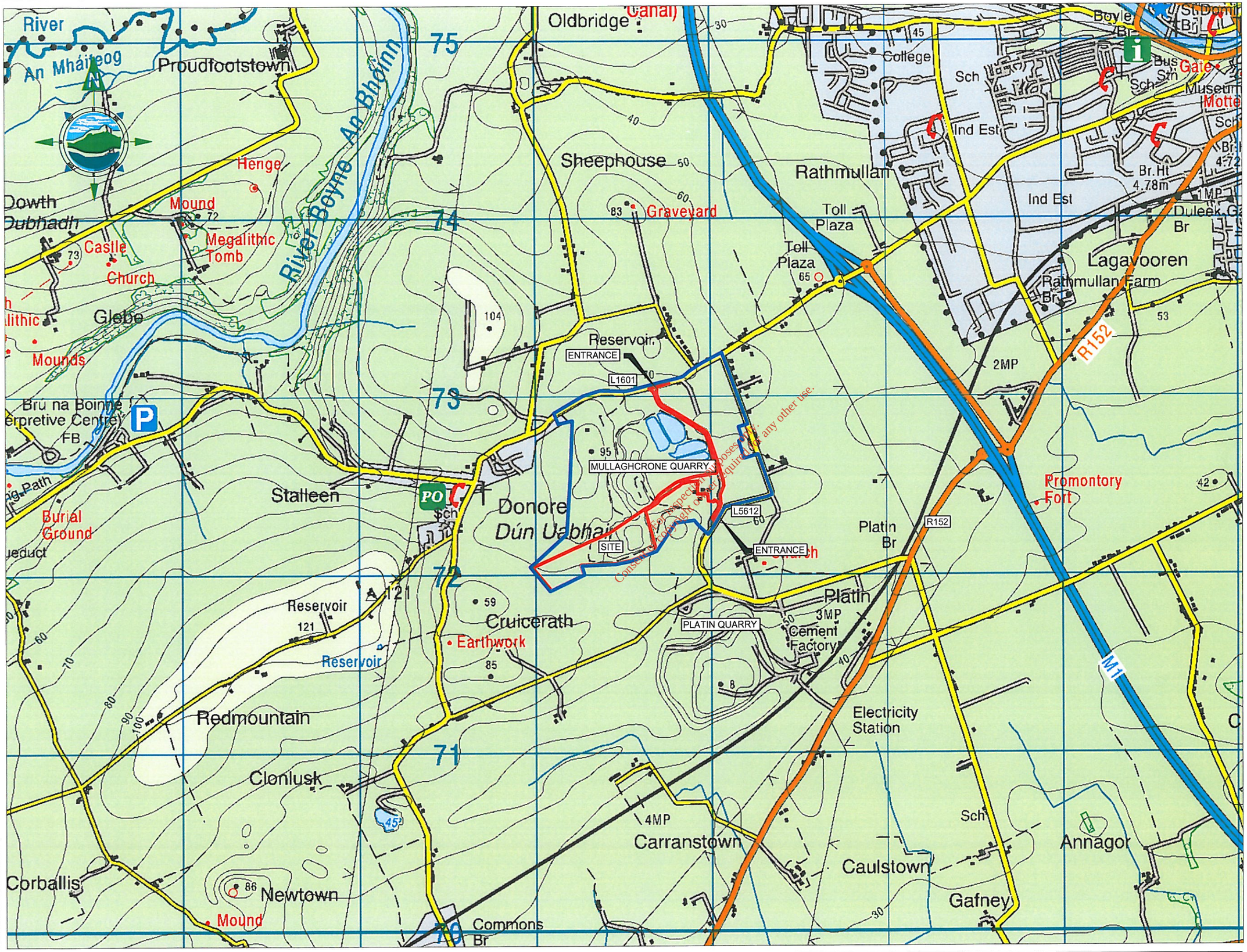
The site is located in the east of County Meath. The property is in the ownership of Roadstone Wood Ltd. The area of the overall Roadstone Wood property extends to 93.8 hectares (ha) and is bound by a local road (L1601) to the north; Platin Quarry to the south, agricultural land to the west and by a local county road (L5612) to the east (see Figure 1.2).

The first site entrance to Mullaghcrone Quarry, which is on the northern boundary of the site, is located approximately 1km northeast of the village of Donore, County Meath (see Figure 1.1). The second site entrance to Mullaghcrone Quarry, the 'Platin Entrance', which is located along the southern boundary of the site, is located approximately 1 km southeast of the village of Donore, County Meath (see Drawing No. 1.2). With respect to other population centres, the quarry is approximately 4km north of Duleek, 4km southwest of Drogheda, 9.5km east of Slane and within 2 km of the M1 Motorway.

Planning permission for the site has previously been granted by Meath County Council and is within the Roadstone Wood property ownership. The lands included in this EIS apply to 11.7 ha deposition area and 3.6 ha associated facilities/haulage routes within the property ownership. The total application area is 15.3 hectares.

A number of waste permits have operated on the site under the jurisdiction of Meath County Council, including 2006/19 'Soil and stones' and WPF/MH/11/0003/01 'C&D'.

This EIS is prepared for development requiring a waste licence and relates to the deposition of soil and stones and recycling of C&D material. The waste licence application is to aid in the continued restoration of the south west section of Mullaghcrone Quarry. This EIS and associated, waste license application is submitted to EPA. The waste licence will involve the future infilling of 1,200,000 m^3 (1,800,000 tonnes). By maintaining an average soil and stones infilling rate of 100,000 tonnes per annum, with C&D comprising 50,000 tonnes per annum will allow this waste licence to continue is use for a further 20 years approximately. Given the variable demand lead natural of the C&D and soil and stones recovery, the quantities outlined may vary from year to year.



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GENERAL LEGEND

LAND OWNERSHIP BOUNDARY

ACTIVITY BOUNDARY

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

200m 0 200m 400m 600m

Issue	Date	Description	By	Chkd
B	27.05.11	ISSUED FOR LICENSE REVIEW	MN	JD
A	28.03.11	ISSUED FOR LICENSE REVIEW	MN	JD

Client: Roadstone Wood

Project: MULLAGHCRONE WASTE LICENSE APPLICATION

Title: SITE LOCATION MAP

Scale @ A3: 1:20,000

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

Project Director: D. Grehan

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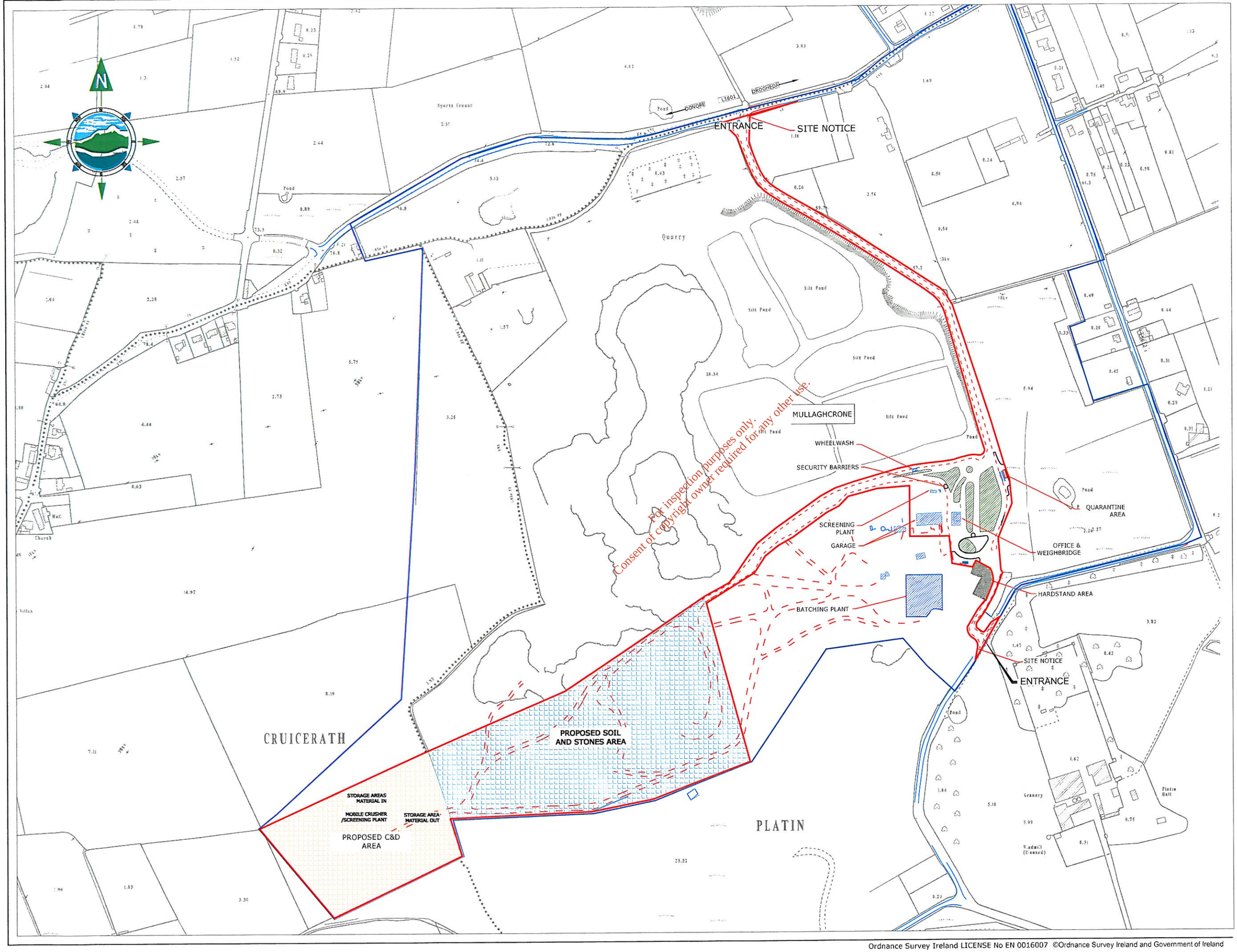
Drawing No: Figure 1.1 | Issue: B



GENERAL LEGEND

LAND OWNERSHIP BOUNDARY	ACTIVITY BOUNDARY
EXISTING MAJOR CONTOUR 60.00m	EXISTING MINOR CONTOUR
PUBLIC ROAD	EXISTING INTERNAL HAUL ROAD
EXISTING SITE STRUCTURES	EXISTING HARDSTAND
C&D - AREA 1	
SOIL & STONES AREA	

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
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50m 0 50m 100m 150m

Issue	Date	Description	By	Chkd
B	27.05.11	ISSUED FOR LICENSE REVIEW	MN	JD
A	26.03.11	ISSUED FOR LICENSE REVIEW	MN	JD

Client: Roadstone Wood

Project: MULLAGHCRONE WASTE LICENSE APPLICATION

Title: SITE LAYOUT

Scale @ A3: 1:5,000

Prepared by:	Checked:	Date:
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Drawing No. Figure 1.2 Issue. B

1.2 SITE LOCATION

The Mullaghcrone Waste Licence application site is located in an industrial area in the townlands of Cruicerath and Platin, which is approximately 600m to the east southeast of Donore Village. The location of the site in relation to its geographic surrounds is shown on Figure 1.1 (Regional Site Location Map).

The R152 Regional Road passes through Duleek approximately 1.5km to the southwest, with the M1 located 2km to the east of the proposed waste licence area. This national route provides a proximal route for vehicles accessing or exiting the site. The Mullaghcrone Quarry is accessed from two site entrances: the L1601 along the northern site boundary and the L5612 along the southeast boundary.

The site is relatively well screened by the existing topography and hedgerows/trees. The natural screening of the site was accounted for in the infilling design.

On the basis of current and anticipated demand, infill operations will be maintained at an annual average of 100,000m^3 over a 20 year lifetime. Allowing for variations in demand over the lifetime of the operation, permission is sought to facilitate infilling over a 20 year period.

1.3 WASTE LICENCE BACKGROUND

A number of waste permits have operated at Mullaghcrone Quarry, WMP2006/19 soil and stones (see Drawing 6222-2003). Waste permit WMP2006/19 expired on 21st September 2009. A C&D waste permit WPF/MH/11/0003/01 will expire in 2016 or if a waste licence is granted.

The proposed development will also involve the progressive restoration of lands during the infilling operation. Restoration works will be commensurate with the infill of materials in these areas. The proposed waste licence facility will allow for the restoration of the waste licence area between 75 -83 mOD. It is intended that Area 1 will be the location of the C&D permit area with Area 2 for Soil and stones. Separate areas will be maintained for C&D and soil and stones for operational purposes.

The recovery activities at the proposed **C&D Waste Licence facility** will be in accordance with the Fourth Schedule of the Waste Management Act 1996-2008. The **principal activity** to be carried out at the facility will be:

Class 4: Recycling or reclamation of other inorganic materials

Other activities from the Fourth Schedule will include:

Class 3: Recycling or reclamation of metals and metal compounds.

Class 13: Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.

The recovery activities at the proposed **soil and stones facility** will be in accordance with the Fourth Schedule of the Waste Management Act 1996. The **activity** to be carried out at the facility will be:

Class 10: *Spreading of any waste on land with a consequential benefit for an agricultural activity or ecological system, including composting and other biological transformation processes.*

1.4 COMPANY BACKGROUND

"Roadstone is the leading manufacturer and supplier of building materials in Ireland and will continue to be. Roadstone's number one priority is to give a service to its customers, which is second to none. Roadstone will supply top quality products and materials and give excellent value and customer services, by making full use of advanced technology. Roadstone research and development of new products and services is an important factor in the progress and development of the company."

Roadstone Wood is a subsidiary of Cement Roadstone Holdings plc (CRH), the international building material group, with over 950 locations and 75,000 employees in 35 countries and is now one of the top five companies in its sector worldwide.

Founded in 1949, the success of CRH, of which Roadstone Wood is a subsidiary, has been built upon three vital elements – 'People, Products and Progress'. Roadstone Wood is a progressive manufacturer and supplier of a comprehensive range of high quality building materials and products for the construction industry in Ireland. Products are manufactured at the various plants, which operate independently assessed assurance schemes to ISO 9001 standard.

In order to protect the environment and community in which it operates, Roadstone Wood complies fully with national and international environmental standards by using materials that are sympathetically sourced. The company has a record of over 50 years continuous development and service to the construction industry and has made a significant contribution toward building Ireland's infrastructure.

The Mission Statement of Roadstone Wood reads as follows:

Our vision is to continue to be the leading supplier of building materials in Ireland.

We will achieve this by securing adequate reserves which will be extracted and further processed using proper plant and equipment in a safe, healthy and environmentally compliant way.

Our priority is to give a superior service to our Customers. Management asks all employees and contractors to be totally committed to this objective.

We will stick to our core business and produce & supply quality products giving excellent value to our Customer whilst making maximum use of modern technology.

The development of new products, markets and systems of operation is critical to the progress of the Company and employees are invited to share their ideas with Management.

We will be a responsible neighbour in the communities in which we operate and deliver on our social responsibilities especially the Health & Safety of all.

We must be a vibrant and learning organisation with a healthy mix of depth of skills and backgrounds supported by on-going training.

We are committed to supporting our parent company CRH plc. and to enhancing shareholder value.

1.5 PLANNING HISTORY

The Mullaghcrone site has been operated for rock extraction since the original planning permission was granted by Meath County Council in 1978 (Planning Ref.: P77/917). At that time the property was in the ownership of Irish Cement Ltd (ICL). The original quarry occupied an area of approximately 19 ha.

The quarry was acquired by Premier Periclase Ltd. (PPL) in 1980, following a grant of planning permission by Meath County Council in 1980 (Planning Ref.: P79/2120). The grant of planning permission related to the retention of building, plant and other structures within the site. A third party appeal was lodged with An Bord Pleanala against the decision of Meath County Council, however this appeal was unsuccessful, due to the precedence of the land usage within the site established under the planning permission granted in 1978 (Planning Ref. P77/917).

Since 1980 a number of subsequent planning applications have been lodged with Meath County Council and have been granted. A brief outline of the planning applications and decisions reached by Meath County Council are detailed below.

A planning application was lodged to Meath County Council in November 1982 (Planning Reference No. P82/1987) to seek permission for a new entrance to the southeast of the quarry property to allow for access onto the R152 Regional Road, via a 1.5km stretch of county road (County Road No. L5612 & L5613). Following lodgement of further information on the proposal in January 1983, planning permission for the new entrance was granted by Meath County Council in February 1983, subject to 6 No. conditions. The planning decision was appealed by PPL and others to An Bord Pleanala. Following a review of the information submitted regarding the appeal, An Bord Pleanala decided in June 1984 to grant permission for the new entrance subject to the planning conditions of Meath County Council. An Bord Pleanala determined that "*having regard to road conditions in the area and the quarrying activities carried out there, it is considered that the provision of a well designed second entrance would not be contrary to the proper planning and development of the area*".

A planning application with an associated Environmental Assessment Report was submitted to Meath County Council in February 1989 for a quarry of approximately 11ha to the north of the initial quarry property (Planning Reference No. P89/163). Site investigations indicated a reserve of high purity limestone in this area. The application proposed a quarry footprint of approximately 3.7ha for rock extraction and 7.3ha for accommodation land (topsoil and subsoil storage and clay disposal). Meath County Council granted permission on the 18th April 1989, subject to 11 No. conditions.

Two planning applications were lodged with Meath County Council in 1995, the first for the provision of a clay disposal area and associated landscape works over 4.8ha (Planning Ref. 95/263), the second for the demolition of a derelict cottage, within a 0.22ha parcel of land (Planning Ref. 95/633). The extent of

both planning applications is shown on Figure 1.2. Both applications were granted planning permission by Meath County Council.

Roadstone Dublin Ltd. (now Roadstone Wood) acquired Mullaghcrone Quarry from Premier Periclase Ltd. and has operated the site since mid 2006. Irish Cement Ltd., Premier Periclase Ltd. and Roadstone Wood are all Cement Roadstone Holdings (CRH) plc group of companies.

Roadstone (July 2003) lodged a planning application with Meath County Council for the erection of a concrete batching plant with ancillary services within Mullaghcrone Quarry. The position of the batching plant is in the area where the aggregates were previously washed by PPL (see Drawing No. 6222/408). This planning application was successful with permission granted by Meath C.C. on 18th November, 2003 (see Planning Ref. SA/30257). Mullaghcrone quarry (QY 10) is also registered under section 261 (2007).

The entire Mullaghcrone Quarry property extends to 93.8ha within the townlands of Platin and Cruicerath, Donore, County Meath.

1.6 PROCEDURE AND STRUCTURE OF EIS

Environmental Impact Assessment (EIA) requirements derive from European Communities Directive 85/337/EEC (as amended by Directive 97/11/EC) on the assessment of the effects of certain public and private projects on the environment. This EU Directive was transcribed into Irish Law under S.I. 349 of 1989 (European Communities (Environmental Impact Assessment) Regulation).

An EIA is a process that examines the environmental consequences, both positive and negative, of a proposed development. This Environmental Impact Statement has been prepared in accordance with the requirements of Irish implementing legislation namely the European Communities (Environmental Impact Assessment) Regulations 1989-2000.

The objective of the EIA is to identify and predict the scale of impact on the receiving natural environment. Following the assessment of the natural receiving environment and potential impacts on the environment as a result of the development, the EIA describes construction methodologies, development designs and measures by which these impacts may be mitigated and/or reduced. Where it is found that an impact cannot be prevented or mitigated against, or where additional monitoring is deemed necessary, this is also highlighted.

The outcome of the Environmental Impact Assessment process is the production of an Environmental Impact Statement (EIS) and an accompanying Non-Technical Summary. The emphasis of the study is on prevention of impacts, with the resulting information taken into account.

The minimum information that must be contained in an EIS is specified in Part X of the Planning and Development Act, 2000 and Schedule 6 of the Planning and Development Regulations, 2001. The structure and content of this EIS has been based on the legislative requirements as set out in Part X of the Planning and Development Act, 2000 and Part 10 of the Planning and Development Regulations, 2001 and the guidance documents by the Environmental Protection Agency as outlined above.

The consequences of any major development project are generally presented in the form of an Environmental Impact Statement (EIS). The EIS contains information on the scale and nature of the proposed development, a description of the existing environment, impact assessment of the proposed development and mitigation measures to mitigate and/or reduce the impact on the receiving environment.

The structure and content of the Environmental Impact Statement has been based on the following documents, as published by the Environmental Protection Agency.

- Advice Notes on Current Practice in the preparation of Environmental Impact Statements (September 2003).
- Guidelines on the information to be contained in Environmental Impact Statements. (2002).

To allow for ease of presentation and consistency when considering the various elements of the environment, a systematic structure has been adopted for the main body of the statement. This structure is known as a "Grouped Format". The structure is used for each particular environmental aspect as given below.

The overall EIS is arranged in three volumes, as follows:

Volume I: Non-Technical Summary;
Volume II: Environmental Impact Statement;
Volume III: Appendices.

Volume I: Non-Technical Summary

This document provides an overview and summary of the main EIS using non technical terminology and detail. It is a means for non-professionals to review the information included in the main EIS document. It is a stand-alone document and should offer a clear and concise summary of the existing environment, characteristics of the development and mitigation measures for the development.

Volume II: Main EIS

To allow for ease of presentation and consistency when considering the various elements of the environment, a systematic structure will be adopted for the main body of the statement. The structure is used for each particular environmental aspect, as given below:

- Chapter 1 of the Main EIS will provide an introduction and a brief background of the project, the legislative requirements under which the document is prepared, EIS consultation and scoping the layout of the EIS, and the examination of alternatives to the development taking into account the planning context and the existing development.
- Chapter 2 will provide a detailed description of the site and the development, methodology and the programme and phasing of the operation.
- Chapter 3 provides details on the alternatives to the development taking into account the planning context.

Chapters 4 to Chapter 14 inclusive will deal with the following specialist environment assessments: -

- Chapter 4 - Human Beings & Socio-Economic
- Chapter 5 - Flora & Fauna
- Chapter 6 - Soils, Geology & Hydrogeology
- Chapter 7 - Water

- Chapter 8 - Air Quality
- Chapter 9 - Climate
- Chapter 10 - Noise & Vibration
- Chapter 11 - Material Assets
- Chapter 12 - Cultural Heritage, Archaeology and Architectural Heritage Assessment
- Chapter 13 - Traffic & Road Assessment;
- Chapter 14 Landscape and Visual Assessment
- Chapter 15 - Interactions between various environmental aspects

Each of the environmental criteria will be prepared using the following heading: -

- Introduction
- Existing Environment
- Significant Impacts
- Mitigation Measures

Introduction

This section will include background to the assessment and will describe the study methodology in carrying out the assessment.

Existing Environment

In describing the receiving environment, an assessment is made of the context into which the proposed development will be located. This takes account of any other proposed and existing developments.

Significant Impacts

This section allows for a description of the specific, direct and indirect impacts, which the proposed development may have and taking into account mitigation measures. This is done with reference to Receiving Environment and Characteristics of the Development, while also referring to the magnitude, duration, consequences and significance of the development during the operational phases.

Mitigation Measures

This includes a description of any remedial, or mitigation measures that are either practicable or reasonable having regard to the potential impacts.

Volume III: Appendices

All supporting documentation and references, referred to in the EIS text body (Volume II) are included in this volume.

1.7 SCOPING AND CONSULTATION OF EIA

As part of the EIA process, TOBIN Consulting Engineers issued a scoping letter to the EPA, on 6th July 2010, seeking a formal meeting to discuss the scope and extent of the EIS. A preliminary meeting with the EPA was conducted on the 24th August 2010.

1.8 TECHNICAL DIFFICULTIES AND AVAILABILITY OF DATA

No significant technical difficulties or lack of data were experienced in preparing the Environmental Impact Statement for the development.

1.9 STUDY TEAM AND CONTRIBUTORS TO THE EIA

This EIS has been prepared by a team of consultants co-ordinated by TOBIN Consulting Engineers. The relevant inputs of the various members of the Study Team are listed in Table 1.1. The EIS was completed in partnership with Roadstone Wood.

Considering that the Mullaghcrone Waste Licence application is located at an established quarry which has been in existence for a number of decades, a significant amount of historical environmental data has been generated and this data has been used in the EIS.

Table 1.1 List of Bodies involved in Preparation of the EIS

Team Member	Inputs
TOBIN Consulting Engineers	Project Direction, Project Management, Production, Evaluation and Reporting. Introduction, Description of Development, Alternatives, Human Beings / Socio Economic, Flora & Fauna, Soils /Geology& Hydrogeology, Water, Air Quality & Climate, Noise & Vibration, Cultural Heritage, Traffic and Road Assessment, Interaction of the Foregoing
Charles Mount	Archaeology & Architectural Heritage
Mitchell and Associates Ltd.	Landscape and Visual

2 EXISTING SITE AND PROPOSED DEVELOPMENT

2.1 THE SITE

The application area is contained within Mullaghcrone Quarry, owned by Roadstone Wood, as shown on Figure 1.2. The total site application boundary including haul roads encompasses an area of 15.3 ha. The application area is comprised of 11.7ha previously used for waste permit purposes and 3.6 ha of haulage road and associated facilities.

The geomorphological terrain is characterised by undulating to hilly landform, with the hills underlain by clay till material and limestone bedrock.

The application area to the north is bound by Mullaghcrone Quarry which is the main access point for vehicles accessing the development.

Platin Quarry, operated by Irish Cement Ltd., forms the southern boundary with agricultural land located to the west. The land-use adjacent to the application area is predominantly landscaping areas and a limestone quarry.

Donore village is located approximately 0.6km to the northwest of the development entrance. The R152 Regional Road runs in a general northeast to southwest direction through Duleek Village.

2.2 APPLICATION AREA

The site is located in the townlands of Cruicerath and Platin, Donore Co. Meath.

The total site application boundary encompasses an area of approximately 15.3 ha. The proposed development area is at present used for C&D Waste Permit purposes. There are no houses within the site boundary.

The EIS is prepared for a waste licence application comprising infilling of soil and stones, C&D recovery, landscaping measures and visual screening, in respect to which an Environmental Impact Statement (EIS) has been prepared.

2.3 THE OPERATION

C&D operations will be confined to Area 1 of the Waste Licence application area. Infilling operations will be undertaken in Area 2. These are illustrated on Figure 1.2.

The infilling area will develop in 4 No. infilling phases. The reserve life is approximately 20 years.

Soil and Stones Infilling

The infilling will progress from a west to east direction in line with recommendations from the Landscape and Visual Assessment Consultants.

A volumetric assessment of the void space has been undertaken, which is calculated to be approximately 1,200,000m^3 within the target infilling area. This equates to 1,800,000 tonnes of material. The infilling of this material will continue the operations by approximately 20 years.

The infill of material will be 30m – 70m above the watertable. Therefore all workings in this area will be on a dry working platform. It is not proposed that water management systems or controls are required in this area. Any rainfall onto this area will readily infiltrate to ground.

Following infill in this area the land will be restored. Topsoil will be spread over the infilled area and the land will be retuned to grassland for agricultural use.

Operational Procedures

The infilling and transport equipment to be used in the proposed waste license will consist of: -

- Bulldozers;
- Dump trucks; and
- Front-end loaders.

The import of waste material to the site will be undertaken under contract to Roadstone Wood Ltd. As part of the waste license, but separate to the physical infilling operation, waste licence activities will utilise the existing wheelwash, weighbridge and administration/security portacabin office located close to the southern entrance from the L5612.

2.4 WORKING HOURS

The proposed working hours for the proposed development will be as follows: -

- 07.00 to 19.00 hours, Monday to Friday; and
- 07.00 to 15.00 hours on Saturday.
- The waste licence facility will not be operated on Sundays and Public Holidays unless warranted by exceptional circumstances and this will be agreed in advance with the Local Authority.

2.5 EMPLOYMENT

The proposed waste licence area will secure employment for approximately ten existing employees, both directly on-site and for haulage.

Indirect employment will be generated as a result of the Waste Licence activity, in terms of contract transport drivers, suppliers of products and services, machinery suppliers, environmental monitoring, etc.

2.6 SITE SECURITY

The site boundary is fenced along the entrance to the quarry and at the quarry boundaries. Warning signs will be located and maintained at the perimeter fencing providing notice of the proposed on-site Waste Licence operations.

The security measures employed will ensure that accidental entry to the site is prohibited. Regular inspections of the site security arrangement will be undertaken by site operatives and repaired immediately if any damage is noted.

2.7 HEALTH AND SAFETY

The primary concern of Roadstone Wood is the safety and protection of employees, end users, the public, and the environment, with regard to all aspects of the infill, storage, transportation and use of aggregate products and the transportation of construction aggregates. The quarry will operate under the relevant health and safety legislation, i.e. *The Safety, Health and Welfare at Work Act, 2005, The Mines and Quarries Act, 1965* and subsequent Quarries Regulations relating to safety health and safety, training, appropriate site management etc.

All personnel will be appropriately trained and certified in the safe handling, transportation and processing of aggregate materials. All personnel will be thoroughly trained on the properties of all materials and products being handled within the quarry, and will be trained to react in the unlikely event of an unplanned incident.

2.8 TRAFFIC CONTROL AND TRANSPORT ROUTES

All traffic will enter and leave via the existing entrances from the L1601 and L5612 proceed along the internal haul road to the processing and loading area.

All vehicles using the site will be diverted through a wheelwash. The public road network will be cleaned, when necessary, of any dirt and debris as a result of aggregate spillage due to haulage to and from the existing site.

The following mitigation measures will be employed to ensure traffic associated with the development will not impact negatively on the environment.

- Continuation of the adequate on-site parking will be provided for employees and visitors cars;
- Provision of on-site speed restrictions;
- Ensuring that all HGV's are not overloaded;
- Dust suppression; and
- Checking public roads in the vicinity for signs of spillages.

In addition to the above, a road sweeper will be periodically contracted to sweep the road near the entrances on the L1601 and L5612 roadway leading to the R152 National Secondary road.

2.9 SITE ROADS AND HARDSTANDING

The internal roads are tarmaced/concreted from the site entrances to the weighbridge and security barriers. Haul roads are constructed of crushed stone/site won material with relatively minor quantities of construction and demolition waste, principally oversize or recovered (ie. crushed and screened) concrete and bricks.

2.10 MATERIAL INSPECTION AND QUARANTINE

The waste soils to be accepted at the facility are inert wastes, limited to uncontaminated natural soils, sub-soils, stone and rock. 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 areas.

Waste Quarantine Areas

If inappropriate material is identified during inspection, it will be removed to a waste quarantine area before removal from site. It is proposed to use skips on an existing hardstanding area within a secure garage for storage of quarantine rejected waste. The garage is located near the office buildings allowing ready inspection of the quarantine waste.

Laboratory Testing

Laboratory testing of soil, surface water, 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.

2.11 EXISTING SERVICES AND FUEL STORAGE

The required infrastructure at Mullaghcrone is already in place including a weighbridge, wheelwash, mobile crushing plant, offices, garage etc. The location of the existing infrastructure is included on Figure 1.2 of the EIS. All heavy good vehicles (HGV's) to the proposed facility are required to pass over the existing weighbridge.

A vehicle wheelwash is in operation at Mullaghcrone Quarry. This wheelwash is operated in a closed loop system, to minimise water requirements. A macadam surface is present from the public road to the wheelwash to minimise soiling of road surfaces. HGV vehicles pass over the roller bar system and are sprayed from the jet washers on both sides and beneath the trucks. Wash water is then treated to remove suspended solids in a settlement tank. Treated water is then recirculated to the water tank.

At Mullaghcrone Quarry, telephone lines are connected to the Eircom national network providing phone, fax and Internet access is available. The Electricity Supply Board (ESB) supplies electricity to this site from a 10 kV crossing the site. With regard to the application area, vehicles on site and mobile plant are operated by fuel.

The existing fuel storage area is located in a bunded area within a hardstand area close to the main concrete batching area. A fuel contractor will deliver fuel to the bunded fuel storage area at regular intervals. This will eliminate the requirement for bunded fuel tanks within the waste infill area.

Fuel is stored on site in a single 18,600 litre aboveground storage tank (AST**)**. This AST holds the fuel supply for all plant and equipment operating within the site.

A secondary containment system, in the form of an impermeable concrete-lined bund, has been constructed around the AST, to ensure that any spillage during loading or any leakage is adequately contained within the bund. The capacity of the bund is approximately 29,300 litres (Dimensions 7.6m x 2.66m x 1.5m), which is 150% of the volume of the AST. Any spillage gathered within the AST bund will be pumped out by an approved contractor (e.g. Atlas Oil, etc) and transported off-site for treatment.

All oil drums and barrels containing hydrocarbons will be contained within a housed bund unit. Lubricant, gear, engine and waste oil will be stored in bunded units within the maintenance garage. Oil drums in the maintenance garage and workshop will be located on spill trays. Spill kits will be provided in close proximity to all bulk liquid storage areas to ensure, in the unlikely event of a spillage, that the contamination is confined to the immediate area. Absorbents will be used in the event of an oil spill to contain and mop up the area. These absorbents will then be placed in a clearly marked contaminated waste bin. All waste oil will be removed from the site by a permitted contractor. These waste streams would include those that are contaminated with oils, i.e. oily rags.

Staff responsible for the fuel storage facility, are trained in proper fuel handling and spillage response procedures with an appropriate EMS in place.

2.12 SEWAGE AND WASTEWATER TREATMENT

It is proposed to continue to utilise the existing wastewater treatment plant at the site. The septic tank, mechanical aeration system and percolation area within Mullaghcrone Quarry accepts sewage from the canteen and office blocks within the site. It should be noted that of the 25-30 direct and indirect employees, only 5 full time employees use the toilet facilities on a regular basis. As the number of employees will remain the same at Mullaghcrone no amendments are required to the wastewater treatment system.

2.13 WATER MANAGEMENT SYSTEM

Surface Water

All rainwater falling within the site will be contained within the site boundaries, due to the low elevation of the worked out quarry void, relative to the surrounding natural topographic elevation. Due to the nature of the rock this captured water percolates to ground to recharge the underlying aquifer. The groundwater table is approximately 30 m below ground level at the proposed waste licence facility.

Owing to the free draining nature of the ground (i.e. the site is dominated by limestone deposits), rainwater freely infiltrates to ground. Therefore, where works are conducted above the watertable there are no requirements for water management.

In order to minimise soiling of roads and to minimise dust emissions form the site, a wheelwash is in operation within Mullaghcrone Quarry. All vehicles leaving the site are directed through the wheelwash. Delivery vehicles, operated under contract to Roadstone Wood, who do not adhere to the strict Roadstone Wood protocol, are subject to sanction.

At the wheelwash, washwater is contained within an impermeable sump. As required the wheelwash is replenished with water from the water supply. There are no uncontrolled emissions from the wheelwash system.

Water Supply

Water consumption within the quarry/waste permit area is low. It is estimated that the drinking water requirement within the quarry would not exceed 60 litres/person/day. Therefore, for a maximum of 10 persons on site per day, the potable water consumption is 0.6m^3/day. The mains water source is supplied from the River Boyne as part of the East Meath Water Supply Scheme.

2.14 WASTE MANAGEMENT

C&D Area

The C&D area will be undertaken in Area 1 of the waste licence area (see Figure 2.1). Recovery and re-cycling activities at the application site will involve loading of previously stockpiled "unprocessed" material into a crushing plant using a front-end loader. Material produced by the crushing plant will then be transported by front-end loader to 'processed' stockpiles. Recycled material will be loaded and dispatched from 'processed' stockpiles.

Rebars separated from concrete will be stored in a designated location. No sorting of materials other than the separation of rebars from concrete will be undertaken on site, as all material will be sorted and segregated at source before being brought to the application site.

The pre-sorted materials brought to the application site will be stored on-site prior to processing (crushing). Processed material will also be stockpiled prior to transportation of site to markets. Rebar from reinforced concrete will be stored, prior to being removed by a licensed contractor.

The purpose of the proposed operation is to recover and recycle particular elements of construction and demolition waste through pre-sorting of materials at source prior to transportation to the application site.

The objective of Roadstone Wood is to do this in a manner that is sustainable and environmentally friendly, in line with the high environmental standards set by the company for all of its operations. Safeguards to ensure that only suitable material is received on site include but are not limited to:

- Materials to be recovered and recycled will only be accepted from approved Contractors who are aware of the need for and who undertake strict segregation and sorting of waste prior to transporting it to the application site.
- An internal licensing operation will be put in place to ensure that only approved Contractors may use the proposed facility.
- All material arriving on site will be subject to a visual inspection on site prior to and during unloading.
- Any Contractor who carries unacceptable waste to the application site will be refused further use of the facility.

Soil and Stones

This material will be used for the restoration of the quarry lands adjacent to the C&D facility, i.e. at the clay disposal area in Area 2.

All waste will be dealt with in accordance with the relevant legislation and other controls. Good practice will be achieved when recycling used oils and greases, batteries and tyres. All recyclable wastes will be segregated and collected by licensed/permitted waste contractors. Domestic waste will be removed off-site by a contractor with the requisite waste collection permit.

The following measures will be implemented at the site to ensure waste on site is managed to a high standard:

- Materials to be recovered will only be accepted from approved Contractors who are aware of the need for and who undertake strict segregation and sorting prior to transporting it to the application site.
- An internal licensing operation will be put in place to ensure that only approved Contractors may use the proposed facility.
- All material arriving on site will be subject to a visual inspection on site prior to and during unloading.
- Any Contractor who carries unacceptable waste to the application site will be refused further use of the facility.

2.15 SITE MANAGEMENT

A competent management structure will be in place on site at all times, under the direction and supervision of the Quarry Location Manager.

Listed below are a number of specific roles, responsibilities and authorities for the Environmental Management System.

The Managing Director has overall responsibility for fostering a sense of environmental awareness amongst both direct and indirect staff. The Managing Director (in conjunction with his management team) is responsible for ensuring that adequate resources are identified and made available for the effectiveness of this EMS. This includes the steps to be taken in the event of an emergency occurring at a location, which could adversely impact on the environment.

The Environmental Officer has overall responsibility for planning any environmental training that is to be carried out during the year.

The Managing Director and Human Resource Manager have appointed the Environmental Officer.

The Environmental Officer is responsible for: -

- Ensuring that the environmental management system requirements are established implemented and maintained in accordance with ISO 14001:2004.

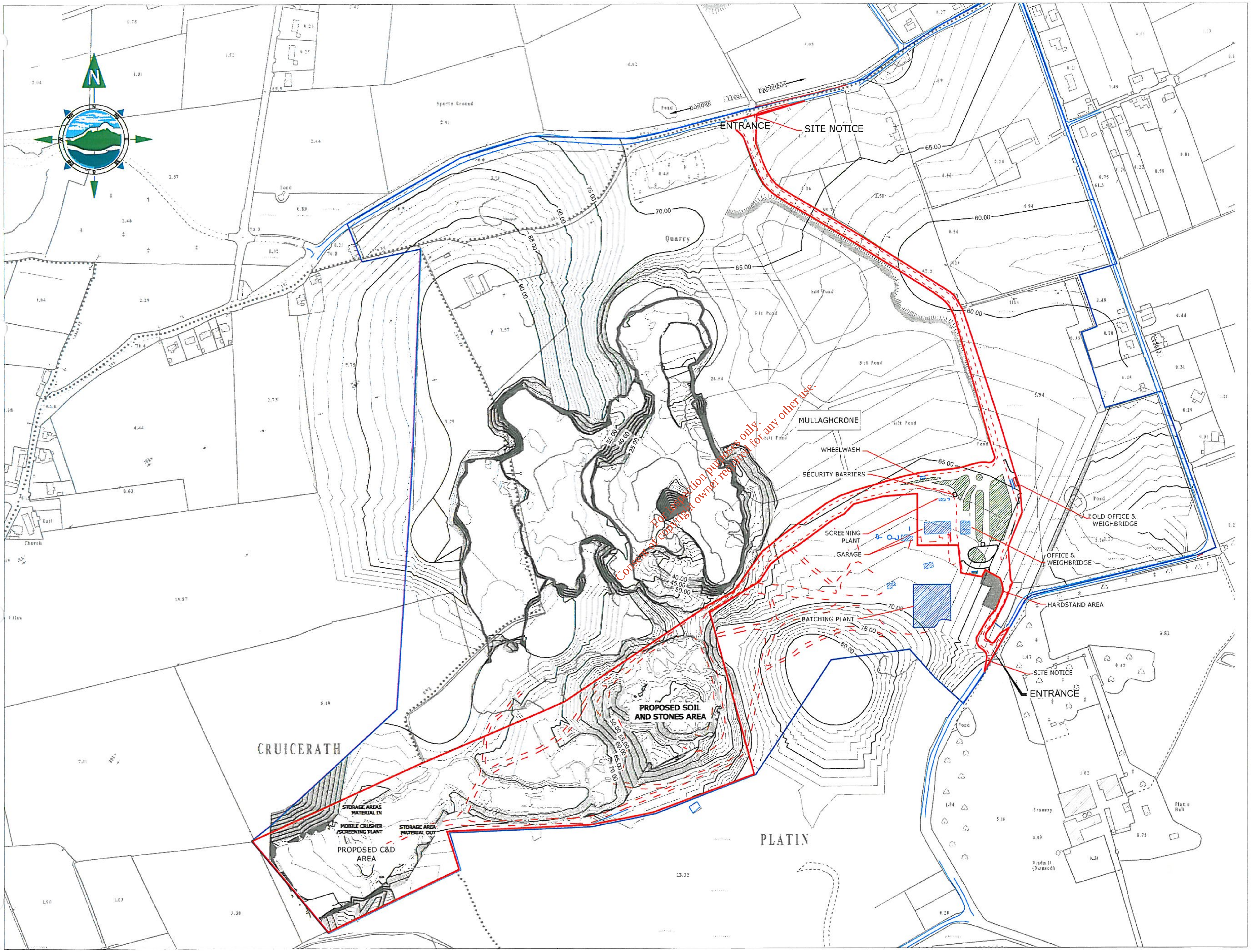
- Reporting on the performance of the EMS to top management for review and as a basis for improvement – this will be completed by including a section on the environmental management system on the management meeting agendas.

Each Location's organisation structure is identified in the Annual Environmental Review EMS/03. It is their responsibility to ensure the resources identified for the effective implementation of the EMS are provided for their individual locations. All location/plant managers are responsible for ensuring excellent levels of housekeeping are maintained at their location.

All employees have a responsibility to comply with specified environmental procedures. They should also inform management of any issues of environmental significance that they notice e.g. spills of oils, leaky drums, faulty abatement systems etc.

2.16 SITE ACCOMODATION

The existing welfare, site office and canteen at Mullaghcrone will serve the proposed waste licence facility. All administration and management for the waste recovery facility will be based at the site office for the duration of the waste licence. Staff changing, washing and cooking facilities are provided at the site office and weighbridge.



GENERAL LEGEND

LAND OWNERSHIP BOUNDARY

ACTIVITY BOUNDARY

EXISTING MAJOR CONTOUR — 60.00m —

EXISTING MINOR CONTOUR

PUBLIC ROAD

EXISTING INTERNAL HAUL ROAD

EXISTING SITE STRUCTURES

EXISTING HARDSTAND

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

50m 0 50m 100m 150m

Issue	Date	Description	By	Chkd
B	27.05.11	ISSUED FOR LICENSE REVIEW	MN	JD
A	26.03.11	ISSUED FOR LICENSE REVIEW	MN	JD

Client: Roadstone Wood

Project:

MULLAGHCRONE
WASTE LICENSE APPLICATION

Title:

SITE LAYOUT AND

EXISTING CONTOURS

Scale @ A3 1:5,000

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

Project Director: D. Grehan

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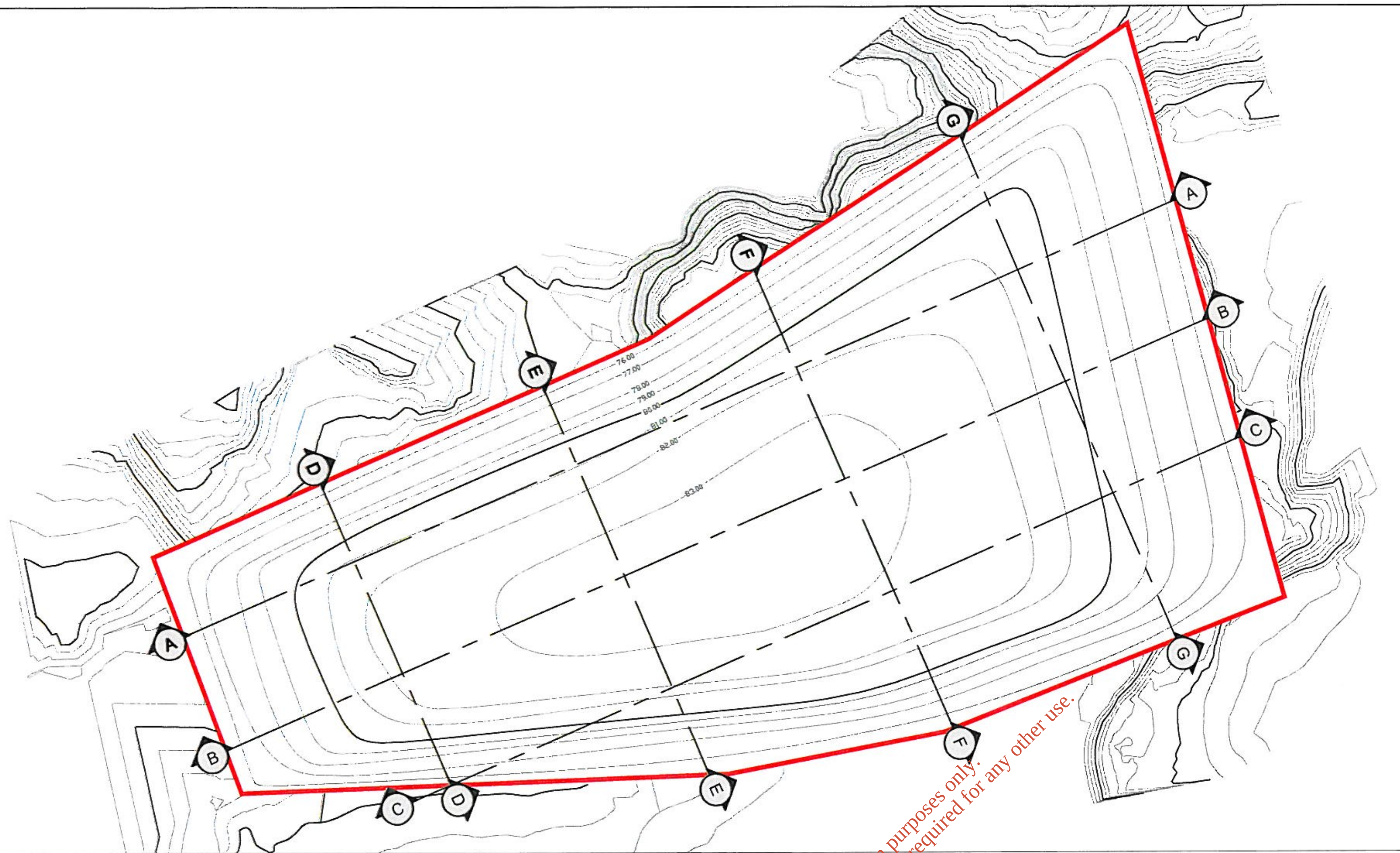
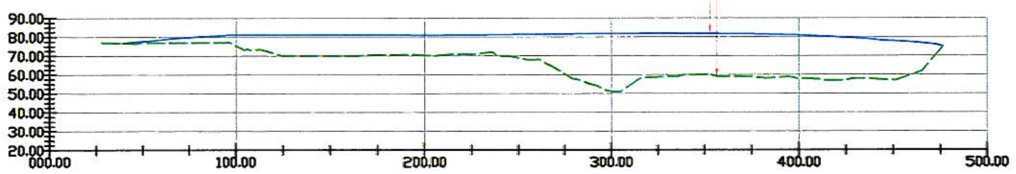
Drawing No Figure 2.1 Issue: B



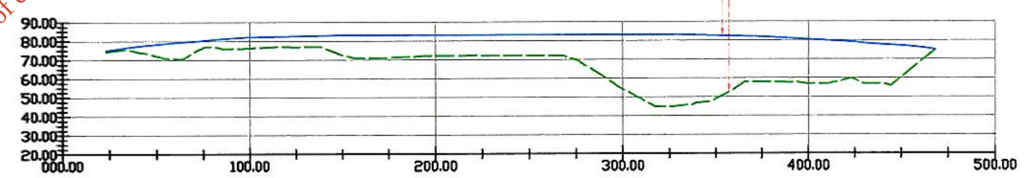
PLAN ON WASTE CAP
SCALE 1:1250

PROPOSED FILL CAP
EXISTING GROUND PROFILE



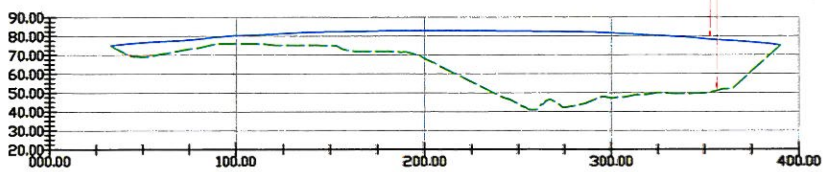
LONGITUDINAL SECTION A-A
SCALE 1:2000

PROPOSED FILL CAP
EXISTING GROUND PROFILE



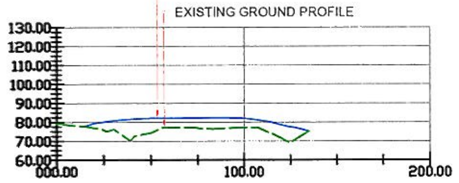
LONGITUDINAL SECTION B-B
SCALE 1:2000

PROPOSED FILL CAP
EXISTING GROUND PROFILE



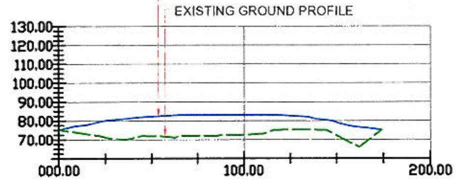
LONGITUDINAL SECTION C-C
SCALE 1:2000

PROPOSED FILL CAP
EXISTING GROUND PROFILE



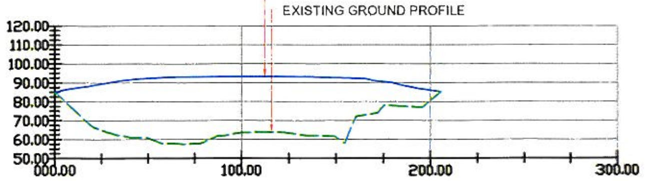
CROSS SECTION D-D
SCALE 1:2000

PROPOSED FILL CAP
EXISTING GROUND PROFILE



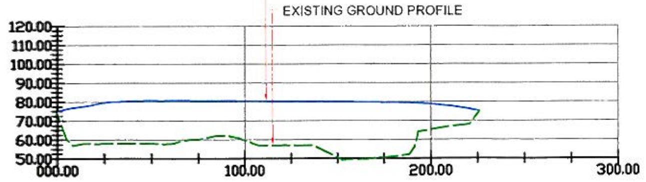
CROSS SECTION E-E
SCALE 1:2000

PROPOSED FILL CAP
EXISTING GROUND PROFILE



LONGITUDINAL SECTION F-F
SCALE 1:2000

PROPOSED FILL CAP
EXISTING GROUND PROFILE



CROSS SECTION G-G
SCALE 1:2000

LEGEND

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

Rev	Date	Description	By	Chkd
B	27.05.11	ISSUED FOR LICENSE REVIEW	MN	JD
A	28.03.11	ISSUED FOR PERMIT REVIEW	MN	JD

Client: Roadstone Wood

Project:
MULLAGHCRONE WASTE LICENSE APPLICATION

Title
PROPOSED SOIL AND STONES & SECTIONS

Scale @ A1: As Shown

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

Project Director: D. Grehan

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Drawing No: Figure 2.2
Revision: B

3 ALTERNATIVES

Schedule 6 of the Planning and Development Regulation (2001) specify that the EIS should include '*An outline of the main alternatives studied by the developer and an indication of the main reasons for his or her choice, taking account the effects on the environment*'.

The EPA publication, Guidelines on the information to be contained in Environmental Impact Statements, states '*The consideration of alternatives also needs to be set within the parameters of the availability of land (it may be the only suitable land available to the developer) or the need for the project to accommodate demands or opportunities which are site specific. Such considerations should be on the basis of alternatives within the site, e.g. design, layout"*.

The proposed application area has been defined as the best available area for land restoration and infill using soil and stones material within the previous Mullaghcrone Waste permit site. Mullaghcrone Quarry has operated under waste permits and its economic continuance over this time demonstrates a market for such an activity. Based on the previous waste permits there is a proven market for this activity. The waste licence will secure the facility into the future. Therefore, the examination of alternative locations was not considered appropriate.

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The future design of infilling and the mitigation measures proposed in this EIS are designed to ensure that the continued workings within the site do not impinge on the adjacent environment. This design by avoidance and reduction is considered an appropriate consideration of alternatives.

Mullaghcrone Quarry is established as an infilling site for soil and stones and C&D waste recycling activities. Owing to its current use, examination of greenfield alternatives for Waste Licence activities is not considered appropriate. Creation of new sources of supply, by developing greenfield sites, is problematic from environmental and community perspectives. The continuance of operations within the Mullaghcrone Quarry site is considered to represent a viable option for this waste license, in terms of location, availability, existing markets, technical characteristics and manageable environmental impacts.

Recycling of construction and demolition waste, including re-use of road construction materials, provides an increasing source of raw materials. In the absence of this facility and the continuing national, regional and local growth over the medium to long term, together with the National Development Plan, the waste would require the sourcing of alternative sites, involving greater haul distances, with consequent cost and road nuisance impacts.

4 HUMAN BEINGS / SOCIO-ECONOMIC

4.1 INTRODUCTION

Human Beings are a vital element to be considered as part of the EIA process. The purpose of this assessment is to examine the existing environment, the potential impacts of the continued restoration at Mullaghcrone Quarry, at Cruicerath and Platin, Donore, County Meath, on human beings. As this quarry is already in existence and this restoration is already underway, this section will provide an assessment of socio-economic issues that may be affected by its continued restoration. This section will focus on population, employment and tourism and amenities.

The total activity area of existing waste permit and proposed waste licence is within an activity area of 15.3 hectares.

4.1.1 Methodology

A desk study was carried out in order to examine all relevant information pertaining to planning and socio economic activity in the study area. The relevant national, regional and local planning guidelines were examined along with the Meath County Development Plan 2007-2013.

Fáilte Ireland tourist literature for Meath was examined in relation to tourism amenity. In addition Ordnance Survey maps were used to identify land use and possible amenity and tourist sites that may be located in proximity to the existing quarry.

4.2 EXISTING ENVIRONMENT

Mullaghcrone Quarry is located in a semi-rural to industrial area in the townland of Cruicerath and Platin, which is approximately 1m 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 the local county roads (L1061 & L5612). 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, dust, traffic, air and water quality on the surrounding environment will be dealt with individually in those relevant sections of the EIS.

4.2.1 Population

To understand an area, its population must be examined. This section will look at the population change over the period 1996-2006. The subject site is located within the townlands of Cruicerath and Platin and the District Electoral Division (DED) of Duleek. Table 4.1 illustrates the population change between 2002-2006 in the State, Leinster, Meath, Duleek DED and Donore (the nearest village to Mullaghcrone quarry).

Table 4.1 Population Change 2002-2006

	2002	2006	% Change
State	3,917,203	4,239,848	+8%
Leinster	2,105,579	2,295,123	+9%
Meath	134,005	162,831	+22%
Duleek DED	2,941	4,366	+48%
Donore	334	728	+118%

Source: CSO 2002 and 2006

Table 4.1 shows that the population of the County Meath (22%) increased at a higher rate then the State (8%). The population in Duleek DED (48%) and the town of Donore (118%) also increased in the period 2002-2006, however at a much higher rate. Central Statistics Office figures indicate that 7% of the population of Leinster live in County Meath, while 3% of Meath's population lives in the DED of Duleek.

4.2.2 Employment

Employment is an important indicator of the economic standing of an area. This section examines unemployment levels, employment status and industrial groups in the area of the existing quarry at Mullaghcrone. The Quarterly National Household Survey (QNHS) provides details of unemployment on a regional level. Mullaghcrone quarry is located in the Mid East Region therefore this Region will be used to illustrate unemployment in the area. The Mid East Region consists of Meath, Kildare and Wicklow.

Table 4.2 Quarterly National Household Survey (Q1 2010)

	Unemployment Rate	Participation Rate
State	12.9%	60.7%
Mid East Region	13.1%	65.9%

Source: CSO, 2010

Table 4.2 illustrates the findings from the most recent QNHS quarter one (Jan-March 2010). The unemployment rate is the number of unemployed persons expressed as a percentage of the total labour force. The unemployment rate for the State was 12.9% while the unemployment rate for the Mid East Region, which contains the study area, was 13.1%. The Mid East Region has a marginally higher unemployment rate than the State.

The participation rate is the number of persons in the labour force expressed as a percentage of the total population (over the age of 15 years). Currently the participation rate in the State is 60.7%. The Mid East Region's participation rate is 65.9%, which is higher then that of the State.

The Central Statistics Office (CSO) publishes figures relating to the live register. These figures are not strictly a measure of unemployment as they include persons who are legitimately working part time and signing on part time. However they can be used to provide an overall trend within an area.

Table 4.3 Live Register 2009-2010

	August 2009	August 2010	% Change
State	436,725	466,923	+6.9%
Mid East Region	41,669	44,822	+7.6%
Meath	11,238	12,348	+9.9%
Navan*	5,910	6,336	+7.2%

Source: CSO 2010 *Closest Social Welfare Office to the Quarry in Co. Meath

The figures in table 4.3 show that over the period August 2009 – August 2010 the number of persons on the live register increased in all regions. This trend indicates that they were more persons unemployed in September 2010 than in September 2009.

4.2.3 Socio-Economic Profile of the Locality

The Donore Local Area Plan 2009-2015 states that *'Donore has a small yet developing range of retail services with a growing level of comparison retailing having being developed in the past two years. Commercial development within the Village is dominated by the recently constructed part-two and part-three storey retail development to the south of the Slane/Stalleen and Duleek Road junction*' (Ref Section 7.1).

Statistics in relation to occupational group are not provided in the Census for Donore. As Donore is located in Duleek DED the occupational group for Duleek DED will be used as an indicator.

Table 4.4 Occupational Group, Duleek DED

Occupational Group	Number (Female)	Number (Male)	Total
Farming, fishing and forestry manager	4	34	38
Other agricultural workers	3	28	31
Manufacturing workers	52	276	328
Building and construction workers	3	306	309
Clerical and office workers	212	28	240
Administration and government workers	70	92	162
Transport workers	17	173	190
Sales workers	158	117	275

Occupational Group	Number (Female)	Number (Male)	Total
Professional workers	124	105	229
Services workers	168	55	223
Other workers	109	139	248

Source: CSO, 2010

Table 4.4 illustrates the occupational group of persons living in Duleek DED. '*Manufacturing workers'* (328) and *'Building and construction workers'* (309) represent the highest number of workers within the DED from 2006 Census data.

4.2.4 Land Use / Agriculture

In Meath 'agriculture, particularly pasture is the predominant landuse spread evenly throughout lowland areas of the central Meath. A mixture of large scale commercial farms and stud farms adjacent or linked to historic demesne landscapes are particularly evident in the south and east of Meath, with smaller scale, mixed use farmland in upland areas and the rolling drumlin landscape of the north and west' (Meath County Development Plan 2007-2013).

The property is in the ownership of Roadstone Wood. The area of the overall Roadstone Wood property extends to 93.8ha and is bound by the Mullaghcrone Quarry to the north; Platin Quarry to the south, agricultural land to the west and by a local county road to the east.

4.2.5 Tourism and Amenities

The current Meath County Development Plan 2007-2013 states that;

'Meath has much to offer as a tourist destination – in particular its rich heritage, the quality of the rural landscape and its coastline. Meath has a large number of visitor attractions, the most famous being the Brú na Bóinne Visitor Centre which incorporates the internationally recognised megalithic tombs and passage graves at Newgrange, Knowth and Dowth. In marketing terms, Newgrange, Trim Castle and Tara have the highest profile in both the domestic and overseas markets and are very popular destination for day trips by tourists staying in Dublin. Apart from the Boyne Valley, there are a number of high quality visitor attractions based on the county's archaeological and historical heritage' (Ref Section 3.3.1).

It is a goal of Meath County Council as stated in the Meath County Development Plan to;

'promote, encourage and facilitate the development of the tourism industry through sustainable means, including the conservation, protection and enhancement of the built and natural heritage, the protection of sensitive landscapes and cultural and community environments in order to maximise upon the economic benefits arising from the industry' (Ref Section 3.3.2).

Meath, according to Failte Ireland, is located in the East and Midlands Tourist Region. This Tourist Region also consists of Counties Kildare, Laois, Longford, Louth, Wicklow, Offaly (east) and Westmeath. The latest available statistics from Failte Ireland are for the year ending December 2009.

These statistics state that the number of visitors to the East and Midlands Tourist Region was 1.8 million in 2009. The total tourism revenue generated from these visits was €407 million. The East & Midlands Region received over 759,000 overseas visitors in 2009, generating €259 million in revenue. County Meath received over 127,000 overseas visitors in 2009 generating revenue of €39 million for this year.

The top visitor attractions in County Meath in 2009 were the Bru na Boinne Visitor Centre and Newgrange.

Views and Prospects
It is a goal of Meath County Council as stated in the Meath County Development Plan to;

'To provide adequate protection of views and vistas that contribute to the appreciation of landscape character' (Ref HER POL 85).

'To maintain scenic vistas and panoramic views from key vantage points and towards key landmarks and features within the landscape' (Ref HER POL 86).

'To protect and enhance the visual qualities of rural areas through the sensitive design of necessary development' (Ref HER POL 89).

Visual amenity and tourist attractions in County Meath are illustrated on Maps 5 and 18 respectively of the Landscape Character Assessment (LCA) which forms part of the Meath County Development Plan 2007-2013.

The LCA states that *'there is a quarry to the south west of Slane … further mineral extraction in the area needs to be carefully sited due to extensive views of the uplands that are available on higher ground and within the Boyne Valley'.* The LCA concludes that Donore Village is *'critical to the setting of Brú na Bóinne World Heritage Site and as such any development in Donore would need to be considered carefully'.*

The Donore Local Area Plan 2009-2015 states that;

Significant progress has been achieved in respect of the ongoing implementation of the planning policies and development objectives contained within the Meath County Development Plan for Donore including the following:

Specific Development Objective DN 1: To maintain a buffer zone between quarrying activities and land intended for residential purposes.

4.2.6 Material Assets

It is an objective of the Council in the Meath County Development Plan 2007-2013 *to ensure that all worked-out pits be rehabilitated to suitable land uses and screened appropriately as part of an aftercare programme. To this end, bonds or levies and a comprehensive restoration/rehabilitation and landscaping plan will be required by the Council as a condition of any permission granted to ensure satisfactory reinstatement on completion of extraction* (Ref Section 10.15.1).

In terms of rehabilitation; *all extractive sites shall be subject to rehabilitation and landscaping programmes in phase with the Extraction* (Ref Section 10.15.3). In terms of waste management it a policy '*to encourage the recycling of construction and demolition waste and the reuse of aggregate and other materials in future construction projects'.* (Ref Section 4.9.3, INF POL 80).

The use of soil and stones from the proposed waste licence facility for the restoration of the quarry is a sustainable operation and in line with the objectives and policies of Meath County Council in their current development plan.

4.3 POTENTIAL IMPACTS

The proposed development will consist of the filling of the quarried area with material from the soil and stones waste license facility which will be graded to imitate a naturally formed 'hillock', to blend with the surrounding undulating agricultural landscape. It will revert back to agricultural use.

Effects on Population

Donore is the nearest villages and is located 600m from Mullaghcrone quarry. As the application site is not visible from the surrounding road network the impact on views in towards the restored site will be imperceptible. Impacts such as noise, dust, traffic, air quality and visual amenity resulting from the proposed waste licence activity have been dealt with in relevant chapters of this EIS.

Effects on Employment

The proposed waste licence area will secure approximately 10 people, both directly on-site and for haulage. Indirect employment will be generated as a result of the Waste Licence activity, in terms of contract transport drivers, suppliers of products and services, machinery suppliers, environmental monitoring, etc.

Effect on Landuse/Agriculture

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 under the waste licence to agricultural land similar to the existing agricultural land surrounding the site.

Effects on Amenities and Tourism

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.

The proposed waste licence activities will not impinge on the buffer zone outlined in the Donore Local Area Plan 2009-2015 or the Brú na Bóinne World Heritage site.

4.4 MITIGATION MEASURES

Mitigation measures in relation to noise, dust, traffic, air quality and visual amenity have been outlined in relevant chapters of this EIS. The impact on employment is positive and therefore no mitigation measures are proposed.

Population

The operation of the waste licence will have limited to no effects on the local population, as similar waste permit activities have previously operated and are currently operated at the site. The waste licence will be managed in such a way as to limit the impact of its operation on the surrounding environment.

Health and Safety

All Mullaghcrone Quarry personnel will be appropriately trained and certified in the safe quarrying, handling, transportation and processing of materials. All personnel will be thoroughly trained on the properties of all materials and products being handled within the quarry, and will be trained to react in the unlikely event of an unplanned incident.

Employment

The impact on employment is positive and therefore no mitigation measures are proposed.

Amenities and Tourism

There are no tourist amenities, walking routes or cycling routes in immediate proximity to the proposed waste licence facility and therefore the operation of a waste licence facility will not have a negative impact on amenities and tourism to the area.

5 FLORA & FAUNA

5.1.1 INTRODUCTION

This assessment was conducted in accordance with Environmental Protection Agency (EPA) *Guidelines on the Information to be contained in Environmental Impact Statements* (EPA, 2002), EPA *Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)* (EPA, 2003), and also in general accordance with the *Guidelines for Ecological Impact Assessment in the United Kingdom* (Institute of Ecology and Environmental Management, 2006).

5.1.2 Notes on Wildlife Legislation

The following wildlife & habitat protection legislation are potentially applicable in this case.

- Irish Wildlife Act (1976, and Amendment, 2000)[1]

It should be noted that badgers & their setts, Irish hare, red squirrel, bats & their roosts are legally protected under the terms of the Irish Wildlife Act (1976, and Amendment, 2000). In cases where development of any kind may affect the concealment of a roost or sett, increase disturbance to a roost or sett or restrict access, it is necessary to inform National Parks and Wildlife Services who may request that a licence with conditions is required. It should also be noted that badger setts & bat roosts are protected by law and can only be removed under licence from the Department of the Environment and Heritage and Local Government (DOEHLG).

The following wild plant protection legislation is potentially applicable in this case.

- Flora (Protection) Order, 1999[2]

All wild plants and habitats are given some measure of protection in Ireland under the Irish Wildlife Act (1976, and Amendment, 2000). In addition a number of rare and threatened plant species are given special protection under the Flora (Protection) Order, 1999.

The order has the effect that, unless you have a licence, you may not: intentionally pick, uproot or destroy any wild plants listed in the schedule, or even collect their flowers and seeds; sell these plants or their seeds if taken from the wild; uproot any wild plants intentionally, except on your own land or with permission.

5.1.3 Methodology

This ecological assessment comprised both a desktop study and a field survey. The desk study comprised the following elements:

- Identification of all sites designated for nature conservation within 10km of the development site.
- Consultation with the relevant statutory and non-statutory bodies.
- Review of existing databases with information on the distribution of rare or protected species.

[1] http://www.irishstatutebook.ie/2000/en/act/pub/0038/index.html
[2] http://www.irishstatutebook.ie/1999/en/si/0094.html

- Review of National Parks and Wildlife (NPWS) and Environmental Protection Agency (EPA) websites.
- Review of Ordnance Survey maps and aerial photography in order to determine broad habitats that occur within the existing site.

TOBIN Consulting Engineers undertook site visits to carry out habitat and general mammal assessments on 7th September 2010.

The approach to the ecological assessment generally followed the assessment procedure as outlined in Figure 8 of Site Evaluation Scheme contained in the National Roads Authority's *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (National Roads Authority, 2009). See Appendix 5.2. The aim was to highlight key ecological receptors (if any) on the site requiring further consideration (mitigation).

The habitat assessment was conducted in accordance with The Heritage Council's Draft methodology, *A Standard Methodology for Habitat Survey and Mapping in Ireland* (Natura Environmental Consultants, 2002) and habitats were classified according to The Heritage Council's *A Guide to Habitats in Ireland* (Fossitt, 2000). Plant identification and nomenclature principally follows Webb *et al.* (1996). Grass identification and nomenclature was further assisted by Rose (1989). The predominant plant species for each habitat type were recorded in order to accurately determine habitats present on the site.

The general mammal survey primarily involved searching the site for evidence/signs of mammals (e.g. tracks, scats, dwellings and occasionally direct sightings) using Hayden and Harrington (2000) as reference if required. An assessment of the habitats in terms of their importance for mammals was also undertaken. Features likely to support bat roosts (if any) including old trees were carefully examined for signs of bat roost activity/ presence. Recent NRA Guidelines for bats on National road schemes were referred to[3].

Survey Constraints

No significant constraints existed. This assessment is based on the current baseline ecological features on the site and proposed zone of impact.

5.2 EXISTING ENVIRONMENT

5.2.1 Desk Review

The site is a former quarry/current waste permit area and habitats are completely modified. No specific reports relating to current ecology on the site are available.

5.2.2 Nature Designated Areas

The National Parks and Wildlife Services database of designated nature conservation areas was reviewed. The database was searched for designated sites within 10 km of the site. Table 6.1 indicates designated sites within 10 km of the site and is illustrated Figure 5.1.

[3] NRA: Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes, 2006a, and Guidelines for the Treatment of Bats During the Construction of National Road Schemes, 2006b.

Table 6.1. Nature Conservation Designations within 10 km of the Site

Site	Distance (km)	Designation
Boyne Estuary SPA	5.1	SPA
River Nanny Estuary and Shore SPA	8.4	SPA
River Boyne And River Blackwater	1.1	SAC
Dowth Wetland	1.5	pNHA
Boyne River Islands	2.2	pNHA
Crewbane Marsh	5.5	pNHA
Duleek Commons	2.2	pNHA
Rossnaree Riverbank	4.9	pNHA
Thomastown Bog	4.9	pNHA
Boyne Woods	8.1	pNHA
Balrath Woods	7.8	pNHA
Cromwell's Bush Fen	8.2	pNHA
Laytown Dunes/Nanny Estuary	7.3	pNHA
Boyne Coast And Estuary	6.3	pNHA
King William's Glen	2.2	pNHA

SAC = Special Area of Conservation
SPA = Special Protection Area for Birds
NHA = Natural Heritage Area
pNHA = proposed Natural Heritage Area (undesignated)

Site synopsis from the National Parks and Wildlife Services (NPWS) database for sites proposed/designated for nature conservation are available on the NPWS website[4].

5.2.3 Habitat Assessment

5.1.1.1 Overview

This site is located within a rock quarry/waste permit area approximately 1.5km from the village of Donore County Meath. The site consists of a previously quarried area which has been partly in filled with subsoil and rock material.

Habitats on the site consist pre-dominantly of disturbed ground. Partly surrounding the site are semi natural habitats including scrub and hedgerows. These described surrounding habitats which are considered the only key ecological receptors will be **avoided** by the development.

Four No. habitat types were identified (see Figure 5.2) on the site and adjacent areas.

[4] http://www.npws.ie/en/ProtectedSites/

They are listed below and described in subsequent sections:

- Re-colonising Bare Ground (ED3);
- Spoil and bare ground (ED2);
- Hedgerows/ scrub (WL1/WS1) – on site boundary;
- Active quarries and mines (ED4) – off site;

Re-colonising bare ground (ED3)
This is the dominant habitat on site. This consists of disturbed soils which are re-vegetating. Species noted include thistle, nettle, silverweed, clover, mayweed, coltsfoot (grass), black medick, willowherb, rosebay willowherb, ragwort, pineapple weed and greater plantain. Butterfly bush is occasional along the edge of existing tracks.

This habitat is of low conservation value and not considered as a key ecological receptor.

Spoil and bare ground (ED2)
This habitat is the most recently disturbed area and includes access tracks. Vegetation is sparse/ non existent.

This habitat is of negligible conservation value and not considered as a key ecological receptor.

Scrub (WS1) – on and offsite
This habitat largely occurs off site though a small area (< 100m^2) exists on the edge of the existing quarry cliff within the site. Scrub habitat is of low diversity and largely dominated by gorse (*Ulex europeaus*) and occasional elder and hawthorn.

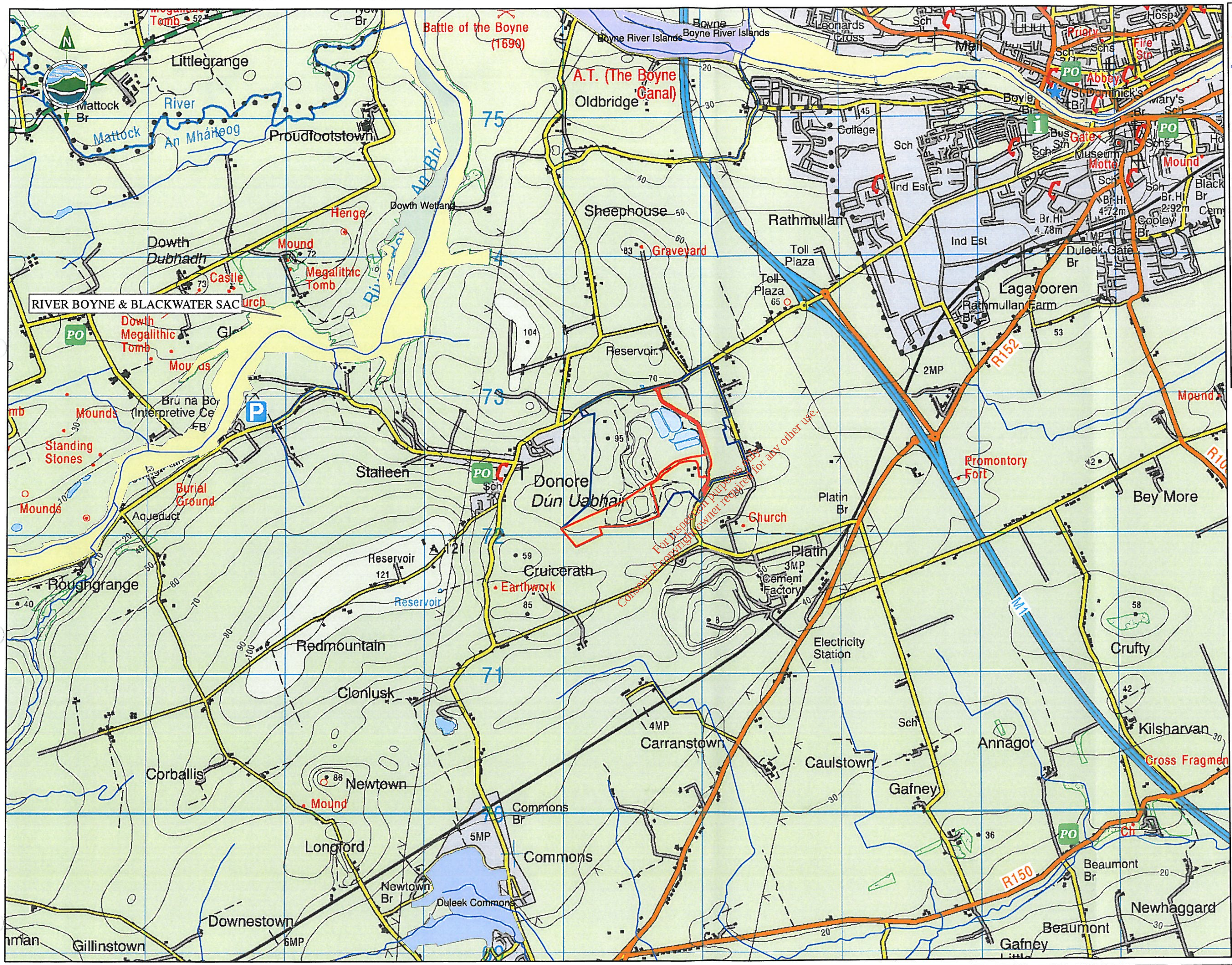
This habitat is considered to be of local importance (lower value) and habitat within the site boundary is not considered as a key ecological receptor.

Hedgerows (WL1)
Part of the site boundary includes hedgerows. Woody species noted include willow, ash, gorse, dog rose and hawthorn.

This habitat is considered to be of local importance (higher value) and occurs on the site boundary. It is considered a key ecological receptor. This habitat will be retained within the development and no impacts will arise.

Active quarries and mines (ED4)
This habitat is located to the northern boundary and outside the Waste License application area. The habitat predominantly consists of an active stone quarry.

The main active quarry is of negligible ecological value.



Legend

- Activity Boundary
- Land Ownership Boundary
- River

0 185 370 740 1,110
Metres

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 OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

A	11-02-11	Issued	A.G.	J.D.
Issue	Date	Description	By	Chkd.

Client:
ROADSTONE WOOD LTD

Project:
MULLAGHCRONE
WASTE LICENCE

Title:
CONSERVATION
FEATURES MAP

Scale @ A3: 1:25,000

Prepared by: A.Gruschka
Checked: J.Dillon
Date: February 2011
Project Director: D. Grehan

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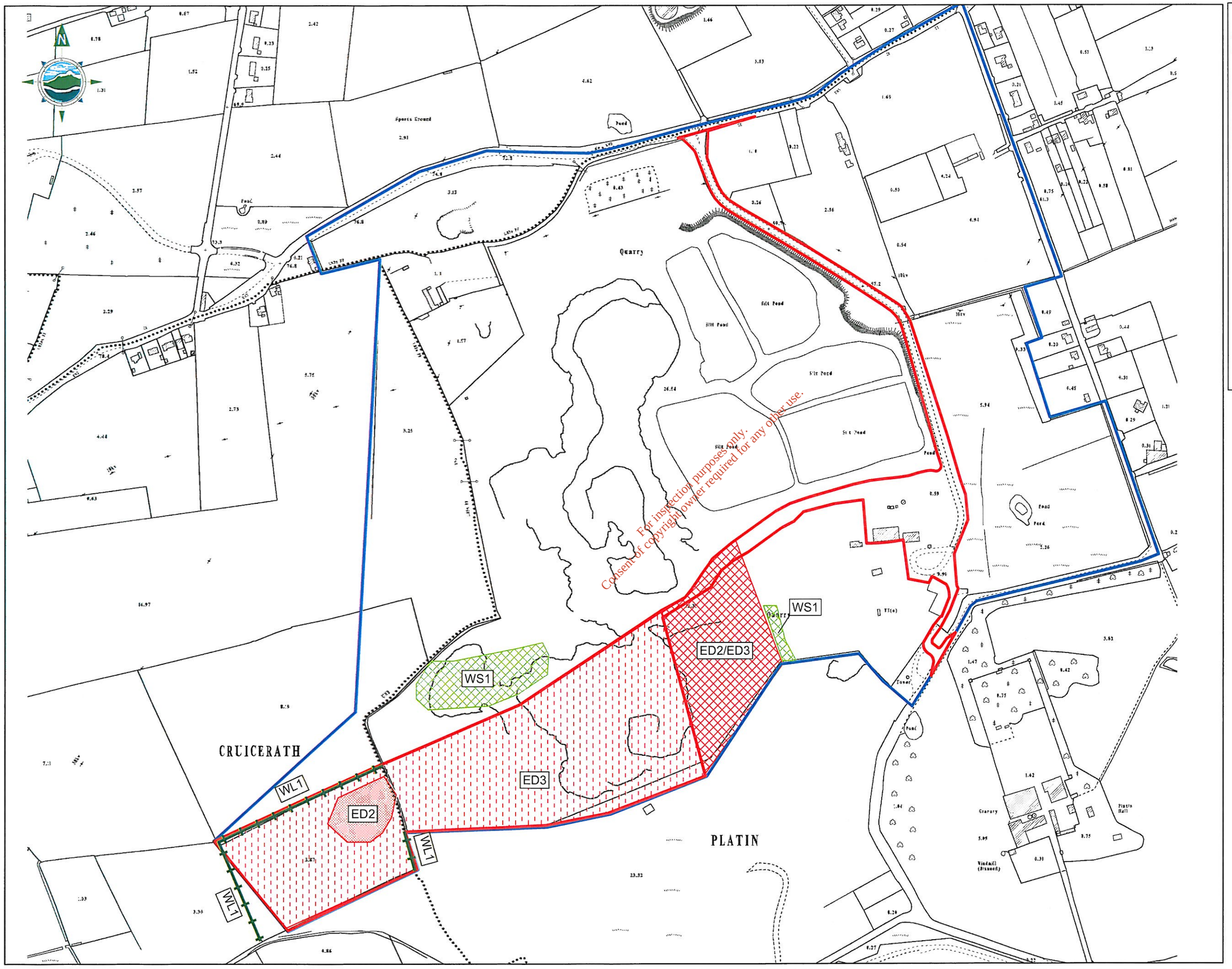
Drawing No.: Figure 5.1
Issue: A



Legend

- Activity Boundary
- Land Ownership Boundary
- WL1 Hedgerows
- ED2 Spoil and bare ground
- ED2 Spoil and bare ground/ ED3 Recolonising bare ground
- ED3 Recolonising bare ground
- WS1 Scrub

0 40 80 160 240
Metres

NOTES

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4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd
A	11-02-11	Issued	A G	J D

Client: ROADSTONE WOOD

Project: MULLAGHCRONE WASTE LICENCE

Title: HABITAT MAP

Scale @ A3: 1:5,000

Prepared by: A.Gruschka | Checked: J.Dillon | Date: February 2011

Project Director: D. Grehan

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Drawing No.: Figure 5.2 | Issue: A

5.2.4 Faunal Assessment

Mammals

No direct observations of mammals were recorded and no signs of protected species such as badgers were made.

The site provides suitable conditions for the small rodents, pygmy shrew and wood mouse. Both species are common and widespread throughout Ireland (Hayden & Harrington, 2000).

Birds

A late summer bird survey was undertaken. The focus of the survey was to determine if Peregrine *Falco peregrinus* and Sand Marten *riparia riparia* colonies exist within the footprint of the development and wider area as these species were determined as potentially sensitive to this development given their association with quarries and conservation status (Peregrine is listed on Annex 1 of the EU Birds Directive and both are considered to be of moderate conservation concern).

No Peregrine or Sand Marten observations or evidence were recorded. No past sand marten breeding colony evidence (burrows) or signs (Peregrine faecal staining) exist. It was confirmed that the quarry cliff has low potential as a nest site for Peregrine.

The following species were recorded, predominantly in surrounding hedges:

- Woodpigeon, *Columba palumbus*
- Wren, *Troglodytes troglodytes*
- Dunnock, *Prunella modularis*
- Robin, *Erithacus rubecula*
- Blackbird, *Turdus merula*
- Blue tit, *Cyanistes caeruleus*
- Pied wagtail, *Motacilla alba*
- Kestrel, *Falco tinnunculus* (foraging on site)
- Jackdaw, *Corvus monedula*
- Chaffinch, *Fringilla coelebs*
- Pheasant, *Phasianus colchicus*
- Skylark, *Alauda arvensis*

Skylark amber listed species of moderate conservation concern Lynas *et al.,* (2007), were noted during survey on the site and may potentially breed here as they do in grassland areas at many existing quarries. Kestrel are also amber listed and were noted foraging only on the site.

All of the birds mentioned are widespread throughout Ireland and are not afforded any specific protection under wildlife law, although it is noted that all birds and their nests are protected during the breeding season (with certain excepted species) under the Irish Wildlife Acts. The retention of boundary scrub/ and woodland areas will limit disturbance and habitat loss for bird species.

Other fauna

The site is unsuitable for breeding frog (*Rana temporia*) and smooth newt (*Triturus vulgaris*). Viviparous lizard (*Zootoca vivipara*) may potentially use scrub and hedgerow areas around the site boundary.

5.2.5 Rare or Protected Flora

The proposed development site is unsuitable for any of species listed under the Irish Flora protection Order as it is completely disturbed.

5.2.6 Overall Evaluation

The proposed site does not lie within or adjacent to any area that has been designated for nature conservation under Irish or European legislation. The nearest designated site is the River Boyne and Blackwater cSAC which lies some 1.1km to the north. No impacts will arise to Natura 2000 sites in the vicinity of the development as potential surface waters from the site do not flow towards Natura 200 sites - refer to mitigation in Chapter 8 Water.

No sensitive ecological receptors exist within the site are likely to be impacted. Hedgerows described will be retained.

The key bird and potential mammal habitat (including bat forage habitat) is hedgerows on the site boundary, which will be retained as part of any proposed development.

5.3 POTENTIAL IMPACTS

5.3.1 Nature Designated Sites

The proposed development site does not lie within or adjacent to any area designated for nature conservation. No direct or indirect impacts on any site designated for nature conservation are predicted from this development. Surface water pollution control measures will remove potential impacts to any downstream (off site) aquatic receptors, refer to Chapter 7 Water.

5.3.2 Habitats

No significant sensitive ecological habitat receptors exist within the site boundary. A small patch of gorse exists at the site edge but this is not considered as a key ecological receptor and may be retained.

5.3.3 Fauna

Removal of sections of re-colonising bare ground and scrub habitat are unlikely to lead to significant loss of nesting sites for birds as these areas are relatively disturbed currently. It is possible that ground nesting species such as skylark and meadow pipit may nest here in the spring. Therefore initial infilling carried out at the wrong time of the year may lead to direct loss of nests, eggs or young birds. All birds and their nesting places are protected under the Irish Wildlife Act (1976) and under the Irish Wildlife Amendment Act, (2000). If the first stage of infilling is proposed during late March to end August it would be recommended that the site be checked immediately prior to confirm that no birds are nesting.

Loss of hedgerow habitat and disturbance from plant activity will be minimal as the perimeter scrub will be retained and will continue to provide feeding and commuting areas for fauna.

Their will be increased ongoing noise and vehicular disturbance to local wildlife. Increased dust and petroleum fumes will add further disturbance impacts locally.

5.3.4 Fisheries Aquatic Ecology

No significant aquatic ecology features exist on site or within the surrounding area.

5.3.5 Rare or Protected Flora

No rare or protected species were recorded or are likely to occur on the site.

5.4 MITIGATION MEASURES

Mitigation measures for specific ecological features are detailed below. To determine the success of mitigation ongoing monitoring will be required particularly with regard to avoiding impacts to adjacent surface waters and fens.

Best practise management systems must be implemented during site clearance, construction and operation of the site to fully comply with all relevant surface water pollution prevention legislation and thus avoid impacts to surface and groundwater drainage systems and indirectly flush habitats described.

No hedgerow and scrub clearance will take place on the site boundary.

It is recommended that any post works rehabilitation plan recognise that the site will have potential for habitat creation such as “rough” grasslands and woodland areas.

Measures should be taken to ensure no indirect impacts occur on areas of retained grassland and scrub. No materials should be stored within 5 m of any trees or shrubs. Materials, especially soil and stones, can prevent air and water circulating to the roots of trees/shrubs. Damage to root systems can kill trees and no roots arising from the hedgerows should be damaged during site clearance and groundworks.

Any landscaping or screening proposals that involve planting vegetation should use native species of local provenance that complement the existing hedgerows and scrub.

5.4.1 Fauna

If the initial disturbance to existing habitats is proposed to take place between March 1st and August 31st than a breeding bird survey should be conducted prior to this to comply with Irish Wildlife legislation. Once current habitats are disturbed it is unlikely that the site will be of any significant value for nesting birds and no further surveys are likely to be required.

Outdoor lighting should be avoided where possible as it has been shown to deter some bat species from foraging. Lighting should be cowled to ensure that light does not spill out onto adjoining habitats and focuses on the works area only, when required. Cowled lights will ensure that lighting is directed onto the proposed development site only. The height of poles should also be restricted to reduce the

possibility of light pollution onto adjoining habitats. The intensity/ brightness of lighting should be limited to minimum requirements for lighting for such developments as stated by health and safety guidelines.

Guidelines such as NRA (2005)[5] and Murnane *et al.,* (2006) should be reviewed and recommendations followed and implemented so as to minimise potential pollution impacts to possible downstream surface waters.

5.5 RESIDUAL IMPACTS

Following full implementation of existing mitigation and management practises on the site no residual impacts are expected to key ecological receptors surrounding the site.

[5] http://www.nra.ie/Publications/DownloadableDocumentation/Environment/file,3493,en.pdf

6 SOILS AND GEOLOGY

6.1 INTRODUCTION

This section of the EIS has been prepared by TOBIN Consulting Engineers and details the geological and hydrogeological environment within the subject site.

The site is situated to the 1 km southeast of Donore Village, Co. Meath. The information contained below is concerned with a description of the existing geological character of the site. The nature, extent and complexity of the geological material are detailed, from the surface downwards through the mineral subsoil to the bedrock. The potential of the geological material to transmit and store groundwater is also assessed, with respect to the hydraulic characteristics of the material through which the water flows.

6.1.1 Study Methodology

This report has been prepared using the recommendations set out in the Environmental Protection Agency (EPA) document 'Guidelines on Information to be contained in Environmental Impact Statements' (2002). The guidelines and recommendations of the Institute of Geologist of Ireland (IGI) publication 'Geology in Environmental Impact Statements – A Guide' was also taken into account in the preparation of this section.

For the preparation of this section of the EIS, the following assessment protocol was followed, which allowed a progressive focus on the subject site, from regional setting to site specific data. The assessment consisted of:

- Consultation with the Geological Survey of Ireland and Local Authority;
- A desk study of all available information;
- A site walkover;
- Data collation of ground investigation programme;
- Interpretation of all data; and
- Preparation of report.

The information contained in this section has been divided into sub-sections, so as to describe the various aspects pertaining to soil and geology. In the preparation of this section, all available regional and site specific information was collated and assessed. The characterisation of the site is considered detailed and sufficient to adequately characterise the geological setting of the site.

All projects and developments that require an EIS are of a scale or nature that they have the potential to have an impact on the environment. In this section the potential impact on the geological environment resulting from development of this site is assessed and mitigation measures are proposed to reduce any significant impacts.

6.1.2 Study Constraints

Mullaghcrone Quarry is an active quarry, which allows an opportunity to visually assess soil and rock profiles within the quarry. This visual appraisal is of great value in assessing the nature and characteristics of the existing geological environment within the site and provides an indication of the probable characteristics within the vertical zone targeted for infilling under this application.

The visual assessment of the geological profiles presented on the exposed quarry walls, together with the data retrieved from intrusive investigations, has been assessed and used to evaluate the geological environment within the area targeted for infilling.

6.2 EXISTING ENVIRONMENT

Soil and subsoil was previously removed from the application area during the quarrying process. Visual assessment of the soils within the surrounding area suggests that the soils are naturally well drained within the site. Where topsoil remains within the site, the average thickness is approximately 0.3m. Infilling of material has partially raised some areas by >30m.

Reference to the Soil Map of Ireland (Soil Survey of Ireland, 1980) and the EPA data indicates that the parent soil type in this region comprises shallow acidic mineral soil, which comprises well drained AMinSW (shallow well drained acidic soil), with associated minor gley soils.

Subsoil Geology

The origin of the unconsolidated subsoil material in this region is associated with the movement and deposition from glaciers during the last Ice Age. The ice sheets ground down the underlying bedrock, breaking the rock and grinding it to small sizes ranging from clay to boulders.

This area of County Meath was completely overlain by an ice sheet that moved in a general south-easterly direction to easterly direction. The powerful erosive force of these ice sheets are considered to have moulded/sculpted the landscape in the area, with glacial features evident in the area.

A Subsoil Map for County Meath, prepared as part of the Groundwater Protection Scheme for Co. Meath, indicates that rock is close to the surface in the vicinity of the existing quarry and proposed waste licence area. In areas where subsoil is recorded, the material is classified as Till derived from Namurian Shales and Sandstones. [3]

As detailed above, the soil and subsoil material have been removed from the application area (area 1& 2) of 11.7 ha by previous quarrying activities. Elsewhere within the site, subsoil continues to overlie bedrock.

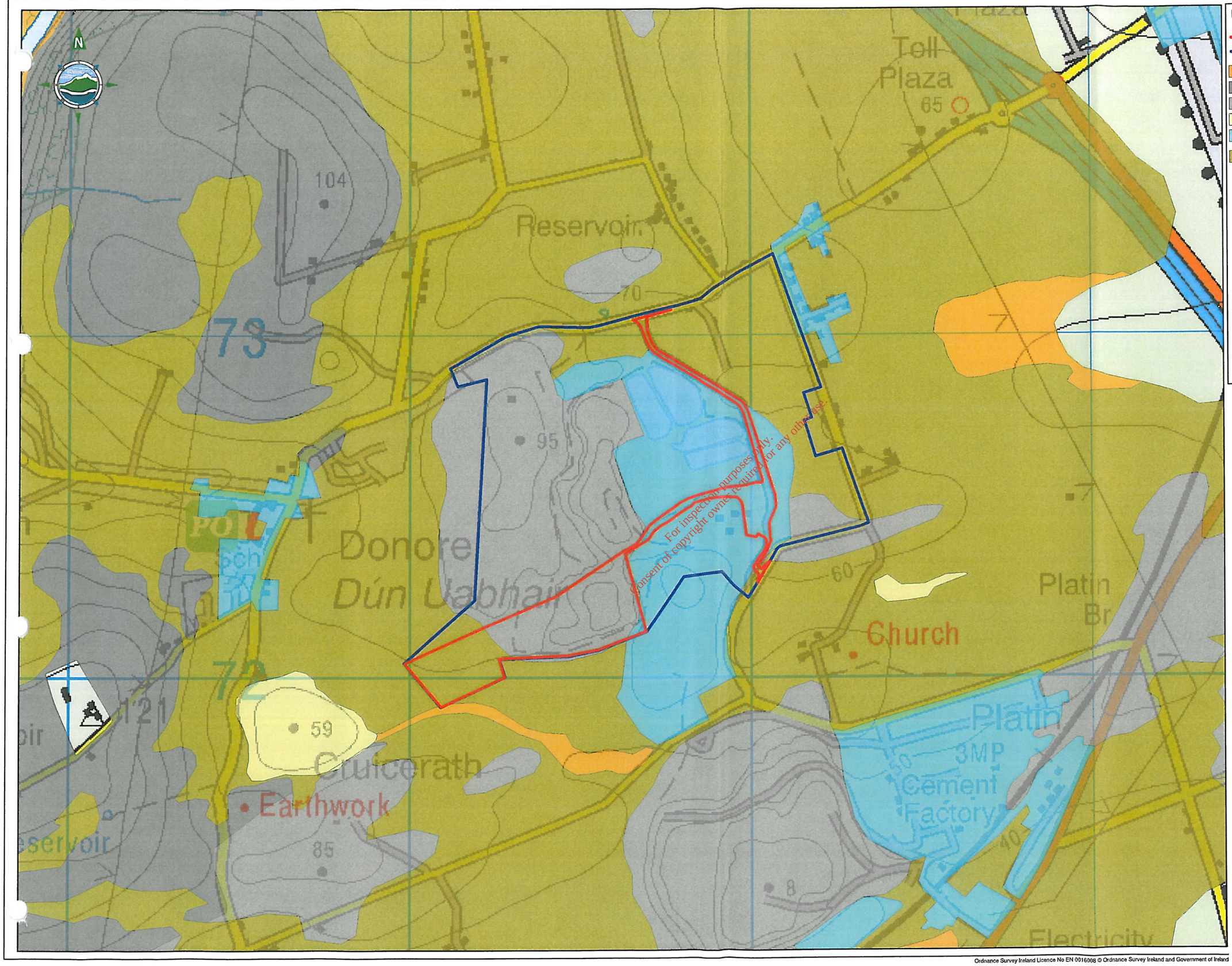
Visual assessment within the existing quarry indicates that the subsoil is clay dominant with angular limestone, shale and sandstone clasts. The visual description of the subsoil is consistent with the classification of Namurian Till.

The Depth to Bedrock Map for County Meath, prepared as part of the Groundwater Protection Scheme, indicates that exposure of bedrock is common in this area. Where unconsolidated material exists it is generally thin. Visual evidence from within the site indicates that the subsoil thickness varies from 0m (outcrop) to a maximum of approximately 3m. Where infilling has taken place under the previous waste permit, the depth to bedrock is >30m.

Bedrock Geology

The distribution of defined bedrock units within the site and in the surrounding region is shown on Figure 6.1.

[3] Groundwater Protection Scheme for County Meath, Geological Survey of Ireland, 1998.



Legend

- Activity Boundary
- Land Ownership Boundary
- Alluvium
- Bedrock outcrop or subcrop
- Karstified bedrock outcrop or subcrop
- Lacustrine sediments
- Made ground
- Till derived from Namurian sandstones and shales

0 70 140 280 420
Metres

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 OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	11-02-11	Issued	A.G.	J.D.

Client: ROADSTONE WOOD Ltd.

Project: MULLAGHCRONE WASTE LICENCE

Title: SUBSOIL MAP

Scale @ A3: 1:10,000

Prepared by: A.Gruschka | Checked: J.Dillon | Date: February 2011

Project Director: D. Grehan

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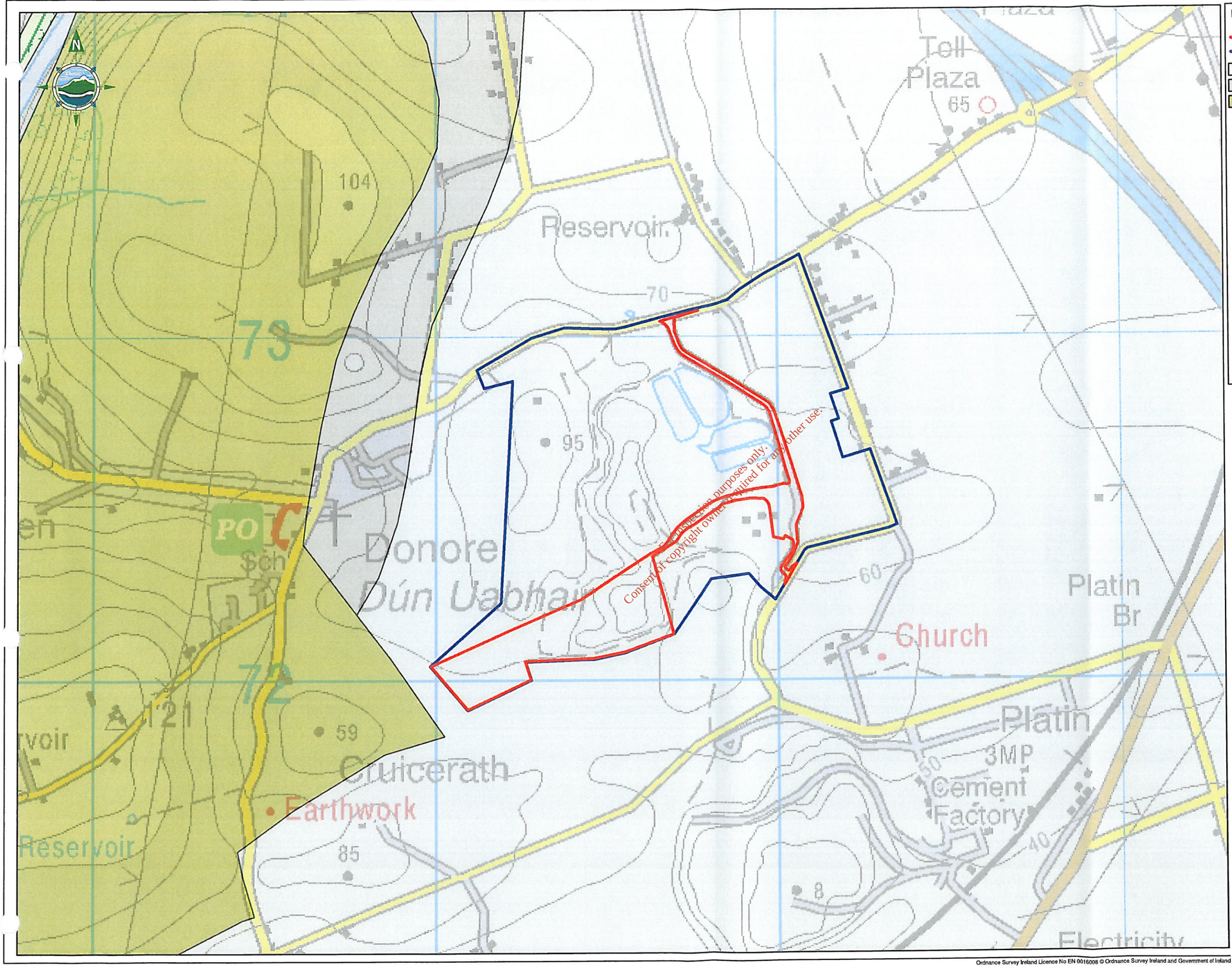
Drawing No.: Figure 6.1 | Issue: A



Legend

- Activity Boundary
- Land Ownership Boundary
- Dinantian Pure Bedded Limestones
- Dinantian Upper Impure Limestones
- Namurian Undifferentiated

0 80 160 320 480
Metres

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 OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	11-02-11	Issued	A.G.	J.D.

Client: ROADSTONE WOOD

Project: MULLAGHCRONE WASTE LICENCE

Title: BEDROCK GEOLOGY

Scale @ A3: 1:10,000

Prepared by:	Checked:	Date:
A.Gruschka	J.Dillon	February 2011

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Drawing No.: Figure 6.2 | Issue: A

Reference to the relevant geological information, the 1:100,000 scale Sheet No. 13 – Geology of Meath (Geological Survey of Ireland (GSI), 1999), indicates that the Carboniferous aged bedrock of the Drogheda Platform occur within the confines of the site. The bedrock map indicates that the Platin Formation underlies the eastern portion of the site. The Clonlusk Formation underlies the majority of the western portion of the site.

The Platin Limestone Formation is composed of sedimentary carbonate rock (limestone), which is supported by carbonaceous grains. Very fine-grained chert units (silica) and micritic (mud rich) units are also recorded within the Platin Formation.

The Clonlusk Limestone Formation description is very similar to that of the Platin Formation and consists of a pale grey, sedimentary carbonaceous rock, which is locally dolomitised and contains chert and shale units interbedded with the carbonaceous unit. The Clonlusk Formation is paler and better sorted than the Platin Formation and the grains supporting the limestones are more micritised. Both the Clonlusk and Platin formations are pure bedded Dinantian age limestones.

The rock encountered on the exposed faces comprised pale to very dark grey coloured, fine-grained, competent rock. The geological structure within the Mullaghcrone Quarry is relatively straight forward, with the individual beds dipping at 25-30^0 and no significant faults observed in exposed faces. Chert (silica) is present at two levels in the succession, but its average over the entire vertical interval is approximately 3-4%. Karstification is evident in several of the quarry walls with clay-filled cavities and voids, but do not appear to be hydrogeologically active. Approximately 10% unsuitable material within the Mullaghcrone Quarry extraction area comprises clay filled fissures within the rock mass and weathered rock along rock fissures and fractures.

All workings are undertaken on a dry working platform. Measurements from a borehole onsite (GW3), drilled at a surface elevation of approximately 24m OD indicates that the watertable is at an approximate elevation of 10.5m OD (or 34.5m below the lowest level of the waste licence area). Therefore all infilling within the proposed waste licence area will be undertaken above the natural watertable.

There are no additional fixed buildings or structures within the proposed waste licence area. The waste licence is required purely for the means of quarry restoration and the recycling of C&D material. It is proposed to utilise existing plant and equipment already on-site (or replacements of mobile equipment) during the lifetime of the waste licence.

6.2.1 Description of the Proposed Development

Roadstone Wood Ltd is the owner and operator of the Mullaghcrone Quarry. Planning Permission for quarrying, waste management, restoration and ancillary activities was granted for an area from Meath County Council.

The current application is being made for a waste licence at Mullaghcrone Quarry, comprising a working area of 11.7 hectares to the south-west of the existing quarry with 3.3 hectares of haul roads.

The overall elevation of the application area varies from approximately 90m OD in the northern part of the site to 72m OD towards the southern and northeastern section of the site. The current floor level

varies from 45mOD to 77mOD within the infilling floor area. The topographic nature of the surrounding lands is generally of moderate relief, with undulating to hilly geomorphology.

Available information indicates that the broad region of Donore is underlain by a Namurian Till that is clay dominant. This limestone bedrock occurs within the Mullaghcrone Quarry site and is evident from current workings. Photoplate 6.1 displays the extent and depth of limestone material existing within the site.

Photoplate 6.1: Vertical face of limestone deposits within site.

A subsoil map of the area is presented in Figure 6.1, which is extracted from information hosted by the Geological Survey of Ireland (www.gsi.ie).

Site observations of bedrock exposures confirm the presence of the Platin Formation underlying the site. Workings within the quarry have exposed bedrock within the waste licence area.

6.3 AQUIFER POTENTIAL

Reference to information hosted by the GSI indicates that the bedrock underlying the site is classified as a Regionally Important Karst Aquifer (diffuse).

6.3.1 Description of the proposed development

It is proposed to infill the proposed site with soil and stones material in 4 No. phases in Area 2. Table 6.1 details the infilling programme and the approximate tonnages to be accepted into the waste licence area.

Table 6.1 Infilling Programme

Phase No.	Volume infilled	Tonnage of material	Approximate Timeframe for infilling in Years
1	300,000m^3	450,000	5
2	300,000m^3	450,000	5
3	300,000m^3	450,000	5
4	300,000m^3	450,000	5
Total	1,200,000 m^3	1,800,000	20

6.4 POTENTIAL IMPACTS

There are no identified geological or geomorphological heritage features within or adjacent to the site. The infilling footprint has been designed to ensure that during its lifetime the proposed development will not adversely affect the environment or adjoining existing land uses.

Mullaghcrone Quarry has an established C&D and soil and stones waste permit with an established custom in the north east region. In terms of potential impacts, it is considered preferable, from both an operator and planning viewpoint, to continue operations in a sustainable manner within an existing facility, than to seek to develop waste licences/waste permits on new Greenfield sites.

During the period of operation within Mullaghcrone Quarry, supporting infrastructure has been developed to minimise the impact of operations on the surrounding environment. This infrastructure will be retained as a direct consequence of this application.

The potential void space within the quarry is estimated, at approximately 1.2 million m^3 or 1.8 million tonnes available for infilling.

Outside the boundary of the site, the impact on the geological environment is assessed as low. Over the lifetime of the existing soil and stones and C&D waste permit 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 and C&D area will be used to create landscape berms to screen the site from its surrounding environment.

The movement of vehicles within the waste licence represent a potential risk to the ground, by means of leakages or spillages to ground. This potential impact is addressed in the mitigation measures through operational procedures.

Rainfall onto infill materials and surfaces can result in the creation of sediment laden waters. Uncontrolled emissions of sediment laden waters can result in sedimentation of natural watercourses

and a detrimental impact on fisheries potential. This potential impact is addressed in the mitigation measure through operational procedures.

The proposed development will extend the lifetime of the waste facility at Mullaghcrone Quarry by an approximate 20 year lifespan. The waste licence area will be infilled to the finished height of 83m OD. Following cessation, the infill of a quarry void will represent a permanent impact on the geological environment. Landscape and after use proposal are required to mitigate the long term impact of the quarry.

A long-term positive impact of the development will be the gain of approximately 11.7 ha of agricultural land.

6.5 MITIGATION MEASURES

The proposed restoration plan for the site is detailed in the Landscape Section. Termination landscaping measures will be undertaken to blend the quarry site into its surrounding environment insofar as is practicable. By its nature infill activities impact on the geological environment, however the measures proposed should mitigate the impact on the surrounding environment.

All vehicles utilised on site will continue to be regularly maintained and checked to ensure any damages or leakages are corrected. Refuelling and maintenance of vehicles will be undertaken at designated and approved locations to ensure the risk to the geological environment is minimised.

All vehicles exiting the waste licence area are required to pass through a wheelwash located towards the east of the proposed site.

All fuel used on the site will be contained within bunded tanks, to ensure full containment in the event of total cumulative failure of tanks. Any rainwater accumulating within the bunded areas is and will continue to be considered as contaminated water and exported from site by an approved and permitted haulier to a designated treatment/disposal site.

Water management infrastructure will be developed during the waste licence, whereby all water will be drained to settlement lagoons prior to recharge to groundwater. These settlement lagoons will be act as low energy environments to allow sediment to fall out of suspension.

6.5.1 SUMMARY

By its nature infilling activities impact on the geological environment. However infilling is an established development at this site and within its surrounds. The development proposal will see the infilling of approximately 1.2 million tonnes of material. While the existing quarry has resulted in a permanent impact on the geological environment, the continuation of infilling operations is considered to pose a low cumulative impact.

Landscaping and visual amelioration measures have already been undertaken within the Mullaghcrone Quarry site. Infrastructure within the Mullaghcrone Quarry site will be in accordance with industry standards and designed to minimise the impact of infilling on the surrounding environment. This infrastructure will continue to be used to ensure the proposed waste licence facility is operated and managed in accordance with the highest possible standards.

It is not envisaged that the proposed development activities on-site will impinge on the geological environment off-site. Mullaghcrone Quarry waste licence facility will adhere to good environmental practices and procedures to ameliorate any impacts of waste licence activities on the surrounding environment.

The mitigation measures proposed are considered appropriate to significantly reduce the potential impact posed by the proposed operations to a level whereby the activities on-site will not impinge on the surrounding environment.

7 WATER

7.1 INTRODUCTION

This section of the EIS has been compiled by TOBIN Consulting Engineers to address the characterisation of the water environment within and surrounding the subject site. The water environment provides a description of the surface water environment and the sub-terrain groundwater environment.

Mullaghcrone Quarry is located approximately 1 km to the southeast of Donore Village. The location of the quarry in relation to its surrounding environment and the regional surface water drainage is shown on Figure 7.1.

Roadstone Wood is seeking a waste licence within the site. This EIS is prepared to assess the potential and predictable impact of continuing infilling, within Mullaghcrone Quarry. It is proposed to infill material at the site, with infilling continuing 30m above the watertable.

7.1.1 Study Methodology

This section of the EIS has been compiled by TOBIN Consulting Engineers to address the water environment within and surrounding the subject site. The water environment is divided into a description of the surface water environment and the sub-terrain groundwater environment.

This report has been prepared using the recommendations set out in the EPA document 'Guidelines on Information to be contained in Environmental Impact Statements' (2002). The guidelines and recommendations of the Institute of Geologists of Ireland (IGI) publication 'Geology in Environmental Impact Statements – A Guide, 2003' was also taken into account in the preparation of this Chapter.

The site is located, in a semi-rural to industrial area within the townland of Cruicerath and Platin, approximately 1 km to the southeast of Donore Village, Co. Meath. The application area occupies 15.3 ha within an overall landholding of 93.8 hectares.

The assessment of the water environment consisted of:

- A desk study of available information;
- A review of site specific investigations, relating to surface water and groundwater;
- A site walk-over of the site and surrounding area;
- Groundwater quality monitoring;
- Hydrogeological testing and assessment;
- Surface water quality monitoring and flow measurements; and
- Interpretation of all data.

Information retained by the Geological Survey of Ireland (GSI), the Office of Public Works (OPW) and Environmental Protection Agency (EPA) was accessed to provide the hydrological and hydrogeological setting of the site. Relevant documents and datasets used to provide the setting of the site included EPA Water Quality Data, topography maps, and GSI Hydrogeological Data.

7.1.2 Survey Constraints

In terms of available information for Mullaghcrone Quarry, significant information and data was available from published information sources at the outset of the assessment by TOBIN Consulting Engineers.

The surface water environment is characterised by flow hydraulics/hydrometrics and existing water quality. However the groundwater environment is naturally more difficult to characterise owing to the subterrain nature of flow.

Previous hydrogeological studies by TOBIN Consulting Engineers (2003) and John Barnett & Associates 2008 (now SLR Consulting) have determined the direction of groundwater flow within the surrounding region. The drilling of boreholes and subsequent water level monitoring was undertaken with the objective of calculating the groundwater flow direction underlying the site. The aquifer is heterogeneous in nature, in that its hydraulic properties vary laterally and vertically within the rock mass. The heterogeneity is influenced by the relatively permeable areas of the jointing/fracturing of the rock and relatively impermeable areas where the rock mass is intact. The degree of interconnectivity of the joints/fractures also influences the heterogeneity.

The complexity of the hydrogeological setting of the aquifer was carefully assessed. The impact assessment has taken account of the data available and the water level analysis.

In terms of site investigations and data collection, TOBIN Consulting Engineers consider that sufficient information is available to characterise the water environment and to determine the potential impact of the development. No seasonal constraints were encountered.

7.2 EXISTING ENVIRONMENT

The purpose of this section is to describe:

The surface water environment;

- Surface water features and regional drainage;
- Assessment of hydrometric data;
- Surface water abstractions within the catchment of the site; and
- Surface water quality.

The groundwater environment:

- Hydrogeological setting of the site;
- Localised hydrogeological aspects of the site and surrounds;
- Groundwater abstractions, both industrial and private;
- Piezometry and groundwater flow regime; and
- Groundwater vulnerability.

7.2.1 Surface Water Environment

7.2.1.1 Surface Water Catchments

Surface Water Drainage

The natural surface water drainage pattern, in the environs of Mullaghcrone Quarry, is shown on Figure 7.1.

There is no surface water features located within the boundary of the proposed site, and there is no visible off-site surface water drainage from the site. A number of quarry settlement ponds are located to the north of the site.

On a regional scale, Mullaghcrone Quarry is situated within the surface water catchment area of the River Nanny. The catchment divide between the River Nanny and the River Boyne occurs to the north of Mullaghcrone Quarry.

The overall River Nanny catchment comprises 250km^2 of land. The main channel of the River Nanny flows immediately to the south of Duleek and the proposed site. The total surface water flow in the River Nanny is fed from two principle sources, surface water run-off from lands within the catchment area and groundwater baseflow.

The presence of dissolution features within the bedrock (karst features) in townlands of Cruicerath and Platin, coupled together with the relative absence of surface water drainage features in the area, suggests that all water falling on the site infiltrates into the bedrock and is transmitted to discharge points at lower elevation (surface watercourses).

A review of Ordnance Survey maps and geological information for the area indicates that there is a 'swallow hole' within the townland of Cruicerath and 'springs' within the townland of Platin, which are karst features indicating the presence of fractures and/or solution features within the rock.

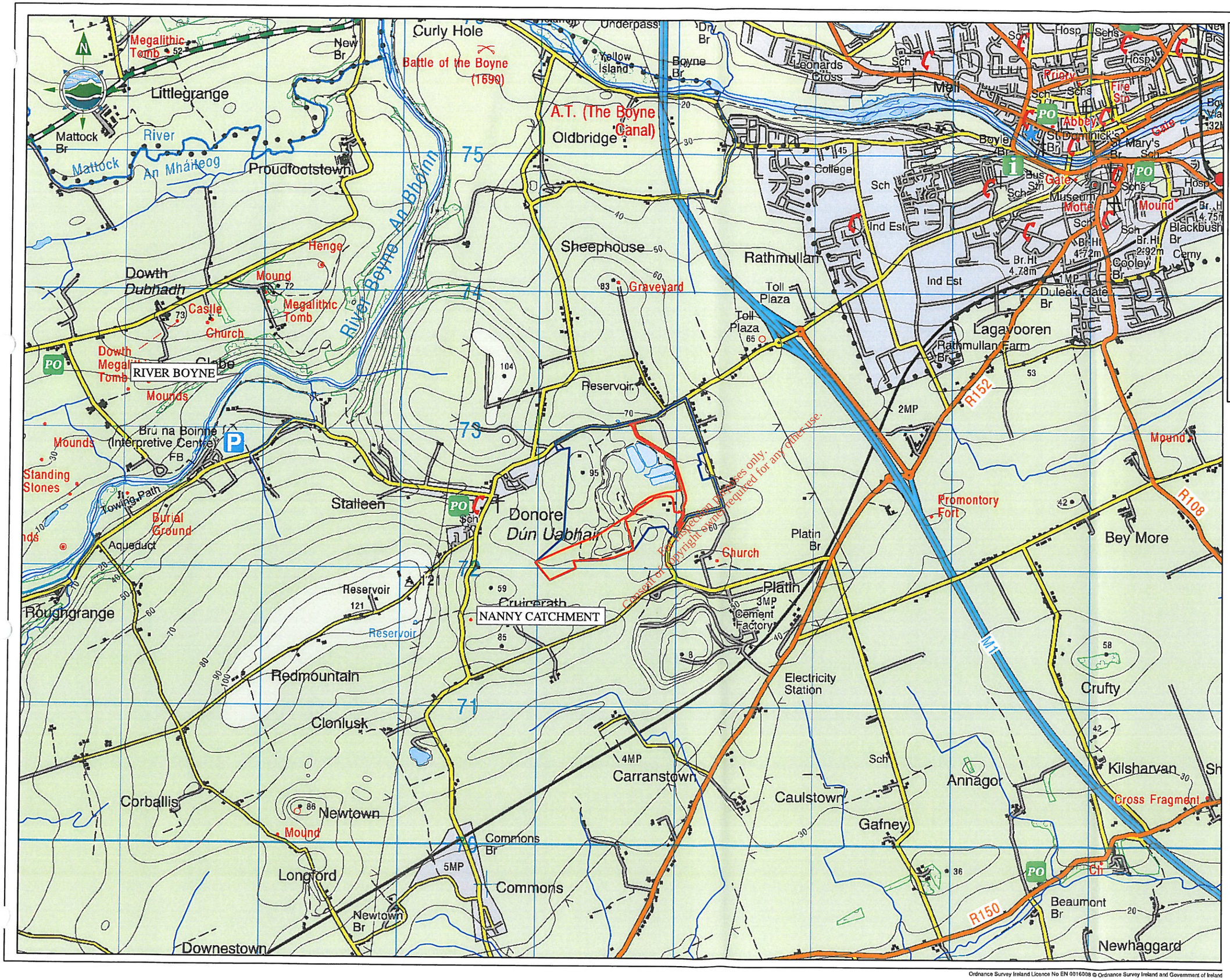
Hydrometric Data

The Office of Public Works (OPW) maintains a number of hydrometric stations in County Meath. The nearest hydrometric stations to Mullaghcrone Quarry on the River Nanny are located in the environs of the village of Duleek, one upstream of the village and two downstream.

The lowest flow on the River Nanny, within the time period 1995 to 1999, was in July 1996, when the mean monthly flow gauge was recorded as 0.089m^3/sec (7,690m^3/day). The lowest flow recorded on the River Nanny at Duleek is 0.04m^3/sec or 3,500m^3/day.

This is an extremely low flow with respect to the size of the River Nanny and suggests that during prolonged dry periods the groundwater baseflow from the aquifer is very low. This would suggest that there is very low storage capacity and high permeability in the bedrock, whereby rainwater travels quickly from recharge points to discharge points.

The highest flows on the River Nanny, within the time period 1995 to 1999, was in February 1995, when the mean monthly flow gauge was recorded as 7.37m^3/sec (636,770m^3/day). This high flow data represents the highest flow at this location. As there are no surface water features on the site at Mullaghcrone Quarry, or off-site runoff, there will be no impact from the proposed development on the River Nanny or its tributaries.



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Legend

- Activity Boundary
- Land Ownership Boundary
- River

0 190 380 760 1,140 Metres

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
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3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	11-02-11	Issued	A.G.	J.D.

Client: ROADSTONE WOOD LTD

Project: MULLAGHCRONE WASTE LICENCE

Title: SURFACE WATER FEATURES MAP

Scale @ A3: 1:25,000

Prepared by: A.Gruschka | Checked: J.Dillon | Date: February 2011

Project Director: D. Grehan

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Drawing No.: Figure 7.1 | Issue: A

7.2.1.2 Surface Water Quality

The EPA monitors the quality of Ireland's surface waters and assesses the quality of watercourses in terms of 4(no.) quality classes; 'unpolluted' (Class A), 'slightly polluted' (Class B), 'moderately polluted' (Class C), and 'seriously polluted' (Class D). These water quality classes and the water quality monitoring programme are described in the EPA publication 'Water Quality in Ireland, 2003'.

The water quality assessments are largely based on biological surveys. Biological Quality Ratings or Biotic Indices (Q values) ranging from Q1 to Q5 are defined as part of the biological river quality classification system. The relationship of these indices to the water quality classes defined above, are set out in Table 7.1 below.

Table 7-1 Relationship between Biotic Indices and Water Quality Classes

Biotic Index	Quality Status	Quality Class
Q5, 4-5, 4	Unpolluted	Class A
Q3-4	Slightly Polluted	Class B
Q3, 2-3	Moderately Polluted	Class C
Q2, 1-2, 1	Seriously Polluted	Class D

The EPA conducts an ongoing monitoring programme of water quality in the River Nanny and wider catchment. Sampling is conducted in summer months for a number of reasons. These include: (a) the macro-invertebrate fauna of rivers are theoretically under the greatest ecological pressure from pollution, because of reduced flows and higher temperatures (McGarrigle et al. 2003); and (b) some macro-invertebrate larvae may not be recorded in freshwater systems during winter months[6].

The nearest EPA Water Quality Measuring point on the River Nanny to Mullaghcrone Quarry is located at the Bridge northeast of Bellewstown House (Station 0500).

Water sampling is conducted at 4 No. monitoring stations on the main Nanny River, two upstream and two downstream of the subject site. The most recent and historical biotic indices at each of the quality monitoring stations situated on the Nanny River are presented in Table 7.2 below.

[6] Macro-invertebrate life cycles often involve an over-wintering strategy

Table 7-2 EPA Monitoring – Biotic Indices

Station No.	Location and Distance from site	1998	2001	2005	2008
Nanny River					
0110	East Br Kentstown	Q2-3	Q2-3	Q2-3	Q2-3
0280	Br d/s Nanny Br	Q 3-4	Q 3-4	4	4
0500	NE of Bellewstown House	Q 3-4	Q 3-4	Q 3-4	Q 3
0700	Br in Julianstown	Q 3-4	Q 3	Q 3-4	Q3-4

The data indicates that the River Nanny water quality at Station 0500 has been recorded as slightly to moderately polluted (Q value of 3 & 3-4). According to the EPA data, the Nanny River was in a generally unsatisfactory ecological condition when sampled in May 2008. There was a further decline in quality noted downstream where luxuriant algal crops and considerable bottom siltation at Bellewstown (0500) and Julianstown (0700) continued to indicate eutrophication and possibly land disturbance. Upgrade works are currently ongoing at the Duleek Waste Water Treatment with the new wastewater treatment plant is due to be completed in 2011. The wastewater treatment facility, currently under construction, will replace the older facility that was built during the 1970's and which is now overloaded.

As there is no surface water drainage from the site, it was not possible to obtain samples to determine site-specific water quality. All water percolates to groundwater within the site and in the surrounding area. All available data for hydrometric stations in the environs of the proposed waste licence site was obtained to determine flows and water levels on the River Nanny. All data obtained from the EPA Hydrometric Station Register are detailed in Table 7.2 above.

7.2.2 Groundwater

7.2.2.1 Aquifer Potential and Characteristics

Reference to the aquifer map for County Meath, prepared as part of the Meath Groundwater Protection Scheme, indicates that the Clonlusk Formation, the Platin Formation and the Mullaghfin Formation are classified as a Regionally Important Aquifer, where groundwater flow is predominantly through fractures and fissures (Rkd). The presence of karst features in the vicinity of the site, and recorded from exposed quarry faces, suggests that the bedrock is fractured.

The limestones underlying this area have a very low primary permeability (intergranular permeability). However based on the information available from Mullaghcrone Quarry and nearby Platin Quarry, the limestones appear to have undergone karstification, which results in an enhanced secondary permeability.

The term 'Karst' applies to the phenomena produced by the solution of calcium based rocks by groundwater flow, expressed through the formation of openings or voids, such as fissures, voids, caves

or collapse features such as swallow holes and resulting in a groundwater flow regime characterised by locally high permeability, high flow rates as well as complicated conduit/fissure flow regimes dominating, rather then intergranular porosity flow. This karstification often has a surface expression in the form of distinctive topography and/or drainage pattern. However, for the purpose of this investigation the term 'karst' is applied only to the phenomena of the dissolution of the limestone bedrock and the creation of a fissure flow regime (secondary permeability) in the bedrock.

The large dewatering programme within Platin Quarry, immediately to the south of Mullaghcrone Quarry, is considered to have a significant impact on the watertable in this area. The Mullaghcrone Quarry site is considered to be within the zone of contribution for the dewatering undertaken within Platin Quarry. This means that all water percolating to ground is transmitted towards Platin Quarry and pumped out to discharge. At present, Platin Quarry dewaters 4,400m^3/day-6,300m^3/day to maintain a 0m OD groundwater level and Irish Cement Ltd. have been granted planning permission to excavate bedrock to a final floor level of –20mOD. Platin Quarry is licenced to discharge 28,000 m^3/day of water. The Platin Quarry groundwater abstraction is carried out in accordance with its planning permissions and its IPPC licence. Groundwater is used to supply the cooling tower for use in the factory. Groundwater not used for cooling is discharged via the common effluent pipe to the River Nanny. The rate at which the Platin Quarry is dewatered varies with the amount of rainfall.

Localised Groundwater Environment

The limestones in the area around Mullaghcrone Quarry display a number of karst conduits, particularly at shallow levels, where solution features are generally filled with clay and bedrock rubble. The Ordnance Survey maps record some karst features close to the quarry, with the townlands of Cruicerath and Platin.

Groundwater flow direction based on hydrogeological studies and groundwater monitoring programmes (SLR, 2008; WYG, 2009) is towards Platin Quarry to the south east. Groundwater levels are monitored as part of the planning permission for Platin Quarry.

ICL has kindly provided the results of historical groundwater level monitoring in the surrounding area (SLR, 2009). The location of these wells is shown on Figure 7.2, and their groundwater levels are shown on Table 7.3 below.

Table 7.3: Groundwater Levels at Platin Quarry on 08 November 2007 (Provided By ICL 2008/SLR, 2009)

Well Number	Groundwater Elevation (mOD)	Well Number	Groundwater Elevation (mOD)
BH03	16.27	BH18	7.81
BH08	16.50	BH20	25.11
BH09	19.62	BH29	21.82
BH10	91.5	BH40	19.57
BH11	15.12	BH41	9.60
BH12	18.61	BH42	14.19
BH16	1.73		

Within the Mullaghcrone Quarry site, the lowest elevation to which quarrying has continued is approximately 24m OD (Malin Head). This quarry floor is to the north of the proposed waste licence area. A borehole was previously drilled on this floor. The static water level in the borehole was measured at 13m below ground level, which equates to an elevation of approximately 10m OD. It is known that the watertable in the region is impacted by the major dewatering programme undertaken within the Platin Quarry site, where quarrying has continued below Ordnance Datum and has been granted permission to lower to –20m OD. Based on the above information the groundwater table underneath the deposition area is approximately 10.5m OD and groundwater flow direction is to the south east.

All water infiltrating to ground flows towards the south and is considered to be dewatered by operations at Platin Quarry. All water abstracted at Platin Quarry is ultimately discharged to the River Nanny, under permission by Meath County Council.

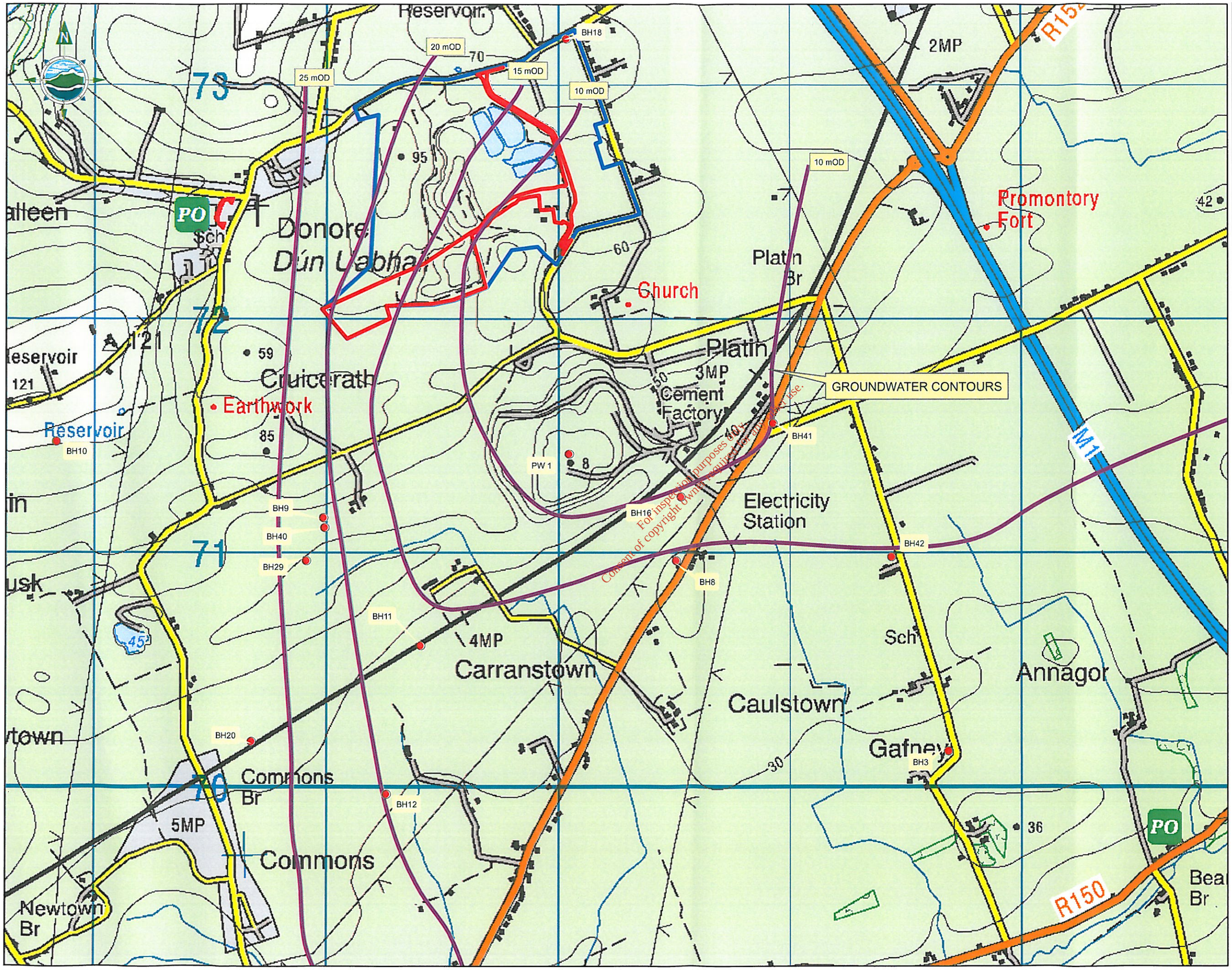
7.2.2.2 Groundwater Vulnerability

Groundwater vulnerability represents the intrinsic geological and hydrogeological characteristics that determine how easily groundwater may be contaminated by human activities. Vulnerability depends on the quantity of contaminants that can reach the groundwater, the time taken by water to infiltrate to the watertable and the attenuating capacity of the geological deposits through which the water travels.

These factors are controlled by the types of subsoils that overlie the groundwater, the way in which the contaminants recharge the geological deposits (whether point or diffuse) and the unsaturated thickness of geological deposits from the point of contaminant discharge.

According to the groundwater vulnerability map for County Meath, the vulnerability rating within the proposed site is Extreme Vulnerability, due to the degree of rock outcrop. According to the site investigation the subsoil thickness in the surrounding area is variable, ranging from 0m to 3m. Therefore the groundwater vulnerability rating of Extreme would appear correct.

The GSI aquifer classification of the underlying bedrock is that of a regionally important fissured aquifer (Rkd) and hence the resource protection rating of the aquifer is Rkd/E (Regionally Important fissured aquifer with an Extreme Vulnerability)



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Legend

- Activity Boundary
- Land Ownership Boundary
- Borehole

0 95 190 380 570
Metres

NOTES

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3 ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4 ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	11-02-11	Issued	A G	J D

Client: ROADSTONE WOOD LTD

Project: MULLAGHCRONE WASTE LICENCE

Title: BOREHOLE LOCATION AND GROUNDWATER CONTOUR MAP

Scale @ A3: 1:15,000

Prepared by:	Checked:	Date:
A.Gruschka	J.Dillon	February 2011

Project Director: D. Grehan

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Drawing No.: Figure 7.2 Issue: A

7.2.2.3 Groundwater flow direction/Groundwater Usage

As part of previous hydrogeological investigations a well audit of existing wells within 500m of the proposed site activity boundary was undertaken in April 2007 by TOBIN Consulting Engineers, an SLR Hydrogeological report to Meath County Council in 2009 and ongoing monitoring and information provided by Irish Cement Limited (ICL).

Platin Quarry, operated by Irish Cement Ltd. (ICL) undertake groundwater level monitoring. One of these wells is within the Mullaghcrone Quarry site boundary, and several are close to it. ICL has kindly provided the results of historical groundwater level monitoring. The location of these wells is shown on Figure 7.2, and their groundwater levels are shown on Table 7.3 above.

The well audit indicates that groundwater usage within 500m of the quarry is relatively low, with no boreholes/wells recorded in use. The limited groundwater abstraction is possibly due to the deep groundwater table underlying the area and the associated high pumping costs. The vast majority of existing dwellings to the north, west and northwest of the site rely on the East Meath Drogheda & South Louth Water Scheme to meet their potable water requirements.

Groundwater Quality

The groundwater in Co. Meath is predominantly calcium carbonate type water, which results from the movement of groundwater through the till, sand and gravels and bedrock limestone that dominate the county. The groundwater in the county is generally hard (251-350mg/l $CaCO_3$) to very hard (>350mg/l $CaCO_3$). Softer waters are found where the Namurian Shales occur (GSI 1998).

As part of this EIS study a number of samples were taken at the site and in the surrounding area to characterise the groundwater in the area and establish a baseline for future comparison.

Groundwater monitoring results were made available from the pumping well GW1 in ICL Platin Quarry for June and December 2010 and sampling of BH18 to the northeast of the site was conducted in January 2011. Samples were taken in specialised containers and delivered to the laboratory on the day of sampling. It was hoped to sample an additional well (GW3) upgradient of the site however this was inaccessible at the time of writing. A sample of GW3 will be taken prior to the operation of the waste licence facility. The analysis showed the groundwater in the area to be of moderate to good quality.

Table 7.4 summarises the water chemistry of the area, with the lab results included in Appendix 7.1.

Table 7.4 Groundwater Chemistry in the Mullaghcrone Area

Parameters	Units	Drinking water Regulations SI 106 of 2007	Downgradient Borehole		Upgradient Borehole
Lab ID			PW1 (ICL site)	PW1 (ICL site)	BH 18 (GW 2)
Sample Date			Jun-10	Dec-10	Jan -11
pH	units	*6-9*	-	-	7.15
Conductivity	µS/cm	*1500*	-	-	466
Chloride	mg/l	*250*	31.01	29.24	34.7
Nitrate	mg/l	*50*	4.35	4.75	12.4
Sulphate	mg/l	*250*	21.49	24.68	54.1
Calcium	mg/l	-	85.2	103.8	32.4
Magnesium	mg/l	-	15.79	-	5.62
Potassium	mg/l	-	3.79	5.33	0.98
Sodium	mg/l	*200*	16.89	16.85	7.12
Total Ammonia as NH3-N	mg/l	*0.3*	0.01	0.011	-
Nitrite	mg/l	*0.5*	0.007	<0.002	-
Cadmium	ug/l	*5*	<0.09	<0.09	<1
Cobalt	ug/l	-	<0.02	0.04	-
Copper	ug/l	*2000*	0.3	0.6	<1
Iron (total)	ug/l	*200*	32.3	10.4	5
Lead	ug/l	25	0.06	0.1	<1
Manganese	ug/l	*50*	6.4	2.2	6
Nickel	ug/l	*20*	<0.14	0.2	<1
Tin	ug/l	-	<2.8	<2.8	-
Zinc	ug/l	-	-	-	<1
Arsenic	ug/l	*10*	-	-	<1
Faecal Coliforms	Cfu/100ml	*0*	-	-	4
Hydrocarbons					
>C12-C16 mg/l	mg/l	-	-	-	*<0.001*
>C16-C21	mg/l	-	-	-	*<0.001*
>C21-C40	mg/l	-	-	-	*<0.001*
Petroleum Range Organics	mg/l	-	-	-	*<0.001*
Diesel Range Organics	mg/l	-	-	-	*<0.001*
BTEX Compounds	mg/l	*0.001*	-	-	*<0.001*

In general the groundwater quality of the underlying aquifer is good. Results would indicate that some organic contamination (possibly from septic tanks or more likely from agriculture) is occurring within underlying aquifer. Low levels of faecal coliforms were detected in the water quality results.

The majority of homes in Donore village are served by the public sewerage scheme, with a number of individual houses treated by private and individual septic tanks. The type of tanks used to treat the effluent is variable, based on the age of the domestic dwellings. Two EPA licenced facilities are in operation within 2km of the site, namely Irish Cement IPPC (P0030-3) and Indaver Waste Licence (W0167-01).

A number of potential contaminant sources are associated with agricultural practices. Landspreading of farmyard wastes and/or artificial fertilisers, in an uncontrolled manner, where the nutrient requirements of the crop are exceeded, may also pose a risk of contamination.

Infiltration of contaminating substances through the ground and into the groundwater can potentially occur where spillages occur on pervious areas, or where underground services leak. Bunding and the secure storage of liquids on impervious hardstanding ground reduce the risk of soil and groundwater contamination.

Groundwater quality at the adjoining Platin Quarry is monitored bi-annually in accordance with IPPC Licence Reg. No. P0030-03. However the groundwater abstracted from Platin Quarry is good, indicating no impact from the existing IPPC facilities, quarry or Waste Permit areas.

7.3 CHARACTERISTICS OF THE DEVELOPMENT

The proposed development will be located within Mullaghcrone Quarry. Water management procedures and environmental compliance measures will be maintained or enhanced dependent on statutory requirements.

The existing infrastructure within the quarry will be maintained and improved to ensure that the proposed waste licence operation does not impinge on the surrounding environment.

This development proposal is seeking to infill soil and stones and recovery of C&D material within Mullaghcrone Quarry. It is proposed to infill to a depth of between 5m and 40m with soil and stones.

The proposed waste licence facility will not operate below the local groundwater watertable. The investigations undertaken as part of the baseline assessment were required for environmental characterisation, but also to determine if the existing methods of water management could be used in the future to control, manage and treat the water inflows and water capture within the site and to discharge this water to the receiving environment without adverse impact.

7.4 POTENTIAL IMPACTS

Mullaghcrone Quarry has operated a number of C&D and soil and stones waste permit facilities since 2004. The proposed development is consistent with operations currently undertaken within the site and it is not proposed to alter the C&D processing or screening methods or the soil and stones (waste permit expired) methodology at the site.

The operation of waste licence activities within the quarry will not result in any workings below the watertable. The proposed waste licence has the potential to alter the surface water drainage at the site. It is proposed to deal with this issue by the installation of toe drains and settlement ponds for storm water flow. The settlement ponds will treat the storm water and thereafter slowly infiltrate to groundwater.

Extreme Rainfall Capture

An important factor in relation to water, is the control and management of rainwater falling within the proposed site, especially during extreme climatic conditions. When the infilling continues the water will need to be drained to collection sumps where the rainwater can dissipate to ground.

In order to quantify the volume of captured rainwater that may occur within the site, extreme rainfall data for the Cruicerath and Platin, Donore area was assessed. For the purpose of this study an extreme rainfall event of 2 hours duration, for a 30-year return period, was used. The rainfall occurring across the site for this 2 hour storm event with a 30 year return period is 32 mm of rain. The extreme rainfall event is assumed to occur during winter months, when evaporation and plant transpiration are lowest. This is considered to be the worst-case scenario, in terms of the volume of water to be dealt within the site.

The total volume of water falling within the waste licence area (11.7 hectares) is calculated as 3744 m^3 over a 2 hour period. It is proposed to locate a surface water storage pond to the east of the waste licence area to cater for storm water events.

It should be noted that the calculations are based on conditions at maximum infill. Therefore, the calculation indicates the volumes of water to be dealt during the worst-case scenario situation, i.e. largest storm event at maximum infill. In reality the water management within the site will be phased throughout the development of the waste licence. Average rainfall recharge will amount to approximately 3.4 m^3/hr.

The potential impact on private wells is an important factor to be considered in the development. However, based on the information available, the risk to the private wells is considered to be low/negligible as there are no private wells located between the proposed waste licence area and the ICL groundwater abstraction point at Platin Quarry P0030-03. Therefore the risk to private boreholes is negligible. On going monitoring of Platin indicates the good water quality downgradient of the proposed waste licence area.

The main water source for the East Meath Water Supply Scheme is the abstraction from the River Boyne at Roughgrange. It is considered that there is no credible risks of impact on this abstraction source as a result of infilling the quarry void or the operation of the C&D facility.

The movement of vehicles within the quarry represent a potential risk to groundwater, from potential leakages or spillages of fuel or oil to ground. This potential impact is addressed in the mitigation measures and through operational procedures already in place.

7.5 MITIGATION MEASURES

Roadstone Wood Ltd has invested in significant infrastructure and operational and environmental procedures to ensure that the proposed operation does not adversely impinge on the surrounding environment.

Roadstone Wood will continue to utilise all required infrastructure and operate 'good housekeeping' procedures if the proposed development is granted a waste licence.

The mitigation measures to be adopted during the lifetime of the waste licence facility have been designed to take into account the nature of water and the environment. The main concerns are the potential of any impact on groundwater in the environs of the site.

All vehicles using the site will be required to pass through a wheelwash located towards the east of the site. This infrastructure will be utilised to ensure the vehicles do not cause soiling of roads.

All potentially polluting materials will be contained within bunded areas, to ensure full containment in the event of total cumulative failure of tanks.

To minimise any impact on the underlying subsurface strata and the groundwater from material spillages all fuel oils, etc. used during operations are stored within bunded areas. The design (volume and construction) of all bunds conform to standard bunding specifications. The retention capacity of bunded areas is 110% of the capacity of the largest tank or drum to be stored within the bunded area.

Spill kits are retained on site to ensure that all potential spillages or leakages are dealt with immediately and staff are trained in their proper use. The servicing of vehicles on site is confined to designated and suitably protected areas; which are located either inside the garage building or on the concrete apron at the front of this building. As outlined in Section 7 an oil interceptor system is used to ensure that any fugitive emissions are prevented from entering watercourses. Wastewater produced on site is held in storage tanks and removed from site by an approved and licensed contractor to a licensed treatment facility.

Surface Water

The total volume of water falling within Area 1 and Area 2 of the waste licence area (11.7 hectares) is calculated as 3744 m^3 over a 2 hour period. It is proposed to locate a surface water storage pond to the east of the waste licence area to cater for storm water events. Surface water captured on site will percolate back to ground at this location.

Groundwater

The groundwater underlying the proposed facility will be flow in the same dewatering towards Platin Quarry, therefore, in net terms, there is no change to the overall hydrological balance. Due to the relatively small area of the proposed waste licence facility and given the nature of the proposed waste licence activities, in relation to the overall catchment, the impact on the regional hydrological and hydrogeological regimes is considered low. The monitoring programme undertaken in the quarry and the proposed site will determine any changes. The monitoring results will be contained in the Environmental Report issued each year and will be made available to interested parties.

8 AIR QUALITY

8.1.1 Introduction

This section addresses the Air Quality of the environment in terms of dust emissions and assesses the potential impacts of the proposed development on the existing environment.

All developments, including waste licence facilities, have the potential to adversely affect air quality in the surrounding area of operations. Currently in Ireland there are no statutory limits for dust deposition from waste licence facilities. However, in recent years the TA Luft/VDI 2119/Bergerhoff Method of dust emission monitoring has become the most commonly used method. This method involves using a direct collection pot to standardised dimensions of either glass or plastic. The system benefits from being a direct collection method i.e. less transferring of material and consequent reduction in sampling errors. This method is defined as an internationally recognised standard and has been adopted by the Environmental Protection Agency (EPA) as the method of choice for licenced facilities.

Department of Environment, Heritage and Local Government (DoEHLG) Guidelines recommend that the TA Luft total dust deposition limit value (soluble and insoluble) of 350 milligram per square metre per day be adopted at site boundaries near waste licence facilities.

8.1.2 Existing Environment

Baseline dust monitoring on site and in the vicinity of sensitive receptors is available for 2010. The locations of the Dust Monitoring Locations are shown on Figure 8.1. Dwellings are located outside the southern and western site boundaries separated from the site by areas of agricultural land. These results are used to identify existing dust deposition levels within the vicinity of the proposed development.

Total dust deposition was measured using the Bergerhoff gauges specified in the German Engineering Institute VDI 2119 document entitled "Measurement of Dustfall using the Bergerhoff Instrument (Standard Method)." Dust gauges are set up approximately 2m above the ground surface and the jars were left open for one month.

The description of each monitoring location is presented in Table 8.1 overleaf and shown on Figure 8.1.

Table 8.1 Description of monitoring locations

Sample Reference	Monitoring Locations
D1	Within site boundary to north west of site
D2	To the northeast of the site
D3	At the south western site boundary
D4	At north western site boundary

Results for the 2010 monitoring period are shown below in Table 8.2.

Table 8.2 Results of Total Dust Deposition

Monitoring Period - 2010	D1 (mg/m2.day) Total Dust Deposition	D2 (mg/m2.day) Total Dust Deposition	D3 (mg/m2.day) Total Dust Deposition	D4 (mg/m2.day) Total Dust Deposition
Jan	91	22	32	48
Feb	71	59	46	67
Mar	38	81	67	77
Apr	8.9	15.4	10.8	17.2
Sep	70	81.1	88.9	67.2
Oct	47.2	87.7	55.6	96.7
Nov	63.8	11.2	64.2	35.4

It can be seen from Table 8.2 that all dust-monitoring locations are below the compliance threshold limit of 350mg/m^2/day, when measured using the TA Luft Bergerhoff Method.