BARBAE QUARRY, NEAR GIRVAN

PROPOSED QUARRY EXTENSION & DEDICATED HAUL ROAD

EIA SCOPING REPORT

AUGUST 2018

BREEDON

CONTENTS

TEXT **PAGE NO.**

DRAWINGS

APPENDICES

1.0 The Site & The Proposed Development

1.1 Introduction

This EIA Scoping Report is submitted in advance of a Planning Application for an extension to the existing Permission for mineral extraction and processing at Barbae Quarry. Operations at Barbae Quarry currently take place under planning certificate 16/00430/ROMP the conditions pertaining to which were approved following a Review of Old Minerals Permission (ROMP) application on 5th October 2016. Planning permission for mineral extraction at the site does not expire until 31 December 2042.

The rock at Barbae is primarily used for single sized aggregates for sale as high PSV stone for road surfacing across the North of the UK and single sized aggregates and manufactured sand used in the production of asphalt and concrete more locally. Barbae Quarry is a source of High PSV road surfacing aggregates which are only available from a limited number of locations within Scotland and is therefore of national significance.

The requirement for high PSV aggregate is quite separate from that of general purpose aggregates for concrete, asphalt and general construction materials for the local market.

Rock reserves within the current planning permission are limited to circa 400,000 tonnes of material, at the current rate of extraction this tonnage of material will be quarried in the next 3 to 4 years; Therefore it is proposed to prepare a planning application to increase the permitted rock reserve at Barbae to allow extraction to continue until current planning end date of 31 December 2042. The site is geographically constrained with little or no space available on the quarry floor for rock processing.

This report aims to provide the necessary information to the planning authority in order for it to provide a Scoping opinion in respect of this proposed development in accordance with The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.

1.2 Site Description

Barbae Quarry is located approximately 5km south-east of the town of Girvan, South Ayrshire. Barbae Quarry is adjacent to another existing quarry at Tormitchell. with High Troweir wind farm to the west and Hadyard Hill wind farm to the north east. The site is accessed via the C13 Pinmore Road which runs directly to the east of the site.

The existing permitted quarry comprises approximately 6.5 hectares of ground whilst the area of mineral extraction comprises circa 2.5 hectares. Elevations across this area vary from 190m AOD or thereby in the West of the existing site above the quarry faces to 130m AOD or thereby in the east close to the Pinmore road. Much of the quarry area including the area of mineral extraction has been stripped of soils to allow for mineral extraction and ancillary activities. Recent rock extraction has established regularised working benches on the 155m AOD and 170m AOD bench levels as shown on Drawing No B10/SCO/02. The full extent of permitted mineral extraction within Barbae Quarry is shown on Drawing No B10/RA/03.

The land comprising the proposed extension to the quarry forms a portion of Barbae hill rising from circa 130m AOD on the southern site boundary to 224m AOD at the high point at the maximum westerly edge of the extension area.

1.3 Site History

Barbae was originally granted planning permission under planning Consent A/488/Q following a planning application submitted in December 1948. The site has operated on an intermittent basis since this time. The ancillary facilities including site access and settlement lagoons are permitted under approval 98/00291/FUL. All operations at the site now take place under planning certificate 16/00430/ROMP the conditions pertaining to which were approved on 5th October 2016 following a Review of Old Minerals Permission (ROMP) application.

The importation of rock from Barbae to Tormitchell and its processing at Tormitchell is permitted under planning permission A/488/Q and provided for under planning certificate 16/00429/ROMP approved on 5th October 2016 following a Review of Old Minerals Permission (ROMP) application for Tormitchell Quarry. The boundary of this permitted area is shown on Drawing B10/SCO/02

1.4 The Proposed Development

The rock at Barbae will continue to be won by drilling and blasting. The operation will be carried out either by a specialist in house team or by using specialist drilling contractors. Following the introduction of very stringent regulations in recent years all blasts are now individually surveyed, designed and monitored to an exacting specification.

Blasting is designed to both dislodge and fragment the in-situ rock in order that it can be lifted directly by excavator and loaded onto plant. The rock at Barbae is primarily used for single sized aggregates for sale as high PSV stone for road surfacing and single sized aggregates and manufactured sand used in the production of asphalt and concrete. The production of single sized aggregates requires large processing areas. The existing permitted site at Barbae Quarry is extremely constrained with little or no space available for the processing of rock products particularly given the need to wash these premium grade products in advance of sale.

Proposals for further mineral extraction will continue use existing drill and blast methods to extend the working area to the west by approximately a further 6 ha at maximum depth of 144m AOD. The proposal would allow the existing quarry faces to be pushed back in a westerly direction with benches developed on the 205m, 190m, 175m, 160m and 144/145m AOD levels.

It is anticipated that the overall output from Barbae and Tormitchell will remain the same as at present at up 200,000 tonnes per annum. As the development progresses, it is envisaged that output from Barbae would latterly contribute 150,000 Tonnes per annum.

Given the constrained nature of Barbae Quarry and the requirement to process the high PSV mineral it is proposed that dedicated haul route is formed between Barbae Quarry and Tormitchell Quarry. The two sites and the proposed haul route are shown on Drawing No B10/SCO/03.

The land on which the dedicated haul route would be formed rises initially from east to west from circa 130m AOD adjacent to the entrance to Barbae Quarry to 204m AOD or thereby within the existing shelterbelt to the north of Tormitchell Quarry before dropping to 166m AOD or thereby as it joins the existing track adjacent to Tormitchell Quarry. Further details of current elevations across these areas are shown on Drawing No B10/SCO/02.

In the short and medium term it is intended that blasted rock will be transported by a dedicated haul road constructed to Tormitchell Quarry where processing will continue to be carried out using mobile primary, secondary and tertiary crushers and associated screening plant with subsequent washing of material undertaken as required.

This would be a continuation of the current processing arrangements where mineral is transported to Tormitchell Quarry for processing. Transit is currently via the public road therefore the proposed dedicated haul route is considered to be a significant improvement to general amenity by reducing vehicle movements on the public roads.

As the development progresses and the developed area of quarry floor increases it will become possible to carry out dry processing (crushing and screening) in the quarry which will reduce the number of vehicle movements between Barbae and Tormitchell Quarry.

Drawing reference B10/SCO/03 enclosed shows a draft overall extraction design for the proposed extension which will release circa 3.75 million tonnes of reserves facilitating continued extraction upon the site until the currently permitted end date of 31 December 2042 together with the anticipated route of the dedicated haul road. The overall design of these facilities will be refined through the EIA process. Proposed extraction will be broken down in phases incorporating progressive restoration and landscaping where possible and an appropriate final restoration design whilst suitable planting will be proposed for the haul road. It is proposed that the dedicated haul route will be narrowed where necessary and retained as an agricultural track following the completion of the development. These measures will be incorporated into the proposals in consultation with the appointed landscape and visual advisors as part of the refinement of the design.

Drawing reference 16311-SK-06 provides for the upgrade of the existing access at Barbae and the access from the dedicated haul road to the Barbae site at the proposed crossing point. In this regard visibility splays of 120x 4.5m have been designed for the junction. A speed survey has been carried out to confirm the acceptability of this junction design. The 7-day speed survey identified maximum 85th percentile speeds on approach to the junction as proposed that are within the 70kph design speed applicable to the 4.5m by 120m visibility splays achieved by the proposed junction layout. It is also relevant to note that the maximum speeds noted occurred only during one hour within the entire week, and that the average 85th percentile speeds at each site in fact are circa 50kph, which is well within the 70kph which the proposed visibility splays provide for.

The junction as proposed would meet the requirements of road safety with relevance to the prevailing conditions on the road. A detailed construction design will be developed for the junction as part of the planning application.

Once completed it is anticipated that this junction upgrade will facilitate:

- The export of unprocessed face rock whilst processing is not being carried out at the site to Tormitchell Quarry for processing and directly from the site to customers should the need arise.
- The despatch of processed rock directly to customers once processing is carried out on site in the longer term.

1.5 The Developer

Breedon Group plc is the largest independent construction materials group in the UK and Ireland employing more than 3000 people. The company supplies an extensive range of products and services to the construction and building sectors.

Breedon Group plc is split into five autonomous divisions. The applicant, Breedon Northern Limited, is the company's northern UK business headquartered in Dundee employing over 1000 people. It is one of the leading producers of concrete, sands, gravel, crushed rock, asphalt and concrete blocks in Scotland and Northern England operating quarries, concrete and asphalt plants throughout these areas.

In south west Scotland Breedon employs over 100 people including 12 people based at Barbae and Tormitchell Quarries with an additional 4 external hauliers based at the site. It is anticipated that the planning application will be submitted jointly by the developer and the landlord of Barbae Quarry; Benan.

2.0 Environmental Impact Assessment (EIA)

2.1 The Regulations

An Environmental Impact Assessment (EIA) systematically provides an assessment of the likely significant environmental effects generated by a project. This helps to ensure that the predicted effects, and the scope for reducing them are properly understood by the public and relevant competent authority before it makes a decision on the merits of a proposal.

In carrying out an EIA, reference is made to the following documents;

i) The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 – These regulations came into force in June 2011.
ii) Planning Circular 1 2017: The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.
iii) Planning Advice Note 1/2013 Environmental Impact Assessment

The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 (the Regulations) specify the projects for which an EIA is or may be required. That is;-

i) Development that falls within a relevant description in schedule 1 of the Regulations always require an EIA referred to as a schedule 1 development.

With respect to quarries this is appropriate where the surface of the site exceeds 25 hectares.

ii) Developments of a type listed in schedule 2 of the regulations, referred to as schedule 2 development, where the provision of an EIA is discretionary.

If a quarry development is for less than 25 hectares it is at the discretion of the Planning Authority whether by virtue of the size, scale and duration of the working and the likely consequential impacts of matters such as traffic, noise and vibration and that an EIA is required. In these circumstances the applicant has considered the potential impacts of the development and determined that an EIA is necessary.

2.2 Scoping Study

Under Regulation 17 of The Regulations, a developer may ask the planning authority for their formal opinion on the information to be supplied in the EIA Report (a 'scoping opinion'). This provision allows the developer to be clear about what the planning authority considers the significant effects of the development are likely to be and, therefore, the topics on which the EIA report should focus.

A request for a scoping opinion must include (Regulation 17(2));

a) a description of the location of the development, including a plan sufficient to identify the land,
b) a brief description of the nature and purpose of the development and its likely significant effects on the environment,
c) such other information or representations as the person making the request may wish to provide or make.

This Scoping study has been prepared to address the requirements described above as part of a request for a Scoping Opinion.

In addition to the minimum requirements listed in points a) and b) above a desk based assessment of available background information on the site and its surrounds including identification of any statutory and non-statutory designations together with an examination of the physical site conditions has been carried out. Where necessary this has led to the appointment of appropriate specialists to advise on the proposed scope of works required in in relation to particular topics.

The findings of this assessment and subsequent specialist advice provided in relation to the scope of works required are detailed in Section 3.0.

3.0 Site Assessment

An investigation of the existing site conditions has been carried out taking into account the proposed development. This has reviewed the physical condition of the site, the nature of proposed development and desk based assessment of available background information on the site and its surrounds including identification of any statutory and non-statutory designations. Where necessary this has led to the appointment of appropriate specialists to advise on the proposed scope of works required in in relation to particular topics.

The findings of this assessment and subsequent specialist advice provided in relation to the scope of works required are detailed in Sections 3.1 to 3.12 below.

3.1 Landscape and Visual Impacts

SLR Consulting Ltd (SLR) has been appointed to assess the landscape and visual impact of the proposal and recommend that a Landscape and Visual Impact Assessment (LVIA) of the proposed development should be carried out. The Scope of works is detailed fully together with associated drawings in **Appendix 1** at the rear of this document and summarised below:

It is proposed that the LVIA work will be undertaken in accordance with Guidelines for Landscape and Visual Impact Assessment (3rd Edition), published by Landscape Institute and Institute of Environmental Management and Assessment in 2013 (GLVIA 3).

The LVIA will deal separately with potential landscape effects and potential visual effects, although where relevant and appropriate, cross references may be made to the same features or elements where they are relevant to both.

The cumulative assessment will be focused on potential effects of working and restoring the proposed extension area in conjunction with the existing permitted operations at Tormitchell Quarry and Barbae Quarry.

Baseline and Landscape Context

Barbae Quarry is an active operation accessed from the C13 Pinmore road adjacent to an isolated dwelling, Glenassel. All mineral won at Barbae Quarry is currently transported along the public highway to the existing plant at Tormitchell Quarry. Tormitchell Quarry is also an active operation worked concurrently with the site and accessed via Tormitchell Farm at c0.2km to the south

Permitted site activities at Tormitchell comprise mineral extraction and processing within the existing quarry, the importation and processing of excavated rock from Barbae, a concrete batching plant and a roadstone coating plant.

Drawing BQE-LA-1 shows the topographical setting and relationship between the two sites and also the proposed extension area and new haul road. The C13 Pinmore road runs along the bottom of a broad valley with Barbae Quarry to the west and Tormitchell Quarry to the east.

The proposed extension would include working parts of the hillside further to the west of the current quarry boundary. Mineral from the proposed extension area at Barbae Quarry would be transported along a new purpose built haul road to Tormitchell Quarry to be constructed as part of the development.

As shown on Drawing BQE-LA-2, the Barbae Quarry site is located within “Ayrshire Foothills” Landscape Character Area defined by SNH’s Ayrshire Landscape Assessment (1998). This area extends around the site, with the boundaries with the adjacent “Pastoral Valley” Landscape Character Area at c1.5km to the south-east, south and south-west and “Low Dale” at over 2km away to the north-west.

The more recent South Ayrshire Landscape Wind Capacity Study (2013) subdivides the above areas and describes Barbae Quarry as located within the “Coastal Foothills” Landscape Character Type, whilst Tormitchell Quarry is located within the “Foothills with Forest and Windfarm” Landscape Character Type. The boundary between the two types is defined by the north-south aligned public highway (Pinmore Road).

The proposed haul road would thus be located within “Ayrshire Foothills” Landscape Character Area defined by SNH’s Ayrshire Landscape Assessment (1998) and the “Foothills with Forest and Wind Farm” Landscape Character Type, as defined in the South Ayrshire Landscape Wind Capacity Study (2013).

Fieldwork was carried out by SLR in January 2016 to the site and surrounding areas, within a 4km study area in order support a Review of Old Minerals Permission (ROMP) applications in relation to the Babae and Tormitchell sites. It is proposed that this study area would also be adopted for the LVIA.

The South Ayrshire Local Development Plan (LDP) (2014) identifies the site as located within a Scenic Area. The LDP has a specific policy "Protecting the Landscape", which states *inter alia* that development within or next to Scenic Areas will be considered against "*the significance of impacts and cumulative impacts on the environment, particularly landscape and visual effects as informed by the Ayrshire Landscape Character Assessment (SNH 1998)*". This policy will be given due cogniscence within the LVIA

Proposed Representative Viewpoints

Paragraph 6.13 of GLVIA3 defines visual receptors as people living in the area, people who work there, people passing through on road, rail or other forms of transport, people visiting promoted landscapes or attractions, and people engaged in recreation of different types. As shown on Drawing BQE/LA/3, Drawing BQE/LA/4 and Drawing BQE/LA/5, comparative ZTVs have been prepared of the existing and proposed quarry landforms using LSS, along with a ZTV of the new haul road.

The ZTV assessment is limited to subtended vertical angles above 0.25˚. Areas with less than this theoretical angle are considered unlikely to generate significant effects. Furthermore the ZTV is based on a bare terrain; that is, the computer model does not include vegetation, structures or other buildings. As a result, the extent of visibility, which is illustrated, is very much a worst case scenario, and would be greatly reduced if other potentially screening features were included in the model.

Nevertheless, the ZTV studies have identified that the gently undulating landform, hills and enclosing valley sides limit the extent of potential views of the existing site and ongoing workings to a relatively localised area.

Following the initial desk based modelling of theoretical visibility associated with the ROMP for the existing quarry sites and a potential extension area, fieldwork was carried out in January 2016 to review the degree of additional screening provided by vegetation and/or built up areas and buildings.

In accordance with paragraph 6.20 of GLVIA3, the selection of the viewpoints to be used in the assessment has taken account of the following range of factors:

- The accessibility to the public;
- The potential number and sensitivity of viewers who may be affected;
- The viewing direction, distance (i.e. short-, medium-, and long-distance views) and elevation;
- The nature of the viewing experience (for example static views, views from settlements and views from sequential points along routes);
- The view type (for example panoramas, vistas and glimpses); and
- The potential for cumulative views of the proposed development in conjunction with other developments.

Photography and fieldwork analysis of views of the site was then carried out from the surrounding landscape. The object was to determine which locations offer the clearest views of the application site and/or are most accessible to the public and to identify representative viewpoints for detailed viewpoint analysis.

The proposed representative viewpoints to be included in the LVIA are provided in Table 3.1 below and are also shown on the suite of mapping and ZTV drawings.

Table 3.1

VP	Location / Description
1	View south from the minor road near to residential property “Tralodden Cottage”
2	View south from the minor road at the access road to residential property “High Troweir”
3	View south from minor road located 1km north of residential property “Glenassel”
4	View south-west from the minor road north of residential property “Glenassel”
5	View west and south from the minor road south of residential property “Glenassel”
6	View north and east from the minor road by farm/residential property “Tormitchell” and access road to Tormitchell Quarry
7	View north from the core path / Carrick Way on the edge of Tormitchell Quarry
8	View west from residential property “Dupin” on the core path / Carrick Way
9	View west from the core path / Carrick Way at a location 1km east of Dupin
10	View west from a distant hilltop near Hadyard Hill wind farm, accessed from the core path, but via an unmarked track

3.2 Ecology

Atmos Consulting (Atmos) has been appointed to assess the ecological impact of the proposed extension of Barbae Quarry, and haul route between Barbae and Tormitchell Quarries. The site context and proposed scope of works is detailed below

Guidance and legislation
Conservation of species and habitats in the UK is governed by designation and legal protection of sensitive features. Sites designated as Special Areas of Conservation (SAC) and/or Special Protection Areas (SPA) are of European Importance and are created under the European Commission (EC) Directives 92/43/EEC (the 'Habitats Directive') and 79/409/EEC (as replaced by 2009/147/EC, the 'Birds Directive'), respectively. Sites designated as 'Ramsar sites' are wetland areas of international importance designated under the Ramsar Convention (Ramsar, Iran, 1971). Sites that are considered of national importance are legally protected as Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Marine Nature Reserves (MNR), whereas sites of regional or local importance are protected as Local Nature Reserves (LNR). In addition to those statutory designations, a range of non-statutory designations also exist, such as Ancient Woodland Inventory (AWI) areas and Wildlife Sites (WS).

The legislative provisions in Scotland for the protection of wild species are contained primarily in the Wildlife and Countryside Act 1981, the Nature Conservation (Scotland) Act 2004, the Badgers Act 1992, the Deer Act 1963 (as amended by the Deer Act 1991) and the Conservation of Seals Act 1970. Some species receive strict protection as European Protected Species (EPS) under the Conservation (Natural Habitats, & c.) Regulations 1994.

In addition to those that are legally protected, some species and habitats are of conservation interest and require consideration by planning authorities. They are primarily listed on the Scottish Biodiversity List (SBL) (Scottish Government 2013) and the Ayrshire Local Biodiversity Action Plan (LBAP) (Ayrshire Biodiversity Partnership 2007).

Data sources
A range of ecology works has been carried out for the site to date, as follows:

- Desk study, extended Phase 1 habitat survey and NVC survey of Barbae Quarry and proposed extension zone (EnviroCentre 2015) Drawing No. 167296-002;
- Protected mammal survey of Barbae Quarry and proposed extension zone (Atmos 2016); and
- Ground truthing of existing habitat and mammal surveys and updating baseline with proposed haul route corridor (Atmos 2017), Figure 3.21.

These surveys have been carried out using standard approaches and will be fully detailed in the EIA report.

Baseline

Setting
No statutory or non-statutory nature conservation designation overlaps with the existing Barbae Quarry, the proposed extension zone or the proposed haul route. The local area is characterised by farmland, pasture and commercial forestry with moorland present at higher altitudes. The larger Tormitchell Quarry is present 200m to the southwest of the existing Barbae Quarry, and Hadyard Hill Wind Farm is present 300m east of Barbae and immediately north of the proposed haul route.

Habitats
For ease of reference, the results of the updated Phase 1 habitat survey (Atmos 2017) are presented in Figure 3.21 and the earlier 2015 survey results (EnviroCentre 2015) are presented in Drawing No. 167296-002. The existing Barbae Quarry is characterised by an open quarry void dominated by bare ground and ephemeral/short perennial vegetation, with more developed semi-natural habitats present along the northern, eastern and southern site boundaries.

They include marshy grassland, neutral grassland, bracken *Pteridium aquilinum*, scrub, tall ruderals, a pond/lagoon and the watercourse, Barbae Burn.

The proposed extension zone at Barbae Hill is characterised by improved grassland and stands of bracken. The proposed haul route between Barbae and Tormitchell Quarry is also dominated by improved grassland as well as narrow (c 50m wide) bands of open woodland, comprising mature broadleaved trees, and the route is proposed to cross a section of this habitat.

With the exception of ponds, the habitats described above also occur in the area immediately surrounding the site, together with fen, swamp, conifer woodland and acid grassland. Rush pasture occurs on the slops north of the proposed extension zone.
In general, these are common and widespread habitats of low to medium ecological value. However, some are national nature conservation priorities through their inclusion on the SBL or Ayrshire LBAP. They include rush-pasture, ponds and rivers, fen, dry acid grassland and wet woodland. Impacts on these habitats will be assessed in the EIA report.
In addition, some wetlands were assessed as potentially groundwater-dependent terrestrial ecosystem (GWDTE) under the Scottish Environment Protection Agency (SEPA) classification (SEPA 2014). They include the following:

- Marshy grassland: M23 *Juncus effusus/acutiflorus-Galium palustre* rush-pasture, M25 *Molinia caerulea-Potentilla erecta* mire and MG10 *Holcus lanatus-Juncus effusus* rush-pasture;
- Wet woodland: W7 *Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum* woodland;
- Fen: M27 *Filipendula ulmaria-Angelica sylvestris* tall-herb fen;
- Neutral grassland: MG9 *Deschampsia cespitosa-Holcus lanatus* grassland; and
- Swamp: S7 *Carex acutiformis* swamp.

Following the initial Phase 1 habitat survey, further baseline assessment of hydrology, geology and hydrogeology have determined these areas to be surface water-fed and so are not considered to be groundwater dependant (please see Section 1.2.4 below and further discussion in the hydrology Section 3.3 of this Scoping Report).

Species
No evidence has been recorded of protected species, such as badger *Meles*, otter *Lutra* or water vole *Arvicola amphibius*, in the proposed extension zone or in adjacent areas.

Bats could potentially roost in ash *Fraxinus excelsior* or pedunculate oak *Quercus robur* trees along the proposed haul route, as well as within the disused kennel adjacent to where the western junction of the proposed track joins the public road at Glenassel. This potential will be further investigated in line with Bat Conservation Trust (BCT) guidance (Collins 2016) and will be detailed in the EIA Report.

It is likely that breeding birds, which are protected under the Wildlife and Countryside Act 1981 establish territories within or adjacent to the extension site and the haul route.

Potential impacts
Because the extension zone does not support protected or otherwise notable species or habitats, the potential for impacts on valued ecological features is low.

Areas of potential High and Moderate GWDTE were assessed during a site walkover by a Technical Director from SLR who specialises in hydrological and hydrogeological impact assessments and are further discussed in Section 3.3 of this Scoping Report. It was confirmed that these habitats are not sustained by groundwater, but rather rainfall and rainfall-runoff locally. It is suggested, therefore, that buffers specified in SEPAs guidance to these habitats do not apply.
The quarry extension will result in reduced habitat available for ground-nesting birds, and the haul route will also result in the loss of individual trees and grassland habitat which may be used by breeding birds. However, these habitats are common and widespread in the local area and birds are likely to find suitable habitat elsewhere.

It is possible that bats roost in mature trees along the haul route, as well as within the stonework and slate tiles of the disused kennels adjacent to the revised junction with the main road. This will be further assessed and detailed in the EIA Report. The route has been designed to minimise the impacts on trees; if roosts are confirmed within trees and/or kennel building to be removed this will result in the identification of appropriate mitigation to avoid significant impacts.

Proposed assessment

Prior to submission of a planning application, it is proposed that endoscopic inspection by a fully licenced bat surveyor is completed within all structures with potential bat roost features within 30 m of the proposed access track route. This would include the disused kennels located south of the junction of the new track with the public road. In addition, as the Phase 1 habitat survey was undertaken following an earlier design iteration, a small area to the northeast of the survey area will be re-visited to check for sensitive habitats, signs of protected species and to endoscopically inspect any features that could support roosting bats. This data will then be included within the subsequent Ecology Chapter of the EIA Report.

The assessment of impacts on ecological features from mineral extraction and related development will follow the methodology devised by the Chartered Institute of Ecology and Ecological Management (CIEEM) and described in the *Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater and Coastal* (CIEEM, 2016) (the CIEEM Guidelines). These provide guidance on the process of identifying the value of ecological features, characterising impacts upon them, and assessing whether these impacts are significant. An ecologically significant impact is defined in the CIEEM Guidelines as "*an impact (negative or positive) on the integrity of a defined site or ecosystem and/or the conversation status of habitats or species within a given geographical area.*"

The Ecology Chapter of the EIA Report will detail the methods used in the assessment, the baseline conditions, the assessment of impacts and proposed mitigation or compensation measures which are needed to reduce any significant impacts identified in the assessment.

References

CIEEM (2016). Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater and Coastal (2nd edition). Chartered Institute of Ecology and Environmental Management.

Collins J (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practise Guidelines (3rd edition). The Bat Conservation Trust, London.

Atmos (2016). Barbae Quarry Mammal Survey. March 2016. Atmos Consulting Ltd.

Atmos (2017). Barbae Quarry Update Surveys and Haul Route Corridor Survey. October 2017. Atmos Consulting Ltd.

Ayrshire Biodiversity Partnership (2007). Ayrshire Biodiversity Action Plan 2007-2010. The Conservation and Enhancement of Ayrshire's Biodiversity. Available online at: http://www.south-ayrshire.gov.uk/documents/2008%20ayrshire%20lbap.pdf (accessed October 2017). Note that at the time of writing no more recent document is available for South Ayrshire.

EnviroCentre (2015). Barbae Quarry Extended Phase 1 Habitat Survey and NVC Survey. November 2015.

SEPA (2014). Planning guidance on on-shore windfarm developments. Land Use Planning System SEPA Guidance Note 4, version 7. SEPA, 14 May 2014. Scottish Environment Protection Agency

Scottish Government (2013). Scottish Biodiversity List, version 1.5. April 2013. Available online at: http://www.gov.scot/Resource/0041/00419456.xls (accessed October 2017).

3.3 Groundwater and Surface Water

The site, its setting and potential impacts on the water environment (hydrology and hydrogeology) that might occur as a result the proposed development are very well understood as a consequence of the existing workings at Barbae and the adjacent Tormitchell Quarry.

In addition, prior to preparing this scope of works a site walkover survey was undertaken by a Technical Director from SLR who specialises in hydrological and hydrogeological assessments.

The site visit and previous studies at Barbae and Tormitchell have been used to inform the proposed scope of works outlined below.

Site Setting
The existing Barbae Quarry and proposed extension lie within the headwater catchment of the Barbae Burn, a tributary of the Water of Assel. The Barbae Burn and Water of Assel flow southward. The Water of Assel is a highly regarded fishery. The Barbae Burn, as it passes site, is at an elevation of about 128mAOD.

British Geological Survey mapping shows Alluvium bounds the larger watercourses locally and that this is underlain by Glacial Till. The Till thins at higher elevations and superficial deposits are widely absent from the hill tops locally. No superficial deposits are shown below the proposed Barbae extension and this was confirmed at the time of the site walkover survey. The bedrock locally comprises sandstones, conglomerates and limestones of the Ordovician geological epoch. There is no peat at site.

It is expected that groundwater will be present in both the Alluvium and the bedrock deposits. Groundwater in the Alluvium is likely to be in hydraulic continuity with the Barbae Burn and Water of Assel and perched above the low permeability Glacial Till. It is noted that the existing Barbae Quarry has a basal elevation of 140mAOD and has not intercepted any groundwater in the bedrock deposits; this was confirmed at the time of the site visit. The proposed floor of the extension area is 145mAOD, and therefore it is expected, like the existing quarry, will not intercept groundwater.

Review of floodplain mapping published by SEPA suggests that the floodplain associated with the Barbae Burn and Water of Assel is limited, and does not extend to the existing quarry, the proposed extension area or the proposed new access track.

At the time of the site visit it was confirmed that there were no properties, other than those owned by the applicant, within 250m of the proposed quarry extension. No properties were recorded within 100m of the proposed track between Barbae and Tormitchell quarries.

A National Vegetation Classification (NVC) survey has already been completed and has been used to screen for the potential presence of Groundwater Dependent Terrestrial Ecosystems (GWDTE) in line with SEPA guidance (LUPS-GU31, 2014). Areas of potential High and Moderate GWDTE were assessed at the time of the site walkover and it was confirmed that these habitats are not sustained by groundwater, but rather rainfall and rainfall-runoff locally. It is suggested, therefore, that buffers specified in SEPAs guidance to these habitats do not apply.

Potential Sources of Impact
Without mitigation or adherence to best practice, impacts on the water environment could occur during the two main stages of development (operation and restoration). Potential sources of impact could arise from:

- generation of potentially polluting runoff as a consequence of soil stripping and stockpiling;
- alteration of surface water flows and quality as a consequence of constructing watercourse crossings;
- alteration of surface water flows and groundwater recharge, as a result of mineral extraction;
- pollution of surface water or groundwater as a consequence of mineral stockpiling and haulage;

- pollution of ground and or surface water as a result of restoration works and application of fertilisers; and
- construction of temporary site buildings, such as weighbridge, welfare facilities and compound.

Method of Assessment and Reporting

The potential sources of impact on the water environment will initially be assessed by completing a desk study. The study area will include all proposed site infrastructure. In addition details of local water use and quality within a buffer of 2km from the proposed infrastructure will be considered.

Mitigation included and embedded in the site design and operation of the site will be presented. Potential impacts on the water environment will then be identified, and any further or additional mitigation measures required to address these impacts will be proposed in accordance with best practice guidance and with reference to site specific conditions.

Given the location and geographical context of the site, it is considered that a basic Flood Risk Assessment (FRA) will need to be prepared to satisfy Scottish Planning Policy. This will be incorporated into the text of the impact assessment and will include principals for the control and management of runoff rather than a detailed water management plan.

A qualitative risk assessment methodology will be used to assess potential effects in which the probability of an effect occurring and the magnitude of the effect, if it were to occur, are considered. This approach provides a mechanism for identifying the areas where mitigation measures are required and for identifying mitigation measures appropriate to the risk presented by the proposed development. This approach allows effort to be focussed on reducing risk where the greatest benefit may result.

Items Scoped Out of Assessment

As a consequence of the site setting and development proposals it is suggested that it will not be necessary to undertake the following:

- detailed assessment of potential GWDTE;
- detailed flood risk assessment, flood risk modelling and sizing design of watercourse crossings;
- groundwater elevation or quality modelling;
- detailed assessment of effects on private water supplies;
- cumulative impact assessment;
- fisheries assessment; and
- water quality sampling.

Legislation and Guidance

The water environment chapter will be prepared with reference to best practice guidance and legislation, including (but not limited to):

- Scottish Planning Policy (SPP), Scottish Executive, June 2014;
- EC Water Framework Directive (2000/60/EC);
- Water Environment and Water Services (Scotland) Act 2003;
- Water Environment (Controlled Activities) Regulations 2011;
- Planning Advice Note (PAN) 50, Controlling the Environmental Effects of Surface Mineral Workings, Scottish Executive, 1996;
- Good Practice on Controlling the Effects of Surface Mineral Working on the Water Environment, Department of the Communities and Local Government and Mineral Industry Research Organisation, 2008;
- Pollution Prevention Guidance (various dates and references), SEPA;
- Land Use Planning System – SEPA Guidance Note 31 (GWDTE and Groundwater Abstractions), SEPA, October 2014;
- The SuDS Manual C753, CIRIA, 2016; and
- Environmental Good Practice on Site C692, CIRIA, 2010.

3.4 Cultural Heritage

CGMS Consulting has been appointed to consider potential impacts upon Cultural Heritage as a result of the proposed development. This chapter of the Scoping Report identifies the proposed scope of the EIA to assess likely significant effects from the proposed development on cultural heritage assets.
Cultural heritage assets are defined as:

- Listed buildings;
- Conservation areas;
- Scheduled monuments;
- World Heritage Sites;
- Inventory gardens and designed landscapes;
- Inventory battlefields;
- Non-designated archaeological sites and monuments and other historic features or places.

It is based upon consideration of readily available information including:

- Historic Environment Scotland databases;
- Historic mapping; and
- Walkover survey.

In addition, West of Scotland Archaeology Service (WoSAS) has been consulted. A Cultural Heritage Appraisal including Figures showing any archaeological features identified is included within **Appendix 2**.

Study Areas
Data has been gathered for the extension and the surrounding 1km. This is based on the surrounding topography, which greatly restricts the visibility of the Site and therefore the proposed development from greater distances.

Baseline Conditions
There are no designated heritage assets (Scheduled Monuments, Listed Buildings, Inventory Gardens and Designed Landscapes, Inventory Battlefields and Conservation Areas) within the Site or the 1km study area. The nearest designated asset is the scheduled Dinvin Motte (SM2202) which is over 2.8km from the Site and screened by intervening hills.

Within the proposed extension is part of a field-system associated with the farmstead of Barbae, which lies approximately 180m to the south of the proposed extension. The field-system comprises spread earth banks and rig and furrow. Barbae appears on Blaeu's map (1654) as 'Barhe' and Roy's map (1752-55) as 'Barbeg'. Roy's map shows it as a cluster of five buildings and a walled enclosure with cultivated land extending to the north, north-east and south-west. The field system is therefore likely to date to the Post or Late Medieval period. Aside from its rather schematic representation on Roy's map, the field system is not mapped. The First Edition Ordnance Survey map shows the area of the proposed extension as unimproved and unenclosed moorland. Elements of the field-system within the Site are limited to banks; the rig and furrow occupies the south-facing slopes to the south of the proposed extension. It would appear likely that the proposed extension lies within land given over to grazing in the Post or Late Medieval period.

Associated with the banks is a sub-square enclosure, which has the appearance of a stock enclosure or hay ree.

Overlying the banks are a system of stone dykes and a number of small quarry pits, which are likely to date to the late 18th/early 19th century and which are probably contemporary with the now ruined buildings at Barbae. The dykes do not extend into the proposed extension.

The proposed haul road for the most part runs within a shelterbelts. This formed part of a more extensive series of shelterbelts known as Tormitchell Wood and Balcletchie Wood (WoSAS 53518), which were probably planted in the 19th century. Most of these are now missing and the trees within the shelterbelt are sparse; the Ayrshire Designed Landscapes Survey describes them as being 'in an advanced state of decline' (Peter McGowan Associates 2009). The belt is defined by stone dykes. No trace remains of an enclosure (Canmore 170580) shown abutting the northern boundary of the shelterbelt on the 1856 Ordnance Survey map remains. A magazine shown on the same map, however, survives as a roofless shell, next to the existing track. The line of a former break in the shelterbelt is marked by two slight banks.

There is no recorded evidence of pre-Medieval activity in the study area. The land within the proposed extension is semi-improved and the soil profile is very shallow, generally less than 20cm. In such conditions, it would be reasonable to expect features pre-dating the banks to survive as upstanding features. The potential for unrecorded archaeology to be present within the proposed extension is therefore considered to be very low.

Potential Significant Effects

Based on the above, it is considered that the proposed extension will remove elements of the field system and in the absence of mitigation this is likely to result in a significant effect.

There is potential for a significant impact upon the remnants of Tormitchell Wood, depending on the exact design of the access track.

There is very limited potential for significant effects in relation to currently unrecorded archaeology.

Issues to be Scoped Out

There are no designated assets within 2km of the Site, the nearest being 2.8km and it is proposed that setting impacts are scoped out of the assessment.

Proposed Assessment Methodology

The cultural heritage impact assessment will be undertaken with reference to the following guidance:

- Chartered Institute for Archaeologists (2017) Standard and Guidance for Historic Environment Desk-Based Assessment;
- Historic Environment Scotland Managing Change in the Historic Environment series.
- Historic Environment Scotland (2016) Historic Environment Scotland Policy Statement
- The need for further baseline data to be gathered will be established through consultation with WoSAS.

The sensitivity of assets will be determined with reference to their importance. In respect of designated assets, importance will be determined by their designation. The importance of non-designated assets will be determined by reference to local categorisation, i.e. WoSAS' Non-Statutory Register, and relevant designation criteria guided by professional judgement.

Guideline sensitivity criteria are set out below:

Sensitivity	Guideline Criteria
High	Internationally and nationally important designated assets (world heritage sites, scheduled monuments, Category A-listed buildings, IGDLs and inventory battlefields) or assets meeting the criteria for national importance; all assets rated 'C' or 'V' by WoSAS' Non-Statutory Register (NSR) are considered to be of national importance. Some conservation areas are of national importance.
Medium	Heritage assets of regional importance, comprising Category B and C listed buildings, some conservation areas and undesignated cultural heritage assets of regional importance.
Low	Undesignated cultural heritage assets of local importance

The magnitude of effects will be considered in terms of the change in the affected asset's significance. The guideline criteria to be applied are set out below:

Magnitude	Guideline Criteria
Substantial	Complete or near complete loss of fabric or change in setting such that significance is completely or almost completely lost.
Major	Major alteration to key elements of the asset or its setting, such that post-development cultural significance of the asset will be fundamentally changed.
Moderate	Partial loss or alteration to one or more key elements of the asset or its setting, such that post-development cultural significance of the asset will be materially changed.
Minor	Change in the asset's fabric or setting resulting in the asset's cultural significance being slightly diminished.
Negligible	Change in the fabric or setting leaving the asset's significance unchanged.

The predicted significance of the effect will be determined through a standard method of assessment based on professional judgement, considering both sensitivity and magnitude of change and guided by the matrix below. 'Major' and 'Moderate' effects are considered significant.

		Magnitude				
		Substantial	Major	Moderate	Minor	Negligible
Sensitivity	High	Major	Major	Major	Moderate	Negligible
	Medium	Major	Moderate	Moderate	Minor	Negligible
	Low	Major/ Moderate	Moderate	Minor	Negligible	Negligible

Potential Mitigation

Mitigation is most likely to take the form of offsetting physical loss through preservation by record. However, in relation to Tormitchell Wood, potential impacts will be avoided or reduced through design which will including additional planting within the shelterbelts. The mitigation strategy will be developed in consultation with WoSAS, South Ayrshire's archaeological advisors.

3.5 Noise

Vibrock has been appointed to consider the environmental impact of noise as a result of the proposed development. Guidance applicable to the assessment of noise impacts from mineral extraction and related development is provided by:

- BS5228-1:2009(as amended): Code of practice for noise and vibration control on construction and open sites [British Standards Institute, 2009];
- PAN 50 Controlling the Environmental Effects of Surface Mineral Workings. Annex A: the Control of Noise at Surface Mineral Workings [Scottish Office, 1996].

Baseline
The closest property to the permitted development is Glenassel Lodge approximately 100m from the closest point of future mineral extraction. This property is under the control of the applicant and as such is not considered noise sensitive in respect of the EIA regulations. With the exception of this property there are no other potentially sensitive receptors within circa 250m of future mineral extraction activities. The closest receptors are as follows:

Noise Receptor	Approx. distance from site	Description
Tormitchell Farmhouse	250m	Farmhouse to the south of the Barbae Quarry extension.
Dupin	500m	Farmhouse to the south east of the proposed haul road.
Burnside	600m	Property south of Barbae Quarry on the east side of the C13.

Potential Impacts
The use of large plant and machinery has the potential, if not properly controlled, to result in adverse noise impacts at residential locations close to such an operation.

In the short and medium term the main existing noise sources resulting from the working of Barbae Quarry would continue during future working, within the extension with a drill rig, excavator and a dump truck, required for the extraction and transportation of material from the site to Tormitchell Quarry. Material extracted from Barbae Quarry would then be transported along a dedicated haul route to Tormitchell Quarry and processed using mobile plant located within Tormitchell Quarry.

Later in the development as area under quarrying reaches its maximum lateral extent it will become possible to carry out dry processing (crushing and screening) in the quarry to limit the volume of material transported to Tormitchell to that which requires washing and that used in concrete and asphalt production. This material would continue to be transported to Tormitchell Quarry.

Mineral extraction will continue at Tormitchell Quarry for the life of the proposed development. As a result cumulative noise from operations at both quarries should be considered including the impacts of the transport and processing of rock extracted from Barbae at Tormitchell.

Proposed Assessment
A noise assessment will be carried out to demonstrate compliance Scottish Government Guidance contained in PAN 50 Annex A – “the Control of Noise at Surface Mineral Workings”. This involves a visual survey of the site and surrounding area and the measurement of existing noise levels measured at representative locations around the development. The proposed locations are as follows:

- Tormitchell Farmhouse
- Dupin
- Burnside

Measurements will made in terms of L_{Aeq}, L_{A90}, and L_{Amax} thus enabling the existing noise climate to be characterised.

A series of noise predictions, based upon BS 5228 and PAN 50 will then be undertaken in respect of these noise sensitive locations including where relevant the predicted cumulative impact of operations at both Barbae and Tormitchell Quarries. The predicted noise levels will be assessed against recommended criteria, limits that are largely based on the guidance contained in Planning Advice Note 50.

3.6 Vibration

Vibrock has been appointed to consider the environmental impact of vibration as a result of the proposed development. For surface mineral working sites in the Scotland *Planning Advice Note 50 Annex D "the control of blasting surface mineral workings"* provides guidance on permissible ground vibration levels. This guidance recommends limits for ground vibration as a result of blasting operations as measured at vibration sensitive buildings. Further guidance is provided by BS5228-1:2009(as amended): Code of practice for noise and vibration control on construction and open sites British Standards Institute, 2009; and British Standard 6472–2: 2008 - Guide to evaluation of human exposure to vibration in buildings: Part 2: Blast-induced vibration.

Baseline Conditions
The closest property to the proposed development is Glenassel Lodge approximately 100m from the closest point of future mineral extraction. With the exception of this property there are no other potentially sensitive receptors within circa 250m of future mineral extraction activities. The closest receptors are as follows:

Noise Receptor	Approx. distance from site	Description
Glenassel Lodge	100m	Residential property east of the Barbae Quarry site, on the C13 road. **Controlled by the applicant**
Tormitchell Farmhouse	250m	Farmhouse to the south of Barbae extension
Wind Farm	650m	
Burnside	600m	Property south of Barbae Quarry on the east side of the C13.

Potential Impacts
The initial stage of the rock extraction process at Barbae Quarry is the drilling and blasting of the strata. Drilling and blasting will continue to be required to facilitate rock extraction throughout the operational life of the quarry. Vibration occurs at the quarry face through the use of blasting techniques to dislodge and fragment the in situ rock.

When an explosive detonates within a borehole stress waves are generated causing very localised distortion and cracking. Outside of this immediate vicinity, however, permanent deformation does not occur. Instead the rapidly decaying stress waves cause the ground to exhibit elastic properties whereby the rock particles are returned to their original position following the passage of the stress waves. Such vibration is always generated even by the most well designed and executed of blasts and will radiate away from the blast site attenuating as distance increases.

Vibration is also generated within the atmosphere where the term air overpressure is used to encompass both its audible and sub-audible frequency components. Again, experience and knowledge of blast type and design enables prediction of levels and an assessment of their significance. In this instance predictions can be made less certain by the fact that air overpressure levels may be significantly influenced by atmospheric conditions. Hence the most effective method of control is its minimisation at source.

Proposed Assessment

Planning Advice Note 50 Annex Annex D "the control of blasting surface mineral workings" provides appropriate vibration limits for ground vibration at vibration sensitive structures. With experience and knowledge of the factors which influence ground vibration, such as blast type and design, site geology and receiving structure, the magnitude and significance of these waves can

be accurately predicted at any location. In this regard Vibration data from monitoring blasts at Barbae Quarry will be accessed and analysed. The results obtained from this analysis will then used to predict the likely levels of vibration from future blasting operations at the quarry at the following identified closest receptors:

- Glenassel Lodge – Considered solely in relation the potential for physical damage. A limit of 15mm per second was imposed under condition as part of the ROMP Review in 2016 and this limit is considered appropriate with vibration levels above this level being considered significant in relation to the EIA Regulations.
- Tormitchell Farmhouse
- Wind Farm
- Burnside.

3.7 Air Quality & Greenhouse Gas Emissions

The assessment of all atmospheric emissions associated with the development will be considered within a single Chapter of the EIA Report incorporating both assessment of effects on local air quality and an evaluation of emissions of greenhouse gases (GHGs) identified as the cause of global climate change.

The assessments will consider both the construction and operational phases of the development in respect of both air quality and climate change. The assessment will be undertaken by ITPEnergised and led by Stuart McGowan. Stuart is a Chartered Environmentalist and Member of the Institute of Air Quality Management. He has 20 years' experience in air quality assessment and has extensive experience of Environmental Impact Assessment.

The study will consider the following relevant Regulations, Policy and Technical Guidance to inform the assessment, as follows:

- Air Quality (Scotland) Amendment Regulations 2016;
- The Air Quality Standards Regulations, 2010;
- The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, 2007;
- The Environment Act, 1995;
- Planning Advice Note (PAN) 51 Planning and Environmental Protection, 2006;
- The DEFRA Local Air Quality Management Technical Guidance LAQM.TG(16), 2016;
- The Scottish Government Cleaner Air for Scotland Strategy (CAFS), November 2015;
- IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning, 2016;
- Planning Advice Note 50 Controlling the Environmental Effects of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings, 1998
- Air Quality Annual Progress Report for South Ayrshire Council, 2017 (2018 as available);
- IEMA Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance, 2017.

Baseline Conditions

The project development site is located in a rural location approximately 5 km south-east of Girvan. With the exception of the existing Barbae Quarry and the Tormitchell Quarry which is located immediately to the south there are no significant sources of air emissions in the local area, other than fugitive emissions which may occur from agricultural activity at certain times of the year. Traffic flows on the immediately local road network are light.

Overall, air quality levels within South Ayrshire are generally very good[1]. The prevailing baseline air quality conditions will therefore be quantified with reference to South Ayrshire Council Local Air Quality Management (LAQM) reports and published data from Scottish Government (www.scottishairquality.co.uk) and Department of Environment, Food and Rural Affairs (Defra) UK Air, Air Information resource.

The existing operations at the Barbae Quarry site and also at Tormitchell Quarry will change as a result of the development. An evaluation of current site activities and baseline effects on local air quality will therefore be undertaken to allow evaluation of the change in effects associated with the development. The method for assessing effects is discussed below.

Potential Impacts

The proposed development has the potential to generate emissions of dust and fine particles during both the construction and operation of the development.

[1] Local Air Quality Management Annual Progress Report 2017, South Ayrshire Council

During the construction phase, emissions are anticipated from the following activities:

- Site preparation (stripping, movement of top soil and other materials) associated with the quarry excavation and haul road will have potential to generate fugitive emissions through the exposure of dry materials to wind induced transport; and
- Vehicle movements associated with the movement of quarry plant and road traffic vehicles has potential to generate fugitive emissions during movement on haul roads and emissions from engine exhausts.

During the operational phase, emissions are anticipated from the following activities:

- Quarry extraction has potential to generate fugitive emissions through agitation of fine particles into air and through the exposure of dry materials to wind induced transport;
- Vehicle movements associated with the movement of quarry plant and movement of materials on the haul road between quarries has potential to generate fugitive emissions on haul roads and emissions from engine exhausts;
- Material stock piles and processing of rock has the potential to expose rock and generate further emissions to air;
- Direct emissions from processing plant in operation on the Tormitchell Quarry will occur, however operation of the plant is covered under the existing planning permission.

Any effect of emissions to air from the development are anticipated to be localised and occur within approximately 1 km of the proposed development, accounting for the type of emissions and local meteorological and atmospheric conditions. The closest receptors to the sites are as follows:

- Tormitchell Farmhouse, located approximately 250 m to the south of the Barbae Quarry extension;
- Dupin, located 500 m south-east of the proposed haul road; and
- Burnside, located 600 m south of the quarry.

There are no other receptors located within 1 km of the site.

Emissions from road traffic movements associated with the development are anticipated to be minimal and will not be noticeable in the context of existing road traffic on the wider road network. Effects on the local road network associated with indirect emissions (dust resuspension) will be localised and will be considered local to the development site only.

The lifecycle of the project will also result in generation GHG emissions, both directly (combustion of fuels) and indirectly (embedded electrical energy from equipment) as a consequence of energy use. The potential impact of the development will be as a result of the change in estimated GHGs due to the development, accounting for changes to existing operations at both the Barbae and Tormitchell Quarries, including any reduction in emissions associated with changes/improvements to existing operations and plant/machinery.

Emissions of GHGs associated with the development are not spatially defined, rather are considered on the basis of the project lifecycle.

Proposed Assessment

The assessment of the effects to local air quality will consider each phase of the development and evaluate the potential for adverse effects.

A risk based assessment for each phase of the development will be undertaken to assess emissions of dust and fine particles based on a Source-Pathway-Receiver model as follows:

- **Sources** of emissions, including material particle size, and likely emission rates;
- **Pathway**
  - Proximity to sensitive receptors;

  - Evaluation of local prevailing meteorological and atmospheric conditions (potential frequency of dry days where the receptor is downwind of source).
- **Receiver**
  - Sensitivity of receptor locations.

The assessment will follow IAQM guidance to evaluate the risk of adverse effects associated with the development. Based on the findings of the risk assessment, appropriate mitigation will be identified to minimise potential effects.

Emissions from road traffic associated with the development will be evaluated with respect to relevant thresholds within LAQM and IAQM technical guidance. It is anticipated that detailed evaluation of road traffic emissions can be screened from the assessment on the basis of low existing and future flows on the local road network.

A quantification of GHGs emissions will be made with reference to identified project activities. The aim of the assessment will be to quantify emissions from each phase of project operations, to allow direct comparison between the baseline situation and proposed development. This will include:

- Evaluation of the effect of increased quarrying rates on Barbae quarry;
- Evaluation of the change in haul route between Barbae and Tormitchell; and
- Effect of sustainable practices adopted as part of the development and improvement in emissions.

It is proposed to assess emissions associated with project activities only, i.e. emissions associated with the manufacture of equipment and materials utilised in the project will not be considered as part of the assessment.

Emissions will be quantified with reference to activity rates determined in consultation with Breedon (engine size, fuel type and operating hours etc.) with reference to activity data for similar sites in the UK. Emission factors will be identified with reference to published data sources, including industry guidance, UK National Atmospheric Emissions Inventory (NAEI) and US EPA AP-42 sources.

Appropriate mitigation will be adopted to minimise emissions, where practicable, with reference to industry good practice.

3.8 Transport

Dougall Ballie Associates (DBA) have been appointed to assess potential transport impacts relating to the development.

Existing traffic flows on the C13 were surveyed in 2016 to support the Review of Old Minerals Application for Tormitchell Quarry. The results indicate that hourly flows on the road, including existing quarry traffic, are in the order of 10 to 20 vehicles per hour in each direction.

With respect to traffic impact, the proposal should be seen in the context of the current permitted development, under which the total output from Tormitchell and Barbae would remain the same at up to 200,000 tonnes per annum. The traffic generation associated with the development in the future is therefore not anticipated to create any network issues.

The current permitted development results in the transport of blasted rock between Barbae Quarry and Tormitchell Quarry on the C13 public road. The proposal anticipates an increase in output from Barbae and a reduction in output from Tormitchell, but no increase in output overall. It is the case however that without mitigation there would be an increase in traffic between the two sites as blasted rock is transported from Barbae to Tormitchell. It is proposed to mitigate this potential effect by creating a new link road between Tormitchell Quarry and the Barbae access junction. By forming the proposed link road, a noticeable volume of traffic movements in the peak situation would be removed from the C13 road between Tormitchell and Barbae, thus reducing the impact of operations in this area. Thus, the proposed link road, which is demonstrated to be achievable in design terms, would ensure that there is no net impact on the C13 as a result of the proposals.

A speed survey has been undertaken in the context of the proposed new haul road junction design, as shown in DBA drawing 16311-SK-06 (dated 22 March 2017).

The proposed junction arrangement shows the new link road from Barbae to the north joining the local road at the location of the existing access to Barbae Quarry. The resultant crossroads junction is demonstrated to be able to achieve 4.5m by 120m visibility splays for both the new (proposed) and existing minor road approaches, subject to certain clearance works being undertaken including the removal of existing vegetation.

Speed surveys were undertaken by placing Automatic Traffic Counter (ATC) s on either side of the existing quarry access. Site 1 was placed some 50m south/west of the Barbae access, and Site 2 was placed some 65m north/east of the access. The ATCs were placed and operated for a period from Thursday, 23rd November 2017 to Wednesday, 29th November 2017, a continuous 7-day period, recording speeds in both directions at each location. The results for the highest hourly 85th percentile vehicle speed at each site in each direction are shown in Table 1, as is the derivation of the design speed relevant to the assessment of junction visibility splays.

Table 1 - Barbae Quarry access junction, as proposed

85th Percentile design speed per hourly time period over 7 days (kph)

		Observed max. 85th Percentile speed per hour time period (mph)		Adjustment (correction) for wet weather speed (mph)		Adjusted wet weather speed (mph)		Adjusted wet weather speed (kilometres per hour)	
		north/east-bound	south/west-bound	north/east-bound	south/west-bound	north/east-bound	south/west-bound	north/east-bound	south/west-bound
Site 1	50m south of junction	39.9	36.5	-2.5	-2.5	37.4	34.0	60.2	54.7
Site 2	65m north of junction	45.2	40.1	-2.5	-2.5	42.7	37.6	68.7	60.5
Period average	Site 1	33.3	34.0	-2.5	-2.5	30.8	31.5	49.6	50.7
	Site 2	33.8	32.3	-2.5	-2.5	31.3	29.8	50.4	48.0

The 7-day speed survey identifies maximum 85th percentile speeds on approach to the junction as proposed that are within the 70kph design speed applicable to the 4.5m by 120m visibility splays achieved by the proposed junction layout. It is also relevant to note that the maximum speeds noted occurred only during one hour within the entire week, and that the average 85th percentile speeds at each site in fact range are circa 50kph, which is well within the 70kph which the proposed visibility splays of 120m provide for.

In conclusion, the junction as proposed would meet the requirements of road safety with relevant to the prevailing conditions on the road.

Proposed Assessment
Subject to the proposed mitigation involving the construction of a haul road between Barbae and Tormitchell no significant impact will result from the proposed development and no further assessment is considered to be required.

3.9 Land & Soil Quality

Scottish Planning Policy (2014) states:
Development on prime agricultural land, or land of lesser quality that is locally important should not be permitted except where it is essential for ……..the extraction of minerals where this accords with other policy objectives and there is secure provision for restoration to return the land to its former status.

Guidance on the quality of agricultural land is provided by The Macaulay Institute Land Capability for Agriculture Maps (LCA) which have defined the capability of land in Scotland for Agricultural use.

Planning Advice Note 64: Reclamation of Surface Mineral Workings provides advice on the management of soils and their reuse in quarry restoration.

Baseline Conditions
As described above the Macaulay Institute LCA classification is used to rank land on the basis of its potential productivity and cropping flexibility. This is determined by the extent to which the physical characteristics of the land (soil, climate and relief) impose long term restrictions on its use. Good quality land is described as LCA Grade 3.1 or above. In this connection:

- The proposed quarry extension area is detailed as Land capability for agriculture class 5.2 Land capable of use as improved grassland. Few problems with pasture establishment but may be difficult to maintain.
- The proposed quarry haul route is defined as Land capability for agriculture class 4.2. Land capable of producing a narrow range of crops, primarily on grassland with short arable breaks of forage crops.
- The existing permitted quarry area at Barbae is fully stripped of a soils in advance of mineral extraction.

As a result none of the land which is proposed to be subject to development is considered to be prime agricultural land.

Potential Impacts
As described above proposed development will not impact upon Prime agricultural land. It is proposed that:

- Soil resources from the quarry extension and the haul route will be retained and stored in accordance with good practice for future reuse in progressive restoration including that associated with the haul road embankments following construction and final restoration of the completed development.

Thereafter:

- The quarry excavation at Barbae will be restored progressively where possible to a suitable after use with remaining soils reused in final restoration of the completion of the development.
- The quarry haul route will be retained as an agricultural track following the completion of the development;

Proposed Environmental Impact Assessment
It is proposed that land and soil quality is scoped out of the EIA process due to the lack of significant potential impacts associated with the development and the mitigation measures proposed to further reduce the impacts as described above.

3.10. Population and Human Health

Relevant guidance on impacts upon population and human health at this stage is limited. Reference has been made to “Health in Environmental Impact Assessment - A Primer for a Proportionate Approach” produced by IEMA.

Potential Impacts
The development is not likely to have significant negative impacts to human health as a result of Visual Amenity (3.1), water quality (3.3), Noise (3.5), Vibration (3.6), Air Quality (3.7) or accidents and disasters (Section 3.11). No potentially significant impacts on human health are therefore anticipated.

The granting of planning permission for the development will facilitate the retention of employment for the existing 16 people will be employed in the day to day operation of this site. The workforce is sourced locally, from Ayrshire. The level of employment and locally sourcing of staff is not anticipated to have an impact on the population of the region, but will have a positive economic benefit.

The site is the only concrete plant between Troon/Kilmarnock and Stranraer as such the concrete produced from this site will continue to meet a much-needed demand of concrete in the region.

Proposed Environmental Impact Assessment
It is proposed that population and human health is scoped out of the EIA process due to the lack of significant potential impacts associated with the development. Relevant mitigation measures for air quality and noise and Vibration will be included in the EIA process under the relevant sections.

3.11 Major Accidents & Disasters

The company has not had any significant environmental accidents or disasters across their 40 quarries, 17 asphalt plants, nearly 70 ready-mixed concrete plants and a concrete products manufacturing facility.

Major accidents/disasters that may affect the surrounding area include floods and forest fires.

Flood risk is considered in Section 3.3 which confirms that given the location and geographical context of the site, it is considered that a basic Flood Risk Assessment (FRA) will need to be prepared to satisfy Scottish Planning Policy. This will be incorporated into the impact assessment and will include principals for the control and management of runoff rather than a detailed water management plan. This issue will therefore be dealt within the Ground and Surface Water section of the EIA.

Although not likely to result from the quarry activities a forest fire from an external source could potentially wipe out the existing trees to south of Barbae and to the north of Tormitchell site together with any planting carried out as part of the proposed development. This could potentially increase the landscape and visual impacts of the development and giving rise to air quality impacts over the surrounding area. The fire risk will be contained by appropriate standoffs of all quarry plant and equipment to woodland. The proposed response of forest fires in the area will be the same as those used nationwide, with reliance on the Scottish Fire and Rescue Services and the specialised skills they offer. No further management measures are proposed due to the very low likelihood of a forest fire occurring during the 25-year life cycle of the site. Standard health and safety precautions will be in place at the site in the event of a fire which would include evacuation of people.

Additionally, the risk of fires and significance of them has the potential to be reduced through people being present on the site and the ability to notice the fire and quickly inform the relevant authorities helping to minimise the spread.

Proposed Environmental Impact Assessment

It is proposed that Major Accidents and disasters is scoped out of the EIA process due to the lack of significant potential impacts associated with the development. Relevant mitigation measures for water management will be included in the EIA process under the relevant sections.

3.12 Natural Resource Usage and Waste

Relevant policy and guidance includes:

- The Waste (Scotland) Regulations 2012 [Scottish Minister, 2012];
  The Management of Extractive Waste (Scotland) Regulations 2010 [Scottish Minister, 2010]
- Zero Waste Plan [Scottish Government, 2010]; and
- Waste Hierarchy.

There are currently no regulations on, or pertaining to, sustainable resourcing in Scotland. In 2010 the Scottish Government published Scotland's Zero Waste Plan [Scottish Government, 2010a], which sets out the government's vision for a sustainable and resource efficient future. Breedon intend to operate at Barbae in accordance with this vision which aims to:

'Reduce Scotland's impact on the environment, both locally and globally, by minimising the unnecessary use of primary materials, reusing resources where possible, and recycling and recovering value from materials when they reach the end of their life.'

Baseline

The majority of the site is currently agricultural grazing with the exception of the existing quarry area comprising circa 6.5 hectares which is currently under quarry operations. Soils resources are limited across both the quarry extension area and the haul route with up to 0.3m of soils and 0.7m of overburden present over these two areas.

Potential Impacts.

Soils and overburden will be removed the quarry excavation area and the proposed dedicated haul route and stockpiled for later use restoration. The movement and handling of this material will be minimised to ensure its quality is not degraded. This resource will remain on site for future use in accordance with the site waste management plan prepared in accordance with The Management of Extractive Waste (Scotland) Regulations 2010.

The main natural resource used during the operation of the site is the greywacke rock which will be excavated, processed and then sold to the market. It is anticipated that during the life of the project a total of 3.75 million tonnes will be extracted and removed from site. As a finite resource, it is important to ensure that this is done in to maximise resource usage therefore minimising likely significant effects.

Welfare waste will result from the proposed development with, appropriate waste segregation and recycling impacts are not deemed to be significant. Potential impacts on ecology (3.2) water quality (Section 3.3), Air Quality and Greenhouse Gas Emissions (Section 3.7) and soil quality (Section 3.9) are discussed within the relevant sections.

Mitigation

Mitigation proposed to minimise effects on natural resources and waste are outlined in Table 3.13 13.

Table 3.13: Proposed Mitigation for Natural Resources and Waste

Phase	Risk/Effect	Cause	Mitigation
Operation	Material usage	Inefficient use of resources	Soil and overburden will be appropriately stored, for reuse with reuse in progressive restoration where possible. No soils will leave site.

			Facilities are designed to minimise material usage.
Operation	Material Usage	Inefficient use of resources	Extracted rock will be processed as efficiently as possible to maximise the saleable product including the washing of crushed rock fines to produce a manufactured concrete sand. Any residues from extraction or processing will be reused in site restoration in accordance with the sites extractive waste management plan.
Operation	Waste	Incorrect waste disposal	Segregated bins provided. Waste appropriately segregated.

Proposed Environmental Impact Assessment

No significant effects are expected from site operations phase of the site and mitigation has been identified to minimise any effects arising. As a result it is proposed this topic is scoped out of the Environmental Impact Assessment.

4.0 Conclusions

A full range of environmental aspects relating to the development have been considered. The following topics are proposed to be scoped out of the EIA process as they are not likely to have significant environmental impacts:

- Land and Soil Quality
- Population and Human Health
- Major Accidents and disasters

Additionally, two topics are proposed to be scoped out with the implementation of standard mitigation measures outlined in the individual section, as these are not likely to have significant impacts. These are:

- Transport
- Natural resource Usage and Waste.

This approach has been taken in accordance with the 2017 Regulations; to insure the EIA focuses on the potential significant environmental risks and that the EIA Report is proportionate to the risk of the development.

Mitigation measures outlined in these sections of the Scoping Report will be included in an Environmental Management Plan for the development which will set out the mitigation needed to manage environmental effects during the construction and operational phases to ensure they are successfully implemented.

The following topics are proposed to be considered in detail in accordance with the scope of works identified in Section 3.0 above:

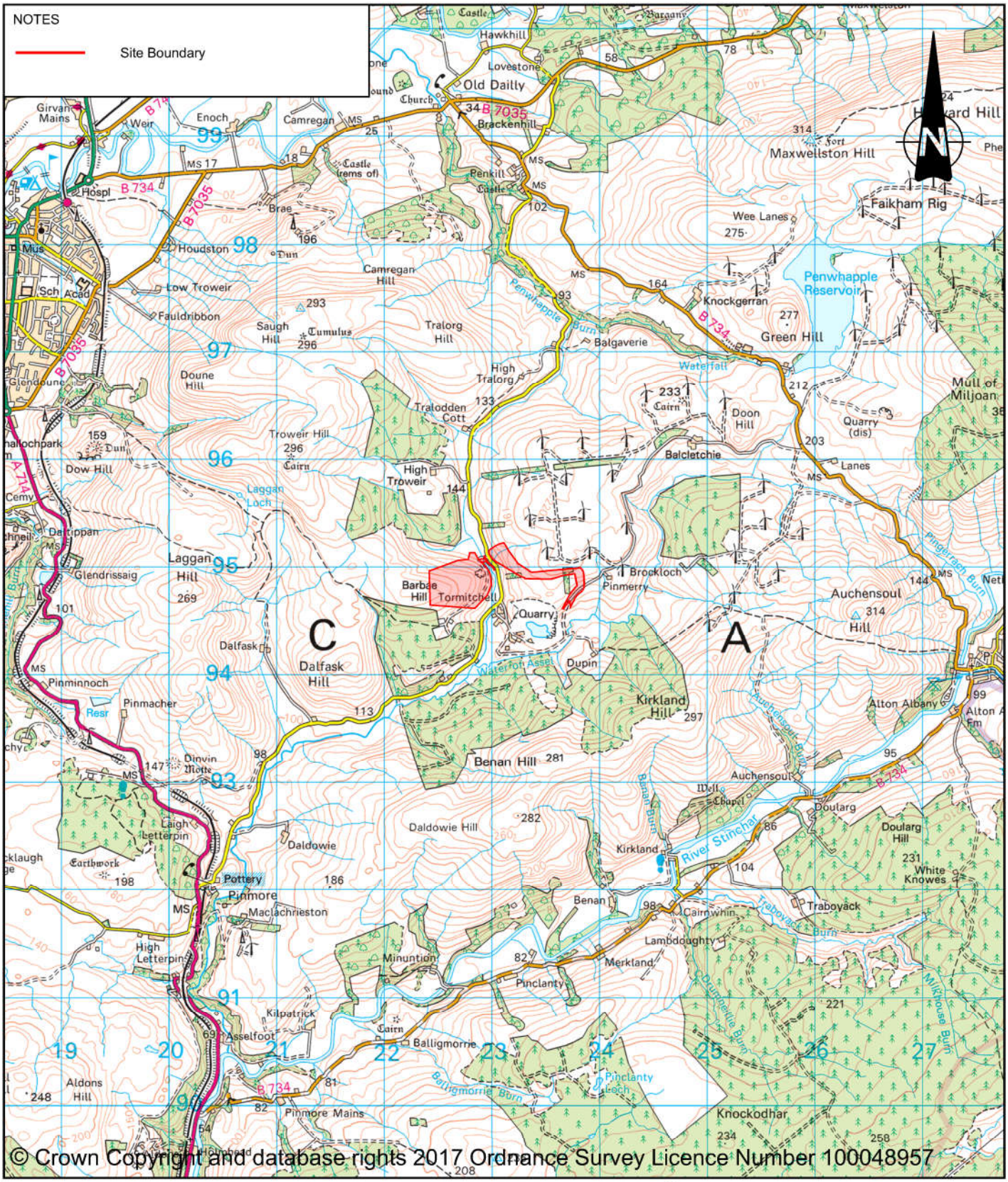
- Landscape and Visual Impact
- Ecology
- Cultural Heritage.
- Noise Impact
- Hydrology and Hydrogeology
- Vibration
- Air Quality and Greenhouse Gas Emissions.

DRAWINGS

JOHNSON POOLE & BLOOMER 50 SPEIRS WHARF GLASGOW G4 9TB TEL: 0141 331 1456 FAX: 0141 331 1567

NOTES

Site Boundary



CLIENT

BREEDON

JOB TITLE

BARBAE QUARRY

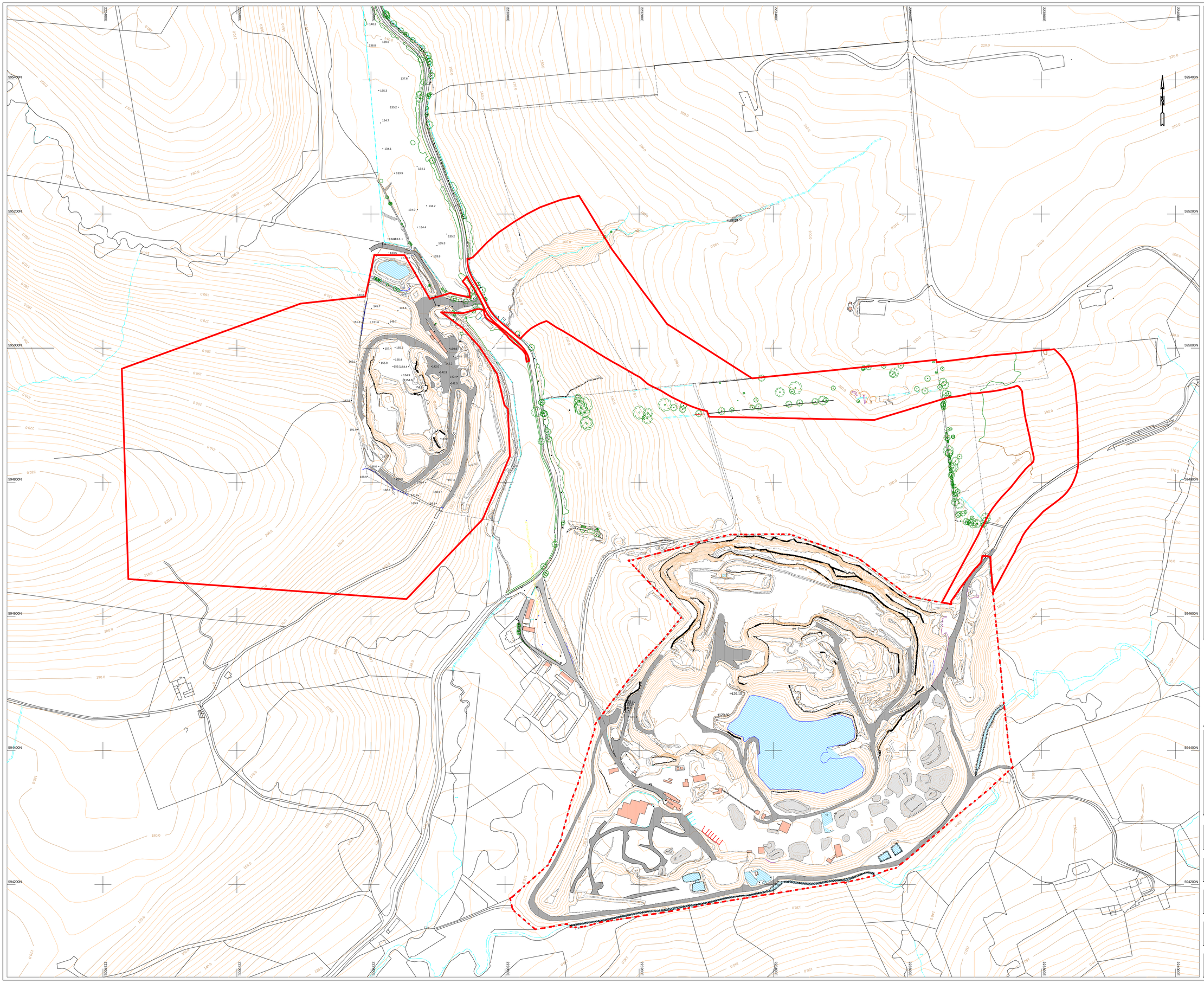
DRAWING TITLE

SITE LOCATION PLAN

JOHNSON POOLE & BLOOMER CONSULTANTS

SCALES	ORIG.DRG.SIZE	DATE	DRAWN BY	APPROVED BY	DRAWING No.
1:50,000	A4	OCT 2017	RK		B10/SCO/01

A4 border: 277 x 190



LEGEND

SITE BOUNDARY

PLANNING CONSET REF: 16/00429/ROMP

NOTES

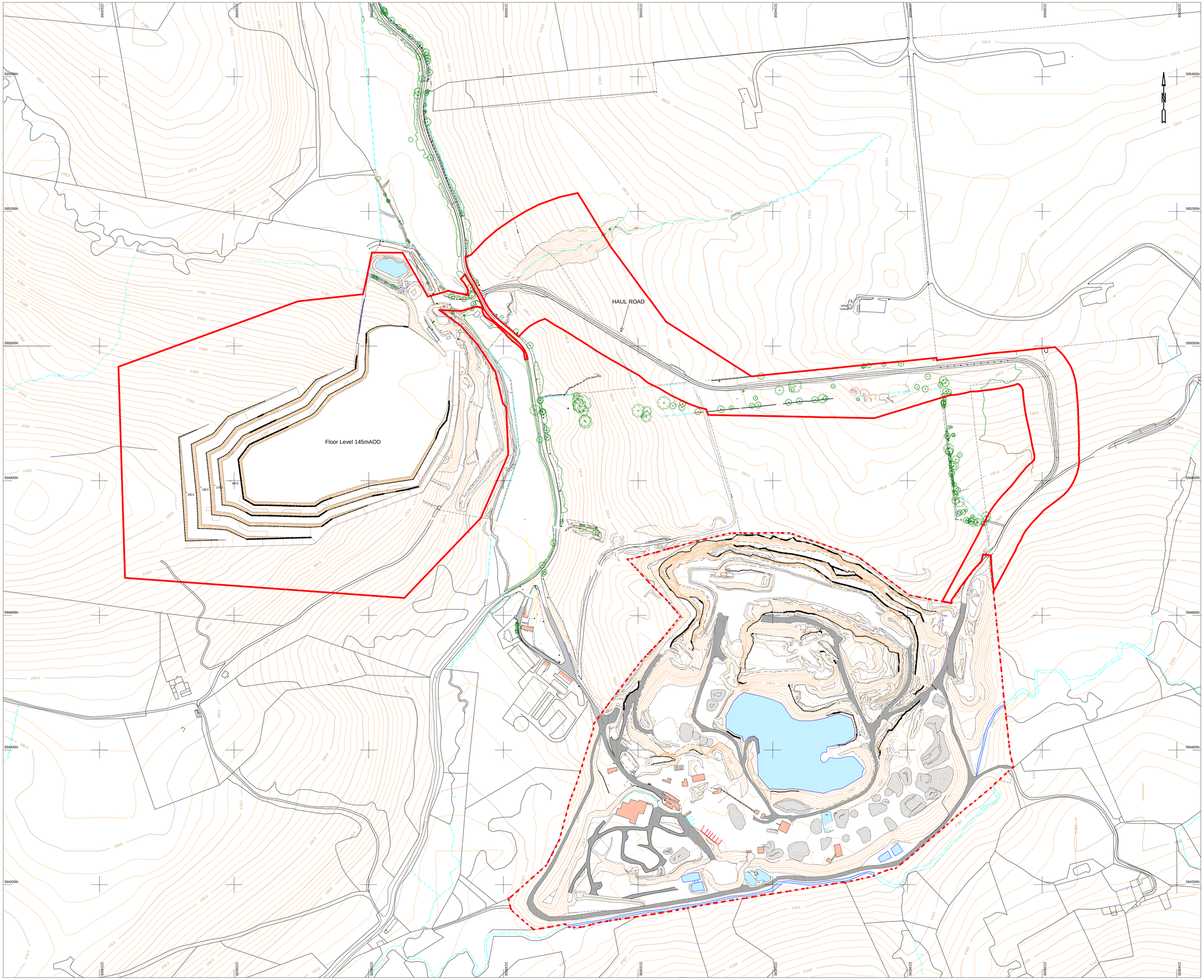
JOHNSON POOLE & BLOOMER CONSULTANTS

BREEDON

BARBAE QUARRY

EXSITING SITE LANDFORM

Drawn By	Approved By
RK	
Scale	**Original Plan Size**
1 : 2500	A1
Date Plotted	**Drawing No.**
02-AUGUST-2018	B10/SCO/02



LEGEND

SITE BOUNDARY

PLANNING CONSET REF: 16/00429/ROMP

NOTES

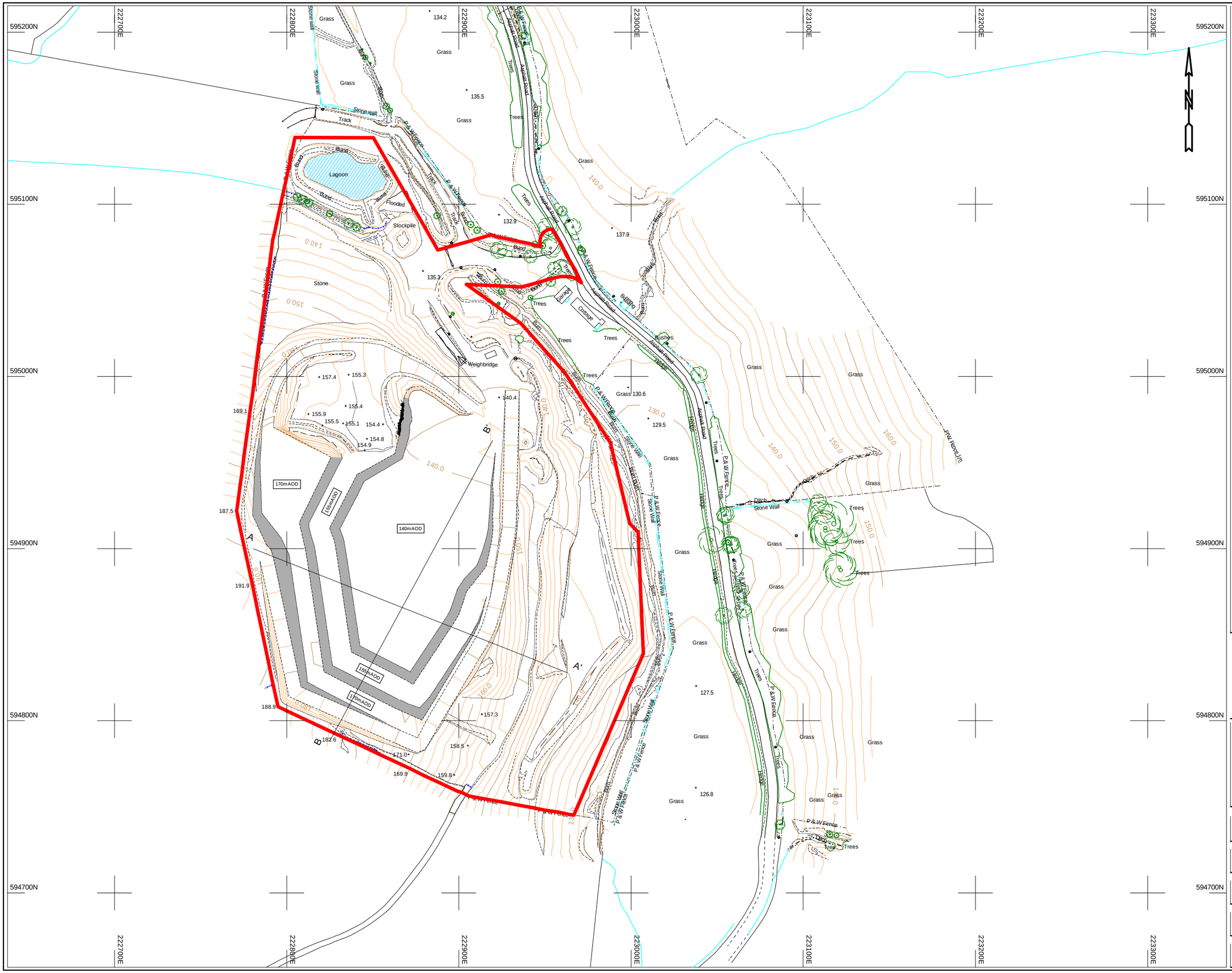
JOHNSON POOLE & BLOOMER CONSULTANTS

BREEDON

BARBAE QUARRY

PROPOSALS PLAN

Drawn By	Approved By
RK	
Scale	Original Plan Size
1 : 2500	A1
Date Plotted	Drawing No.
02-AUGUST-2018	B10/SCO/03



LEGEND

SITE BOUNDARY

NOTES

JOHNSON POOLE & BLOOMER CONSULTANTS

BREEDON AGGREGATES

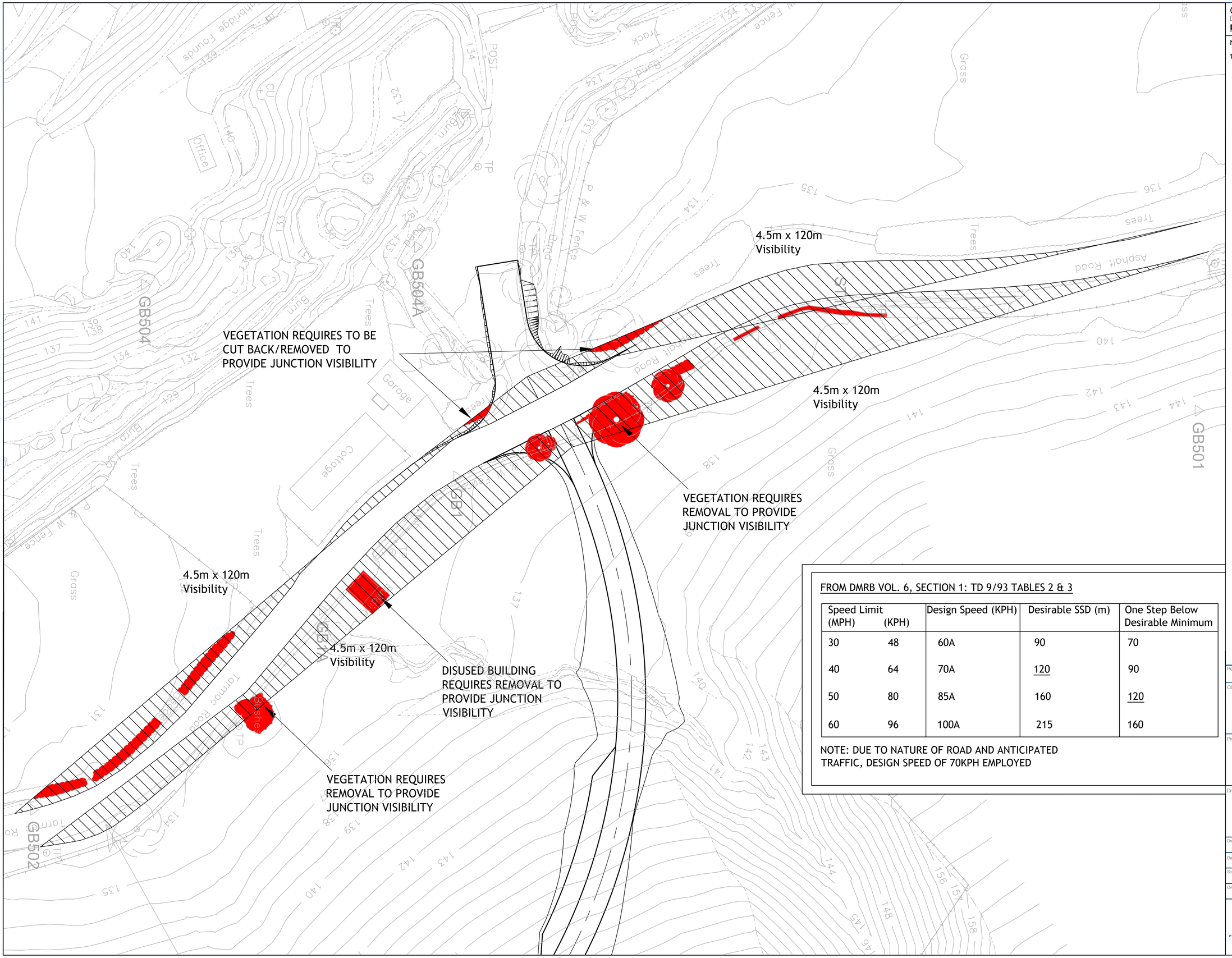
BARBAE QUARRY

FULL EXTENT OF MINERAL EXTRACTION

Drawn By: RK	Approved By:
Scale: 1 : 2000	Original Plan Size: A3
Date Plotted: 01-APRIL-2016	Drawing No.: B10/RA/03

Notes:

1.



FROM DMRB VOL. 6, SECTION 1: TD 9/93 TABLES 2 & 3

Speed Limit (MPH)	(KPH)	Design Speed (KPH)	Desirable SSD (m)	One Step Below Desirable Minimum
30	48	60A	90	70
40	64	70A	120	90
50	80	85A	160	120
60	96	100A	215	160

NOTE: DUE TO NATURE OF ROAD AND ANTICIPATED TRAFFIC, DESIGN SPEED OF 70KPH EMPLOYED

Rev.	Revision details:	By:	Checked:
		Date:	Date:

Client: BREEDON AGGREGATES

Project: BARBAE QUARRY

Drawing Title: JUNCTION VISIBILITY
BARBRAE JUNCTIONS

Drawn: I.R.		Checked: F.G.A.	
Date: 22.03.17		Date: 22.03.17	
Scale: 1:250	@A1	Dwg. No: 16311-SK-06	
Dwg Status: INFORMATION		Print: COLOUR	

Dougall Baillie Associates
3 Glenfield Road, Kelvin
East Kilbride G75 0RA
t: 01355 266480
f: 01355 221991
e: enquiries@dougallbaillie.com
w: www.dougallbaillie.com
civil. structural. transportation. water management.

222500 223000 595500 595000

143m
Issues
135m
Drain
Quarry
(Limestone)
Glenassel
Kennels
132m
Quarry
189m
Barbae Hill
129m
Track
Tormitchell
Bridge

1 2 3 4 5 6 7 8
A B C D E F G

Do not scale this map

Legend

- Target Notes
- Wetlands
- Site Boundary
- Protected Species Survey Area
- Japanese Knotweed

JNCC Habitat Code

- A2.2 Scattered scrub
- A3.1 Scattered broad-leaved trees
- B2.1 Unimproved neutral grassland
- B4 Improved grassland
- B5 Marshy grassland
- C1.1 Continuous bracken
- C3.1 Tall ruderal
- E3 Fen
- F1 Swamp
- G1 Open water
- G2 Running water
- J1.3/J4 Ephemeral/ short perennial and bare ground
- J2.2.2 Defunct species-poor hedge
- J2.4 Fence
- J4 Bare ground

Client: Breedon Aggregates

Project: Barbae Quarry

Title: Extended Phase 1 Habitat Survey

Status: Final

Drawing No.: 167296-002

Revision:

Scale: 1:3,000 | A3

Date: 3 Nov 2015

Drawn: JI | Checked: KE | Approved: KH

ENVIRO Centre
Craighall Business Park, Eagle Street, Glasgow, G4 9XA
Tel: 0141 341 5040
Fax: 0141 341 5045

Barbae Quarry

Breedon Northern

Figure 3.21
Phase 1 Habitat
Survey Results

223000
223500
595000
594500
135m
132m
129m
125m
120m
Wind Turbine
Wind Turbine
Kennels
Glenassel
Quarry (Limestone)
Quarry
Tormitchell Woods
Track
Tormitchell Bridge
Tormitchell Quarry (Whinstone and Lime)
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
I
SI

Key

- Survey area
- Trunk road
- Target Note
- Scrub - scattered
- Broadleaved Parkland/scattered trees
- Running water
- Broadleaved woodland - plantation
- Scrub - dense/continuous
- Neutral grassland - unimproved
- I — Improved grassland
- Marsh/marshy grassland
- SI — Poor semi-improved grassland
- Other tall herb and fern - ruderal
- Fen
- Swamp
- Standing water
- Running water
- XX — Cultivated/disturbed land - ephemeral/short perennial
- Buildings
- Bare ground
- Track/road

atmos CONSULTING

0 40 80 160
Metres

N

Scale @ A3:
1:3,500

19/12/2017 30801/HB/010a
Drawn by: AA Checked by: TH Approved by: MF