NON-TECHNICAL SUMMARY

Environmental Impact Assessment Report

Deepening of Existing Quarry at Rossmore, Carrigtwohill, Co. Cork

Prepared for: Lagan Materials Ltd.

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1.0 INTRODUCTION

1.1 Development Overview

This Environmental Impact Assessment Report (EIAR) provides supporting information to accompany a Planning Application to Cork County Council by Lagan Materials Ltd. (hereafter referred to as "Lagan") in respect of the further development of the existing quarry at Rossmore, Carrigtohill, Co. Cork.

The development is similar to that previously granted under An Bord Pleanala reference number PL04.QD.0010 and will consist of the deepening of the existing quarry extraction area by 2 no. 15 metre benches from -20m OD to -50m OD, along with minor amendments to the permitted quarry layout (Plan File ref. no's: S/02/5476 & ABP Ref. PL04.203762 and ABP Ref. PL04.QD.0010) all within the existing permitted quarry footprint and the continued use of the existing water management system (settlement pond / infiltration pond system, permitted under PL04.QD.0010) for the life of the proposed development, all within an application area of c. 12.6 hectares. An extraction capacity of up to 375,000 tonnes per annum is sought to provide the applicant with the ability to respond to demand for aggregates for large infrastructure projects in the Region. Permission is sought for twenty years plus two years for final restoration (total duration 22 years).An Appropriate Assessment Screening Report has also been prepared in support of the planning application and is provided as a separate document.

1.2 The Applicant

The applicant, Lagan Materials Limited, was previously part of the Lagan Group. On 20th April 2018, the Lagan Group was acquired by Breedon Group plc. Breedon is a public company with ordinary shares traded on the Alternative Investment Market (AIM). Throughout the UK and Ireland, the company employs approximately 3,600 people and operates 2 cement plants, 70 quarries, 40 asphalt plants, 200 ready-mixed concrete plants, 9 concrete and clay products plants, 4 contract surfacing businesses, 6 import/export terminals and 2 slate production facilities.

1.3 Site Location

The application site is located in a coastal setting and on a local county road approximately 2km south of Carrigtwohill and 6km southwest of Midleton, Co. Cork, refer to Figure NTS1. It is located approximately 2km south of N25 National Primary Road (E-30 European Route) which links Cork City to Rosslare Europort.

The site is located in the townland of Rossmore, Carrigtwohill, Co. Cork. Access to the lands is via an existing access to the public road to the north which connects to the N25 National Primary Road to the north. The local county road forms the northern site boundary which links the R624 Regional Road to the west at Fota and the N25 National Primary Road at Midleton. Beyond the southern boundary of the lands is an access right of way to the adjacent Kilsaran quarry and Rossmore Bay, part of the Cork Harbour channel.

Further beyond the immediate adjacent land uses there is Fota Island Wildlife Park (2km to the west), the commercial/retail/residential centre of Carrigtwohill (2km to the north) and other extractive industries (2.5km to the north-east).

1.4 Site Description

The application site is a well-established quarry. The overall landholding measures c. 42.9ha. The site is accessed via an existing site entrance along a private road, which leads south from a crossroads with the east-west public highway to the north. The existing quarry layout is sown on Figure NTS2.

Existing site operations comprise of limestone extraction / processing and asphalt production. The site access is located to the southeast corner along with the wheelwash, weighbridge and portacabin site offices / canteen associated with the site. Crushing and screening is carried out on the quarry floor by mobile processing plant. Stockpiling of aggregate materials also takes place on the quarry floor.

1.5 Site Access

The established quarry haul routes will continue to be used. The junction between the private access road and the L3619-0 road was recently realigned to the west of its previous position to form a right-left staggered crossroads, with cutting back and removal of some trees along the south side of the L3619-0 in the vicinity of the crossroads undertaken to provide improved visibility for traffic turning out of the private access road. These works were undertaken by Lagan in 2019 following receipt of planning permission from An Bord Pleanala under planning ref. PL04.QD0010 in 2017.

All HGV's exiting the site will continue to pass through the existing wheelwash and weighbridge. The access road from the wheelwash / weighbridge to the county road is asphalt surfaced to prevent carryout of material onto the public road.

1.6 Consideration of Alternatives

The existing permitted quarry area is located in an area favourable to extraction activities, due to, *inter alia:*

- Established long history of extraction at this location;
- Proven high quality limestone reserves – refer to EIAR Chapter 6;
- Located within market distance to Cork City, and a number of large infrastructure projects;
- Located within close proximity to the regional and national roads network – refer to EIAR Chapter 14;
- Best practice industry standard extraction and processing methods are used;
- Low development costs because infrastructure is already in place at the site and the application is for the further development of a long-established quarry.

1.6.1 Do Nothing Alternative

If no further works within the planning application area were carried out, the existing site would be restored to natural habitat after-uses as per the previously permitted restoration proposals.

1.6.2 Alternative Sources of Aggregates

In the medium term there are no real alternatives to the current land-based sources of construction aggregates.

Until End of Waste criteria in respect of Construction & Demolition (C & D) materials is agreed, these recycled materials cannot be relied upon and for the foreseeable future there are no real alternatives to primary land-won aggregates.

Notwithstanding the above, the volume of C&D waste suitable for recycling into secondary aggregates would be considered very low in comparison to the overall demand for aggregates. The demographic spread of the population results in only the large urban centres potentially being capable of generating sufficient volumes of construction and demolition (C&D) waste to justify a commercial operation producing secondary aggregates going forward.

In the longer term (>25 years), there may be some scope for extraction of sand and gravel from marine sources. However, the regulatory system does not yet exist to allow for this.

In the absence of significant volumes of aggregates from recycled / secondary and marine sources, land-based deposits (such as the proven reserves at Rossmore) will continue to be the main source of construction aggregates in Ireland, including Cork and the surrounding.

1.6.3 Alternative Locations

The current planning application is for deepening of the existing permitted quarry at Rossmore, Carrigtwohill, Co. Cork.

The alternatives available to the Applicant relate to:

- Further development (into lands that do not currently have the benefit of planning permission for quarrying) and final restoration of the existing established quarry;

or

- Development of a new replacement 'greenfield' quarry in County Cork to serve the established clients and markets in this region.

At the current time, there is no suitable alternative replacement quarry location available to the applicant in County Cork. It is generally accepted that the overall timeframe for development of a 'greenfield' quarry site (from initial site selection, land acquisition, preparation of a planning application and accompanying EIAR, through planning process and site development to extraction of aggregates) takes between 5 and 10 years.

Notwithstanding the above, the further development of the existing quarry would be beneficial in planning terms by eliminating the need for:

- Extracting additional materials from other quarries within the county, should the applicant be unable to develop a new 'greenfield' site in the event that the existing quarry ceases operation. This would result in faster depletion of aggregate resources at these other quarry locations and potentially result in future intensification of those operations;
- Development of a 'greenfield' site at some other location within the county where there is little or no previous extractive industry landuse;
- Haulage of materials by road from other quarries within, and outside the county, with potentially longer haulage distances and increased traffic levels on the wider road network.

The further development of the existing limestone quarry at Rossmore will assist in continuing to provide extraction from a proven aggregate resource within an established operation, with no significant increase in environmental emissions.

This development is not like a factory for example that can be located at many locations; this is a resource tied development. Aggregates can only be worked where they exist and where the environmental effects of working such resources can be managed to an acceptable level.

The extent of the limestone deposit at Rossmore Quarry has long been established. The further development of the quarry will work the remainder of this identified reserves located within the existing permitted quarry site, which has a proven track record of environmental / planning compliance.

On the basis of the above, it is considered that the further development of the existing established quarry, subject to continued implementation of best environmental management practice and compliance with appropriate planning controls (i.e. planning conditions and recommended emission limit values for the sector) is preferable in an overall planning context, compared to the development of a new replacement 'greenfield' site at some alternative location in the Cork region.

1.6.4 Alternative Designs / Layouts

Alternative designs, including alternative layouts within the site were considered. Minor changes to the previously permitted quarry extraction area have been proposed as part of this EIAR. Quarry deepening will be carried out within the previously permitted area only, with minor amendments to the permitted quarry design, and this is considered to best minimise the potential impacts on the environment from noise, dust, visual impacts.

Extraction Area

Lands to the North and East adjoining the quarry extraction area are owned by the applicant and these lands may be suitable for rock extraction at a future date. These adjoining lands are currently in agricultural use and have not previously been used, or proposed to be used, for quarry development.

The lands to the North of the existing quarry extraction area are currently used as an overburden storage area, or in agricultural use. Any extension of the quarry extraction area into these lands would bring the extraction area closer to neighbouring dwellings and for this reason lateral extension of the quarry into these lands was discounted.

In relation to the lands to the East of the landholding, that lie the far side of the access road to the existing quarry, extensive site investigations will be required to prove the limestone reserves within these lands. Any future planning application to allow extraction within these lands will require an

Environmental Impact Assessment to be carried out. This process (site investigations and EIAR) will take a minimum of 2 – 3 years to complete.

The most immediate available and suitable stone reserves available for extraction at the quarry are the proven reserves contained within the footprint of the existing quarry extraction area, below the current quarry floor level – refer to Chapter 6: Soils and Geology. These reserves are currently permitted to an extraction level of -20m OD and have been subject to recent extensive environmental assessments, hydrogeological assessments and site investigations.

Extraction of the stone reserves from below the quarry floor will not result in any additional land-take and will not result in any significant environmental impact. This EIAR demonstrates that the proposed deepening of the existing quarry development can be carried out without any significant impact on the surrounding environment, and within the recommended environmental emission threshold values for these types of development.

1.6.5 Alternative Processes

Lagan is a company with expertise and experience in the field of quarrying, aggregates production, concrete manufacturing, asphalt manufacturing and road making. This planning application is for deepening of the existing permitted quarry. Lagan use industry standard and best practice blasting techniques to fragment the limestone. This fragmented limestone is processed using mobile crushing & screening plant located within the quarry extraction area, in line with best practice for the sector. Alternative processes are not considered relevant in this instance.

2.0 DESCRIPTION OF THE DEVELOPMENT

2.1 Proposed Development

The proposed development being applied for under this current planning application is shown on Figure NTS3 and Figure NTS5. It is similar to that previously granted under An Bord Pleanala reference number 04.QD.0010 and will consist of:

- Deepening of the existing quarry extraction area by 2 no. 15 metre benches from -20m OD to -50 m OD, along with minor amendments to the permitted quarry layout (Plan File ref. no's: S/02/5476 & ABP Ref. PL04.203762 and ABP Ref. PL04.QD.0010) all within the existing permitted quarry footprint and the continued use of the existing water management system (settlement pond / infiltration pond system permitted under PL04.QD.0010) for the life of the proposed development, within an application area of c. 12.6 hectares – refer to Figures NTS2 and NTS3;
- An extraction capacity of up to 375,000 tonnes per annum is sought to provide the applicant with the ability to respond to demand for aggregates for large infrastructure projects in the Region;
- Permission is sought for twenty years plus two years for final restoration (total duration 22 years).

2.2 Existing Quarry

The existing quarry occupies ground with elevations ranging between -20 m OD and 20 m OD. The lower quarry floor currently extends to a maximum depth of -20 m OD, with the current planning permission authorising extraction to -20 m OD. The application area forms the existing quarry area and water management system (settlement pond / infiltration pond system).

The existing quarry operations comprise extraction of limestone using conventional blasting techniques; processing (crushing and screening) of the fragmented rock using mobile plant and equipment to produce aggregates for use in the production of value added products, road construction and site development works.

There is an existing asphalt plant located to the south of the application site. In addition, planning permission has been granted for a readymix concrete plant, ground limestone processing plant, ground limestone storage building, closed circuit settlement system and all ancillary works (Plan File Ref. No. 20/04124). This plant has not been constructed to date. The potential for cumulative impacts from the existing asphalt plant, permitted readymix plant and ground limestone plant have been assessed in the relevant chapters of this EIAR.

The quarry is a key strategic source and supplier of construction materials for Cork and surrounding region.

2.3 Extraction Rate & Duration of Extraction

The total recoverable reserve of limestone from within the proposed extraction area, from -20m OD to -50m OD is assessed at c. 7.5 million tonnes. This includes the existing permitted reserves to -20 mOD.

The duration of quarrying activities at the application site will largely be dictated by the rate at which the limestone reserve is extracted from the site. There are many factors which will influence this, including, but not limited to the:

- Prevailing economic climate and related construction industry output;
- Distance of construction projects from the facility (and scale of activity).

In light of these and other variables, calculation of extraction rates and duration is not an exact science. However, an extraction capacity of up to 375,000 tonnes per annum is sought to provide the applicant with the ability to respond to demand for aggregates for large infrastructure projects in the Region.

A planning permission duration of 20 years is therefore sought for the extraction and processing period and a further 2 years to complete final restoration of the site.

2.4 Method of Extraction and Processing

Blasting is and will continue to be used within the quarry area to fragment the stone prior to processing (crushing / screening etc.).

The processing of the extracted rock, into aggregate products, will consist of crushing and screening by mobile processing plant within the quarry void.

2.5 Stability of the Quarry

Industry standard slope angles, bench heights, and bench widths will be used for extraction operations at the site.

2.6 Topsoil and Overburden

Within the planning application boundary an area of 12.6 hectares has been used for the extraction of limestone, and ancillary facilities, and therefore has been completely stripped of overburden and topsoil material. No further stripping of topsoil or overburden materials will be carried out within the application area.

2.7 Ancillary Buildings and Infrastructure

Ancillary facilities at the site include the portacabin offices, weighbridge, wheelwash, canteen and toilets.

2.8 Safety and Security

The access gates to the site are locked outside operational hours. At the present time, the property boundary is secured by post and wire fencing and/or hedgerow.

2.9 Groundwater and Surface Water Management

The current water management within the quarry involves pumping a combination of rainwater and groundwater from the quarry floor to the existing settlement lagoon and groundwater infiltration area located to the Southeast of the site.

All water (stormwater and groundwater inflows) pumped from the quarry void will continue to be discharged in compliance with the requirements of discharge licence ref no WP(W)08.18(R) and in accordance with the emission limit values specified under the discharge licence.

Runoff from the asphalt plant and surrounding hardstanding areas, including access roads, drains through two separate oil interceptors and a sediment trap along the southern site boundary before discharging to the settlement lagoon.

2.10 Hydrocarbon Storage

Hydrocarbon storage will continue at the current location. The only hydrocarbons to be stored on site for the quarry development that will have the potential to cause water pollution are small quantities of lubricating oils, hydraulic oils, waste oils, used oil filters and oily rags. All of these are / will continue to be stored in the following manner:

- suitably certified tanks within areas bunded to a capacity of 110% of the tank;
- where two tanks are bunded, bund capacity will be 120% of the largest tank;
- no pipe work will go through the bund at any point to reduce the risk of leakage;
- surface water from bunds will be pumped out through a suitable oil interceptor;
- a bunded tank is provided for waste oils;
- dedicated storage bins are provided for used oil filters and oily rags.

There are no bulk fuels stored at the overall quarry site.

All fuels required to serve mobile plant and machinery are brought to site on an as required basis by local fuel suppliers. A number of spill kits are provided at the site. The existing water management system for the quarry includes a hydrocarbon interceptor.

2.11 General Waste Management Plan

Lagan Materials Ltd. are a member of the Irish Concrete Federation (ICF) and commits themselves to the principles of the Federations Environmental Code. The code states:-

"ICF members will minimise production of waste and where appropriate consider its beneficial use including recycling. They will deal with all waste in accordance with the relevant legislation and other controls in place, including using waste contractors with valid Waste Collection Permits"

Potential waste produced and the measures used to control it are described as follows:-

- Scrap metal – these materials are chiefly produced from the maintenance of the possessing plants and can cause a nuisance if allowed to build up in an uncontrolled manner. A designated scrap metal area will be demarcated on site and the build-up of scrap is controlled by the regular removal by licensed scrap metal dealers.
- Used Oil and Oil Filters – any waste oil/oil filters that may arise from servicing of fixed or mobile plant will be removed from the site by a licensed waste contractor.
- Used Batteries – similarly all used batteries will be removed from site for collection and recycling by a licensed waste contractor in accordance with the Waste Management Regulations.
- Domestic Style Waste (Canteen Waste) – domestic waste generated at the offices and employee's facility will be collected by a licensed waste collection contractor.

2.12 Quarry Operating Hours

In accordance with condition 15 of the existing planning permission, quarry operations will be carried out between 07.00 – 18.00 hrs Monday to Friday and 07.00 – 14.00 hrs Saturday. The quarry will not operate on Sundays or Bank Holidays, except in emergency situations.

2.13 Employment

The proposed development will provide continued employment of up to 8 no. people directly on-site, in addition to a number of indirect employees such as crushing contractors, HGV drivers, maintenance contractors, local suppliers, etc.

2.14 Lighting

Sufficient lighting is provided at the site to ensure safe operations during winter periods.

2.15 Landscaping & Boundary Treatment

There are a number of safety and security measures in place for the existing quarrying operations on the subject site. In this regard, fences are located and regularly maintained around the perimeter of the site, thereby discouraging inadvertent access to the quarry.

The existing settlement lagoon and infiltration area on the south-eastern portion of the site is secured with perimeter security fencing and security fencing.

2.16 Environmental Management and Monitoring

Lagan have implemented an Environmental Management System at Rossmore Quarry as required under Condition No. 9 imposed under An Bord Pleanala reference number 04.QD.0010. A copy of the EMS Manual is enclosed in the EIAR.

The quarry has an established environmental monitoring programme and results of the environmental monitoring programme are submitted to Cork County Council. Water, noise, dust and blast monitoring will continue to be carried out on a regular basis, to demonstrate that the development is not having an adverse impact on the surrounding environment

2.17 Quarry Restoration

2.17.1 Proposed Restoration Scheme

The restoration scheme for the planning application area is shown on the Figure NTS4 - Restoration Plan. The application area will be restored to a natural habitat, which is one of the beneficial after uses listed in the EPA Guidelines: 'Environmental Management in the Extractive Industry' (2006). This will be achieved by the following measures:

- The application area will be left for natural recolonisation by locally occurring grass and shrub/scrub species and the void will fill with water.
- All existing boundary fences and hedgerows will be retained to ensure that the site is secure.
- All plant and machinery will be removed from the quarry void.

The restoration works will be carried out in accordance with the EPA Guidelines (2006).

2.17.2 Site Management and Supervision

The Applicant will clearly define the management responsibility for the site restoration work and will ensure that this person has the necessary information (from the planning application) and authority to manage the whole restoration process. Relevant staff will be briefed on the scheme and will be adequately supervised / controlled. A system of record keeping for the key restoration activities will be put in place.

2.17.3 Long Term Safety and Security

Existing hedges surrounding the development will be gapped up and thickened where required. These combined with fencing and the secure and locked entrance gates to the development will prevent unauthorised third party access.

2.17.4 Long Term Surface Water and Groundwater

On completion of extraction operations, a lake will be formed in the quarry void as groundwater returns to its natural level.

2.17.5 Decommissioning of Plant and Machinery

Redundant structures, plant equipment and stockpiles will be removed from site on permanent cessation of extraction activity. Machinery and buildings will either be utilised by Lagans on other sites, or be sold as working machinery or scrap.

As part of the overall decommissioning process, all fuel, oil storage and septic / effluent treatment tanks within the existing site will be removed from the site by a licensed waste contractor. Therefore, there will be no potential for fuel, oil or sewage to cause long-term water pollution following completion of extraction activities.

2.17.6 Aftercare and Monitoring

No aftercare or monitoring is required for the restoration proposals for the application area.

3.0 EXISTING ENVIRONMENT, EFFECTS AND MITIGATION

3.1 Population and Human Health

The review of population is based on a Small area ID 047077003 and the electoral division (ED) of Carrigtwohill. The change in population from 2011 to 2016, as per the Census 2016, for the electoral division, County Cork, Munster and the State shows a marginal increase in population for the Small area ID 047077003 with a much greater increase in the wider ED of Carrigtwohill. Much of the development within this ED has taken place north of the N25. In 2016, the total population in County Cork was 417,211, of which Males numbered 206,953 and Females were 210,258 The census results indicate that the rate of population growth in the intercensal period in Carrigtohill has fallen below trends at the county, provincial and national level. However, this was preceded by substantial population growth between the 2006-2011 census periods of 36.72%.

According to the results of the 2016 Census, of the 5,227 people aged 15 years or older in Carrigtwohill ED, some 3,294 were at work, 34 were looking for their first job and 277 were unemployed. Others were students, working in the home, retired, unable to work or other. The population of Carrigtwohill and County Cork categorised by occupation at the time of Census 2016 shows that the population of Carrigtwohill is more likely to be engaged as managers, directors, and senior officials; and in associate professional and technical occupations than the population of the wider county. The population of Carrigtwohill is also less likely to be engaged in skilled trades occupations but more likely to be engaged as process, plant and machine operatives than the County as a whole.

The Pobal HP Deprivation index is Ireland's most widely used social gradient metric, which scores areas in terms of affluence or disadvantage. The index uses information from the census, such as employment, age profile and educational attainment, to calculate this score. The index is used by various state agencies and government departments to target resources towards disadvantaged areas. The 2016 Pobal HP Deprivation Index shows Carrigtohill with a score of 6.20 which in terms of affluence is marginally above the national average.

Rossmore Quarry is a significant source of raw materials for the construction sector. The deepening of the existing quarry with proven limestone aggregate reserves is required to ensure that Lagan meets the demands of the market(s) they have built up in the region, including supply, to the local construction industry, infrastructure projects and Local Authorities. The proposed development is of strategic importance in relation to the construction of new housing in particular and this is underlined by national objectives in relation to house building. The recently adopted National Planning Framework targets the delivery of 550,000 additional households in Ireland to 2040 (National Policy Objective 32). This is a medium-term, temporary, direct and positive effect on the local and regional economy. The proposed development will secure the continued employment of 40 people for the duration of the quarry operations. This is a medium-term, direct and positive effect on employment.

The potential adverse effects include those related to noise, vibration, dust, visual impact and traffic. Each of these matters, and associated management / mitigation measures, is addressed in the Environmental Impact Assessment Report (EIAR) and summarised in this Non-Technical Summary. Deepening of the existing quarry is not likely to have any significant effects on tourism / amenity assets, or on human health.

The environmental monitoring programme implemented at the overall site confirms that the quarry operations have operated and continue to operate within the recommended dust, noise and vibration limit values set out in best practice guidelines for the sector and conditions attached to planning permissions.

3.2 Biodiversity

An Ecological Impact Assessment has been carried out to inform the wider Environmental Impact Assessment process and production of an Environmental Impact Assessment Report to accompany the planning application by Lagan for deepening of the existing quarry.

The proposed deepening of the existing quarry at Rossmore, Co. Cork will result in localised effects on the ecology of the Site. The active quarry extraction area will continue to operate under the requirements similar to those set out in the existing planning permission. The existing vegetation around the perimeter of the site will be retained and will not be impacted.

The proposed development will involve the deepening of the existing extraction area and therefore there will be no further stripping of topsoil, overburden material, neither will there be any need to remove any vegetation and so there will be no loss of habitat with biodiversity value. Potential direct and indirect effects on biodiversity may arise due to water discharge, noise, dust and vibration effects within the permitted quarry area.

The current settlement lagoon and infiltration area (discharge to ground) are fully functional and are sufficient to receive the discharge volumes from the quarry void. Discharge volumes from the proposed development will remain within the limits of the Discharge Licence WP(W)08/18 (R) which was issued in 2019. The discharge water quality arising from the proposed development will have no effect on the local biodiversity, any Natura 2000 site or shellfish areas.

Noise generation from the proposed development will be reduced by locating all of the mobile crushing and screening plant within the quarry void. An existing berm along the southern boundary of the quarry provides additional screening. Noise affects in the local biodiversity and in particular the birds in the SPA will be negligible. Baseline dust deposition monitoring at the site indicates that the levels at the development site are well below the limit for fugitive dust emissions of 350 mg/m2/day and therefore well below the level of 1000 mg/m2/day, where it is considered that dust could be likely to have a significant effect on sensitive ecosystems. As the proposed development is located within the current quarry void there will be no significant increase in dust levels and there will be no effect on the local biodiversity. Ground-borne vibration levels from blasting are predicted to be well below a peak particle velocity of 12 mm/sec. and will therefore have no significant effect on the local biodiversity.

Overall, the residual effects on biodiversity are not anticipated to be significant.

There will be no effect on sites designated for nature conservation (Great Island Channel SAC 001058 and Cork Harbour SPA 004030) as a result of the proposed development. A separate Appropriate Assessment Screening Report has been submitted as a separate document within the planning application documentation.

3.3 Land, Soils and Geology

There has been a change in historical land use from agricultural land to extractive industry, aggregate processing and manufacturing within the overall site. There is no further land take required as part of the proposed development that relates to the deepening of an existing quarry.

A geological appraisal to assess the soils and geology within the overall site has been carried out. The appraisal comprised a review of available geological literature and maps, and geological site investigation work.

The Teagasc soil mapping for the Irish Forestry Soils (IFS) mapping project, indicates that the soils in the vicinity of the site are characterised by deep and well drained Acid Brown Earths and Brown Podzols, underlain by glacial till. The soils at the site have been removed in the past to facilitate

quarrying activities and are currently stored in the northern part of the site awaiting restoration. It is not proposed to remove any soils as part of this proposal to deepen the existing quarry

The GSI geology map Sheet 22 (East Cork - Waterford) shows major geological faults running north south in the vicinity of the site. The southern part of the site is underlain by the Carboniferous Little Island Formation which is comprised of massive and crinoidal fine Limestone. In the northern part of the site, the Little Island Formation is overlain by the Clashavodig Formation Limestone, a bedded sequence of grainstones, wackestones and micrites. Both formations are fine grained limestones. The Little Island Formation is described in the GSI Geological memoirs (1995) as being comprised of a uniform 500m thick succession of mudbank Limestone. The proposed development at the site involves the continuance of use of the existing quarry in the Little Island Formation Limestone, from its existing floor level to the existing permitted floor level of -40 mOD. The Little Island Formation Limestone is the main geological unit which has been quarried at the site.

The GSI database (www.gsi.ie) shows the closest karst features to the site are two landforms east of the quarry. Goat Hole cave is located approximately 1.0 km to the east, and a spring is located approximately 1.3 km east of the quarry; both karst features are in in Ballintubbrid West townland. No significant karst features have been encountered at the quarry.

There are no designated Irish Geological Heritage sites at Rossmore and there are no sites of County Geological Interest within or immediately adjacent to the development.

The construction stage has been completed for the existing quarrying operations at the site. The operational stage of the quarry is the further extraction of the Limestone material within the permitted quarry footprint, over the proposed lifetime of the continuance of use of the existing quarry. During the operational stage, the limestone rock will be quarried and processed at the site under the continuance of use. Operations at the quarry will adhere to the Health and Safety Authority Safe Quarry Guidelines in relation to the Safety Health and Welfare at Work (Quarries) Regulations 2008-2019 and this will limit the potential for unplanned events such as instability of quarry faces or instability in adjacent lands. The residual impact of the proposed continued quarry operations on soils and geology will be low to imperceptible.

The restoration of the application area to natural habitat afteruse will have a positive impact on the biodiversity of the site and local area. There will be a residual impact associated with the long term loss of the original agricultural land (pre original quarry development) and this will be both a permanent and minor negative impact at site level.

3.4 Water

The application site lies within the Lee, Cork Harbour and Youghal Bay catchment, the Tibbotstown_SC_010 surface water sub-catchment and is underlain by the Midleton Groundwater Body (GWB). The quarry is in a coastal setting and is adjacent to the Great Island Channel SAC (Site Code 001058), Great Island Channel pNHA (Site Code 001058) and Cork Harbour SPA (Site Code 004030).

The quarry is permitted to operate below sea level to a permitted depth of -20m OD. The assessment of potential impacts to the water environment focussed on the continued extraction to a depth of -50m OD.

The site has a discharge licence [WP(W)08/18(R)] issued by Cork County Council in February 2019, which permits a daily volume of 12,000 m3/d or 500m3/hr, and therefore an established and operational water management system has been constructed to treat and infiltrate the waters arising

at the site. The water management system is located to the east of the quarry working site. The water system was designed to accommodate the 1:100 year storm event, the combined effect of the adjacent working quarry, potential recirculating groundwater from the infiltration pond and also made provision for a future potential scenario for the cessation of the adjacent site. In the event that the neighbouring quarry operation ceased, Lagan would have to dewater both quarries and this treatment capacity is built into the lagoon systems. Flow meter measurements at the Lagan site suggests an annual average daily volume = 396m3/d, a maximum average value of 797m3/d in October & November 2020 and a minimum value of 58m3/d, on average, during the month of June. It is therefore concluded that the site did not intercept the 2015 EIS predicted groundwater volumes and neither is it dealing with any of the neighbouring quarry's waters. The actual measured values for discharge therefore align more with the normal rainfall runoff values. The site is therefore managing <10% of the water envisaged in the 2015's EIS modelling outputs for the -20m OD elevation at which the site is now working, for which the water management systems were built. Hydro-G concludes that this provides great capacity for future developments. The lagoons and infiltration area already built can treat and infiltrate 12,000m3/d to ground. The water management systems are licensed under WP(W)08/18(R). Given that they operate at <10% of design capacity, 90% capacity remains available for future development and cessation of pumping at the next door site.

The site is located on a relatively flat coastal plain. Natural ground level prior to quarrying at the site was 10m OD, generally. There are some small, localised elevation rises to 20m OD and 30m OD but even the town of Carrigtwohill, 2km north, has a general land elevation of 10m OD. The land to the south, immediately outside the boundary berms, is coast with a 0m OD elevation. The topography of the area is controlled by the floor of an elongate east west trending valley in east Cork.

The GSI maps the Teagasc Soils categories in the southern half of the site as 'Bedrock at surface-Calcareous RckCa' and the northern half as 'Till derived chiefly from Devonian sandstones TDSs' (www.gsi.ie). The soils in the surrounding lands are described by the GSI as 'Till derived chiefly from Devonian sandstones TDSs'. The adjacent quarry to the west is also mapped as 'Bedrock at surface-Calcareous RckCa'.

The GSI subsoils map for the area also shows that the southern half of the site and the quarry next door to the west is mapped as the subsoil (Quaternary Sediments) classification of 'Bedrock outcrop or subcrop' Rck (www.gsi.ie). Lands in the remainder of the overall landholding are mapped as subsoil type ''Till derived chiefly from Devonian sandstones TDSs'.

Groundwater vulnerability for the site is mapped by the GSI as 'Extreme - X ' (Rock at or near surface).

The site is underlain by Carboniferous period Limestones. The Geological Survey of Ireland (GSI) 1:100000 geology sheets map the northern part of the site as underlain by the Clashavodig Limestone Formation, which is a cherty fine limestone, and the southern portion of the site as the Little Island Formation, which is a massive and crinoidal fine Limestone. Both the Little Island and the Clashavodig are mapped as 'Dinantian Pure Unbedded Limestones' (https://dcenr.maps.arcgis.com/).

The site is underlain by an aquifer classified as a Regionally Important Aquifer which is karstified and dominated by diffuse flow (Rkd).

The underlying Middleton Groundwater body is mapped as a diffuse karst system (https://dcenr.maps.arcgis.com/ & GSI, 2004). No evidence of significant water bearing karst features have been revealed at the site, which is to be expected given the 'diffuse' karst mapping. There are no GIS mapped karst features at the site. It is noted that there is a mapped cave @ 1km to the east and a mapped spring @ 1.5km, approximately, to the southeast.

There are no Public Water Supply (PWS) or National Federation Group Water Scheme (NFGWS) groundwater protection areas mapped in the vicinity of the application site or the surrounding lands. The GSI well database (www.gsi.ie) does not record any mapped wells within 5km of the site. There

are no residences within 500m of the sump at the site. Well survey results suggest that the domestic residences to the north of the site, along the east west trending third class road are served by mains supply. There is a farm at 700m from the sump and it uses water from a well, which is not within radius of impact from the quantified dewatering regime at the site. Furthermore, progression deeper in the rock is unlikely to present more water because the floor of the quarry is probably close to the base of the active groundwater aquifer now, with little experience of groundwater requiring management.

EPA mapping (https://gis.epa.ie/EPAMaps/Water) presents RAINFALL_SAAR = 1047mm/yr. While Effective Rainfall is presented by the GSI as 616mm/yr, a Recharge Cap is applied and the Maximum Groundwater Recharge Capacity component is mapped as 200mm/yr. Within the quarry area itself, the nature of the rock matrix has a low primary porosity and the rock itself is of low permeability. Therefore, the GSI apply a Recharge Cap and only 200mm/yr. Rainfall runoff to the sump lagoon in the quarry floor is the primary mechanism for rainfall runoff derived water to move through and from the site.

On a regional scale the application site is located within the Lee, Cork Harbour and Youghal Bay surface water catchment within Hydrometric Area 19 of the South Western River Basin District. Locally, the site is in the Tibbotstown_SC_010 surface water sub-catchment and the WFD River sub-basin (IE_SW_19T250870). Hydrometric Area 19 has an overall area of 2,182km2. The overall catchment and the sites setting are presented in the EIAR Figure 7.13 series. The site lies in the Tibbotstown sub basin of Hydrometric Area 19 and that sub basin is mapped as having a catchment area of 52km2 (https://gis.epa.ie/EPAMaps/Water).

Rivers on the land are only a small part of the site's hydrological setting. The site does not interact with rivers. The site was a sand and gravel pit before the underlying limestone was revealed to be a resource required for building. Sand and Gravel areas do not present land water courses. Hence there are none in the vicinity of the site. While the 'Tibbotstown_010' has small tributaries at 1.5km to the NW and the SE, the site's hydrological significance is its coastal setting. The site does not interact with any rivers.

The site sits on a northern boundary of the 'North Channel Great Island' Transitional Waterbody (IE_SW_060_0300). This transitional waterbody is a shallow mudflat type area that feeds into Cork Harbour (IE_SW_060_0000), which is mapped south of the transitional water and hence south of the site. The Lagan quarry site sits on a northern flank of the North Channel Great Island Transitional Waterbody and that waterbody is a feeder to the north-eastern part of Cork Harbour. A more significant magnitude feeder into Cork Harbour is Lough Mahon (IE_SW_060_0750), which feeds from the northwest, and is also fed by Lough Mahon [Harper's Island] (IE_SW_060_0700) and the Lee (Cork) Estuary Upper (IE_SW_060_0950).

While the main channel of the Blackwater River (Cork/Waterford) SAC (Site Code 002170) is 20km to the north, a southerly headwater is 15km from the Lagan and adjacent Kilsaran site. With respect to the Blackwater River, Groundwater flow direction is from north to south towards the coast and the site and therefore, the site cannot present any threat to the Blackwater system. Downgradient of the site, the Great Island Channel SAC (Site Code 001058) is adjacent to and immediately south of the site, Cork Harbour SPA (Site Code 004030) is to the south and at numerous inlets to the east and south. This estuarine channel immediately to the south of the site mapped as the Great Island Channel SAC and the Cork Harbour SPA is also mapped as a 'Nutrient Sensitive' Area estuary labelled by the EPA as the "Owennacurra Estuary / North Channel" (IE_SW_060_0400). Cork Great Island North Channel (IE_SW_060_0300) is also a designated Shellfish Area and the Owennacurra Estuary / North Channel (IE_SW_060_0400) is a mapped Waste Water Treatment Directive Sensitive Area.

The GWB in which the proposed development site is located is the Middleton GWB (IE_SW_G_058). This GWB is reported to have an approximate area of 136km2 (GSI, 2004). Information presented by

the EPA is that the Middleton GWB (IE_SW_G_058) is assigned "Good" Status (https://gis.epa.ie/SeeMaps) for the reporting period 2013 – 2018. The Risk Classification for the GWB has been deemed "Review" in the WFD Cycle 2. The Groundwater Body has been mapped as Review in the 2nd WFD Cycle and remains as such in the 3rd, current cycle. The 'Review' risk status essentially means that the assessment resources of the EPA are needed more in other areas of the catchment. Hydro-G suggests that if there were significant problems in the Groundwater Body, the EPA would be working on its Risk/Status. The Groundwater Body remains mapped as Good Status.

The EPA has mapped pressures from numerous sources for the entire country. While, historically, the Groundwater Body may have been considered as potentially under pressure from abstractions, it is not mapped as such now (2021 data search on https://gis.epa.ie/EPAMaps/Water). Neither does EPA mapping present any suggestion for pressure on the Groundwater Body from Agricultural or Extractive Industry sources in the area. The only mapped pressures in the area are outside the radius of significance to the site. There are mapped Agricultural Pressures on the Ballinhassig East (IE_SW_G_004) Groundwater Body to the north of the Midleton Groundwater Body that underlies the site and on the DUNGOURNEY_020 (IE_SW_19D070700) river flowing towards Midleton. It is therefore concluded that the two quarries operate without presenting pressures warranting mapping by the EPA (https://gis.epa.ie/EPAMaps/Water.

With respect to the potential for coastal flooding, CFRAMS modelled water levels for many points in Cork Harbour and Little Island are 1m lower than the southern boundary berm height, indicating that the berm will not be overtopped.

Previous site investigations comprised almost 30 boreholes, numerous trial pits, soakaway tests and Rotary Core drilling. Therefore, the geology and potential for interaction with the water environment has been characterised in detail previously. Borehole logging and Pump Testing previously reported for the site suggest competent rock with low water yields and low transmissivities. In 2021 three new Production Wells (PWs) were drilled at 8" diameter to depths below the proposed deepening elevation of -50m OD for the purposes of evaluating the likelihood of encountering large volumes of groundwater in the future. Each of the 2021 PW's were pump tested to evaluate potential future dewatering requirements. Water yields were low @ <10m3/hr and concur with previous results. No significant groundwater was encountered during drilling previously and none of significance, considering the setting, in this investigation. Overall, previous hydrogeological evaluations at the site applied conventional hydrogeological equations to conclude and present a potential future dewatering value range of 6,000m3/d for the site, when the neighbours were also dewatering, and 12,000m3/d for the site if the neighbours site ceased operation and groundwater rebounded. That 6,000 to 12,000m3/d potential future dewatering volume was calculated for the workings to bring the site to -20m OD. Part of the site is now at that floor level, more or less, and the actual metered dewatering volume is <10% of that predicted. Hydro-G therefore concludes that the application of conventional hydrogeological equations is not appropriate for the site.

There is a flowmeter on the discharge pipe conveying waters from the floor sump to the water management lagoon and infiltration system to the east of the site. Therefore, the record of waters arising is available. The current volume of waters arising ranges from 50 to 800m3/d, approximately, whereas ELV for volume specified in the Licence is 12,000m3/d.

The site monitors discharge quality four times per year as per Condition 2.6 of Trade Effluent Discharge Licence WP(W)08/18(R). Results suggest full compliance with the ELVs specified in WP(W)08/18.

Groundwater quality sampling is carried out to satisfy the monitoring proposal that was agreed with the Planning Authority for the site. It is concluded that the groundwater quality is good and there are no detectable Petroleum Hydrocarbons in the water.

Given the scale of Cork Harbour and its large contributing catchment area, potential hydrological or hydrogeological impacts on the designated sites are unlikely to result from the proposed development.

The downstream estuary is a designated shellfish area, a Nutrient Sensitive Area and a SAC, connected to SPA area. Mass balance calculations for explosives residues suggest that the residual N compound would have a total N concentration of <0.001 mg/l N. Specifically, resultant concentrations in waters within the quarry, if impacted by explosives within the working quarry site area, would be: 0.0005 mg/l NO3, 0.0004 mg/l NH4 and 0.00003 mg/l NO2. Overall, the residual concentrations meet the requirements of the Surface Water Regulations & the targets set out in both the Freshwater Fish Directive and Salmonid Waters Regulations. The risk of impact to local water quality arising from the use of explosives at the site is therefore non-existent, based on industry standard method of calculation. These calculations are based on PEAK abstraction rates.

Overall, the potential for impact arising from the site itself was assessed in the context of hydrocarbons, excavations, water quality, sediment transfer, increased dewatering and use of explosives. Hydro-G concludes no potential for impact because of site management measures and the large extent of the water management system (lagoon and infiltration area). Planning Compliance correspondence for the site (2020) presents the agreement for hydrocarbon bunds at the exit area of the lagoons, upgradient of the infiltration area.

Residual effects are not envisaged for any phases including Construction, Operational and Post-Operational. No Transboundary effects are envisaged because the site is on the southern coast of Ireland.

No impact is envisaged with respect to alteration of water balance: The site is licensed to discharge a maximum potential future volume of 12,000m3/d. The waters are discharged to an infiltration area relatively close to the quarry. The infiltration area feeds the estuary. Therefore, there is no significant net loss of water to the estuary. The current volume of waters arising ranges from 50 to 800m3/d, approximately. The volumes currently encountered at <10% of those that were predicted for the excavation level of -20m OD, which some of the site is now at. Therefore, the prediction of 12,000m3/d has not been realised and that volume remains valid as a volume that could, but probably will not, be experienced in the future when the site continues to -50m OD.

With respect to the potential for cumulative impact,

There is another working quarry adjacent. The quarry is owned and managed by Kilsaran. They dewater substantially more water than the Lagan quarry although their discharge licence [WP(W)10/18] does not actually specify a discharge volume.

- There are Urban WWTPs at Carrigtwohill with numerous discharge points mapped by the EPA (https://gis.epa.ie/EPAMaps/Water), including stormwater overflows, and a WWP plant at Midleton designed to serve a PE of 20,000, including Tertiary Treatment for nutrient removal. The EPA envision map system displays 14 WWTPs in the catchment of Cork Harbour.

- Agricultural pastureland in the upgradient catchment and alongside the site must be considered because arable pasture is listed in EPA (2021) as the most significant nutrient pressure to the transitional waterbody to the south of the site.

- The Rossmore Civic Amenity Site is south of the quarry.

For the purposes of cumulative impact, the two quarries should be considered as one large void totalling extraction areas of 10ha, approximately, on the Lagan site and 26ha on the Kilsaran site = 36ha total.

The combined POTENTIAL FUTURE maximum discharge volume is 33,000 m3/d, although at present, while the Kilsaran site is reported to actual discharge up to 21,000 m3/d, the range of metered discharge on the Lagan site is currently 58 to 797m3/d. If the Kilsaran site stopped pumping, the Lagan site would not draw the full 21,000m3/d dewatering volume from the Kilsaran site. The wall between the two sites is competent. The high tides ingress at Kilsaran would be retained at its own site. The water management lagoons and infiltration area for the Lagan site can accommodate waters that would arise should the adjacent site cease. That design caveat is clearly stated in the documentation supporting the design and construction documents for the 2019 granted Lagan site's Discharge Licence WP(W)08/18(R) licensed 12,000m3/d.

Both quarries send their waters to discharge in the same area. The Kilsaran discharge is immediately south of the Lagan infiltration area. They can therefore be conceptualised as one big lagoon and infiltration area, having two distinct licences because they are attributed to two different business owners. The ELVs Conditions for hydrochemical quality of both Discharge Licences are always met.

The EPA envision map system displays 14 WWTPs in the catchment of Cork Harbour. In addition, agricultural pastureland in the upgradient catchment and alongside the site must be considered another pressure because arable pasture is listed in EPA (2021) as the most significant nutrient pressure to the transitional waterbody to the south of the site.

Hydro-G concludes no potential for cumulative impact because the quarry's use of explosives will contribute hardly any nitrogen and there is no source of phosphorus in the working void. Quarries are not the issue in this landscape.

Also, to the south of the site, on the other side of the channel, is the Rossmore Civic Amenity Site. This is a Cork County Council Recycling site that should be appropriately controlled with respect to emissions. One must assume correct operation of a Local Authority site and in that case, Hydro-G concludes no potential is presented by the Civic Amenity Site for cumulative impact.

Given the coastal setting and the fact that the two quarries are on the edge of the land, no other developments are deemed to require assessment in terms of both quarries' potential for impact.

In overall conclusion,

- The 'In Combination Effect' is negated because the two adjacent working quarries abstract and then recharge the same water close to its original ultimate destination. There is no net loss of water to the downstream sites.
- The surface water features are the downstream transitional waters, which are also mapped as Nutrient Sensitive, Shellfish, SAC/SPAs. These are protected by the Conditions of the Discharge Licence for the site and the control measures constructed to comply with Conditions of the Licence.
- Groundwater will not be impacted, no domestic well users are within radius of the quarry's sump and mitigation measures are in place to prevent sediment clogging of the infiltration area and control of hydrocarbons.

3.5 Climate

Ireland has a typical maritime climate with relatively mild and moist winters and cool, cloudy summers. The prevailing winds are south westerly in direction. The climate is influenced by warm maritime air associated with the Gulf Stream, which has the effect of moderating the climate, and results in high average annual humidity across the country. The area of least precipitation is along the eastern seaboard of the country in the rain shadow of the Leinster uplands.

The climate data recorded within the region of Rossmore Quarry has been sourced from Cork Airport. The existing quarry and continuance of use of same is not of sufficient scale to have any direct or indirect impacts on the regional or local climatic conditions.

Many developments have the potential to emit greenhouse gas (GHG) emissions to the atmosphere during the construction, operational and decommissioning phases of the development. GHG emissions at Rossmore Quarry have been calculated and are assessed as not significant in the context of existing national emission levels. Measures will be implemented to assess and/or monitor greenhouse gas emissions and to reduce these wherever practically possible.

The vulnerability of Rossmore Quarry to the effects of climate change has also been considered. Based on the development vulnerability assessment, measures to improve the resilience of the project to extreme rainfall, flood, flash flood, storms, and winds, are required. Specific climate change adaption / resilience measures are and will continue to be implemented at the quarry. The relative sea level rise (c. 25 cm over the next 50 years) and storm surges (50 to 100cm) will not materially impact on the quarry development over its operational life due to the topographic level differences between Rossmore Bay and the quarry property. Monitoring of the climate resilience measures shall be undertaken on a regular basis, and details of these reviews shall be recorded under the Environmental Management System (EMS) for the development

3.6 Air Quality

An assessment of fugitive dust emissions from the overall site has been undertaken. The assessment takes into consideration the potential sources, surrounding receptors, and the pathway between source and receptor in order to assess the magnitude of risk of impact without mitigation measures in place.

The main focus of the assessment is the potential impact on sensitive receptors from fugitive dust emissions from the following activities:

- transport – access road and internal haulage routes;
- extraction, storage and transfer of stone; and
- processing plants and facilities.

The sensitive receptors within 500 metres of the quarry extraction area were identified based on the land-use. A number of these receptors were assessed in greater detail, as they were considered to have a potential for a greater risk of dust impact.

In the absence of any mitigation measures, the risk of impact from dust emissions was determined to be 'insignificant ' to 'slight adverse'. With the management / mitigation measures in place, the risk of dust impacts is reduced to 'insignificant / acceptable' at all receptors.

A range of existing management measures have been and are in place to minimise the generation / migration of fugitive dust and to ensure that the extraction, processing and restoration operations comply with the relevant threshold values. These management measures are in accordance with the best environmental practice measures for the sector, and include:

- Processing plant is fitted with dust suppression (water sprays).
- All plant and machinery are regularly maintained.
- Dust suppression (e.g. water bowser) is utilised to suppress dust on internal haul road surfaces, in dry weather.
- Existing overall site boundary hedgerows have been maintained and encouraged over the years so as to help minimise the migration of dust beyond the overall site boundary.

- The perimeter screening berms constructed are vegetated mitigate against the migration of dust beyond the site boundary.
- Vehicle speeds are and will continue to be controlled on all internal haul roads. Internal traffic management measures have been implemented within the overall site including speed limit signage.
- Surfacing of access road.
- Wheelwash facility.
- Use of a road sweeper.

Dust deposition monitoring carried out at the overall site boundaries indicates that there is compliance with the recommended dust deposition emission limit value of 350 mg/m2/day (averaged over 30 days) set out in the environmental management guidance for the sector.

Based on the above, it is concluded that deepening of the existing quarry and related quarrying operations with continued implementation of the existing management measures, will not have a significant dust deposition impact on human receptors or sites designated for nature conservation (Great Island Channel SAC 001058 and Cork Harbour SPA 004030). Overall, the effects of the development on air quality are considered to be acceptable.

Dust deposition monitoring will continue be undertaken as part of the existing environmental monitoring programme at the quarry. Dust monitoring locations shall be reviewed and revised where and as/when necessary. The results of the dust monitoring shall be submitted to Cork County Council on a regular basis for review and record purposes.

3.7 Noise

Rossmore Quarry is an existing operation. Existing measured noise conditions associated with overall site activities (including ancillary activities) were applied to assess the potential noise and impacts at sensitive receptors and identification of potential impacts.

The existing noise monitoring carried out at the quarry confirms that noise levels recorded comply with the noise threshold limits set out in Condition No. 10 of the An Bord Pleanála Planning Ref. QD 04.QD0010. This monitoring is representative of the cumulative noise levels from all activities on the site.

A noise assessment shows that the potential impact of the existing activities within the overall site (including the application site), the predicted specific LAr, 1hr dB(A) are below the noise criterion limits for daytime at all the nearest noise sensitive locations. There will be no operational changes of noise associated with the existing activities in the application site and the likely noise levels that would be generated by the manufacturing and ancillary plant operations at the overall site will not change. No further mitigation measures are required.

With respect to ecological receptors, noise levels measured at the Rossmore site boundary from all quarry operations do not and will not exceed the noise guidance limits of LAeq 55dB and maximum noise emission levels are below LAmax 80dB therefore there will be a negligible noise impact on the Natura 2000 / designated European sites (SAC / SPA).

A number of existing mitigation measures are in place to minimise the generation and migration of noise, and these will continue to be implemented. These mitigation measures are in accordance with the best practice measures for the sector and include:

- Existing screening berms will be retained and will act as acoustic barriers to the closest residences;
- Existing perimeter hedge planting will be retained along the northern, southern and western quarry boundaries;
- Screening berms will be inspected on a regular basis and maintained as necessary.
- All mobile crushing will continue to take place on the quarry floor, behind newly exposed quarry faces;
- All mobile plant used at the development will have noise emission levels that comply with the limiting levels defined in EC Directive 86/662/EEC and any subsequent amendments;
- All plant items will be properly and regularly maintained and operated according to the manufacturers' recommendations, in such a manner as to avoid causing excessive noise (i.e. all moving parts are kept well lubricated, all cutting edges are kept sharpened, the integrity of silencers and acoustic hoods are maintained);
- All plant will be fitted with effective exhaust silencers which are maintained in good working order to meet manufacturers' noise rating levels. Any defective silencers will be replaced immediately.

There is an existing noise monitoring programme in place at the site. The results of the noise monitoring are submitted to Cork County Council on a regular basis for record purposes.

3.8 Vibration

Blasting operations will continue in the existing quarry. Blasting-induced vibration is impulsive and transient in nature. A typical blast consists of a number of drilled blast holes into which are placed explosive charges. The charged holes are detonated individually by use of detonators, each with different delays.

The main reason for complaints from blast-induced vibration is usually attributed to the fear of damage and/or nuisance rather than actual damage or nuisance itself. The human body is very sensitive to vibration; this can result in concerns being raised at vibration levels well below the threshold of cosmetic damage to buildings or the levels stated in the existing planning conditions.

The frequency of blasts is dependent on market demand. The duration of a blast in terms of noise is of short duration, similar to a clap of thunder.

The following measures have been and are implemented at the quarry to minimise disturbances due to blasting operations. These mitigation measures are in accordance with the '*best practice / mitigation'* measures described in Section 3.2 of the DoEHLG (2004) guidelines.

- Blasting will not be carried out on Saturdays, Sundays or public holidays;
- Written notification of each blast will continue to be provided 7 days in advance of each blast, to all residences within c. 1km radius of the quarry;

- On the morning of each blast, the quarry manager provides verbal confirmation (by telephone) to local residents to confirm that the blast is due to take place on the day;
- Additional verbal confirmation is provided by the quarry manager later in the day, when the exact time of the blast is confirmed;
- Blast notification is provided by pre-blast and post-blast siren warnings;
- All blasting operations are carried out by a certified 'shotfirer' in accordance with the relevant health and safety regulations;
- The optimum blast ratio is maintained, and the maximum instantaneous charge shall be optimised.
- The blast design and blasting methodology uses the monitoring results to optimise and ensure consistent blast designs.

To avoid any risk of damage to properties in the vicinity of the site, the groundborne vibration levels from blasting do not exceed a peak particle velocity of 12 mm/sec, in accordance with the existing planning permission - An Bord Pleanála Planning Ref. QD 04.QD0010 Condition No. 12

A review of the blast monitoring results at the quarry indicate indicate that the air overpressure and the groundborne vibration levels comply with the threshold limit values set out in condition no. 12 of the An Bord Pleanála Planning Ref. QD 04.QD0010.

On the basis of the historical and existing blasting results, and the distance between proposed development and receptors, it is concluded that continuing of blasting operations within the existing quarry will have no significant impact on any sensitive receptors.

Monitoring of blasts (both for groundborne vibration and air overpressure) have been and continue to be carried out at the quarry. The blast monitoring results have been and continue to be submitted on a regular basis to Cork County Council for record purposes. The scope of the blast monitoring has been and continues to be reviewed annually.

3.9 Material Assets

The local material assets in the vicinity of the overall site include residential buildings, historic buildings/monuments, road infrastructure, built services (ESB and water mains etc.) and waste management. Consideration of residential buildings; historic buildings / monuments and road infrastructure is assessed under the topics of Air Quality; Noise & Vibration; Cultural Heritage and Traffic.

The existing road access infrastructure, processing, and ancillary development is in place and there will be no site establishment or preparatory works required. The proposed development will not require the installation of electricity, water supply, telecommunications or wastewater infrastructure. All of the necessary infrastructure is already provided within the overall site. Given that the proposed development does not require the provision of any additional built services and the overall site currently operates without significant adverse effects on built services, it is considered that the proposed development would not have any significant, adverse, direct or indirect effects on water supply, wastewater, telecommunications or electricity supply.

The proposed development relates to the deepening of the existing quarry. No construction stage arises and accordingly there will be no construction stage impacts. There are existing waste

management arrangements in place in relation to general waste that would be generated by the staff working at the overall site. These arrangements will remain in place for the duration of the operational stage. Any waste generated by the operational stage works will be handled and stored in an appropriate manner and will be removed off site by an appropriately licenced waste collector. The limited volume of general waste generated within the overall site is appropriately handled. It is considered, therefore, that the impact of waste generation from the proposed development will be medium-term, temporary and insignificant.

3.10 Cultural Heritage

The cultural heritage component of the environmental impact assessment report for the proposed development at Rossmore Quarry consisted of desk-based assessment and field inspection undertaken within the overall quarry site.

There are no recorded monuments located within the application site. The closest Recorded Monument to the application area externally is RMP CO076-007---- a Lime Kiln in Barryscourt townland. This monument is situated 0.42km north of the application area and is considered to be too far distant to be directly or indirectly impacted by the proposed development.

There are no structures identified on the National Inventory of Architectural Heritage within the application site. There is one structure included in the NIAH situated outside the application area in the study area. This house in Barryscourt townland No. 20907613, is located 0.52km to the north of the application area. This structure is considered to be too far distant to be directly or indirectly impacted by the proposed development.

There will be no direct impacts on any known items of archaeology, cultural heritage or buildings of heritage interest in the application area or the vicinity. There will be no indirect impacts on any known items of archaeology, cultural heritage or buildings of heritage interest in the application area or the vicinity. No mitigation or monitoring measures are required in relation to cultural heritage.

3.11 Landscape & Visual

A landscape and visual impact assessment (LVIA) of the proposed development at Rossmore Quarry has been completed in accordance with accepted guidance.

The proposed development would occur in a landscape which features an existing quarry, as well as many other manmade influences, located within a designated High Value Landscape (HVL). The proposed development constitutes the continuation of existing permitted extraction activities, resulting in the introduction of a permanent lake within the quarry void, as part of final restoration works. This waterbody would be substantially screened from the surrounding landscape by existing berms and vegetation along the site boundaries, as well as proposed additional planting. There would be no change in terms of loss of farmland land cover or loss of landscape elements such as trees, hedgerows and woodland. Overall, the proposed development is deemed to have negligible landscape effects and to be compliant with landscape policy set out in the County Development Plan.

The visibility of the application area was initially assessed by a desktop study of ordnance survey mapping, Zone of Theoretical Visibility (ZTV) mapping and available aerial photography, followed by a field survey. This field survey revealed that the topography of the existing quarry development, including the vegetated boundary berms, ensure that the application area is not visible in the vast majority of views from the surrounding landscape, in particular from locations on low-lying or

undulating land. Further to that, local topographical changes, and dense roadside, as well as frequent intervening hedgerow and woodland vegetation, greatly restrict views towards the application area.

The only views of the application area can be gained from a number of locations between 1.5-3km to the south-west of the application area. Parts of the existing northern and eastern quarry faces and are intermittently visible from the elevated sections of three local roads on the northern side of Great Island. Roadside vegetation restricts the number of available views. Some of the existing plant and structures, but which are not located within the application area, are visible to the front of the quarry void in these views. While it is acknowledged that there are many similar views from agricultural fields within the elevated land on the northside of Great Island, these are typically not publicly accessible and were therefore not considered further as part of the visual assessment.

Effects on visual amenity at a sample viewpoint along one of the local roads on the northern side of Great Island are documented in the EIAR. The existing quarry faces, which are visible as a narrow band in the midground of available views, will be pushed back slightly. Also, the removal of stockpiles and the early stages of the lowering of the quarry floor will be visible. Once the quarry floor within the visible area has been lowered by one bench, all further extraction activities will be fully screened. Any activities associated with the extraction works, e.g. the transport of material from the extraction void to the processing area, will not change from what is currently visible. All changes will be fully contained within the existing visible quarry development and no characteristic elements removed or new elements added. As a result, the change to existing views will be barely perceptible. Also considering the small number of viewers (i.e. users of the local roads and local residents) and the short duration of extraction works visible (i.e. the changes to the upper quarry faces), the visual effects were assessed as minor/negligible or less.

The proposed development will not result in any changes to the existing settlement pond/infiltration pond system for the duration of the extraction works (until final restoration of the overall site). Also considering that the pond is very well screened by surrounding topography and vegetation, there will be no visual effects associated with this section of the application area.

During the post-operational stage following permanent cessation of extraction, plant and machinery will be removed, and the site will be restored in accordance with the Restoration Plan illustrated in Figure NTS 4. This restoration will result in some beneficial effects on surrounding landscape and visual amenity compared with the current baseline.

The ZTV mapping provided with the EIAR was used to assess the differences between the permitted and the proposed development. Only minor changes to the areas of theoretical visibility were identified, which can be attributed to the proposed changes to the upper quarry faces. As a result, it can be said that the difference between the permitted development and what is proposed now is in a slightly longer duration of the extraction works, prior to the final restoration of the quarry development, but not in changes to what will be visible. The end result with regard to landscape and visual effects, following final restoration, will be almost identical.

3.12 Traffic

The planning application relates to the further development of the existing Lagan Quarry located at Rossmore, Carrigtwohill, Co. Cork. An extraction capacity of up to 375,000 tonnes per annum is sought to provide the applicant with the ability to respond to demand for aggregates for large infrastructure projects in the Region.

Part of this will continue to be transferred to the on-site asphalt plant for use in the manufacture of bituminous bound materials, and also to the permitted readymix concrete plant and ground limestone

processing plant, if constructed, while the balance will continue to be transported off-site, both to external customers and to other Lagan locations for use in the manufacture of value added products.

The quarry is located approximately 2km south of Carrigtwohill town, 1.5km south of the N25 National Road, and approximately 18km east of Cork City. Quarry traffic will utilise an existing private access extending approximately 750m south of its junction with L7645 and L3619.

Classified vehicle turning counts were carried out on the 13th April 2021 at the junctions between the L7645/L3619, the L3619/Father O'Keefe Terrace, L7645/L3612 and the N25 Interchange.

The "Traffic and Transport Assessment Guidelines" published by Transport Infrastructure Ireland recommend the assessment of traffic in the Base Year, for the Opening Year, the Opening Year +5 years and the Opening Year +15 years. The assessment years for the impact assessment are therefore 2021 for the Base Year, 2022 for the Opening Year, 2027 and 2037 for the Future Assessment Years.

An assessment of link capacity on the L7645 and the L3619 was undertaken for 2022, 2027 and 2037. It was determined that both roads will continue to operate within capacity for each of the assessment years 2022, 2027 and 2037.

Junction Capacity Analysis was undertaken at the junctions between the L7645/L3619, the L7645/L3612 and the N25 Interchange. The results of the Junction Capacity Analysis indicate that all junctions assessed will operate within capacity for each of the assessment years 2021 (Base Year), 2022 (Opening year), 2027, and 2037.

Sightlines have been assessed at the development access against Section 5.6.3 of TII Publications document DN-GEO-03060, which requires 160m of unobstructed visibility (where the design speed is 85kph) at a point 3.0m back from the edge of the carriageway. The visibility to the north satisfies the sightline requirements of the TII Publications document "Rural Link Design" (DN-GEO-03031), Table 1.3 for a posted speed of 80km/hr

Due to the rural character of the area, there are no pedestrian and cyclist facilities in the vicinity of the quarry, however the absence of VRU facilities at this location is not connected with, or affected by, the operation of the quarry.

This Traffic and Transport Assessment concludes that the local road network will continue to operate within capacity for each of the assessment years 2021, 2022, 2027 and 2037 and that the quarry will have a negligible impact on the operation of the road network in the vicinity of the quarry.

3.13 Interaction of the Foregoing

The interactions of the various potential impacts and mitigation measures have been covered, where applicable, under the relevant sections within the EIAR.

FIGURES

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NOTES

1. ORDNANCE SURVEY IRELAND LICENCE NO. CYAL50167032 (C) ORDNANCE SURVEY IRELAND / GOVERNMENT OF IRELAND.

2. EXTRACT FROM OS DISCOVERY SERIES MAP REF NO'S: 1606; 1806.

LEGEND

LAND OWNERSHIP AREA

APPLICATION AREA

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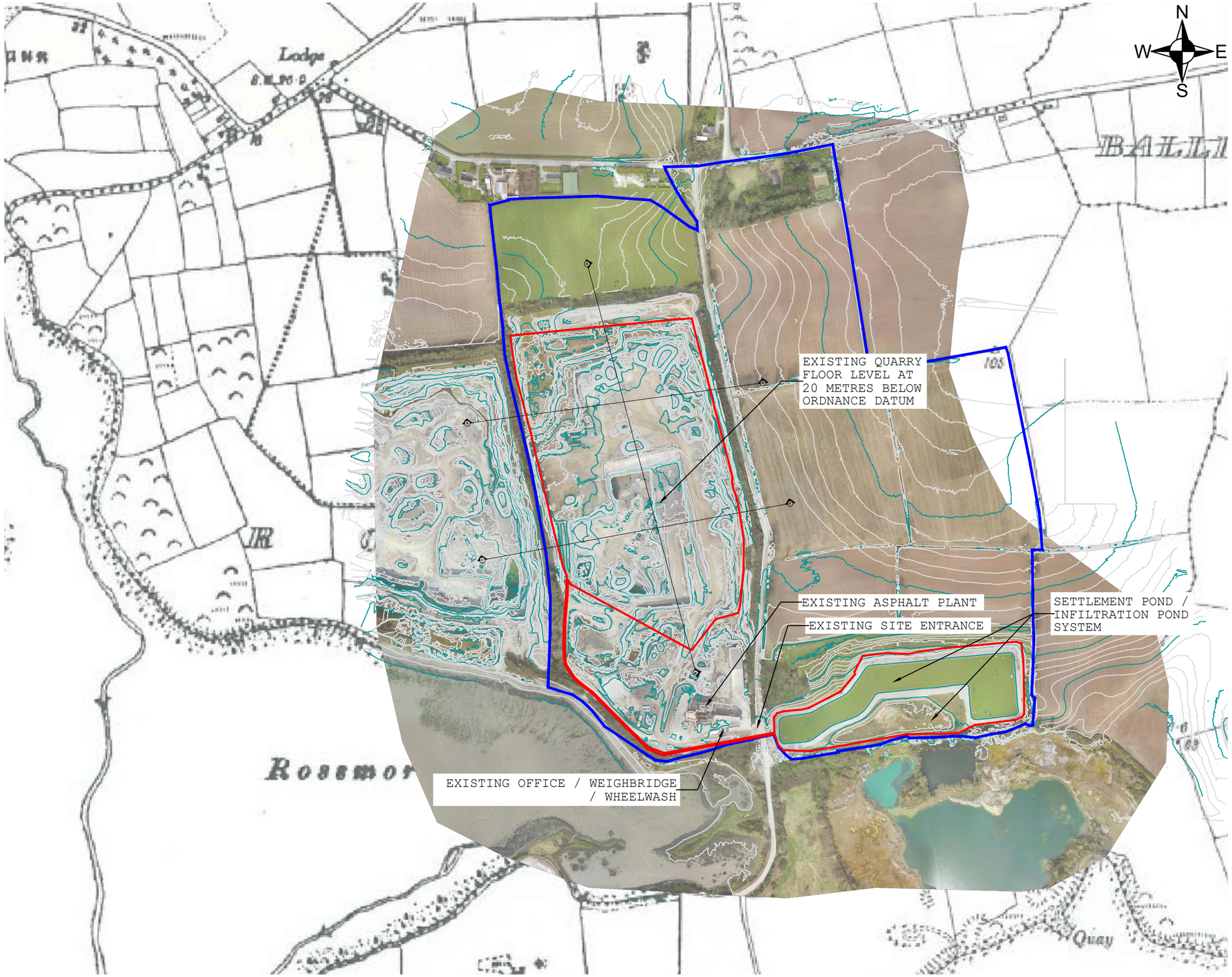
SITE LOCATION

FIGURE NTS 1

Scale: 1:25,000 @ A3

Date: OCTOBER 2021

501.00584.00024.FIG NTS1.dwg



NOTES

1. ORDNANCE SURVEY IRELAND LICENCE NO. CYAL50167032 (C) ORDNANCE SURVEY IRELAND / GOVERNMENT OF IRELAND.

2. AERIAL PHOTOGRAPHY CARRIED OUT BY SLR CONSULTING MARCH 2021

LEGEND

LAND OWNERSHIP (c. 43.5 Ha.)

APPLICATION AREA (c. 12.6 Ha.)

B — CROSS SECTION LOCATION REFER TO FIGURE 2.3

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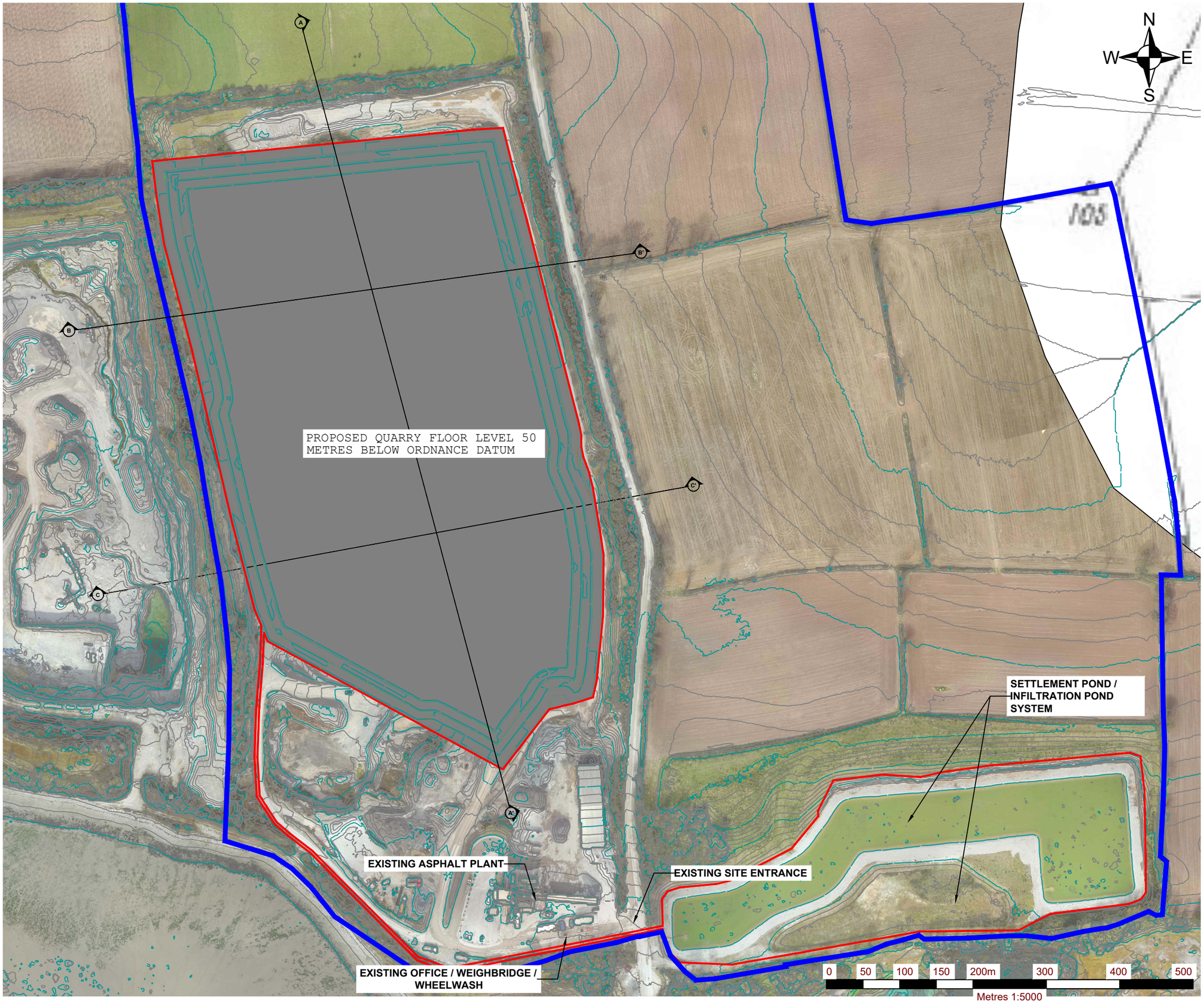
EXISTING SITE LAYOUT

FIGURE NTS 2

Scale: 1:5,000 @ A3

Date: OCTOBER 2021

501.00584.00024.FIG NTS2.dwg



NOTES

1. ORDNANCE SURVEY IRELAND LICENCE NO. CYAL50167032 (C) ORDNANCE SURVEY IRELAND / GOVERNMENT OF IRELAND.

2. AERIAL PHOTOGRAPHY CARRIED OUT BY SLR CONSULTING MARCH 2021

LEGEND

- LAND OWNERSHIP (c. 43.5 Ha.)
- APPLICATION AREA (c. 12.6 Ha.)
- B — CROSS SECTION LOCATION REFER TO FIGURE 2.3

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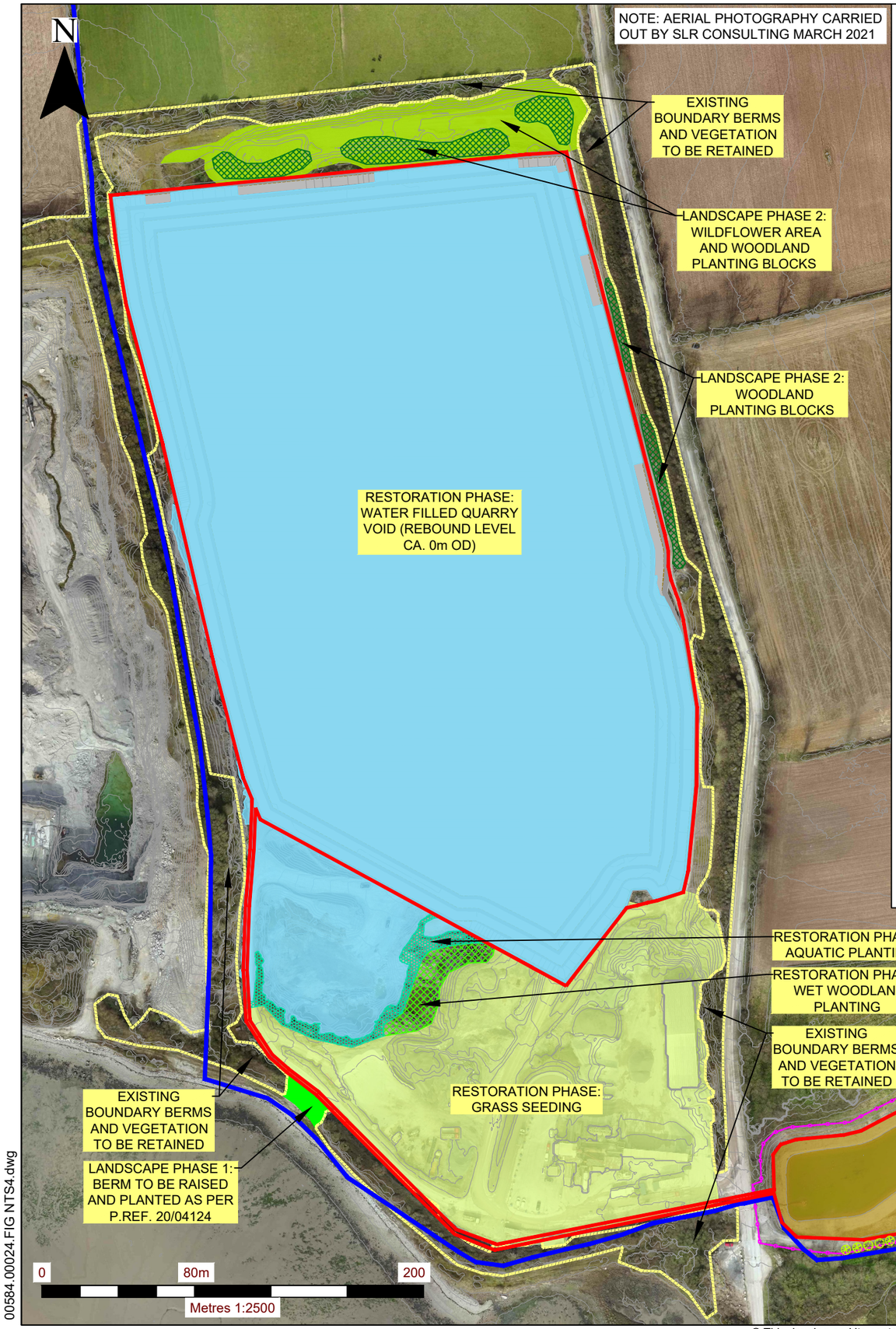
PROPOSED SITE LAYOUT

FIGURE NTS 3

Scale: 1:5,000 @ A3

Date: OCTOBER 2021

00584.00024.FIG NTS3.dwg



LANDSCAPE MITIGATION AND RESTORATION PROPOSALS

The proposed landscape and restoration works at Rossmore Quarry will be carried out on a phased basis, as described further below. It is proposed to restore the the site to a natural habitat, which is one of the beneficial afteruses recommended in the EPA Guidelines 'Environmental Management in the Extractive Industry' (2006). All existing boundary screening berms and vegetation will be retained.

LANDSCAPE PHASE 1 - TO BE CARRIED OUT ON COMMENCEMENT OF THE PROPOSED DEVELOPMENT

- A gap in the berm along the southern boundary will be closed by raising the relevant section of the berm slightly, using overburden from within the site, and planting a native shrub mix, as permitted under P.Ref. 20/04124 (refer to Drawing 5 submitted with the planning application for further details).
- Rows of pedunculate oak and downy birch (selected standard size) will be planted in a number of locations along the southern boundary of the settlement pond / infiltration pond system, as indicated on the plan (refer to Planning Drawing 5).

LANDSCAPE PHASE 2 - TO BE CARRIED OUT DURING THE COURSE OF THE PROPOSED DEVELOPMENT

- As soon as all overburden has been placed into the area along the northern boundary, those parts of the disturbed area to be turned into a wildflower meadow will be covered with a maximum 5cm of soil from stores within the site. The wildflower area will then be seeded with a suitable wildflower mix, such as the 'Seaside Wildflora Mix', Product Code: EC06 by wildflowers.ie (refer to: http://www.wildflowers.ie/mixes/ec/ec06.htm), or similar, to be agreed with Cork County Council.
- The proposed woodland planting areas along the northern and eastern boundary, will be covered with 20cm of soil from stores on site, as soon as they become available, and will be planted with a native woodland mix (refer to Planning Drawing 5).

RESTORATION PHASE - TO BE CARRIED OUT ON COMPLETION OF ALL EXTRACTION WORKS

- The quarry void will be cleared of all plant, machinery and stockpiles and left to naturally re-fill with water. The water rebound level is expected to be around 0m OD, which will result in some shallow water areas at the southern end of the waterbody.
- The shores of the shallow water area will be planted with an aquatic plant mix (as soon as the water levels have fully rebound - refer to Planning Drawing 5). Please note that for health and safety reasons it is not feasible to carry out planting on those sections of the upper quarry benches which will remain above the water level, i.e. along the western, northern and eastern boundary of the water body.
- To the east of the shallow water and aquatic planting an area will be covered with 20cm of soil from stores on site and a block of wet woodland planting will be carried out (refer to Planning Drawing 5). This will increase the variety of habitats present and therefore the biodiversity of the restoration area.
- The processing area will be cleared of all plant, machinery and stockpiles. It will then be levelled, covered with any leftover overburden and soil material and seeded with a native grass mix (refer to Planning Drawing 5).
- The settlement pond / infiltration pond system will be left for natural regeneration. For health & safety reasons it is not possible to carry out planting within the settlement pond area. It is therefore more practicable to let the pond dry out naturally and become colonised with locally occuring grass and scrub species. The existing secure fencing surrounding the pond system will be retained and prevent unauthorised access to this area.

GENERAL NOTES

Grass/Wildflower Seeding: Surface preparation, seeding and establishment works of the wildflower / grass areas will be carried out by a suitably experienced landscape contractor, as per the manufacturer's instructions. Seeding will take place whilst suitable weather conditions prevail.

Aquatic Planting: The aquatic planting will be carried out by a suitably experienced landscape contractor under supervision of an ecologist.

Woodland / Tree Planting: All proposed species are native and are typically present in the local area.
All plants to be protected with spiral guards or alternatively with rabbit proof fencing. All plant handling, planting and establishment works will be carried out in accordance with current best practice and will take place in the appropriate planting season (e.g. bareroot planting: November to March only and in favourable weather conditions by a suitably qualified landscape contractor.

Aftercare: Establishment maintenance will be carried out for 2 years following each phase of the planting works (minimum 3 maintenance visits per year; i.e. spring, summer and autumn). This will include weed control, replacement planting where required and the adjustment/removal of tree ties and spiral guards. With regard to the wildflower area this will cover all necessary maintenance tasks (e.g. grass cutting and removal of cut material from site) to achieve successful establishment.

LEGEND

- LAND OWNERSHIP (c. 43.5 Ha.)
- APPLICATION AREA (c. 12.6 Ha.)

EXISTING FEATURES TO BE RETAINED

- BOUNDARY SCREENING BERMS AND VEGETATION
- SECURE FENCE SURROUNDING THE SETTLEMENT POND / INFILTRATION POND SYSTEM

LANDSCAPE PHASE 1
(TO BE CARRIED OUT ON COMMENCEMENT OF THE PROPOSED DEVELOPMENT)

- RAISING OF BOUNDARY BERM AND PLANTING TO CLOSE GAP, AS PER P.REF. 20/04124
- PEDUNCULATE OAK AND DOWNY BIRCH TREE PLANTING (SELECTED STANDARD SIZE)

LANDSCAPE PHASE 2
(TO BE CARRIED OUT DURING THE COURSE OF THE PROPOSED DEVELOPMENT, AS AREAS BECOME AVAILABLE)

- WILDFLOWER SEEDING ON NORTHERN BOUNDARY BERM
- WOODLAND BLOCKS ON NORTHERN BOUNDARY BERM AND ALONG EASTERN BOUNDARY

RESTORATION PHASE
(TO BE CARRIED OUT ON COMPLETION OF ALL EXTRACTION WORKS)

- QUARRY VOID TO BE LEFT TO NATURALLY FILL WITH WATER (REBOUND LEVEL CA. 0m OD)
- AQUATIC PLANTING ALONG SHALLOW EDGES OF WATERBODY
- WET WOODLAND PLANTING BLOCK
- PROCESSING AREA TO BE CLEARED, LEVELLED, COVERED WITH SOIL AND GRASS SEEDED
- SETTLEMENT POND / INFILTRATION POND SYSTEM TO BE LEFT FOR NATURAL REGENERATION

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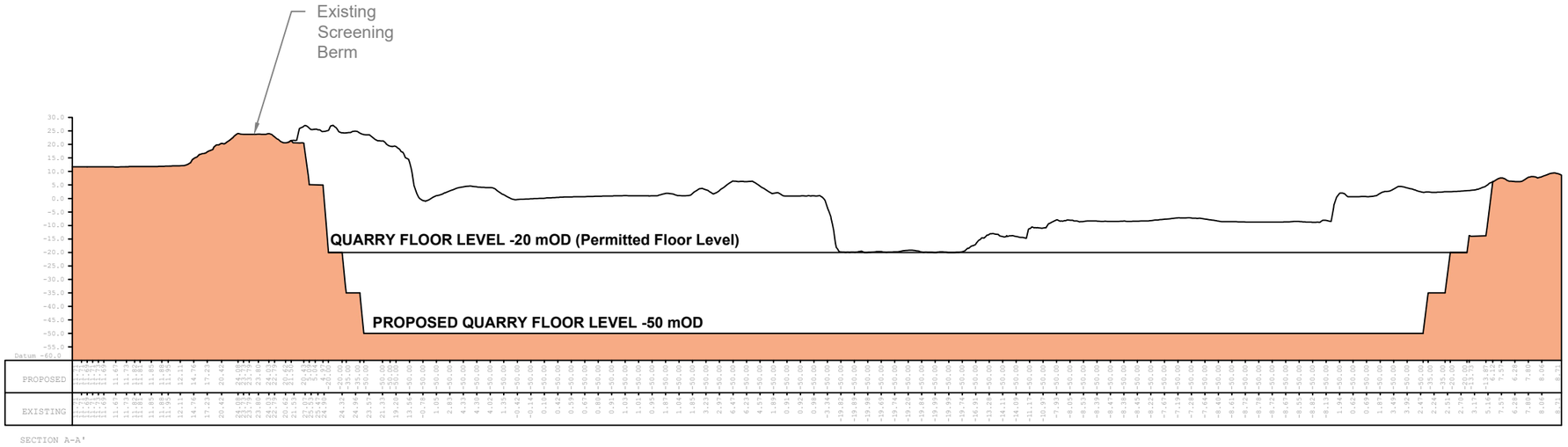
LANDSCAPE MITIGATION AND RESTORATION PLAN

FIGURE NTS 4

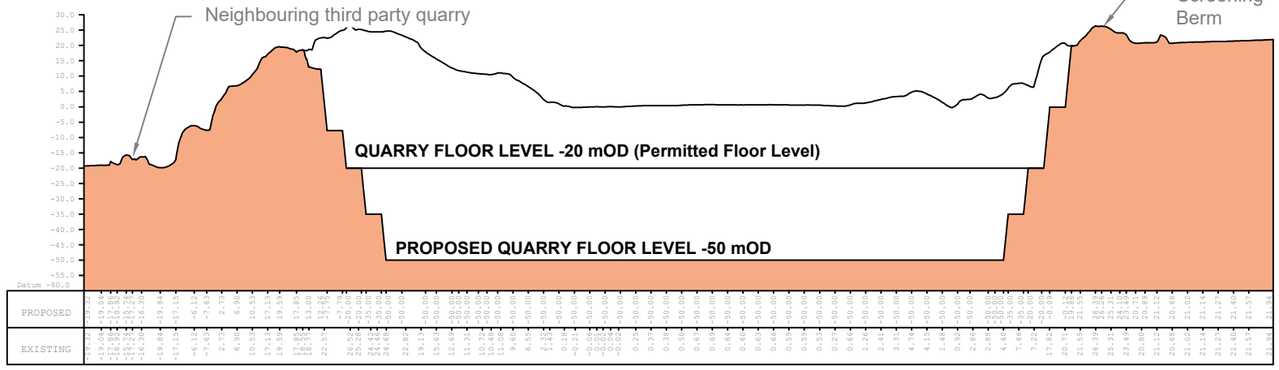
Scale: 1:2,500 @ A3

Date: OCTOBER 2021

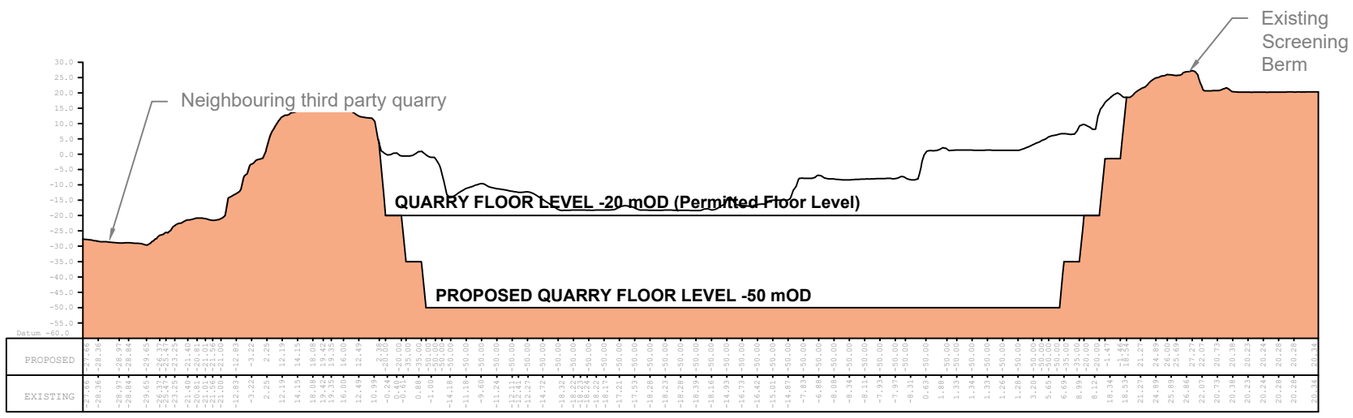
00584.00024.FIG NTS4.dwg



SECTION A-A'



SECTION B-B'



SECTION C-C'

REFER TO FIGURES NTS2 & NTS3 FOR CROSS SECTION LOCATIONS

0 20 40 60 80m 120 160 200

Metres 1:2000

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EXISTING AND PROPOSED CROSS SECTIONS

FIGURE NTS 5

Scale	Date
1:2,000 @ A3	OCTOBER 2021

00584.00024.FIG NTS5.dwg