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INTRODUCTION

- 5.1 This Chapter of the Environmental Impact Statement evaluates the regional and local geological conditions prevailing at the established construction and demolition (C&D) waste recovery facility at the Central Quarry at Huntstown and the location of the planned long-term replacement facility to be located at the north-eastern corner of the quarry complex.
- 5.2 This Chapter also assesses the impact of the proposed intensification of C&D waste recovery activity at the Central Quarry in the near-term (next 2-3years) and at the planned replacement facility over the longer term thereafter. The extent of the application site to which this application applies is shown in Figure 5-1.
- 5.3 The information presented in this chapter is based on a detailed examination of the existing quarries at Huntstown and the surrounding area and was prepared by Derek Luby B.E. (Civil) MSc. (Soil Mechanics) and Tom Moore PGeo. in accordance with the publication *Geology in Environmental Impact Statements* issued by the Institute of Geologists of Ireland.

RECEIVING ENVIRONMENT

Study Methodology

- 5.4 Existing information on the regional solid and drift geology of the Huntstown area and its surrounds was collated and evaluated. Subsequent to this data compilation and review, site visits and inspections were undertaken to review the solid and drift geology at the Central Quarry and at the location of the proposed replacement facility, within the Huntstown quarry complex. Surrounding areas were also inspected at the same time.
- 5.5 A drilling program was undertaken to install six groundwater monitoring wells across the Huntstown Quarry complex in July 2010. Rock chip samples from the open-hole drilling were collected at that time were examined to assist in assessing the geology of the Huntstown area. Well locations and borehole logs are presented in Section 6 of this EIS.
- 5.6 In May 2015, a geophysical survey was undertaken at the Central Quarry site by APEX Geoservices Ltd. to determine the likely lithological distribution and bedrock structure in that area. The results from the geophysical surveying informed the planning and execution of a subsequent drilling programme which sought to establish the location and depth of geological contacts within and/or between limestone formations and the distribution and nature of any potential karstic clay-infilled features which may have been present. The drilling programme at the Central Quarry was undertaken in June 2015 and comprised a total of 9 No. boreholes.
- 5.7 In August and September 2016, a geophysical survey was undertaken by APEX Geoservices to assess the likely lithological distribution and bedrock structure at the site of the proposed replacement recovery facility to the northeast of the quarry complex. A follow-up drillhole investigation was undertaken in November 2016 to verify the findings of the geophysical investigation.
- 5.8 The following activities were undertaken as part of this geological assessment:
 - Examination of GSI 1:100,000 geology map Sheets 13 and 16
 - Review of available geological information and literature

- Review of groundwater monitoring well installation records
- Review of 2015 rotary core borehole records
- Site / quarry face inspections

Regional Geology

Soil

- 5.9 Teagasc soil mapping, reproduced in Figure 5-1, indicates that the Huntstown quarry complex was originally underlain by renzinas and lithosols and greybrown podzolics and brown earths. Site inspections indicate that there is a significant amount of Made Ground (soil disturbed or placed by human activity) across the Huntstown Quarry complex other than that identified by Teagasc soil mapping. Most of the Made Ground arises from historical and ongoing extractive activity, principally overburden removal and stockpiling or installation of fixed plant and infrastructure. As a result, few areas of original, undisturbed soil remain across the Huntstown Quarry complex.
- 5.10 The site of the proposed replacement recovery facility in the north-eastern corner is possibly one of the few relatively undisturbed areas within the quarry landholding. The Teagasc mapping indicates that this area is underlain by renzinas and lithosols, thin stony soils comprised principally of partially weathered (limestone) rock fragments, which insturn suggests rock occurs at or close to the ground surface.
- 5.11 The Teagasc soil mapping also indicates that the undeveloped or undisturbed lands immediately beyond the Huntstown Quarry complex are underlain by well-drained calcareous soils (defived from limestone) which are suitable for a wide range of agricultural activity, generally grassland or tillage. There are also some poorly drained calcareous soils which have more restricted uses, principally as seasonal grassland.

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Quaternary Geology

5.12 Teagasc sub-soil (parent material) mapping, reproduced in Figure 5-2, indicates that the application site at Huntstown is underlain by bedrock at, or close to, the ground surface. In areas beyond the application site, where subsoils do occur, they typically comprise glacial tills derived from Carboniferous limestone.

Bedrock Geology

5.13 The GSI 1:100,000 geology maps (Sheets 13 and 16) indicate a complex geology around Huntstown, refer to Figure 5-3. The Huntstown Quarry complex straddles a number of geological formations. It is underlain by the Malahide Formation in the southern part of the site. This is overlain to the north-west by the Waulsortian Limestones of the Feltrim Limestone Formation which is, in turn, overlain to the north-west by the Tober Colleen. The Tober Colleen is in faulted contact with the Malahide Formation to the north-west, the Malahide Formation in this area having reverse faulted to the south over the Tober Colleen Formation.

Local Geology

Introduction

5.14 There are currently three main areas at the Huntstown Quarry complex where extraction is taking place, or has taken place in the recent past. These are referred to in turn as the North, Central and South Quarries. The extensive rock exposures in these working areas, in conjunction with information from recent groundwater well and resource drilling, allows a reasonable assessment of the distribution of different lithological formations and the structure of the geology around the application site to be made.

Soil and Subsoil Deposits

- 5.15 Soils and superficial deposits have been entirely stripped from the footprint of the existing waste recovery facility at the Central Quarry and on much of the surrounding land (at higher level). Soil stripping was undertaken principally to facilitate past and proposed future quarrying at this location. Some of the surrounding land has also been used at various times in the past for stockpiling of aggregate.
- 5.16 Significant further disturbance of in-situ soils and subsoil deposits is anticipated at the existing recycling facility on foot of the planned future development of the Central Quarry (once the existing C&D facility has been relocated to the north-east of the Huntstown complex). Planning permission for future development of the Central Quarry was granted by Fingal County Council in 2014 (Planning Ref. No. FW12A-0022 and An Bord Pleanála Ref. No. 06F.241693).
- 5.17 Inspection of the road descent and quarry faces around the Central Quarry suggests that the original depth of subsoil, prior to site stripping and rock excavation was quite thin, of order of 1m to 2m maximum, and that it generally comprised very stony glacial till.
- 5.18 Inert construction and demolition waste has been imported to and recovered at the existing permitted waste recovery facility at the Central Quarry since 2004 and was suspended in 2015 pending regularisation of waste management regulatory issues. The unprocessed C&D waste (and processed / recycled aggregate derived from it) which is currently stockpiled at the established recovery facility was sourced from construction and development sites across the Greater Dublin Area and is inert.
- 5.19 The proposed replacement facility in the north-eastern corner of the quarry complex is currently used as seasonal grassland and is grazed by horses. The soil is likely to be relatively thin and stony and appears to be free draining, with only minor quantities of run-off collecting at a minor closed depression at the south-western corner.
- 5.20 Geophysical testing undertaken at the proposed replacement facility in the north-eastern corner of the quarry complex in 2016 suggests that soil / subsoil cover at the southern and central sections is relatively thin, typically 2m to 5m thick over bedrock, although it appears to thicken notably toward the northern section, up to 10m deep, as the upper surface of the underlying bedrock falls to the north.

5.21 Follow-up rotary drilling in November 2016 indicated that the depth to solid competent rock at the relocated facility was 3m. Geophysical survey and drillhole data for this area is reproduced in Appendix 5-A.

Bedrock Geology

5.22 The geological sequence at Huntstown was investigated in detail by *Jones et al.* (1988), although at that time development of the current South Quarry had not commenced. The bedrock sequence in the Huntstown area, as determined by *Jones et al.* is presented in Table 5-1 below.

FORMATION	MEMBERS	ESTIMATED THICKNESS	Description
LUCAN FORMATION		250m at Huntstown? 1000m+ Regionally	Dark fine-grained limestone and thin shales
TOBER COLLEEN FORMATION		100 – 200m?	Shales and dark limestones
FELTRIM LIMESTONE FORMATION (WAULSORTIAN)		200 – 250m	Pale-grey micritic sparry limestones
MALAHIDE LIMESTONE FORMATION	Barberstown Nodular Member _{co^t w}	ection e84m	Nodular limestones and shales
	Dunsoghley ^{oo} Massiye Crinoidal Member	47m	Massive crinoidal limestones
	Huntstown Laminated Member	40m	Laminated coarse limestones
	St Margarets Banded Member	86m	Interbedded shales and limestones
	Swords Argillaceous Bioclastic Member	>860m	Variable. Massive clean limestone units interbedded with banded limestone/shale units and argillaceous bioclastic limestones. Mudstone-dominated units have also been recorded
	Turvey Micrite Member	40m	Micritic limestones and thin shales
	Lower Limestone Shale Unit	>30m	Limestone and shale

Table 5-1Lithological Sequence of Formations Present In Huntstown Quarry
(Partly Based On Jones et al. 1988)

- 5.23 The South Quarry at Huntstown is developed within limestones of the Malahide Formation which dip steeply to the north in the eastern part of the quarry and to the north-west in the western part of the quarry. The limestones are dominated by well-bedded limestones.
- 5.24 As already noted, the Central Quarry is currently in use as a C&D waste recycling facility and is not currently being worked. The existing quarry (and planned future extension thereto) is developed in the pale micritic Waulsortian limestones of the Feltrim Limestone Formation.
- 5.25 The Waulsortian Limestones at the Central Quarry are overlain to the north and north-northwest by argillaceous limestones and mudstones / shales of the Tober Colleen Formation which dip steeply to the north-northwest, above the Waulsortian Limestones. The contact between the Waulsortian limestones and the Tober Colleen Formation is exposed in the sides of the roadway leading down into the Central Quarry.
- 5.26 The North Quarry, where inert soil waste recovery is currently ongoing is developed in a sequence of well-bedded limestones. Academic research on the fossil fauna of the bedrock sequence exposed at the quarry indicates that it is also developed within sub-Waulsortian limestones of the Malahide Formation.
- 5.27 The West Quarry is underlain predominantly by the Malahide Formation, with the exception of the south-eastern corner, where it is underlain by calcareous mudstones and argillaceous limestones of the Tober Colleen Formation. The Malahide Formation in this area is described as comprising of limestones, dolomitised limestones and interbedded argillaceous limestones.
- 5.28 The Tober Colleen Formation in the West Quarry is in reverse fault contact with the limestones, dolonitised limestones and interbedded argillaceous limestones of the Malahide Formation.
- 5.29 A detailed geological map showing outcrops of, and contact between, the various rock formations around the Huntstown Quarry complex is presented in Figure 5.4. This geological map is more accurate than the regional mapping published by the GSI as it is based on extensive site specific data obtained by way of geophysical surveying and rock drilling at Huntstown over many years.
- 5.30 The geophysical survey data obtained from across the quarry complex, together with the presence of significant fracturing, veining and dolomitization in drill cores also indicates that the rock mass of the Malahide Formation contains significant internal faulting.
- 5.31 Recent bedrock drilling at the site of the relocated recovery facility intersected sequences of dolomitised packstones (limestones) from the Dunsoghley Massive Crinoidal Member and Huntstown Laminated Member and the underlying interbedded argillaceous bioclastic limestones, limestone and calcareous mudstone of the St. Margaret's Banded Member at depth. The strong dolomitisation identified in the rock cores, particularly at the northern end, suggests that there is a fault in close proximity to this area. Geophysical survey and drillhole data for this area is reproduced in Appendix 5-A.

Structure

5.32 The bedrock sequence at Huntstown dips steeply to the north or north-west, with recorded dip values varying from 23° in the east of the South Quarry to

44° in the west. The sequence in the Central Quarry is recorded as dipping at 54° to the north-west. The sequence in the North Quarry dips reasonably uniformly to the north-west or north-northwest, with dip values varying from 30° to 55°.

- 5.33 As the limestones exposed in the North Quarry have been dated as being older than, and therefore stratigraphically below, the Waulsortian Limestones of the Central Quarry, there must be a significant reverse fault present between the Central Quarry and North Quarry. A probable fault plane has been identified in the immediate southern part of the North Quarry where the main access road enters this area. This is interpreted as part of the trace of the reverse fault and the trace of the reverse fault has therefore been located on the basis of this exposure.
- 5.34 The Tober Colleen Formation is interpreted as being approximately 200m thick in the Huntstown e steep dip suggests that the sub-crop area of the Tober Colleen Formation would be approximately 100m in width from the exposure of the basal contact of this unit in the Central Quarry access road.
- 5.35 The rocks of the Tober Colleen Formation are well jointed. The dominant jointset trends roughly N-S and are sub-vertical, typically dipping between 87° east and 87° west. These joints are frequently associated with calcite or calcite dolomite veins. In some locations they may be solutionally enlarged and have brown clay fills which are rare in the North Quarry and South Quarry, but more common around the Central Quarry.
- 5.36 The Malahide Formation within the West Quarry at Huntstown is fault separated from the North Quarry by a major reverse fault, exposed along the south faces of the North Quarry and identified by geophysics and drilling in the north-western part of the West Quarry.
- 5.37 The sequence in the West Quarry dips steeply (25° to 45°) to the north or north-northwest. The rock is strong to very strong and weathering is rarely significant more than a few tens of metres below the rock surface.
- 5.38 A simplified geological cross-section through the Central Quarry and the Huntstown Quarry complex is provided in Figure 5-5. Some of the geological features and characteristics discussed above are illustrated in Plates 5-1 to 5-4 at the end of this chapter.

Geological Heritage

- 5.39 Consultations were previously held with the Geological Survey of Ireland (GSI) to ascertain and confirm the geological heritage value of rock exposures at Huntstown. These consultations revealed that the geological contact between the Waulsortian Limestones of the Feltrim Limestone Formation and the Tober Colleen Formation exposed in the roadway leading into the Central Quarry has been designated as a Geological Heritage Site as part of Theme 8 of the Irish Geological Heritage (IGH) Programme (Lower Carboniferous).
- 5.40 Arising from consultations, staff working on the IGH Programme have requested that the exposure be maintained if possible as part of any future planned development at the Central Quarry. In time, the existing exposure could be designated as a Natural Heritage Area (NHA) on geological and geomorphological grounds under the Wildlife (Amendment) Act of 2000.

Economic Geology

- 5.41 Crushed rock which is currently extracted from quarries across the Huntstown complex are used to produce aggregates which in turn have a variety of uses including:-
 - Concrete products;
 - Readymix concrete;
 - Road sub-base, base and blacktop (tarmacadam) surfacing; and
 - General aggregate, structural backfill etc.

Karstification

- 5.42 Pure limestones, comprising 100% calcium carbonate (CaCO₃), are readily dissolved by weak acid rainfall. The dissolution and enlargement of discontinuities in the limestone (such as joints, fractures, etc.) over geological time leads to the formation of unique landforms such as closed depressions (dolines), sinkholes, springs, turloughs and caves.
- 5.43 Strictly speaking, the term 'karst' is applied to areas where surface drainage has been disrupted by underground capture of surface streams by dissolution of the bedrock. A broader definition of the term bewever includes landscapes where distinctive karst landforms occur as a result of dissolution of the underlying bedrock.
- 5.44 Dissolution features in karst limestones, whether open or infilled present significant environmental challenges, particularly with respect to protection of groundwater quality and groundwater fed ecosystems. They also present unique engineering challenges, particularly with respect to slope instability and control of drainage.
- 5.45 A review of the GSI Karst Database indicates that there is no known historic (or mapped) karst related features in the vicinity of Huntstown Quarry.
- 5.46 The presence, nature and extent of any karstification at Huntstown Quarry has been separately assessed by inspection of existing quarry faces and from a programme of geophysical surveying and rock drilling undertaken in 2015. These inspections revealed a number of minor solutionally enlarged and clayinfilled joints, particularly within the Feltrim (Waulsortian) Limestone Formation which occurs around the Central Quarry. Where they occur, such features would generally be expected to pinch (narrow) with depth.
- 5.47 The previous development of the Central Quarry was terminated by a series of major clay-infilled features which occur at its eastern end. Examination of these features indicates that they are largely vertical or sub-vertical features, orientated north-south or north-northwest to south-southeast. As a consequence, planned future development of this quarry will be to the west and south.
- 5.48 The recent drilling programme (in 2015) identified a number of clay-infilled solution features, interpreted as a thin zone of vertical to sub-vertical fissures, orientated roughly north-south, over 200m to the west of the existing western limit of the Central Quarry.

5.49 A thin zone of epikarst is developed immediately below the contact between bedrock and overburden. In the existing quarry faces, this epikarst zone extends for only 1.0m into the bedrock and is characterised by slight enlargement of discontinuities by dissolution.

IMPACT OF PROPOSED DEVELOPMENT

Evaluation of Impacts

- 5.50 The evaluation of impacts of the proposed intensification and relocation of C&D waste recovery activity at Huntstown on soil and geology at and in the vicinity of the Central Quarry, the new (relocated) facility and the surrounding areas is based on a methodology similar to that outlined in the 'Guidelines for the Assessment of Geology, Hydrology and Hydrogeology for National Road Schemes' published by the National Roads Authority (2009).
- 5.51 The importance of existing soil and geology attributes identified at the application site is assessed in the table below :

Attribute	Status / Occurrence	Importance
Agricultural Soil	Low-value productive soil grazed grassland at the relocated site to be removed (lost) an stockpiled in screening berms around th proposed facility or elsewhere within th quarry complex of the support Other soil beyond quarry site support agriculturat activity / urban development.	l) Medium d e e s
Geological Heritage	Heritage feature located along access roa leading to Central Quarry	d High
Economic Geology (I)	Existing C&D waste recovery facility at Centra Quarry located over high quality limeston resource which has planning approval for extraction. No extraction currently possibl due to presence of C&D recovery facility an waste / processed stockpiles.	al High e or e d
Economic Geology (II)	Geological surveys, drilling and assessmer carried out at the location of the replacemer C&D waste recovery facility indicate th potential aggregate quality to be low.	nt Low nt e
Subsoil	Subsoils are relatively free draining and free of contamination, but otherwise have limite function.	of Low d
Geohazards	Potential for instability / erosion of soil i screening berms and/or stockpiles aroun quarry complex.	n Low d
	Occasional rockfalls at Central Quarry limited by presence of stockpiled material against existing rock faces.	– S

Table 5-2Importance of Geological Attributes in Vicinity of Application Site

5.52 The magnitude of these impacts on the soil and geology attributes is assessed in Table 5.3 overleaf:

Table 5-3 Significance of Impacts on Soil and Geology

Attribute	Impact of Proposal on Attribute	Magnitude
Agricultural Soils	Loss of existing soil cover and existing agriculture use (grazing). Loss relatively insignificant in both local and regional context.	Small, negative
Geological Heritage	No impact - the proposed development will not alter the existing exposure / geological contact	None
Economic Geology (I)	Relocation of existing recovery facility will facilitate further rock extraction at Central Quarry (already approved) and extraction of proven resource.	Moderate, positive
Economic Geology (II)	Development of replacement facility limits potential rock extraction at new location, with long-term sterilisation of underlying, low quality limestone resource. Other, higher value geological resources are however available elsewhere within quarry complex.	Small, negative
Subsoil	Importation of more C&D waste and more intensive processing / recycling activity introduces an increased risk of potential subsoil / bedrock contamination. Also risk of fuel leaks and/or spills from plant and trucks.	Moderate, negative
Subsoil	Construction of hardstand area at replacement facility will not adversely impact existing subsoil function (principally drainage).	None
Geohazards	Continuation and/or intensification of recovery activities at Central Quarry will have no impact on existing low level hazards.	None

- 5.53 The proposed development of a replacement waste recovery facility at the north-eastern corner of the Huntstown quarry complex will result in the loss of productive agricultural soil (a maximum of 5.2 hectares of grassland). As there is abundant soil resource in the surrounding local area, the magnitude of this loss is considered to be small, even in a local context. As the magnitude of loss of a medium value soil resource is small, the significance of this impact is deemed to be **minor** and negative.
- 5.54 The proposed relocation of the waste recovery facility to the north-east of the quarry complex over the short-to medium term will facilitate extraction of a relatively high value limestone resource. As the magnitude of this impact on local economic geology is assessed as moderate, the overall significance of this impact is assessed as **moderate** and positive over the short-to medium term.
- 5.55 The relocation of the recovery facility to the north-east of the quarry complex will prevent extraction of any underlying low value limestone aggregate underlying this site. As the magnitude of this impact on local economic geology is assessed as small, the overall significance of this impact is assessed as **imperceptible**.

- 5.56 Without mitigation, the increase in traffic volumes and the increase in C&D waste recovery activities could increase the probability of a leak or spillage of fuels/oils at the existing recovery facility and planned replacement facility. The magnitude of any potential impact from hydrocarbons on underlying subsoil and bedrock likely to be local and long-term.
- 5.57 Without mitigation there is also an increased risk of ground contamination at the existing or planned replacement recovery facility on account of the intensification of waste importation and recovery activities. The potential impact of contaminated consignments being delivered to, and end-tipped at, the recovery facilities is considered to be local and long term.
- 5.58 Assuming the waste recovery facilities continue to run in accordance with existing best waste management practice, with the required plant and staff resources put in place to facilitate this, the risk of introducing potential ground contamination is likely to be small to moderate at worst. Given that the risk of introducing contamination into existing relatively low value subsoil and/or rock is small to moderate, the significance of this potential impact is assessed as **minor** and negative. It is considered that mitigation measures are required to manage / limit potential impacts.

Interaction with Other Environmental Receptors

- 5.59 The potential risks associated with the importation and handling of contaminated C&D materials at either the existing or proposed replacement facility could have implications for groundwater quality, were infiltrating rainfall to percolate down through any contaminated materials and hardstanding materials into the underlying locally important aquifer. This aspect is discussed in more detail in Chapter 6 of this EIS (Water).
- 5.60 During establishment / set-up of the replacement C&D waste recovery facility, the existence of unvegetated soil stockpiles and/or screening berms could give rise to dust blows during dry windy weather. These issues are discussed in in Chapter 8 of this EIS (Air Quality).
- 5.61 The stripping of soil at the replacement C&D waste recovery facility at the north-east corner of the quarry complex during the set-up / establishment phase could impact on underlying buried archaeological resources. These issues are discussed in in Chapter 11 of this EIS (Cultural Heritage).

Do-nothing Scenario

- 5.62 If output from the existing C&D recovery facility remains unchanged and the facility is not relocated to the north-eastern corner of the landholding, there will be some continued risk of adverse impact on geological resources, principally arising from potential for contamination by imported C&D wastes and/or plant engaged in recycling activity, albeit the level of risk may be somewhat lower that otherwise envisaged by this proposal.
- 5.63 Were the proposed development not to proceed, there would be no loss of soil or soil function for the existing grassland area in the north-eastern corner of the quarry complex. However, given existing development pressures on this and surrounding lands arising from its proximity to Dublin and high capacity national road infrastructure, it is unlikely that this site would remain undeveloped over the medium to long-term future.

MITIGATION MEASURES

- 5.64 Several measures are currently being implemented at the existing C&D waste recovery facility to mitigate against any potential adverse impacts on the receiving geological environment which could arise in the course of waste recovery activities. The existing (and proposed additional) mitigation measures include the following:
 - Fuel is stored at an auto diesel fuel storage tank at the site infrastructure area. This tank is constructed over a sealed concrete pavement and with a perimeter bund sized to provide a storage / retention capacity of 110% of tank storage volume. Occasional refuelling will also be undertaken over hardstanding areas at the recovery facilities using double skinned bowsers.
 - Oils, greases and hydraulic fluids are stored under cover in bunded containers placed over a concrete slab at the maintenance shed;
 - Refuelling and routine servicing of plant and machinery will take place at existing maintenance sheds or over paved, drained hardstanding areas;
 - Good site management practices are implemented to reduce risks of spills, including regular monitoring and inspection of storage vessels and regular maintenance and servicing of construction plant and equipment;
 - Such additional plant and resources as is necessary to ensure that the recovery facility continues to be managed and operated in accordance with best waste management practice and to ensure compliance with inhouse environmental management systems, planning consents and waste licence conditions will be provided by the Applicant;
 - Contingency plans / procedures have been developed and are in place to deal with potential leaks and spills. An emergency spill response kit is held on site.
- 5.65 In order to minimise the risk of importing and introducing contaminated waste materials to the site, management systems have been introduced at the recovery facility to establish the source of imported materials in advance and to confirm that they are inert. Once received at the site a multiple level testing regime will be put in place to test the materials for compliance and includes:
 - comprehensive on-site verification, comprising visual inspection and record of all imported C&D wastes unloading at the site
 - basic characterisation testing covering a wide range of parameters to determine the leaching behaviour of the inert wastes imported to site;
 - frequent, compliance testing covering a limited range of key parameters.
- 5.66 It is considered that the combined effect of the above measures will be to reduce the overall magnitude of the potential contamination impact to small and that the corresponding significance of the mitigated impact will be **minor** and negative.
- 5.67 In order to confirm that there are no residual risks to in-situ soil and geology, provision is made for continued monitoring of groundwater for the duration of the C&D waste recovery activities and for a short aftercare period thereafter.
- 5.68 In order to reduce the risk of localised erosion and potential dust emissions during the establishment phase for the replacement facility in the north-eastern corner of the quarry complex, the area of bare or newly exposed subsoils will

be kept to a minimum and hardstanding materials will be placed over the exposed subsoil as soon as possible after soil stripping. Any new, re-profiled or extended soil stockpiles or raised screening berms will also be immediately vegetated or grassed to minimise erosion and dust blow.

5.69 It is proposed to restore the lands at the replacement facility in the northeastern corner following cessation of C&D waste recovery activities. In order to facilitate future agricultural use of the restored land, all hardstanding materials will be removed and a minimum 300mm combined thickness of any stripped topsoil and subsoil stockpiled nearby will be placed over the in-situ subsoil. The final landform will also be graded so as to facilitate long-term runoff overground toward the proposed drainage channel along the western side of the facility which will remain in place.

RESIDUAL IMPACT ASSESSMENT

- 5.70 The potential impacts of the proposed development upon the soils and geology have been identified and assessed, and where appropriate, mitigation measures have been identified which mitigate any potential environmental impacts arising from the proposed increase in C&D waste intake rates to the waste recovery facility at Huntstown.
- 5.71 It is recommended that all aspects of C&D waste recovery activity should continue to be undertaken in accordance with best practice environmental guidance, similar to that which is currently being implemented, and that such additional plant and resources as may be required are made available by the Applicant.

Intensification of Activity at Central Quarry

5.72 Measures have been identified which will continue to ensure that there will be no significant impact on the any residual subsoil cover and/or bedrock at the Central Quarry arising from the intensification of C&D waste recovery activities over the short term.

Relocation of Activity to New Facility

- 5.73 Measures have also been identified which will ensure that there will be no significant impact on the soils, subsoils and bedrock at and beyond the proposed replacement facility at the north-eastern corner of the quarry complex as a result of planned C&D waste recovery activities.
- 5.74 Measures are also proposed to provide for long-term restoration of these lands to agricultural use following cessation of waste recovery activities.

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Plate 5-1 Limestones Exposed in Western Face of the North Quarry. Note steep dip to north-west and well-bedded nature of the limestones.



Plate 5-2 Exposure of the Geological Contact in Huntstown Central Quarry. between the Waulsortian Limestones of the Feltrim Limestone Formation (to right) and Tober Colleen Formation (to left). Contact marked by arrow. Unprocessed C&D waste in foreground.

ROADSTONE LIMITED HUNTSTOWN C&D WASTE RECOVERY FACILITY, FINGLAS, DUBLIN 11 INTENSIFICATION OF ACTIVITY AND RE-LOCATION OF FACILITY

SOIL AND GEOLOGY 5



Plate 5-3 View to South-East across Central Quarry with processed C&D waste / recycled aggregate stockpiled in foreground



Plate 5-4 View to South across Central Quarry with unprocessed C&D waste stockpiled in foreground

ROADSTONE LIMITED HUNTSTOWN C&D WASTE RECOVERY FACILITY, FINGLAS, DUBLIN 11 INTENSIFICATION OF ACTIVITY AND RE-LOCATION OF FACILITY



Figure 5-5 Geological Cross Section Through Central Quarry

ROADSTONE LIMITED HUNTSTOWN C&D WASTE RECOVERY FACILITY, FINGLAS, DUBLIN 11 INTENSIFICATION OF ACTIVITY AND RE-LOCATION OF FACILITY



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APPENDIX 5-A GEOPHYSICAL SURVEY (SOREHOLE DATA : NORTH EASTERN For men of constraint area





6 Knockmullen Business Park Regus House, Herald Way Gorey Pegasus Business Park Co. Wexford Castle Donington Ireland. Derby DE74 2TZ T +353 (0)402-21842 UK F +353 (0)402-21643 T +44 (0)844 8700 692 E info@apexgeoservices.ie www.apexgeoservices.co.uk www.apexgeoservices.ie www.apexgeoservices.co.uk



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2D resistivity profile Seismic refraction profile

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FIGURE 1: EM CONDUCTIVITY RESULTS 2016 - AREA B	
SCALE 1:2500	



FIGURE 2: SUMMARY MAP 2016 - AREA B SCALE 1: 2500

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¹ Proposed borehole

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	Huntstowr Assessme Huntstowr Roadstone Depth (m)	Huntstown Geold Huntstown Uuari Roadstone Depth (m) Type / FI 0.00 - 4.00 0.00 - 7.00 4.00 - 7.00 7.00 - 10.00	Huntstown Geological Assessment Huntstown Quarry Roadstone Depth (m) Type (m) / FI TCR 0.00 - 4.00 40 4.00 - 7.00 100 7.00 - 10.00 98	Nuntstown Geological Assessment Huntstown Quarry Roadstone Depth (m) Type 7/FI Coring TCR 0.00 - 4.00 40 29 4.00 - 7.00 100 90 c 7.00 - 10.00 98 79	Huntstown Geological Assessment Prost Huntstown Quarry Roadstone Depth (m) Type (TFI) Coring (CO) 0.00 - 4.00 40 29 18 4.00 - 7.00 100 90 or eetee 89 100 7.00 - 10.00 98 79 56	Number of the sessent of the	No. No. <td>Huntstown Geological Assessment Project No. 501.00180.00165 Co-ords: Huntstown Quarry Level: Evel: Roadstone Depth Level (m) Depth TCR SCR RQD M(m) Level (m) 0.00 - 4.00 40 29 18 January January</td> <td>No. Project No. 501.00180.00165 Co-ords:</td> <td>Project No. Sasessment Co-ords: 311164.00 - 242116.00 Heint Inf. Sheet 1 of. Huntstown Geological Assessment Project No. Scale Co-ords: 311164.00 - 242116.00 Hole Type Rc Huntstown Quarry Level: 77.80 Scale Rodatsone Dates: 14/11/2016 - 14/11/2016 Logged B CB Ophy Type TCR SCR RCD Mm Implementation 0.00 - 4.00 40 29 18 Implementation Implementation 0.00 - 4.00 40 29 18 Implementation Implementation 4.00 - 7.00 100 90 90 68.80 Implementation Implementation 7.00 - 10.00 98 79 56 90 68.80 Implementation Implementation</td>	Huntstown Geological Assessment Project No. 501.00180.00165 Co-ords: Huntstown Quarry Level: Evel: Roadstone Depth Level (m) Depth TCR SCR RQD M(m) Level (m) 0.00 - 4.00 40 29 18 January January	No. Project No. 501.00180.00165 Co-ords:	Project No. Sasessment Co-ords: 311164.00 - 242116.00 Heint Inf. Sheet 1 of. Huntstown Geological Assessment Project No. Scale Co-ords: 311164.00 - 242116.00 Hole Type Rc Huntstown Quarry Level: 77.80 Scale Rodatsone Dates: 14/11/2016 - 14/11/2016 Logged B CB Ophy Type TCR SCR RCD Mm Implementation 0.00 - 4.00 40 29 18 Implementation Implementation 0.00 - 4.00 40 29 18 Implementation Implementation 4.00 - 7.00 100 90 90 68.80 Implementation Implementation 7.00 - 10.00 98 79 56 90 68.80 Implementation Implementation

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SI R							R	16-HTN-18				
SER								-	•	Sheet 2 of 4		
Project Name: Huntstown Geological Assessment			Pr 50	oject No. 1.00180.0	0165	Co-ords:	311164.00 - 242116.00	Hole Typ RC	е			
Location:		Huntstown	Huntstown Quarry						Level:	77.80	Scale	
Client:		Roadstone							Dates:	14/11/2016 - 14/11/2016 CB		3y
	Water	Depth	Туре	e TCR	Coring	3	Depth	Level	Lenerd	Otratura Dagariation	-]
vveii	Strikes	(m)	/ FI		SCR	RQD	(m)	(m)	Legenu	Stratum Description	1	
		10.00 - 13.00 13.00 - 16.00 16.00 - 19.00		100	66 83 ැර	52 73 Fr Asentof 37	12.00	65.80 Purposes only feet required f		<1cm wide slightly argillaceous dark grey le 20deg SCA Strong, massive, medium dark grey, fine gr PACKSTONE with minor fractured mudstor slight iron staining. Trace argillaceous wisp minor calcite veining. LIMESTONE - DUNSOghley Massive Member <1cm wide slightly argillaceous dark grey la 20deg SCA Strong, massive, medium dark grey, fine gr PACKSTONE with minor fractured mudstor slight iron staining. Trace argillaceous wisp minor calcite veining. LIMESTONE - DUNSOghley Massive Member Strong, massive, medium grey, fine grainec PACKSTONE with common brecciated calc minor argillaceous wisps throughout. Minor intervals with concentrations of argillaceous slightly iron staining. UMESTONE - DUNSOghley Massive Member Moderately strong, laminated, medium darf grained dolomitised PACKSTONE with inte grey wackestone. Minor intervals where wa to weak, slightly iron stained mudstone inter laminations.	aminations @ ained dolomitised the intervals with a stroughout and e Crinnoidal aminations @ ained dolomitised the intervals with a throughout and e Crinnoidal d dolomitised site veining and fractured s wisps and e Crinnoidal c grey, fine rbedded dark tockestone grades rbeds-	
							20.00	57 80		Weak, massive, dark grey brown, fine grair WACKESTONE. Faulted.	ned muddy	19
Rema	rks							01.00		Continued on next sheet		
Drilled	by IDL										AGS	5

							Borehole No.					
SLR ^{**}							R	16-HTN-18				
					P	roiect No		-		Sheet 3 of 4		
Project Name: Assessment			50	01.00180.0	0165	Co-ords: 311164.00 - 242116.00		RC				
Location:		Huntstowr	Huntstown Quarry							77.80	Scale 1:50	
Client	:	Roadstone	Roadstone						Dates:	14/11/2016 - 14/11/2016	Logged By CB	
Well	Water Strikes	Depth (m)	Type / FI		Coring		Depth (m)	Level (m)	Legend	Stratum Description		
		()	/ 1 1	ICR	SCR	RQD	20.13	57.67		LIMESTONE - Dunsoghley Massive Crinnoidal		<u> </u>
										Member Weak, massive, dark grey brown, fine grain	ned muddy	
										WACKESTONE - Faulted. LIMESTONE - Huntstown Laminate	ed Member	
		19.00 - 22.00		100	30	27				Strong, massive, rust grey, medium grained weathered dolomitised PACKSTONE	I, moderately	21 -
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		28.00 - 31.00		100	92	72						29 -
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Rema	rks		I		<u> </u>					Continued on next sheet		
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							Borehole No.				
							R	16-HTN-18			
JLK								0	Sheet 4 of 4		
Project Name: Huntstown Geological Assessment			Pr 50	oject No. 1.00180.0	00165	Co-ords:	311164.00 - 242116.00	Hole Type RC			
Location:		Huntstown	Huntstown Quarry						Level:	77.80	Scale
Client	:	Roadstone							Dates:	14/11/2016 - 14/11/2016	Logged By
	10/	Dauth	T		Corinc		Dauth				СВ
Well	vvater Strikes	Depth (m)	/ FI	TCR	SCR	RQD	(m)	(m)	Legend	Stratum Descriptior	ו
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		34.00 - 37.00		100	83	5 ⁶⁶⁸					
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							40.00	37 80			
Rema Drilled	iks I by IDL						.0.00	01.00		End of borehole at 40.00 m	
											AGS

APPENDIX 5-B BOREHOLE LOGS : CENTRAL QUARRY
Since Instrumental matrix Is-HTC-0 to the Strumental second seco	SLR Project Name: Location: Client: Piezo Drill T 0.00	Geolog Huntsi Roads Tag TCF 0 50	ndy Arbo + 353 1 25 y.strconsulting gical A own tone Core Geote SCR 19	chnical D RQD	lin 14 ax. + 353 sment	Depth (m)	Diroject N Dirodite Level (m OD)	lo. 30.00119	Co-ords: Level: Dates:	310979E - 241197N 57.27 m AOD 24/06/2015 Stratum Description	15-HTC-0 Hole Type Rotary Scale 1:50,000 Logged By TM
Project Name: Geological Assessment Project No. 501.00180.00119 Co-ords: 310979E - 241197N Hole Type Rotary Rotary Scale Location: Huntstown Level: 57.27 m AOD Scale 1:50,000 Client: Roadstone Dates: 24/06/2015 Logged B TM Piezo Dates: 24/06/2015 Logged B TM 0.00 Son Robustmical Date Come doubtried IDate Come doubtried IDAte	Project Name: Location: Client: Piezo Drill T 0.00	Geolog Huntst Roads Tag TCF 0 50	gical A own tone Core Geote SCR	chnical I RQD	Data FI	Depth (m)	Diect N Diect N Diece Diece (m OD)	lo. 30.00119 Litho	Co-ords: Level: Dates:	310979E - 241197N 57.27 m AOD 24/06/2015 Stratum Description	Hole Type Rotary Scale 1:50,000 Logged By TM
Location: Huntstown Level: 5.72 m AOD Scale 1:50,000 1:50,000 Client: Roadstone Dates: 24/06/2015 Dates: Price Orrecessented Date 1:00,000 Open Total Scale 1:00,000 Total Scale 1:00,000 1 0.09 19 3 25 11 1	Location: Client: Piezo Drill T 0.00	Huntsi Roads Tag TCF 0 50	tone Core Geote SCR 19	chnical E RQD	Data FI	Depth (m)	Level (m OD)	Litho	Level: Dates:	57.27 m AOD 24/06/2015 Stratum Description	Scale 1:50,000 Logged By TM
Client: Roadstone Dates: 24/06/2015 Logged B TM Piece Ten Generation later market has been presented for the standard dispective in the standard di	Client: Piezo Drill T 0.00	Roads Tag TCF 0 50	tone Core Geote SCR 19	chnical I RQD	Data Fl	Depth (m)	Level (m OD)	Litho	Dates:	24/06/2015 Stratum Description	Logged By TM
Decomposition Depint Tag TCH CCH DCH DCH <thdch< th=""> DCH DCH</thdch<>	Piezo Drill T 0.00	Tag TCF 0 50	Core Geote SCR I I I I I I I I I I I I I I I I I I I	chnical E	Data	Depth (m)	Level (m OD)	Litho	Wouldortine Of	Stratum Description	
0.00 0 1 3 25 1 Waldonian Stromatication Stromatication and the service of t	0.00	50	19	3			1		Moulostia - O		
6.00 6.00 6.00 6.00 6.00 97 87 63 10 9.00 6.00 6.00 97 87 63 10 6.00 6.00 6.00 6.00 6.00 6.00 6.00 6.00 7.10 6.017 7.10 6.07 7.10 7.1	3.00	0			25	-1 -2 -2 -2.90	54.37		Waulsortian Stro Non - Intact r stromatactid	matactid Biomicrite eturns of light grey, fine grained biomicrite LIMESTONE with occasional matactid Biomicrite sive, light grey, fine grained, stromatactic dESTONE	Jay
97 87 63 10 6.70 50.57 97 87 63 10 6.70 50.17 97 87 63 10 9 9.00 9 9 9 9	6.00	100	80	55	9		meetto		borniche Lin	Nother	
Continued next sheet	9.00	97	87	63	10	6.70 7.10 	50.57		Muddy Limeston Moderately s grained muds Waulsortian Stro Strong, mass biomicrite LIN	e / Calcareous Mudstone trong dark grey muddy LIMESTONE with stone interbeds, occasional clay filled fra imatactid Biomicrite ive, light grey, fine grained, stromatactic VESTONE	1 fine ctures
						L				Continued next sheet	

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Project N	lame: Ge	eologi	ical A	ssess	sment	Pr 50	roject N 01.0018	lo. 30.00119	G Co-ords: 310979E - 241197N Hole Type B Co-ords: 310979E - 241197N
Location	: Hu	intsto	wn						Level: 57.27 m AOD Scale 1:50,00
Client:	Ro	adsto	one						Dates: 24/06/2015 Logged B
Piezo	Drill Tag	C₀ TCR	re Geote SCR	chnical I RQD	Data Fl	Depth (m)	Level (m OD)	Litho	Stratum Description
	12.00	80	70	47	9	-11 -11.70 -12	45.57		Waulsortian Stromatactid Biomicrite Waulsortian Veines Bleues Strong, massive, medium to dark grey, veines bleues
	15.00	27	23	18	25	-13			Putpose of brany other toe.
	18.00	37	28	28	25	-16 -17 -17.30	39.97		Waulsortian Stromatactid Biomicrite Strong, massive, medium to dark grey, veines bleues LIMESTONE with occasional stromatactid biomicrite LIMESTONE
		100	100	97	4	- 19			Continued next sheet

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Project IN	lame: Ge	ologi	cal A	ssess	sment	50	<u>)1.001</u> 8	30.0011	9 Co-ords: 3109/9E - 24119/N	Rotary
Location	: Hı	intsto	wn						Level: 57.27 m AOD	Scale 1:50,000
Client:	Rc	adsto	one						Dates: 24/06/2015	Logged By TM
viezo	Drill Tag	Co TCR	re Geote	chnical D	Data FI	Depth (m)	Level (m OD)	Litho	Stratum Description	
	21.00	100	97	93	5	-21 -22 -23 -23.60	33.67		Waulsortian Stromatactid Biomicrite	d
		100	97	92	6	-25	Ponsent of		A Purpositives	
	27.00	100	53	53	8	-27 -28 -29				

SLE	2	SL 7 Du Wind Tel. 1	RC undrum dy Arbo	ONSL Busine: ur, Dub	Ilting ss Park, Ilin 14 ax. + 353	Irela	nd		Borehole No 15-HTC-01
Project Na	ame: G	eologi	ical A	SSES	sment	Pr 50	roject N 01.0018	lo. 30.0011	9 Co-ords: 310979E - 241197N Hole Type Rotary
Location:	Н	untsto	wn						Level: 57.27 m AOD Scale 1:50,000
Client:	R	oadsto	one						Dates: 24/06/2015 Logged By TM
Piezo	Drill Tag	C₀ TCR	re Geote SCR	chnical I RQD	Data Fl	Depth (m)	Level (m OD)	Litho	Stratum Description
	30.00	100	100	100	3	-31 -32 -333.00	24.27		Waulsortian Stromatactid Biomicrite Waulsortian Veines Bleues Strong, massive, mediarn to dark grey, veines bleues LIMESTONE with occasional stromatactid biomicrite with occasional white pregular patches
	36.00	100	87	87	4	- 33 5.00 - 36 - 37	22.27		Waulsortian Stromatactid Biomicrite Strong, massive, light grey, fine grained, stromatactid biomicrite LIMESTONE
	39.00	40	30	30	1	- 39			
Remarks:	Drilled by	IDL							End of Borehole at 40.00 m

Description Toy of the construction Toy of the construction <thtoy construction<="" of="" th="" th<="" the=""><th>C</th><th></th><th></th><th>SL 7 Du</th><th>R C</th><th>ONSL Busine</th><th>ulting ss Park</th><th>Irela</th><th>nd</th><th></th><th></th><th></th><th></th><th>Borehole No</th></thtoy>	C			SL 7 Du	R C	ONSL Busine	ulting ss Park	Irela	nd					Borehole No
Project Name: Geological Assessment Project No. 501.0180.00119 Co-ords: 311011E - 241119N Hole T, Rodar Location: Hunistown Level: 77.55 m AOD Scalar Client: Roadstone Dates: 23/06/2015 Logged TM Pico Dates: 23/06/2015 Mathematical Statum Description Statum Description Pico Dates: 23/06/2015 Mathematical Statum Description Statum Description Pico Dates: 23/06/2015 Mathematical Statum Description Statum Description Pico Dates: 0.00 TA Dates: Statum Description Mathematical Status TA Dates: Dates: Statum Description Mathematical Status TA Dates: Date	2	LK		Wind Tel. + www.s	ay Arba + 353 1 29 strconsulting	our, Dub 964667 F g.com	911N 14 ⁵ ax. + 353	1 2964676						15-HIC-02
Location: Hunistown Level: 77.55 m AOD Scalar (150,00) Client: Roadstone Dates: 23/06/2015 Logged TM Piezo Dates: 23/06/2015 Status Description Piezo Dates: 23/06/2016 Status Description Piezo Tale Piezo Piezo Status Description Piezo Tale Piezo Piezo Piezo Piezo Piezo Tale Piezo Piezo Piezo Piezo <t< td=""><td>Proje</td><td>ect Name</td><td>: Ge</td><td>eologi</td><td>ical A</td><td>sses</td><td>smen</td><td>Pi 50</td><td>roject N 01.0018</td><td>lo. 30.001⁻</td><td>19</td><td>Co-ords:</td><td>: 311011E - 241119N</td><td>Hole Type Rotary</td></t<>	Proje	ect Name	: Ge	eologi	ical A	sses	smen	Pi 50	roject N 01.0018	lo. 30.001 ⁻	19	Co-ords:	: 311011E - 241119N	Hole Type Rotary
Client: Poadstone Piero Dates: 23/06/2015 Logged TM Piero 0.00 10 0.00 10 0.00 10 0.00 10 0.00 10 0.00 10 0.00 10 0.00 10 0.00 10 0.00 10 0.00 10 0.00 10 0.00 10 0.00 10 0.00 0.00 10 0.00 <td>Loca</td> <td>tion:</td> <td>Hu</td> <td>intsto</td> <td>wn</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Level:</td> <td>77.55 m AOD</td> <td>Scale 1:50,000</td>	Loca	tion:	Hu	intsto	wn							Level:	77.55 m AOD	Scale 1:50,000
Piezo Construction Construction Construction Structure Description 1 0.00 1 Structure Description Water Structure Description 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 Water Structure Description 1	Clien	nt:	Ro	adsto	one				1	1		Dates:	23/06/2015	Logged By TM
Remarks: Drilled by IDL	Piezo	Dri	l Tag	Co TCR	scR	RQD	Data FI	Depth (m)	Level (m OD)	Litho			Stratum Description	
6.00 73 53 53 12 5.80 6.00 71.55 Clay inflit 6.00 73 70 67 7 8 Clay inflit Storage register in a module provide the inflit 9.00 78 70 67 7 8 F F Remarks: Drilled by IDL Contrued next abet Contrued next abet		3	00	73	57	40	13	-1				vauisoritan Veiu Strong, mass LIMESTONE	nes bleues sive, mid grey, fine grained, veines bleu È with occasional irregular calicte infill	Ies
6.00				73	53	53	12	-4	005-010		log the	upposes only a	ny other use.	
Remarks: Drilled by IDL		6.	00	78	70	67	7		71.55			Clay Infill Vaulsortian Veii Strong, mass occasional si irregular pato	nes Bleues sive, medium grey, veines bleues LIME tromatactid biomicrite with occasional v ches	STONE with white
Remarks: Drilled by IDL							-	- - - - - -					Continued next sheet	
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Proje	ect Nan	ne: Ge	eologi	cal A	ssess	sment	Pr 50	oject N 01.0018	lo. 30.00119	Co-ords: 311011E - 241119N	Hole Type Rotary
Loca	ation:	Hu	intsto	wn						Level: 77.55 m AOD	Scale 1:50,000
Clier	nt:	Ro	adsto	one						Dates: 23/06/2015	Logged By TM
Piezo		Drill Tag	Co TCR	re Geote SCR	chnical I RQD	Data Fl	Depth (m)	Level (m OD)	Litho	Stratum Description	
			100	100	97	5	- - - - - - - - - - - - - - - - - - -			Waulsortian Veines Bleues	
		12.00					12 12 12.70	64.85		Waulsortian Stromatactid Biomicrite Strong, massive, light grey, fine grained, stromatactid biomicrite LIMESTONE with minor veines bleues LIMES	STONE
		15.00	87	80	77	5	- 14	63.15		Wallsortian Stromatactid Biomicrite Strong, massive, light grey, fine grained biomicrite LIMESTONE	
		15.00	100	83	80	5	-16	onsento			
		18.00					- - - - - - - - - - - - - - - - - - -	59.55		Waulsortian Stromatactid Biomicrite Strong, massive, medium to dark grey, veines bleues LIMESTONE with occasional stromatactid biomicrite LII	MESTONE
			97	90	90	5	- 19 			Continued part cheet	
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Project N	lame: G	eologi	ical A	ssess	sment	F با	Project N 501.0018	lo. 30.0011	9 C	o-ords:	: 311011E - 241119N	Hole Type Rotarv
Location	: Hı	untsto	wn						L	evel:	77.55 m AOD	Scale 1:50,000
Client:	Ro	oadsto	one						D	ates:	23/06/2015	Logged By TM
Piezo	Drill Tag	Co TCR	re Geote SCR	RQD	Data FI	Deptl (m)	h Level (m OD)	Litho			Stratum Description	
	21.00 24.00 27.00	100	97 97	PQD 63 97 93	FI 8 8 7	- 21 - 22 - 23 - 24 - 25 - 26 - 27 - 28 - 29	Consentor		Wauls	ortian Stro	matactid Biomicrite	
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S	LR		SL 7 Du Wind Tel. +	RC Indrum dy Arbo 353 1 29 Irconsulting	ONSU Busines our, Dub 964667 Fa	Ilting ss Park, lin 14 ax. + 353	1 2964676	nd				Borehole No 15-HTC-02
Proje	ect Name:	Ge	ologi	cal A	ssess	ment	Pr	oject N	NO.	Co-ords	: 311011E - 241119N	Hole Type
Loca	ation:	Hu	ntsto	wn			50	J1.0010	00.0011	Level:	77.55 m AOD	Scale
Clier	nt:	Roa	adsto	one						Dates:	23/06/2015	Logged By
Piezo		-	Co	re Geote	chnical D	Data	Depth		Litho		Stratum Description	
1 1020	30.0	lag 10	ICR	SCR	RQD	FI	- (11)			Waulsortian Stre	omatactid Biomicrite	
	33.0	00 -	100	90	87	10	- 31 - 32 - 32 - 33					
	36 (00 -	97	83	83	6	-34	onsent of		a purposes only.	Noter use.	
	36.0	90 -	100	100	97	6	- 36					
	39.0	00 -					38.70 39 39.20 39.80	38.85 38.35 37.75		Argillaceous Bic Strong medi argillaceous Argillaceous Bic Strong dark with interbec	Inclastic Limestone um to dark grey thinly bedded LIMESTC interbeds Inclastic Limestone grey to black thinly bedded CALCAREO Ided argillaceous bioclastic LIMESTONE	NE with US MUDSTONE
Der			·								Continued next sheet	
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		- 6	SL	RC	onsu	Ilting	Irela	nd				Borehole No
S	LF	5	7 DU Wind Tel. 4 www.s	dy Arbo 353 1 29 Irconsulting	Busines our, Dub 964667 F g.com	SS Park lin 14 ax. + 353	1 2964676					15-HTC-02
Proj	ect N	ame: G	ieologi	ical A	ssess	smen	t F	roject N 01.0018	o. 30.00119	Co-ords:	311011E - 241119N	Hole Type Rotary
Loca	ation:	F	luntsto	wn						Level:	77.55 m AOD	Scale 1:50,000
Clie	nt:	F	loadsto	one				1		Dates:	23/06/2015	Logged By TM
Piezo		Drill Tag	TCR	SCR	RQD	FI	Depth (m)	Level (m OD)	Litho		Stratum Description	
		42.00	77	63	63	25	40.00	37.55		Clay Detail 39.80r Argillaceous Bio Strong dark g with interbed	n - 40.00m : Clay Infill clastic Limestone grey to black thinly bedded CALCAREOU ded argillaceous bioclastic LIMESTONE	JS MUDSTONE
			93	83	77	7	-43			pupose only. a	Nothernse.	
							- 445.00 - 46 - 47 - 48 - 49	32.55	CONTRACT		End of Borehole at 45.00 m	
Rema	ırks:	Drilled by	IDL			 	L					

SI	R		SL 7 Dui Wind Tel. +	R Co ndrum y Arboi 353 1 29	ONSU Busines ur, Dub	Ilting ss Park lin 14 ax. + 353	j Irela	nd		Borehole No 15-HTC-03
Proje	ct Name:	Geol	logi	cal A	SSess	smen	t Pr	oject N	lo. 30.00119	G Co-ords: 310872E - 241188N Hole Type Rotary
Locat	ion:	Hunt	tstov	wn						Level: 84.99 m AOD Scale 1:50,000
Client	t:	Road	dsto	ne						Dates: 22/06/2015 Logged By TM
Piezo	Drill	Tag T	Cor CR	e Geote SCR	chnical E RQD	Data Fl	Depth (m)	Level (m OD)	Litho	Stratum Description
	<u>Drill</u> 0.00 3.00		40 33	32 30	RQD 4 25	9 9 25	(m) -1 -2 -33.00 -4 -6 -6.50 -7 -8	(m OD) 81.99 60 78.49		No Recovery
	9.00) —					99.00	76.29 75.99		Waulsortian Stromatactid Biomicrite Strong, massive, light grey, fine grained, stromatactid biomicrite LIMESTONE with occasional veines bleues LIMESTONE Waulsortian Karst Karst - Dark brown to black glacial till with occasional light brown to buff clay interbeds, light brown to range clay at the bottom 30cm
Remark	ks: Drilled	by IDL			<u> </u>	 		<u> </u>		Continued next sheet

Sign Windy Arbour, Dublin 14 Tel. + 353 1 296467 15-HTC Project Name: Geological Assessment Project No. 501.00180.00119 Co-ords: 310872E - 241188N Hole T Rotal Location: Huntstown Level: 84.99 m AOD Scal 1:50,0 Client: Roadstone Dates: 22/06/2015 TM Piezo Core Geotechnical Data Depth (mOD) Litho Stratum Description Value 62 0 25 11 Waulsortian Karst	C-03 Type ry le 000 1 By
Project Name: Geological Assessment Project No. 501.00180.00119 Co-ords: 310872E - 241188N Hole T Rota Location: Huntstown Level: 84.99 m AOD Scal 1:50,0 Client: Roadstone Dates: 22/06/2015 Loggec TM Piezo Core Geotechnical Data Drill Tag Depth (m) Level (m) Litho Stratum Description 4 62 0 0 25 11 Waulsortian Karst 12.00 12.00 12 11 12 12 12	ype ry le)00 d By
Location: Huntstown Level: 84.99 m AOD Sca 1:50,0 Client: Roadstone Dates: 22/06/2015 Logged TM Piezo Core Geotechnical Data Drill Tag Depth TCR Level (mOD) Litho Stratum Description Value 62 0 0 25 11 Waulsortian Karst 12.00 12.00 12 12 12 12 12 12	Ie 000 J By
Location: Huntstown 1:50,0 Client: Roadstone Dates: 22/06/2015 Logged TM Piezo Core Geotechnical Data Drill Tag Depth ICR Level (m) Litho Stratum Description Value 62 0 0 25 1 Value Value Value Value 12.00 12.00 12	000 d By
Client: Roadstone Dates: $22/06/2015$ TM Piezo TCR SCR RQD FI Orthological Mail Construction Waulsortian Karst V Drill Tag TCR SCR RQD FI Onto Value Stratum Description V Value Value Value Value Value Value Value	
Piezo Core Geote-chical Data Depth (m) Level (m) Litho Stratum Description Piezo Drill Tag TCR SCR RQD FI (m) (m) Litho Stratum Description Image: Stratum Description 62 0 0 25 Image: Stratum Description Image: Stratum Description Image: Stratum Description 11 Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Stratum Description Image: Strat	
12.70 72.29 Waulsortian Stromatactid Biomicrite	
13 Dolomitised Strong, massive, light grey, fine grained, stromatactid biomicrite LIMESTONE with occasional veines bleues LIMESTONE	
70 60 57 7	
1144.00 70.99	
14.20 70.79 Waysortan Stromatactid Biomicrite Strong, massive, light grey, fine grained, stromatactid biomicrite LIMESTONE	
14.80 70.19 Karst - Light brown / buff Clay	
15.00 15.00 Waulsortian Stromatactid Biomicrite Strong, massive, light grey, fine grained, stromatactid biomicrite LIMESTONE partially dolomitised	
Ento Contraction of C	
16.10 68.89 Waulsortian Karst Feature Karst - Light brown / orange Clay	
17.30 67.69 Waulsortian Stromatactid Biomicrite	
18.00	
83 37 27 25	
Remarks: Drilled by IDL	l

	_			SL 7 Du	.RC	ONSU Busine	Ilting	, Irela	nd			Borehole No
S	LF	5	7	Wind Tel. + www.sl	Jy Arbor 353 1 29 Irconsulting	ur, Dub 964667 F g.com	lin 14 ax. + 353	1 2964676				15-HTC-03
Proj	ect N	ame:	Geo	logi	cal A	ssess	smen	Pr t 5(oject N 01.0018	lo. 30.00119	Co-ords: 310872E - 241188N	Hole Type Rotary
Loca	ation:		Hun	tsto	wn						Level: 84.99 m AOD	Scale 1:50,000
Clie	nt:		Roa	dstc	one						Dates: 22/06/2015	Logged By TM
Piezo		Drill Ta	ag T	Cor CR	re Geoter SCR	chnical D RQD)ata FI	Depth (m)	Level (m OD)	Litho	Stratum Description	
								20.00	64.99		Waulsortian Karst Karst - Light brown / orange Clay	
		21.00	_			<u> </u>	 	20.70 221.00	64.29 63.99		Waulsortian Stromatactid Biomicrite Dolomitised Strong, massive, light grey, fine grained, stromatactid biomicrite LIMESTONE with occasional	veines
								- - - -			bleues LIMESTONE Waulsortian Karst Karst - Returns of Clay	
								- - - 22		$\langle \rangle$		
				17	12	8	25	-				
								- 23		$\langle \rangle$. 1 ^{50.}	
								23.70	61.29		Waulsortian Stromatactid Biomicrite	
		24.00						- 2244.00	60.99		Dolomitised Strong, massive, light grey, fine grained, strongtactid biomicrite LIMESTONE with occasional opened LIMESTONE	veines
								- - - - - - - - - - -		THE PETTON	Wagsortian Karst Karst - returns of orange / buff clay	
				10	0	0	25	- - - -	entof	COPYL		
								- 26	OIS	$\langle \rangle$		
								- - - -				
		27.00						- 27		$\langle \rangle$		
								- - - 28 -				
				60	33	30	25	- - - -		\square		
								- 29		$\langle \rangle$		
			_				_	29.90	55.09		Continued next sheet	
Rema	rks:	Drilled b	y IDL	-			ł				Continued next sneet	I

	6	1	SL	RC	onsu	Iting	Irela	nd				Borehole No
S	_R*	2	7 Du Wind Tel. +	dy Arbo 353 1 29 Irconsulting	busines our, Dub 964667 Fa	ss Park lin 14 ax. + 353	1 2964676					15-HTC-03
Proje	ect Name:	Ge	eologi	cal A	ssess	sment	t F	oject N 01.0018	lo. 80.00119	Co-ords:	310872E - 241188N	Hole Type Rotary
Loca	tion:	Hu	intsto	wn						Level:	84.99 m AOD	Scale 1:50,000
Clien	it:	Rc	adsto	one				1		Dates:	22/06/2015	Logged By TM
Piezo	Drill	Tag	Co TCR	re Geote SCR	chnical E RQD	Data Fl	Depth (m)	Level (m OD)	Litho		Stratum Description	
	30.0	00					30.20 30.25	54.79 54.74		Naulsortian Stroi Detail 29.90m grained, stron dolomitised Clay Clay Infill	natactid Biomicrite - 30.20m : Strong, massive, light grey, natactid biomicrite LIMESTONE partially matactid Biomicrite	fine ,
			97	93	93	3	31.45	53.54		Strong, mass biomicrite LIM Waulsortian Stron Strong, mass	ve, light grey, fine grained, stromatactic IESTONE partially dolomitised matactid Biomicrite ive, light grey, fine grained, stromatactic	·
							- 32			biomicrite LIN	ESTONE with occasional veines bleue:	S LIMESTONE
	33.0	00					- 33				at use.	
			80	63	63	25	- 34		Solution of the second s	anose out an	yothe.	
							- 35 - 35 - 35.80 - 35.90	049.19 49.09		Clay		
	36.0	00					- 36.00 	48.99		Clay Infill Waulsortian Stron Strong, massi biomicrite LIN Waulsortian Kars Karst - returns	matactid Biomicrite ive, light grey, fine grained, stromatactic IESTONE with occasional veines bleues t s of orange / buff clay	LIMESTONE
			48	30	27	25	- - - 37.90 - 38	47.09		Waulsortian Stror Strong, massi biomicrite LIN	natactid Biomicrite ive, light grey, fine grained, stromatactic ESTONE with occasional veines bleuer	
	39.0	00										
			25	18	15	25	-				End of Parabala at 40.00 m	
Remar	ks: Drilled	by II	DL			 					Ling of Dorenore at 40.00 III	

CL	- 2		SL 7 Du	R Co	ONSU Busines	Ilting ss Park	Irela	nd		Borehole N	hole No
SL	K		Winc Tel. + www.sl	Jy Arboi 353 1 29 Irconsulting	ur, Dub 964667 Fa 9.com	lin 14 ax. + 353	1 2964676			15-HTC-04	ПС-04
Project N	Name:	Geo	logi	cal A	ssess	sment	t F	oject N 01.0018	lo. 80.0011	9 Co-ords: 310787E - 241049N Hole Type Rotary	e Type otary
Location	:	Huni	tsto	wn						Level: 82.69 m AOD Scale 1:50,000	3cale 50,000
Client:		Roa	dsto	one						Dates: 18/06/2015 Logged By TM	ged By ГМ
Piezo	Drill T	ag T	Con CR	re Geoteo SCR	chnical E RQD	Data Fl	Depth (m)	Level (m OD)	Litho	Stratum Description	
	0.00 3.00 6.00 9.00		8	0	0	25	1 1 4 4.30 6 6.50 6.80 7 7 8 8.50 99.00 9.40	78.39 78.39 76.19 75.89 74.19 73.69 73.29		No Recovery Non - Intact returns of limestone cobbles and occasional clay Made and the second sec	
							-			Waulsortian Veines Bleues Strong, massive, medium to dark grey, veines bleues	
Remarks:	Drilled	by IDL	_							Continued next sheet	

Project N Location	lame: Ge	www.s	Irconsulting	g.com	4. 1 000	. 200.070				
Project N Location	lame: Ge					Pi	oject N	lo.		Hole Type
Location		eologi	cal A	ssess	sment	50	01.0018	30.00119	Co-ords: 310787E - 241049N	Rotary
	: Hı	untsto	wn						Level: 82.69 m AOD	Scale 1:50,000
Client:	Ro	badsto	one				1		Dates: 18/06/2015	Logged By TM
Piezo	Drill Tag	C₀ TCR	re Geote SCR	chnical I RQD	Data Fl	Depth (m)	Level (m OD)	Litho	Stratum Description	
						- 10.00	72.69		Remaining Detail : 9.40m - 10.00m : LIMESTONE with o	ccasional
		100	80	80	6	-11 -11.50	71.19 71.09		Waulsortian Stromatactid Biomicrite Strong, massive, light grey, fine grained, stromatactic biomicrite LIMESTONE with occasional veines bleues Brecciated Calcite Vein Brecciated calcite vein	LIMESTONE
	12.00					- 12			Waulsortian Veines Bleues Strong, massive, medium to dark grey, veines bleues LIMESTONE with occasional stromatactid biomicrite	LIMESTONE
	15.00	100	98	98	2	- 13.60	69.09		Waulsortian Stromatactid Biomicrite Strong massive, light grey, fine grained, stromatactic biomicrite LIMESTONE with occasional veines bleues	I S LIMESTONE
	15.00	100	73	73	4	16.50	66.19		Waulsortian Veines Bleues Strong, massive, medium to dark grey, veines bleues LIMESTONE with occasional stromatactid biomicrite	LIMESTONE
	18.00					17.90	64.79		Waulsortian Stromatactid Biomicrite	
	18.00	100	78	60	6	- 18 - 18.30 - 19 - 19	64.39		Waulsoritan Stronatactio Biomcnie Strong, massive, light grey, fine grained, stromatactic biomicrite LIMESTONE with occasional veines bleues Waulsortian Veines Bleues Strong, massive, medium to dark grey, veines bleues LIMESTONE with occasional stromatactid biomicrite	
						t			Continued next sheet	

Project	Name: G	eologi	cal A	ssess	sment	Pr	oject N	10.	Co-ords:	310787E - 241049N	Hole Type Botany
Locatio	n: Hı	untsto	wn			50	01.001	50.0011	Level:	82.69 m AOD	Scale
Client:	R	padsto	one						Dates:	18/06/2015	Logged By
Piezo		Cor	e Geote	chnical D	Data	Depth		Litho		Stratum Description	
	21.00	100	97 87 73	97 87 70	4	-21 -22 -22.40 -22.90 -23 -24 -24 -25 -26 -27.00	60.29 59.79		Waulsortian Strong, mass biomicrite LIM Waulsortian Vein Strong, mass LIMESTONE Mutoposes of Forter Mutoposes of Forter Mutopo	matactid Biomicrite ive, light grey, fine grained, stromat IESTONE with occasional veines b with occasional stromatactid biomic worthet worthet matactid Biomicrite ive, light grey, fine grained, stromat IESTONE with occasional veines b	actid leues LIMESTONE eues prite LIMESTONE
						- 29					

		8	SL	RC	onsu	Iting	Irela	Ind					Borehole No
S	LR	0	7 Du Wind Tel. + www.s	dy Arbo 353 1 29 Irconsulting	BUSINE: ur, Dub 64667 F	ss Park Ilin 14 ax. + 353	1 2964676	i					15-HTC-04
Proj	ect Name	e: Ge	eologi	cal A	ssess	sment	P 5	roject N 01.0018	lo. 30.0011	9	Co-ords:	310787E - 241049N	Hole Type Rotary
Loca	ation:	Hu	ntsto	wn							Level:	82.69 m AOD	Scale 1:50,000
Clie	nt:	Ro	adsto	one							Dates:	18/06/2015	Logged By TM
Piezo	Di	rill Tag	Co TCR	re Geote SCR	chnical I RQD	Data Fl	Depth (m)	Level (m OD)	Litho			Stratum Description	
	3	33.00	100	87	83	6	-31 -32 -32.70 -33	49.99		v	Vaulsortian Stro Strong, mass	matactid Biomicrite sive, light grey, fine grained, stromatactid	1
		26.00	100	98	98	2	- 34	Consent of		ono	uposes only a	Noter 198.	
			100	99	99	2	-37						
	3	39.00	100	100	100	1	39						
Rema	rks: Drill	led by I	DL			ł						LING OF BOTOTIONE AT 40,00 III	

	_ 6	N			ONSL Busine	Ilting	, Irela	nd			Borehole No
SL	.R •)	Wind Tel. +	Jy Arbo 353 1 29 Irconsulting	Jur, Dub 964667 F	in 14 ax. + 353	1 2964676				15-HTC-05
Project	t Name:	Geo	ologi	cal A	sses	smeni	t F	oject N 01.001{	lo. 80.0 <u>011</u>	9 Co-ords: 310761E - 241135N	Hole Type Rotary
Locatio	on:	Hunt	tsto	wn						Level: 81.27 m AOD	Scale 1:50,000
Client:	·	Roa	dsto	one						Dates: 17/06/2015	Logged By TM
Piezo	Drill T	ag T	Core FCR	re Geote SCR	chnical D RQD	Data FI	Depth (m)	Level (m OD)	Litho	Stratum Description	
	4.00) —	3	2	0	25	-1			No Recovery Overburden, returns of boulder clay and limestone cot	bles
	6.00) —	60	18	5	6	4.70 -5 -6	76.57		Waulsortian Veines Bleues Strong, massive, medium to dark grey, veines bleues LIMESTONE with occasional stromatactid biomicrite L	.IMESTONE
	9.00	,	100	78	75	5	9				
Pomark:	o: Drilled		 				L	<u> </u>		Continued next sheet	
nemana	5. Dilligu	Ју ње	-								

SIR	S 7 E Wi	LR C Jundrum ndy Arbo	ONSU Busines our, Dub	Ilting ss Park, lin 14	Irela	nd			Borehole No 15-HTC-05
		+ 353 1 29 .sirconsulting	964667 Fa	ax. + 353	1 2964676	oject N	lo.	Co. ords: 210761E - 241125N	Hole Type
Location:	Huntst	own		Sinen	50	01.0018	30.0011	Level: 81.27 m AOD	Rotary Scale
Client:	Roads	tone						Dates: 17/06/2015	Logged By
Piezo	(ore Geote	chnical D	Data	Depth	Level	Litho	Stratum Description	
	100	73	67	5	- 11			Waulsortian Veines Bleues	
12	2.00	82	82	1	-12 -13 -14			Mar required for any other use.	
18	5.00 100 8.00	22	22	4	- 15 15.80 (16 16-16.10 - 17 - 17	65.17		Waulsortian Stromatactid Biomicrite Strong, massive, light grey, fine grained, stromatactid biomicrite LIMESTONE Waulsortian Veines Bleues Strong, massive, medium to dark grey, veines bleues LIMESTONE with occasional stromatactid biomicrite L	IMESTONE
	100	100	100	1	- 19			Continued next sheet	

Project	Name: G	eologi	cal A	ssess	sment	Pr 50	oject N)1.0018	lo. 80.0011	9 Co-ords:	310761E - 241135N	Hole Type Rotary
Locatio	n: H	untsto	wn						Level:	81.27 m AOD	Scale 1:50,000
Client:	R	oadsto	one						Dates:	17/06/2015	Logged By TM
Piezo	Drill Tag	C₀ TCR	re Geote SCR	chnical D RQD	Data Fl	Depth (m)	Level (m OD)	Litho		Stratum Description	
	21.00	100	92	92	3	-21 -21.10 -22 -22.60 -22.65 -223.00	60.17 58.67 58.62 58.27		Vaulsortian Ven Strong, massi biomicrite LIN ClayClay Infill Waulsortian Strong, massi biomicrite LIN Waulsortian Vein Strong, massi LIMESTONE	natactid Biomicrite ve, light grey, fine grained, stroma IESTONE natactid Biomicrite ve, light grey, fine grained, stroma IESTONE es Bieues ve, medium to dark grey, veines to with occasional stromatactid biom	atactid atactid atactid bleues icrite LIMESTONE
	24.00	100	98	98	2	-25 -25 -26 -27	onserto		A Purpose include		
		100	75	72	4	27.40	53.87		Waulsortian Stron Strong, massi biomicrite LIN	natactid Biomicrite ve, light grey, fine grained, stroma IESTONE with occasional veines	atactid bleues LIMESTONE

~		7 Du	.RC	ONSL Busine	ulting ss Park,	Irela	nd			Borehole No
SLR		Wind Tel. + www.s	dy Arbo 353 1 29 Irconsulting	our, Dub 964667 F g.com	lin 14 ax. + 353	1 2964676				15-HTC-05
Project Nar	me: Ge	eologi	cal A	sses	sment	Pr 50	oject N 01.0018	o. 30.00119	Co-ords: 310761E - 241135N	Hole Type Rotary
Location:	Hu	untsto	wn						Level: 81.27 m AOD	Scale 1:50,000
Client:	Ro	adsto	one						Dates: 17/06/2015	Logged By TM
Piezo	Drill Tag	Co TCR	re Geote SCR	RQD	Data FI	Depth (m)	Level (m OD)	Litho	Stratum Description	
	30.00	100	97	97	2	-31 -31.50 -32	49.77		Waulsortian Stromatactid Biomicrite Waulsortian Veines Bleues Strong, massive, medium to dark grey, veines bleues LIMESTONE with occasional stromatactid biomicrite LI	MESTONE
	33.00	100	98	98	1	34 34.40 34.80 35 35.70	46.87 46.47 46.47		Wallsortian Stromatactid Biomicrite Strong, massive, light grey, fine grained, stromatactid biomicrite LIMESTONE with occasional veines bleues Strong, massive, medium to dark grey, veines bleues LIMESTONE with occasional stromatactid biomicrite LI Waulsortian Stromatactid Biomicrite Strong, massive, light grey, fine grained, stromatactid	LIMESTONE
		100	97	97	3	- 37				
	39.00	100	100	100	0	39	41.97		Waulsortian Veines Bleues Strong, massive, medium to dark grey, veines bleues LIMESTONE with occasional stromatactid biomicrite LI	MESTONE

		. 6		SL 7 Du	R C	ONSU Busines	I lting ss Park	Irela	nd		Borehole No
S	LF	5	2	Winc Tel. +	y Arbo 353 1 29	ur, Dub 964667 Fa	lin 14 ax. + 353	1 2964676			15-HTC-06
Proje	ect Na	ame:	Geo	ologi	cal A	ssess	men	Pi 50	roject N 01.0018	lo. 30.00119	Co-ords: 310792E - 240995N Hole Type Rotary
Loca	ation:		Hur	ntsto	wn						Level: 79.19 m AOD Scale 1:50,000
Clier	nt:		Roa	adsto	one				1		Dates: 16/06/2015 Logged By TM
Piezo		Drill Ta	ag ⁻	Cor TCR	re Geote SCR	chnical D RQD	ata Fl	Depth (m)	Level (m OD)	Litho	Stratum Description
		3.00		67	45	30	25	-1 -1 -1.40	77.79		No Recovery Non - Intact retruns of limestone Waulsortian Stromatactid Biomicrite Strong, massive, light grey, fine grained, stromatactid biomicrite LIMESTONE with occasional veines bleues LIMESTONE
		6.00		100	100	100	3		Consent of		Purposes only and
		9.00	-	100	77	77	4	-7-7-99			
Rema	rks: I	Drilled I	by ID	L	<u> </u>	1	 		1		Continued next sheet

		1	SL	RC	onsu	Ilting	Irela	nd			Borehole No
S	LF	2	7 Du Winc Tel. +	Indrum dy Arbo + 353 1 29 sirconsultin	Busines our, Dub 964667 F Ig.com	35 Park, lin 14 ax. + 353	1 2964676				15-HTC-06
Proj	ect Na	ıme: Ge	eologi	ical A	SSes	sment	Pr t 5(roject N 01.0018	lo. 30.0011§	Co-ords: 310792E - 240995N	Hole Type Rotary
Loca	ation:	Hı	untsto	wn			I			Level: 79.19 m AOD	Scale 1:50,000
Clie	nt:	Rc	adsto	one						Dates: 16/06/2015	Logged By TM
Piezo	-	Drill Tag	Co TCR	re Geote	RQD	Data FI	Depth (m)	Level (m OD)	Litho	Stratum Description	
			100	82	80	4				Waulsortian Stromatactid Biomicrite	
		12.00					- 1122.00	67.19		Waulsortian Veines Bleues Strong, massive, medium to dark grey, veines bleues LIMESTONE with occasional stromatactid biomicrite I	IMESTONE
			100	100	100	2	- 14			puposes only any other t	
		15.00	100	70	65	5	-15	F Consent of			
		18.00					- 18				
			100	80	80	4	- 19.50	59.69		Waulsortian Stromatactid Biomicrite Strong, medium grey, fine grained, stromatacid biomi	crite
Rema	ırks: [Drilled by I	DL		4	1		<u>.</u>	<u> </u>	Continued flext sheet	

Project I	Name: G	eologi	ical A	sses	smen	Pr t 50	oject N	lo. 80.00119	Co-ords:	310792E - 240995N	Hole Type Rotary
Locatior	n: Hu	untsto	wn						Level:	79.19 m AOD	Scale 1:50,000
Client:	Ro	oadsto	one						Dates:	16/06/2015	Logged By TM
Piezo	Drill Tag	C₀ TCR	re Geote SCR	chnical [RQD	Data FI	Depth (m)	Level (m OD)	Litho		Stratum Description	
	21.00	100	97	83 97 78	2	21 22 23 24 24.20 25 26 27 27.10 28	54.99 552.09		Waulsortian Strong, medi LIMESTONE	MESTONE micrite to medium grey, fine grained biomic matactid Biomicrite um grey, fine grained, stromatacid b with occasional veines bleues LIME	rite

Project I	Name: G	eologi	cal A	ssess	sment	Pr t 50		10. 30 001 1	9 Co-ords	: 310792E - 240995N	Hole Typ Botary
Locatior	n: Hi	untsto	wn				1.0010	0.001	Level:	79.19 m AOD	Scale 1:50,000
Client:	R	badsto	one						Dates:	16/06/2015	Logged E TM
iezo	Drill Tag	Co TCR	re Geote SCR	chnical D	Data Fl	Depth (m)	Level (m OD)	Litho		Stratum Description	
	33.00	100	83	80	8	- 31 - 32 - 33			Wadisofilari Si	net use.	
	33.00	100	90	90	3	-34 -35	5005ento		on purposes only:	any other	
	36.00	100	97	97	4	- 36 - 37 - 37 - 37 - 37 - 37	41.24		Argillaceous Bid	oclastic Limestone	
	39.00					- - - - - - - - - - - - - - - - - - -	40.19		Strong dark argillaceous pale grey bi Argillaceous Bid Strong dark	grey fine grained, thinly bedded b LIMESTONE, bedded at 25Ű, in omicrite LIMESTONE oclastic Limestone grey fine grained, thinly bedded b	ioclastic terbedded with
		100	100	100	2	-			argillaceous		

S	LR	SI 7 C Win Tel.	Undrum ndy Arbc + 353 1 2	ONSU Busine our, Dub 964667 F	ss Park Sin 14 ax. + 353	j Irela , 3 1 2964676	nd				Borehole No 15-HTC-07
Proj	ect Name:	Geoloç	gical A	lsses:	smen	t Fr	roject N 01.001{	Jo. 80.00119	Co-ords:	: 310722E - 241010N	Hole Type Rotary
Loca	ation:	Huntst	own						Level:	79.44 m AOD	Scale 1:50,000
Clier	nt:	Roadst	tone						Dates:	15/06/2015	Logged By TM
Piezo	Drill T	ag TCR	ore Geote	echnical D	Data Fl	Depth (m)	Level (m OD)	Litho		Stratum Description	
	3.00	23	12	6	25	2.50	76.94		Vo Recovery Non - Intact r clay Waulsortian Stro Strong, mass weathered s veines bleue	preturns of limestone cobbles and occasion pomatactid Biomicrite sive, medium grey, fine grained, partially tromatactid biomicrite LIMESTONE with the LIMESTONE	nal
	6.00	50	23	5	7	-4	0056000 73.54	A CONTRACT OF CONTRACTOR OF CONTRA	Autorian Kar	Noter us	
	6.00	80	53	40	20	-6 6.40 7 7,60 8,00 8,10	73.04 71.84 71.54 71.44 71.34 71.34		Waulsortian Kar Karst - Light vein Maulsortian Bior Strong, mass LIMESTONE 	st brown clay returns with brecciated calcit micrite sive, pale to medium grey fine grained bi strong, pale to light brown orange stained mitised LIMESTONE micrite	e iomicrite
Domo	9.00				_	- 8.30 - 8.35 - 9 - 9 - 9.45 - 9.55	71.14 71.09 69.99 69.89		Strong, mass weathered st Maulsortian Kar- Karst - Light Waulsortian Bior Moderately s partialy dolo Waulsortian Kar Clay filled fra	sive, medium grey, fine grained, partially tromatactid biomicrite LIMESTONE st brown clay returns micrite strong, pale to light brown orange stained mitised LIMESTONE st acture Continued next sheet	
Rema	rks: Drilled	by IDL									

S			7 Du 7 Du Wind Tel. +	RC Indrum dy Arbo	ONSL Busine: our, Dub	ulting ss Park, Ilin 14 ax. + 353	1 2964676	nd		Borehole No 15-HTC-07
Proje	ect Nar	ne: Ge	ologi	cal A	g.com	sment	Pr 50	oject N	lo. 30.0011	19 Co-ords: 310722E - 241010N Rotary
Loca	ation:	Hu	ntsto	wn						Level: 79.44 m AOD Scale 1:50,000
Clier	nt:	Ro	adsto	one				1		Dates: 15/06/2015 Logged By TM
Piezo		Drill Tag	C₀ TCR	re Geote SCR	chnical [RQD	Data Fl	Depth (m)	Level (m OD)	Litho	Stratum Description
			73	67	50	11	- 10.30 - 10.70 - 10.73 - 11	69.14 68.74 68.71		8.35m - 9.45m : Waulsortian Biomicrite Detail 8.35m - 9.45m : Strong, massive, pale to medium grey fine grained biomicrite LIMESTONE 9.45m - 9.55m : Waulsortian Karst Detail 9.45m - 9.55m : Karst - Light brown clay infill
		12.00					- 1122.00	67.44		9.55m - 10.30m : Waulsortian Biomicrite Detail 9.55m - 10.30m : Strong, massive, medium grey, fine grained, partially weathered stromatactid biomicrite LIMESTONE numerous clay infills (2-3cm) to 10.3m Waulsortian Biomicrite Strong, massive, medium grey, fine grained, partially weathered stromatactid biomicrite LIMESTONE
							- 12.20 	67.24		Waulsortian Karst Karst - Light brown clay infill Waulsortian Biomicrite Strong, massive, medium grey, fine grained, stromatactid biomicrite LIMESTONE Waulsortian Karst
			70	63	60	4	- 1144.00	65.44		Karst - Light brown / boff clay infill Waulsortian Biomicrite Strong, massive, medium grey, fine grained, stromatactid biomicrite LIMESTONE Waulsortian Biomicrite Strong, massive, medium grey, fine grained, stromatactid biomicrite LIMESTONE Waulsortian Biomicrite Strong, massive, medium grey, fine grained, stromatactid biomicrite LIMESTONE with numerous calcite veins
		15.00					- 15.40 - 15.40 - 16	64.045		Waulsortian Biomicrite Strong, massive, medium grey, fine grained, stromatactid biomicrite LIMESTONE
			100	83	77	7	- - - - - - - - - - - - - - - - - - -	62.34		Waulsortian Veines Bleues Strong, massive, medium to dark grey, veines bleues LIMESTONE with occasional stromatactid biomicrite LIMESTONE
		18.00	73	72	72	2	- 18 			
Rema	rks: Di	rilled by IE	 DL				L			Continued next sheet

	-	-	SL	RC	ONSL	ulting	Irela	nd		Borehole No
S	LR	2	Vine Tel. +	dy Arbc 353 1 29	busine our, Dub 964667 F g.com	ss Faik, lin 14 ax. + 353	1 2964676			15-HTC-07
Proj	ect Na	me: Ge	eologi	ical A	sses	sment	Pr 50	oject N 01.0018	lo. 30.0011	IgCo-ords: 310722E - 241010NHole TypeRotary
Loca	ation:	Hı	intsto	wn						Level: 79.44 m AOD Scale 1:50,000
Clie	nt:	Ro	adsto	one						Dates: 15/06/2015 Logged By TM
Piezo		Drill Tag	C₀ TCR	re Geote SCR	RQD	Data Fl	Depth (m)	Level (m OD)	Litho	Stratum Description
		21.00		52	26	10	21.00 21.20 -22	58.44 58.24		Waulsortian Karst Waulsortian Karst Karst - Light brown / buff clay infill Waulsortian Veines Bleues Strong, massive, medium to dark grey, veines bleues LIMESTONE with occasional stromatactid biomicrite LIMESTONE
		24.00		53	36	10	- 23 - 23.50 - 23.55 - 24	55.94 55.89		Waulsortian Karst Karst Hight brown / buff clay infill Waulsortian veines Bleues Strong massive, medium to dark grey, veines bleues
			100	93	87	6	-25	onsent of		on the recent of the former of
		27.00	45	40	38	5	- 27 - 28 - 28 - 29			
Rema	urks: D	orilled by I	L DL	1	1			<u> </u>		Continued next sheet

Project I	Name: Ge	eologi	cal A	5595	sment	P	roject N	0.	Co-ords:	310722E - 241010N	Hole Type
		cologi			Sincin	5	01.0018	30.00119	00-0103.	5107222 - 24101010	Rotary
Location	n: Hu	untsto	wn						Level:	79.44 m AOD	1:50,000
Client:	Ro	badsto	one						Dates:	15/06/2015	
iezo		Co	re Geote	chnical I	Data	Depth	Level	Litho		Stratum Description	I IVI
	33.00	65	97 60	60	3	-31 -31 -32 -33 -34 -35 -36.00	49.44 49.44		Waulsortian Stro Strong, mass biomicrite LIM	st	atactid es LIMESTONE
	39.00	95	95	95	4	36.10	43.34		Karst - Light Waulsortian Stro Strong, mass biomicrite LIN LIMESTONE irregularly oc	brown / buff clay infill brown / buff clay infill sive, medium grey, fine grained, stroma VESTONE with occasional veines bleu ; partially dolomitised in places with oc curing calcite veins	atactid les iccasional

5		8	SL	RC	onsu	Ilting	Irela	nd				Borehole No
S	LR		Win Tel www.s	dy Arbo + 353 1 29 strconsulting	busines our, Dub 964667 Fa	ss Park lin 14 ax. + 353	1 2964676					15-HTC-08
Proj	ect Nar	ne: (Geolog	ical A	ssess	smen	t Pi	roject N 01.0018	lo. 30.00119	Co-ords	: 310599E - 241062N	Hole Type Rotary
Loca	ation:		Huntsto	wn						Level:	81.41 m AOD	Scale 1:50,000
Clie	nt:		Roadst	one				_		Dates:	09/06/2015	Logged By TM
Piezo	-	Drill Tag	TCR	scR	chnical E RQD	Data Fl	Depth (m)	Level (m OD)	Litho		Stratum Description	
		3.00	10	0	0	25	-12			Dverburden Non - Intact	returns of limestone with stif dark grey C	LAY
		4.50	20	7	0	25			0*10*10*10*10*10*10*10*10*10*10*10*10*10	unose only.	Nother 158.	
		6.00	17	13	13	25	-5 -5 	fonsent of				
			7	0	0	25			0: 10: 10: 10: 10: 00: 00: 00: 00: 00: 0			
		7.50	93	40	40	5	- 88.00	73.41		Waulsortian Vei Strong, mas biomicrite Ll	nes Bleues sive, medium grey, fine grained, stromata MESTONE with occasional veines bleue	actid s LIMESTONE
		9.00	100	100	100	0	9				Continued next sheet	
Rema	ırks: Di	rilled by	y IDL			r						
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No. No. 15-HTC Weight Maxary, Lawin 14 weight Maxary, Trick, 100 1894007 Mole Type, 100 189407 Hole Type, 100 189407	-			SL 7 Du	R C		Borehole No					
Project Name: Geological Assessment Project No. 501.00180.00119 Co-ords: 310599E - 241062N Hole Ty Rotan Location: Huntstown Level: 81.41 m AOD Scale 1:50.00 Client: Roadstone Dates: 09/06/2015 TM Piezo Date: 09/06/2015 TM Date: 00/06/2015 TM 100.50 Common Science Dates: 09/06/2015 TM 100.50 100 100 100 2 11.60 09.71 Wautortian Kerst Kerst - Light brown functions with common to the science biological MESTONE 112.00 100 67 00 3 15 08.11 Wautortian Kerst Kerst - Light brown functions with common to extract the science biological MESTONE 113.00 100 100 11 15 08.11	SI		2	Winc Tel. + www.sl	dy Arbo 353 1 29 Irconsulting	ur, Dub 964667 Fa	lin 14 ax. + 353	1 2964676				15-HTC-08
Location: Huntstown Level: 81.41 m AOD Scale 1:50,000 Client: Roadstone Dates: 09/06/2015 Logged TM Pieco Doi 100 100 00 2 10 Statum Description 10.50 100 12.20 00.11 Weadortine Kont	Proje	ect Name:	Ge	ologi	cal A	ssess	sment	Pi 50	roject N 01.0018	lo. 30.00119	Co-ords: 310599E - 241062N	Hole Type Rotary
Client: Poadstone Dates: 09/06/2015 Logged TM Place Date in a transmission Core detectival Max (nr. 2) (nr. 2	Locat	tion:	Hu	ntsto	wn						Level: 81.41 m AOD	Scale 1:50,000
Piezo Dell'age TCR SCR POD FI Version Multicitation Stratum Description 105 105 100 100 100 2 11 100 100 100 100 11	Clien	ıt:	Ro	adsto	one						Dates: 09/06/2015	Logged By TM
10.50 10 100 100 100 100 100 11.60 69.91 12.00 100 100 100 100 11.60 69.91 11.60 69.91 12.00 100 87 80 3 12.20 69.91 11.60 69.91 11.00 67 80 3 12.20 69.91 11.60 69.91 13.50 100 87 80 3 12.20 69.91 12.20 13.50 100 87 80 3 13.20 68.11 Walkortian Karst 13.50 13.50 13.30 68.11 14.40 98.11 Walkortian Market 15.00 100 100 100 10 14 98.11 Walkortian Karst 15.00 100 100 10 11.60 64.01 Walkortian Karst UMESTONE 16.50 11.60 11.60 11.60 11.60 11.60 11.60 11.60 11.60 15.00 100 100 100 0 11.60 11.60 11.60 11.60 11.60 15.00 11.60 11.60 11.60 11.60 11.60 11.60 11.60	Piezo	Drill	Tag	Co TCR	re Geote SCR	chnical D	ata Fl	Depth (m)	Level (m OD)	Litho	Stratum Description	
1.000 100 100 100 2 11 100 100 2 11 100 100 2 11 100 100 2 11 100 100 2 11 100 100 2 11 100 88.81 11 Wulstortin Kart Wulstortin Kart 12.00 100 87 80 3 12 69.21 Wulstortin Kart Wulstortin Kart Wulstortin Muritie UMURITie Wulstortin Muritie UMURITie Wulstortin Muritie UMURITie Wulstortin Muritie UMURITie Wulstortin Muritie Wulstortin Muritie UMURITie		10 5	50					-			Waulsortian Veines Bleues	
12.00 11.63 68.78 Waldsorfian Karst 12.00 100 87 80 3 12 100 87 80 3 13 68.21 Strong, massive, light gray, fine grained, stronatactd biomicrite 13.50 13 13.30 68.11 Waldsorfian Averst Strong, massive, light gray, fine grained, stronatactd biomicrite 13.50 93 80 80 2 14 Strong, massive, light gray, fine grained biomicrite 15.00 100 100 100 10 15 Strong, massive, light gray, fine grained biomicrite 15.00 16 15 15 Strong, massive, light gray, fine grained biomicrite 16.50 65 47 47 3 17 18.00 16 17 64.01 Waldsorfian Karst 18.00 18.00 63.41 Waldsorfian Karst Karst - Cavity 18.00 19.30 62.11 19.30 62.11 Waldsorfian Karst 18.00 19.30 62.11 19.30 62.11 Waldsorfian Karst 18.50 19.30 62.11 19.				100	100	100	2	- 11 - 11 	69.81		A	
100 87 80 3 12.20 68.21		12.0	00					11.63	69.78		Waulsortian Karst Karst - Light brown / buff clay infill Waulsortian Biomicrite	/
13.50 13.30 68.11 Waulscrian Venes Blacks 13.60 93 80 80 2 14 14 14 Strong massive Medium occasional stromatactid biomicrite LIMESTONE 15.00 100 100 100 0 16.50 65 47 47 3 17.40 64.01 Waulscrian Karst 18.00 47 33 33 1 19.50 19.30 62.11 Waulscrian Karst 19.50 19.50 19.50 62.11 Waulscrian Karst 19.50 19.50 19.50 62.11 19.50				100	87	80	3	- 12.20 - - - - - - - - - - - - - - - - - - -	69.21		Strong, massive, medium grey, fine grained, stromatac biomicrite LIMESTONE with occasional veines bleues Waulsortian Micrite Strong, massive, light grey, fine grained biomicrite LIMESTONE	tid LIMESTONE
LIMESTONE with occasional stromatactid biomicrite LIMESTONE 93 80 80 2 15.00 100 100 100 0 16 0 65 47 47 3 17.40 64.01 18.00 47 33 33 1 19.50 19.5		13.5	50					13.30	68.11		Waulsortian Veines Bleues Strong, massive medium to dark grey, veines bleues	
16.50 17 17 17 47 3 17 64.01 Wallsortian Karst Karst - Cavity 18.00 47 33 33 1 19.50 62.11 Wallsortian Karst LIMESTONE Wallsortian Karst Karst - Cavity 19.50 47 47 33 1 19.50 62.11 Wallsortian Karst Karst - Solution feature with light brown to yellow clay infill		13.50	00	93	80	80	2	- 14 - 14 			LIMESTONE with occasional stromatactid biomicrite Li	IMESTONE
1000 65 47 47 3 17 64.01 Waulsortian Karst Karst - Cavity 18.00 47 33 33 1 19.30 63.41 Waulsortian Micrite Strong, massive, light grey, fine grained biomicrite LIMESTONE 19.50 47 33 33 1 19 19.50 19.50 62.11 Waulsortian Karst Karst - Solution feature with light brown to yellow clay infill		16 5	50	100	100	100	0	- 16	onsento			
18.00 47 33 33 1 18.00 63.41 Waulsortian Micrite Strong, massive, light grey, fine grained biomicrite LIMESTONE 19.50 47 33 33 1 19 19.50 19.50 62.11 Waulsortian Karst Karst - Solution feature with light brown to yellow clay infill				65	47	47	3	- 17 - 17 - 17.40	64.01		Waulsortian Karst Karst - Cavity	
19.50 19.50 62.11 19.50 62.11 Waulsortian Karst 61.91 Galaxies Continued next sheet		18.0	00	47	33	33	1	- 1188.00	63.41		Waulsortian Micrite Strong, massive, light grey, fine grained biomicrite LIMESTONE	
Continued next sheet		19.5	50					19.30 19.50	62.11 61.91		Waulsortian Karst Karst - Solution feature with light brown to yellow clay infill	/
Remarks: Drilled by IDL	Remar	ks: Drilled	l by IE	DL		1					Continued next sheet	

		1	SL			Iting	Irela	nd			Borehole No
S	LR	0	Winc Tel. +	dy Arbo 353 1 29 Irconsulting	ur, Dubl 64667 Fa	lin 14 ax. + 353	1 2964676				15-HTC-08
Proj	ect Nam	e: Ge	eologi	cal A	ssess	ment	Pr 50	oject N 01.0018	lo. 30.00119	Co-ords: 310599E - 241062N	Hole Type Rotary
Loca	ation:	Hu	untsto	wn						Level: 81.41 m AOD	Scale 1:50,000
Clie	nt:	Ro	padsto	one						Dates: 09/06/2015	Logged By TM
Piezo	D	rill Tag	Con TCR	re Geote SCR	chnical D RQD	ata Fl	Depth (m)	Level (m OD)	Litho	Stratum Description	
			53	53	53	0				Waulsortian Veines Bleues Detail 19.50m - 20.70m : Strong, massive, medium to grey, veines bleues LIMESTONE with occasional stro biomicrite LIMESTONE	dark matactid
		01.00					20.70	60.71		Naulsortian Micrite Strong, massive, light grey, fine grained biomicrite	
		21.00	52	52	52	0	LIMESTONE Waulsortian Veines Bleues Strong, massive, medium to dark grey, veines bleues LIMESTONE with occasional stromatactid biomicrite	IMESTONE			
			Waulsortian Karst Karst - Light brown / buff clay infill with occasional limestone cobbles								
	2	22.50									
			7	0	net 115°.						
							-			AN any offer	
	2	24.00					- 24			ob the	
		26.50	64	60	60	3	-225.00	56.41		Waulsortian Veines Bleues Strong, massive, medium to dark grey, veines bleues LIMESTONE with occasional stromatactid biomicrite	IMESTONE
			40	39	39	25	- 27 - 27 - 27.80 - 28	53.61		Waulsortian Karst Karst - Light brown / buff clay infill	
							- 29				
Rema	rks: Dril	led by I								Continued next sheet	
n territa	ing. Dill	ieu by I	UL								

	5	S S	LR C	onsu	Iting	l Irela	nd			Borehole No
S	LR*	W Te	indy Arba + 353 1 2 w.sirconsultir	busines our, Dub 964667 F 1g.com	ss Park lin 14 ax. + 353	, 1 2964676				15-HTC-08
Proje	ect Name:	Geolo	gical A	ssess	smen	t F	oject N 01.0018	lo. 30.00119	Co-ords: 310599E - 241062N	Hole Type Rotary
Loca	ation:	Hunts	town						Level: 81.41 m AOD	Scale 1:50,000
Clier	nt:	Roads	tone				1		Dates: 09/06/2015	Logged By TM
Piezo	Drill T	ag TCI	Core Geote	RQD	Data Fl	Depth (m)	Level (m OD)	Litho	Stratum Description	
	30.00	56	34	32	3	-31 -31.40	50.01	Waulsortian Karst Waulsortian Veines Bleues Strong, massive, medium to dark grey, veines bleues LIMESTONE with occasional stromatactid biomicrite I	LIMESTONE	
	32.50	93	93	90	2	- 33	47.41		outs' any other use.	
	26.00	10) 57	50	13	- 3355.00	46.41	in the second se	Waulsortian Karst Waulsortian Veines Bleues Strong, massive, medium to dark grey, veines bleues LIMESTONE with occasional stromatactid biomicrite I	LIMESTONE
	36.00	10	0 100	97	3	- 36				
	57.50	73	73	73	2	- 38				
	39.00	70	60	50	4	+ 39 - - - - - - -				
Rema	rks: Drilled	by IDL		1				I	End of Borenole at 40.00 m	

SI	R	Z 7 W Te	LR C Dundrum indy Arbo	Busine Dur, Dub	Ilting ss Park lin 14 ax. + 353	j Irela	nd				Borehole No 15-HTC-09
Projec	ct Name:	Geolo	gical A	ISSES	smen	t P	roject N 01.0018	lo. 30.00119	Co-ords	: 311141E - 241331N	Hole Type Rotary
Locati	ion:	Hunts	town						Level:	79.41 m AOD	Scale 1:50,000
Client	:	Roads	stone				-		Dates:	25/06/2015	Logged By TM
Piezo	Drill T	ag TC	Core Geote	RQD	Data Fl	Depth (m)	Level (m OD)	Litho		Stratum Description	
	0.00 3.00 6.00	8	·			-1	Conservation	Britistic of the second	Waulsortian Kar Stiff to very : with occasio	rst stiff dark grey to black sandy gravelly CL nal cobbles	AY
	9.00	50				9				Continued next sheet	
Remark	s: Drilled	by IDL									

		F				ONSU Busines	Ilting	lrela	nd			Borehole No
S	LR	5.4	2	Wind Tel. + 3	y Arbo 353 1 29	ur, Dub	lin 14 ax. + 353	, 1 2964676				15-HTC-09
Droi	oot No	-	Gaa				mon	PI	roject N	10.	Co. ordo: 211141E - 241221N	Hole Type
FTUjt		une.	Geo			55655		5	01.0018	30.0011	g 00-0105. 511141E - 2415511	Rotary Scale
Loca	ation:		Hunt	tstov	wn						Level: 79.41 m AOD	1:50,000
Clier	nt:		Road	dsto	ne				1		Dates: 25/06/2015	Logged By TM
Piezo		Drill Ta	ag T	Core CR	e Geote SCR	chnical E RQD	Data Fl	Depth (m)	Level (m OD)	Litho	Stratum Description	
		12.00		37				- 11 - 12 - 13 - 14 - 15.00 - 16 - 17 - 18 - 19	64.41		Waulsortian Karst Waulsortian Karst Firm to stiff buff to light brown CLAY with occasiona orange interbeds	
				55				-		$\langle \rangle$	Continued next sheet	
Rema	rks: [Drilled I	by IDL									

	_ (S		ONSL Busine	ulting ss Park	Irela	nd				Borehole No		
S		Wi Tel	+ 353 1 2 slrconsultin	our, Dub 964667 F g.com	llin 14 [:] ax. + 353	1 2964676					15-HTC-09		
Proje	ect Name:	Geolo	gical A	sses	smen	t Pr	oject N)1.0018	lo. 30.00119	Co-ords	s: 311141E - 241331N	Hole Type Rotary		
Loca	tion:	Huntst	own						Level:	79.41 m AOD	Scale 1:50,000		
Clien	nt:	Roads	tone						Dates:	25/06/2015	Logged By TM		
Piezo	Drill	ag TCR	Sore Geote	RQD	Data Fl	Depth (m)	Level (m OD)	Litho	Wayleartian Ka	Stratum Description			
	21.0	0				-21 -22 -23 -24 -25 -26 -27 -28	onsett of	Berten and a state of the state	Waulsortian Ka	un one use.			
Remar	ks: Drilled	by IDL			-	-				Continued next sheet			
	_ (SL		ONSL Busine	ulting ss Park	g Irela	nd					Borehole No
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SL	.R	1	Wind Tel. + 3 www.slr	y Arbou 353 1 29 consulting	ur, Dub 64667 F	lin 14 ax. + 353	, 1 2964676						15-HTC-09
Project	t Name:	Geo	logic	cal A	ssess	smen	t Pr	roject N	lo.		-ords:	: 311141E - 241331N	Hole Type
, Looptia		Llund	toto:				50	01.001	50.001	19		70.41 - 400	Scale
Location: Huntstown								Lev	/ei.	79.41 III AOD	1:50,000 Logged By		
Client:	Client: Roadstone								Dat	tes:	25/06/2015	TM	
Piezo	Drill T	ag T	Cor CR	e Geoteo SCR	chnical [RQD	Data Fl	Depth (m)	Level (m OD)	Litho			Stratum Description	
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		1	100				37.50	41.91	1	Waulsort	ian Kar	rst	
							-		/	Firm	to stiff p	pale to light yellow CLAY	
							- 38		/				
							38.40	41.01	/	Waulsort	ian Kar	rst ev to black silty CLAY with occasional co	bbles
	00.00										an gre	sy to block only OLYT With Occasional O	
	39.00	, _					- 39		1				
			90				- - -		1	K.,			
							-		/				
Remarks	s: Drilled	by IDL	-									End of Borehole at 40.00 m	
	-	-											



Huntstown Central Quarry : Bedrock Geology, Borehole Location and Cross-Sections





ithc	logy Legend
	Tober Colleen Formation
	Waulsortian Limestones
	Malahide Formation
	Malahide Formation - Muds
	Fault Associated Dolomite