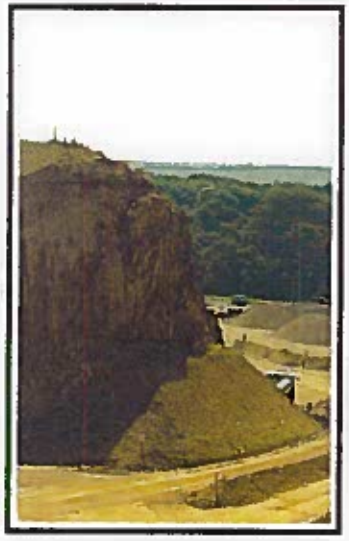
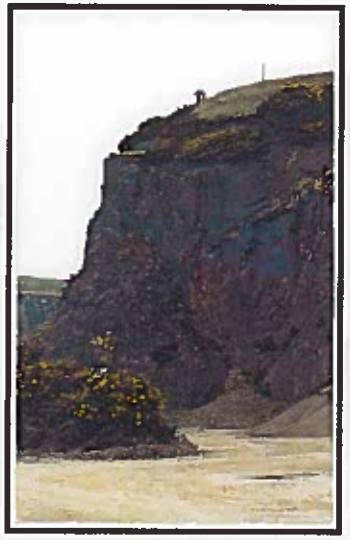
MASON BROS QUARRY PRODUCTS LTD

Proposed extension to

Rhyndaston Quarry





Environmental Impact Assessment

Volume 1

Environmental Statement

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1.0 INTRODUCTION

1.1 Background to the environmental statement

This Environmental Statement (ES) sets out the results of an Environmental Impact Assessment (EIA) of a proposal by Mason Bros. Quarry Products Limited for the extension of Rhyndaston Quarry, Roch, Pembrokeshire. The location of the quarry is illustrated on Plan 3125:19 which is produced within the accompanying brochure of plans (Volume 3 of the overall submission). It lies approximately 10 kilometres north-west of Haverfordwest, and on the eastern boundary of the Pembrokeshire Coast National Park.

The ES forms part of a detailed planning application which has been submitted to Pembrokeshire Coast National Park Authority. It seeks permission for an easterly extension of the quarry, within an overall site area of 2.9 hectares. The development would proceed as a progression of the existing eastern quarry face, with the quarry ultimately working down to a base level of 85 metres AOD within a defined area of the quarry.

The current circumstances at the quarry are illustrated on plan ref no. 3125:120. Quarry operations are proceeding along the extreme eastern edge of the permitted area, where reserves are sufficient for approximately 9 – 12 months extraction. Permission exists to deepen the floor of the quarry from its current level of 90 metres AOD to 85 metres AOD on the north western area of the quarry, and to 70 metres AOD in the central / south eastern area. If these operations proceed then a reserve of some 1.5 million tonnes would be released.

The current planning permission requires a programme of ground water monitoring to be initiated prior to quarrying below the water table. The water table fluctuates seasonally, but has been estimated to lie at approximately 87 metres AOD. The required ground water monitoring programme has accordingly commenced and is ongoing.

Recent discussions with the National Park Authority and the Environment Agency have highlighted the desirability of continuing the monitoring for as long as possible prior to any substantive deepening of the quarry. This would allow the hydrological effects of deepening and temporary dewatering to be more fully appraised, and for any adverse effects to be addressed with a greater understanding of the hydrogeological circumstances of the area.

The Applicants have reflected upon these discussions, and believe that, in the short and medium term, the most straightforward way of continuing the quarry operation would be via an eastern extension of the quarry working above the level of the water table. This would allow the ground water monitoring to continue into the medium term prior to any substantive sub water table within the existing quarry.

In addition, the proposed extension scheme proposes quarrying to a depth of 85 metres only, and for such deepening to be confined to the northern area of the existing and extended site. This is considered to have considerable amenity and restoration benefits, which are discussed later in this ES. However, if the National Park Authority are favourably disposed towards granting permission for the development, then, subject to acceptable terms, the Applicants would be prepared to volunteer an

amendment to the current working scheme, and relinquish their rights to work down to 70 m AOD. This would reinforce the restoration and amenity benefits which have been highlighted.

The scheme as proposed would release reserves of some 1.65 million tonnes. This compares to reserves of some 1.5 million tonnes if the quarry is developed and deepened in accordance with the current planning permission. The quarry would continue to work at its current average output level of approximately 80,000 - 100,000 tonnes per annum. The operation would therefore be completed within the currently approved timescale of December 2015. In essence, the development would therefore not extend the operation in terms of time, nor would it substantively increase the available reserve. It would however provide environmental and amenity benefits during the operational phases, and a more attractive and diverse restoration scheme, as discussed in section 4 of the ES.

The statement has been prepared pursuant to the Town & Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 which came into force in March 1999. The regulations implement EC Directive No. 85/337 on the assessment of the effects of certain public and private projects on the environment. The Directive's main aim is to ensure that the decision-making authority determines a planning application in the knowledge of any likely, significant effects on the environment. The Directive therefore sets out a procedure that must be followed for certain types of project before permission can be granted. This procedure – known as 'Environmental Impact Assessment' is a means of drawing together, in a systematic way, an assessment of a project's likely significant environmental effects. This helps to ensure that the importance of the predicted effects, and the scope for reducing them, are properly understood by the public and the decision making authority prior to making its decision.

The accompanying Welsh Office Circular 11/99 provides guidance on the type of projects which require an Environmental Impact Assessment (EIA) to be undertaken. The Circular emphasises that the basic test of the need for an EIA in a particular case is the likelihood of significant effect on the environment. The type of projects listed in Schedule 1 of the Directive must always be the subject of an EIA, whereas projects listed in Schedule 2 must be subject to an EIA whenever they are likely to have significant effects on the environment. The proposed development does not fall within the Schedule 1 list, but Schedule 2 includes a category of developments including mineral extraction where the Circular notes:

"The likelihood of significant effects will tend to depend on the scale and duration of the works, and the likely consequent impact of noise, dust, discharges to water and visual intrusion ... For ... quarries ... EIA is more likely to be required if they would cover more than 15 hectares or involve the extraction of more than 30,000 tonnes of mineral per year."

In that context, the Applicants sought a 'Screening Opinion' from the National Park Authority under the provisions of Part II of Regulation 5 of the 1999 Regulations, as to whether the development proposed might require a formal Environmental Impact Assessment. The response of the Authority, dated 15th August 2000, determined that an EIA was necessary on the basis that:

(i). The proposal is for the extraction of more than 30,000 tonnes a year.

(ii) The proposal is for the extension of mineral extraction into a green field site in a National Park.

(iii) The nature and extent of the proposed development has the potential for significant environmental impact, particularly from noise and vibration. (Full details of prediction, methodology and mitigation schemes will be required with the EIA).

(iv) The development may have an impact on an existing stream currently at 85/90m AOD.

(v) The development may have widespread implications on the landscape within the National Park, and for land in the adjoining area of Pembrokeshire.

The Applicants have accepted that the nature of the development falls within the scope of the Regulations and have accordingly commissioned the preparation of an EIA. The response of the National Park has been of assistance in defining the key issues which need to be addressed as part of the EIA.

WynThomasGordonLewis Limited have been appointed to undertake the EIA and to prepare the resulting ES which describes the outcome of the assessment. Wyn Thomas Gordon Lewis Ltd have considerable experience of undertaking EIA's for a wide variety of projects, and the Company is a member of the Institute of Environmental Assessment and Management. Many technical issues, such as traffic, landscape, visual impact, phased quarry development, and restoration design have been prepared by 'in-house' expertise available at WynThomasGordonLewis Limited.

In addition, the Applicants have appointed a number of specialist consultants to address relevant environmental and technical issues, namely:

- Hydrogeology, geology and geotechnical issues – 'Steve Bennett: Groundwater Consultant'
- Noise – Vibrock Ltd.

1.2 Submitted documents

The ES seeks to provide an objective account of the possible environmental effects of the proposed development, based upon a comprehensive checklist of relevant environmental criteria. The overall aims of the statement are to:

1. Describe the baseline conditions at the site against which changes and effects can be assessed.
2. Describe the details of the respective elements of the overall scheme.
3. Consider the potential environmental effects of the development.
4. Describe the measures that are available to mitigate those effects.
5. Assess the likely effectiveness of the mitigation measures.

The ES (Volume 1) draws together the results of the EIA, and seeks to provide an objective account of the possible environmental effects of the proposed development. It incorporates inputs from the specialist technical consultants, and

is intended to be a self-contained document that covers all relevant topics. Technical Appendices are produced as Volume 2.

In order to enable the findings and conclusions of the ES to be more readily understood a 'non-technical summary' has been prepared as a separate document (Volume 3).

The ES is accompanied by a formal planning application for the development which has been submitted to Pembrokeshire National Park Authority and the completed application form summarises the key elements of the development.

The planning application is accompanied by a series of plans that constitute the formal 'application plans'. The plans have been bound into Volume 4 of the overall submission, and are referred to in various sections of this ES. The Volume also contains a number of figures which have been prepared in support of the visual and landscape assessment. For ease of reference the plan and figures schedule is reproduced in this Statement following the contents page.

1.3 Format of the Environmental Statement

The statement has been prepared to broadly follow the advice on the content of Environmental Statements set out in Appendix 4 of the DoE/ NAW booklet 'Environmental Assessments – A Guide to the Procedures'.

The statement is accordingly subdivided into six sections, namely:

1. Introduction, which sets out general introductory comments to the project;

2. The site and its surroundings, which provides a detailed description of the site and its surroundings as they current exist;

3. The proposed development, which describes the details and nature of the proposals, and introduces some of the potential environmental effects which would be associated with it;

4. The restoration strategy, which provides a description of the concept for the restoration of the site upon completion of quarrying, but with provision for the ongoing restoration of worked out areas of the quarry;

5. Environmental effects and mitigation measures, which describes in detail the potential effects of the development under the sub headings of landscape and visual assessment, noise, vibration, traffic, dust, hydrology and hydrogeology, ecology, cultural heritage and agriculture. The section concludes by considering the likely effectiveness of the mitigation measures which are proposed; and

6. The policy framework, which analyses the relevant planning policy considerations against which the proposal will be judged.

1.4 Planning History and context

The original planning permission at Rhyndaston Quarry was granted in 1961, when the former Haverfordwest Rural District Council issued a temporary approval for quarrying operations (reference HR/4663/61/111). That permission was renewed in 1967, and again in 1970. In 1986, planning permission was granted

for a north-western extension of the quarry (reference C2/186[D2/85/666]). That permission also required the relocation of the processing plant into the central area of the quarry and allowed quarrying to take place to a notional maximum depth of 80ft (24.4m) below original ground level (which is now defined as 85 metres AOD).

In association with that north-western extension, the Applicants have undertaken a considerable amount of restoration and screening work to generally improve the amenity and landscape effects of the quarrying, particularly along the southern boundary.

A further northern extension was granted in October 1993 (ref C2/326), and the eastern extremity of that permitted area now forms the current working area. All permissions relating to the quarry were updated as part of the requirements of the Environment Act 1995. This required Operators to submit modern schemes of planning conditions, which would allow the Planning Authorities to impose up to date controls over ongoing operations. This exercise was undertaken in 1997, and a revised set of conditions was issued by the National Park Authority in November 1997 under ref NP/131/97/DET.

The approved scheme permits quarrying to 85m AOD in the northern area of the site and to 70m AOD in the central/eastern areas. The permission allows the development to continue to an expiry date of 31 December 2020, with quarrying to cease in 2015, to be followed by 5 years of restoration aftercare. The conditions control various operational aspects including working hours, noise and blasting limits and restoration. All of the relevant operational conditions have been implemented, or are being complied with, and the quarry is continuing to work without complaint.

The Applicants consider that the proposed development could be controlled by similar conditions to those already in place at the Quarry. They consider that these will assist in mitigating the environmental effects of the development, and will continue to co-operate with the Minerals Planning Authority in ensuring that all conditions are complied with and properly implemented.

1.5 Summary of the proposed development

The development would involve 9 main elements, namely:

(i) The easterly extension of the quarry as phases 1-5, working progressively back from the existing eastern face in a series of circa 30 metre wide strips. The initial phases have been designed to work behind the main east-west quarry face which would thereby act as a very effective screen to the operations.

(ii) The relocation of the existing plant site into the main 'bowl' of the quarry, during phase 3, where a mobile unit would thereafter follow behind the advancing working face, behind the existing screen provided by the east-west face.

(iii) The early reprofiling of the main overburden storage mound to provide an additional acoustic screen to properties to the west.

(iv) The early relocation from the skyline of the topsoil storage bunds along the northern rim of the quarry, to new temporary stockpiles within the main quarry area.

(v) The implementation of the next phase of agricultural restoration around the south western rim of the quarry,

as a continuation of the successful restoration undertaken around the southern and south eastern areas.

(vi) The deepening of the northern area of the quarry to 85 metres AOD within the northern area of the existing quarry (as currently permitted), and within the north western area of the extension area as 'phase 6c' of the overall operation.

(vii) The progressive restoration of the margins of a shallow lake which would be formed in that deepened area.

(viii) The final quarry operation associated with the removal of the central east-west ridge, as phase 7 of the development, together with the removal and restoration of the ridgeline around the margin of the original plant site area as phase 9.

(ix) The completion of the restoration of the quarry, which would be provided with a diverse range of land uses comprising pasture, landscaped amenity/nature conservation lake, and additional biodiversity interest associated with the restored quarry phases and retained rock outcrops.

2.0 THE SITE AND ITS SURROUNDINGS

2.1 Landscape Setting

2.1.1 *Site description*

Rhyndaston Quarry lies some 10km north-west of Haverfordwest, some 13km east of St. Davids, and 2km north-east of the village of Roch. The existing quarry and the application site are situated within the Pembrokeshire Coast National Park. It lies within an igneous outcrop of Rhyolite, which forms a low ridgeline within generally undulating countryside.

The quarry is bounded to the south by a steep sided narrow tributary valley which runs in a north/northwest direction for a distance of nearly 1km towards the Brandy Brook. Approximately 200m to the south/south-east, lies the residential property and horticultural nursery at Little Rhyndaston, beyond which the land rises gently to the summit of Rhyndaston Mountain at 125m AOD, some 750m to the south-west.

The ridgeline to the north of the quarry reaches a height of 122m AOD, with a fairly gently sloping western flank running down to the narrow flood plain of the Brandy Brook, at approximately 40m AOD. To the north-west lie the agricultural buildings associated with Rhyndaston Fawr Farm, whilst to the east there is an area of low lying marshy land beyond which the land rises gently and then more steeply towards Cuffern Mountains.

In landscape and amenity terms the quarry is not a prominent feature, and there are very few public vantage points towards the quarry. The landscape setting is reviewed more thoroughly in Section 2.2. A footpath crosses the south-east corner of the now restored part of the quarry, and the track to the north of the site is a 'Road used as a Public Path', linking Rhyndaston Fawr with Rhyndaston Villa Farm.

The residential properties at Little Rhyndaston and Rhyndaston Fawr, and an isolated property adjacent to the 'C' class road, approximately 0.4km to the south-east, are the only houses within a 1km radius of the existing quarry.

The operational area of the quarry currently comprises some 8.2 hectares. It has six principal features, namely:

1. The restored land within the south-eastern area of the quarry, 1.56 hectares in extent, comprising the former processing plant site, which has now been restored to productive agricultural use.

2. The screen embankment situated along the north-western edge of the quarry access road, which screens views into the quarry and processing plant site from the public highway to the east of the site.

3. The processing plant site itself, which is fully screened and enclosed within the south-eastern area of the quarry bounded to the north and east by the historic quarry faces, and supplemented to the south by the screen embankment.

4. A further screen embankment at the western edge of the quarry, which encloses and defines the operational area in that part of the quarry.

5. The current extraction area along the north eastern face of the quarry, which is partly enclosed by a west facing promontory on its southern margin.

6. A generally flat base to the quarry, at a level of 90m AOD, where stockpiles of processed stone are located.

The proposed extension area comprises a 2.9 hectare site to the east of the current operational area. It consists of agricultural land, used at different times of the year for arable production and for grazing. The site generally slopes south-eastwards from approximately 114.5metres AOD, to 105metres AOD.

The northern boundary is defined by a track which runs westwards from Rhyndaston Farm, with the north eastern boundary undefined on the ground, but which has been drawn to provide an appropriate margin to the outlying farm buildings at Rhyndaston Farm. The eastern boundary generally follows a drainage ditch which runs southwards from the Farm.

The southern boundary is again undefined on the ground, but represents the north eastern limit of the current planning permission boundary at the existing site. The western boundary is formed by the existing face and fence line along the eastern bounday of the quarry.

2.1.2 ***Landscape Context***

Rhyndaston Quarry is located approximately 3km to the northeast of the A487 where it passes through the village of Roch in west Pembrokeshire. The proposed extension site is located adjacent to the existing quarry on its north-eastern side, near the farmstead of Rhyndaston-fawr. The landscape setting of the area is gently undulating with Dudwell Mountain at 178 metres AOD, forming a prominent feature to the east (refer to Photograph 1 on Figure 3125 L.02) and, to the southwest, Rhyndaston Mountain at 125 metres AOD, also being a recognisable feature within the wider landscape. To the west Brandy Brook, follows one of several steep sided wooded valleys which cut into the otherwise gently undulating topography. One of the tributaries of Brandy Brook occupies a small, wooded valley immediately south of Rhyndaston Quarry.

2.1.3 ***Landscape Character***

Three landscape character types can be identified in the area. The first of these types is the most wide spread and consists of 'rolling hills', having clearly defined field boundaries with intermittently vegetated hedgebanks. The existing Rhyndaston quarry and proposed extension site are located within this character area. The second type, 'wooded valleys', has a dramatically different character with deciduous woodland and scrub vegetation and significant changes in topography. This character type, including Brandy Brook and Camrose Brook, is a distinctive element that defines the extent of the 'rolling hills' in the wider landscape. The third character type is 'Dudwell Mountain', which due to its higher elevation and lack of clearly defined field boundaries forms a recognisable element within many views.

2.1.4 ***Landscape Designations and Policies.*** *(refer to 3125 L06)*

The existing Rhyndaston Quarry and the proposed extension site are located within the Pembrokeshire Coast National Park, as amended on the 22nd November 1995. Prior to that date, Rhyndaston Quarry was over 2.2 km outside the National Park boundary. With reference to the Pembrokeshire Coast National Park (Designation) Variations Order (1989), the National Park was extended in order to incorporate Brandy Brook and its tributaries, a network of wooded, wet valleys containing scrub and thickets. The existing quarry and proposed extension area are located on one of the hills that separate the wooded valleys, which the inspectors report from the Inquiry, refers to as 'individually less attractive, being open farmland'[5]. The

justification for their inclusion within the National Park is that they contribute to the overall natural beauty of the area and provide a setting for the wooded valleys.

The Dudwell Mountain Area of Special Landscape Value (ASLV), as designated within the North Pembrokeshire Local Plan, is just under 1 km to the east of the proposed extension site at its nearest point. This area has footpaths and bridleways, which offer elevated views of the site (refer to Photograph 3 on Figure 3125 L.02). The central part of the Dudwell Mountain ASLV is also designated as a Regionally Important Conservation Area (RICA). To the north of Gignog, outside the National Park, Brandy Brook is designated as an Area of Special Landscape Value (ASLV). The landscape setting of the ASLV and the RICA is a consideration in assessing the effects of the proposed development.

There are three areas, within 1km of Rhyndaston quarry, designated as Scheduled Ancient Monuments (SAMs) within the Pembrokeshire Coast National Park Local Plan. The nearest of these areas to the proposed extension site is a standing stone 450 metres from the site boundary, to the north of Rhyndaston-fawr. The landscape setting of SAMs is a consideration in assessing the effects of the proposed development.

Further designations within the Pembrokeshire Coast National Park Local Plan are the Heritage Coast, which includes coastal waters near Newgale and two Sites of Special Scientific Interest (S.S.S.I), the first to the north of Newgale and the second just south of Newgale Sands. These areas are over 3.5km from the Rhyndaston Quarry and the proposed extension site and too distant to be affected by the proposed development.

2.1.5 *Settlement Pattern*

A minor road, which links the A487 and settlement of Roch with the B4330 and settlement of Hayscastle Cross, passes within 700 metres of the extension site to the east. The village of Hayscastle Cross is 2.2km to the northeast of the extension site and the village of Roch, is 1.5km to the southwest. These are the only significant settlements within 3km of Rhyndaston Quarry.

Scattered farmsteads and small groups of farmsteads and dwellings dominate the settlement pattern of the area. There are several dwellings in close proximity to the extension site, although the settlement density is relatively low adjacent to the site compared to the coastal areas to the west. The closest residential property is at Little Rhyndaston Nursery, which is a small-scale plant nursery 220 metres to the south. The dwelling within the farmstead of Rhyndaston-fawr is 230 metres to the north of the extension site and Barch Farm is 650 metres to the southwest.

2.1.6 *Public Rights of way*

There are no public rights of way crossing the site, but several public footpaths pass within 200m of the site. These include the Road Used as Public Path (RUPP) adjacent to the northern boundary of the existing quarry and the footpath that crosses the restored area at the south western edge of the quarry before entering Little Rhyndaston Wood (refer to Figure 3125 L.04). There are several other footpaths within 2km of the site, most notably the footpaths on Dudwell and Rhyndaston Mountains (refer to Figure 3125 L.06).

2.2 Geology

The quarry is situated within a wide belt of Ordovician strata that stretches from Haverfordwest to Fishguard. The older Ordovician rocks consist of very thick volcanic rhyolite material, which is of medium to fine-grained granulose structure.

The visible strata within the quarry are well fractured as a result of jointing and faulting, and show complex structural relationships. These include small displacement slickenside faults, a series of vertical/high angle joint sets, and infrequent low angle joints with generally small joint openings.

The reserves within the extension area are exposed along the western and southern boundaries in existing faces. The presence of the reserve elsewhere within the site has been verified by a series of six trial pits which have been dug at 50 metre intervals. The location of the trial pits are illustrated on figure 1 with the results set out in table 1.

Table 1 Results of trial pits.

Trial Pit	Top Soil	Sūb Soil	Overburden
TP 1	0.300m	0.350m	2.9000m
TP 2	0.250m	0.300m	2.200m
TP 3	0.250m	0.350m	2.400m
TP 4	0.300m	0.450m	2.950m
TP 5	0.250m	0.250m	2.400m
TP 6	0.250m	0.300m	2.600m

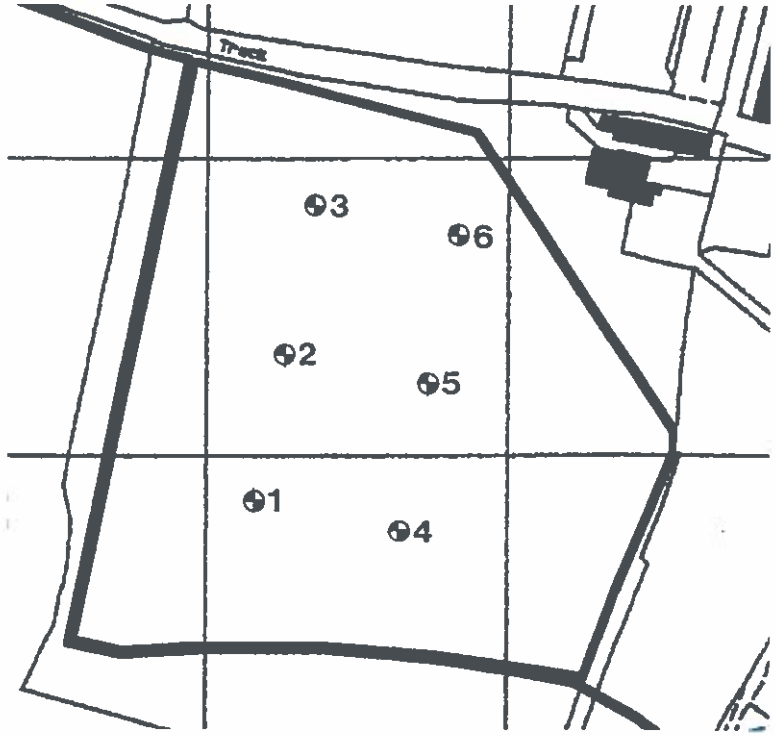

Figure 1 Location of trial pits.

2.3 Hydrology

A 'Water Features Survey' and 'Hydrological Assessment' was carried out by 'Steve Bennett Groundwater Consultant' in the summer of 2001. That exercise was related to planning conditions imposed as part of the 1997 permission (condition 43 of permission ref NP/131/97/DET), and, inter alia, considered the effects of deepening the quarry from 90 metres to 85 metres AOD within the north western area of the existing quarry. The

report has provided the background information for a supplementary report which gas been prepared in relation to the development which forms the subject of this ES and planning application. The principal findings of the respective reports are set out below, and in section 5.6 of the ES.

2.3.1 ***Background***

Rhyndaston Quarry is cut into the flank of a valley feature on Rhyndaston Mountain, where the valley is dissected by a westerly flowing steeply incised stream. Within the quarry floor, at some 90 metres AOD, at least two small issues arise and coalesce to form an inflow to the small quarry lagoon within the main quarry area. The overflow from that lagoon passes through an excavated streamcourse away from the quarry, down a waterfall and into the westerly flowing stream (the Brandy Brook).

The excavation of rock to a depth of 90m AOD has not lead to any significant water problems, apart from occasional ponding following heavy rain, on the quarry floor in the vicinity of the plant. Water for the various operational and ancillary requirements of the quarry is largely taken from within the sperate small quarry lagoon situated to the west of the site office/weighbridge.

2.3.2 ***Hydrological Framework***

The annual rainfall in the vicinity of Rhyndaston Quarry is some 1200mm/year, of which approximately 700mm/year does not evaporate, and is therefore available for run off and infiltration.

The surface soils and drift covering over the bedrock is stony and is bound in a silty sandy matrix, without significant clay content. After periods of rainfall some ponding at surface occurs, but in comparison with clay areas of the country it can be assumed that there is a reasonable rate of infiltration into the underlying bed-rock.

The strata at, and in the vicinity, of the quarry are assumed to be permeable, given the well-fractured nature of the geology and the lack of apparent seepage or staining on the existing quarry faces. It is considered, therefore, that the area is a minor aquifer with the potential to sustain springs, domestic supplies, and some agricultural usage. Rainfall recharge of perhaps 20% of the effective rainfall in the general area may result in volumetric recharge averaging some 1400m3/year/hectare. This volume of recharge is sufficient to feed the boreholes and springs of the area.

2.3.3 ***Water Features***

Steve Bennett Groundwater Consultants conducted a water features survey on 21-22 August 2001 in conjunction with the quarry manager. The survey was undertaken within a one kilometre radius of the quarry, as agreed with the Environment Agency. The results of the water features survey are reproduced as appendix 1 to this ES.

The Applicants obtained available details of private domestic abstractions from the Environmental Health Department of the District Council. These formed a sound basis for much of the survey. Maps at 1:2500 and 1:25000 were reviewed for evidence of springs, wells and streams and other features. Further information was obtained by Steve Bennett from detailed discussion with Mr Rowe of Rhyndaston-fawr Farm and with other farmers in the vicinity.

The maps and a comprehensive walkover survey of the area show that wet flushes, seepages, springs and small streams arise at various locations around the hill, often at a level of 90-100mOD.

These coalesce to form a limited number of small stream tributaries of the Brandy Brook, which locally is at a much lower elevation of around 30mOD.

From the water features survey presented in Appendix 1, the water level in a number of boreholes and springs away from the Brandy Brook valley is noted to be around 100mOD.

The recorded water levels in the respective boreholes and springs at the time of survey are set out in table 2.

Table 2 Water levels.

Little Rhyndaston Nursery	c99mOD
Little Rhyndaston	c100mOD
Kite Mountain	c100mOD
Coed y Barch	c06mOD
Rhyndaston Villa	c100mOD
Rhyndaston-fawr	c104mOD
Outer Slade	c100mOD

Other properties such as Coland Rise and Middle Slade reflect a water level at a higher elevation, which is known to be quite acidic. The springs at Rhyndaston Farm (SM 8940 2413) are at about the same elevation as the quarry floor level of 90mOD.

The hydrological model is thus taken to be recharge of a proportion of the effective rainfall into permeable fractured and jointed strata of Rhyndaston Mountain to form a fairly consistent water table level of around 100mOD. This water table level falls slightly towards the valley features and gives rise to a number of discrete springs and seepages.

2.4 Ecology

There are no features of nature conservation interest on the application site. Consultation with the Countryside Council for Wales has confirmed that there are no national or local statutory designations within 2 kilometres of the site. The prevailing agricultural land-use, and the absence of any natural features, along the boundaries or within the site, result in a relatively barren ecological area.

In terms of flora, there are no rare plant species recorded in the area. The site is currently in pasture, but has been cultivated for a variety of arable crops in recent years. Thus there has been little opportunity for other plant species to emerge. When it is not being cropped, it is intensively grazed. As a result of these agricultural demands, there are no trees, hedges, or areas of primary or secondary vegetation growth within the site.

Similarly, with regard to fauna, there is no evidence of mammal interest within the application site. It is possible that species of interest occur in Little Rhyndaston Woods adjacent to the stream that runs along the southern boundary of the quarry. However, the intervening presence of the existing quarry means that principal foraging areas are likely to be located within, and to the east of the wood rather than into the application area.

There is no habitat within the application site itself that could be considered suitable to accommodate any protected species such as bats, badgers, dormouse or any birds, reptiles, amphibians or invertebrates.

Although there is a possibility that the site may be used by species for foraging, it is generally the case that European and UK law protects the animals and their nests, rather than their feeding grounds.

2.5 Cultural Heritage

An assessment has been undertaken, following consultation with Cadw:Welsh Historic Monuments, of the potential for features of historical importance to be present within the application site. Cadw have advised that there are no scheduled ancient monuments (SAM) or listed buildings within the site or in it's immediate vicinity.

There are however, a number of scheduled ancient monuments within a 2 kilometre radius. These are summarised in Table 3, and their locations are illustrated on figure 2.

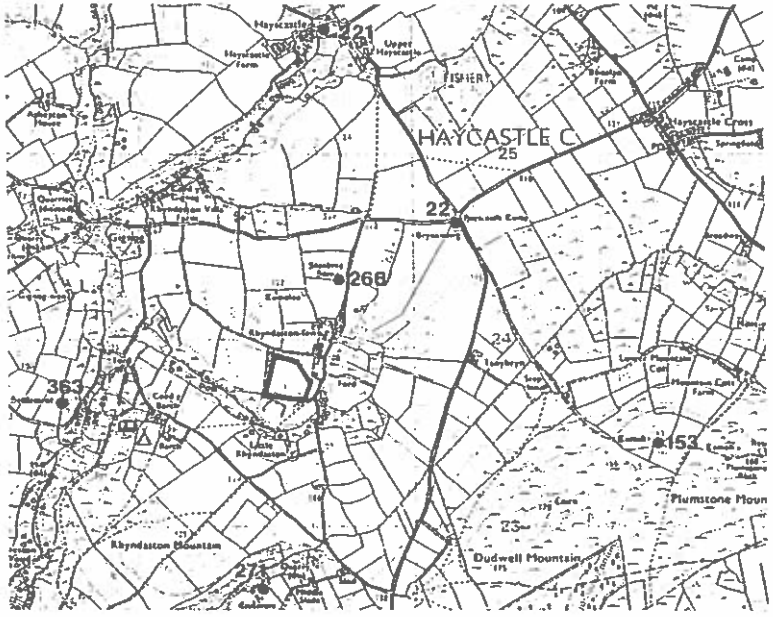

Figure 2 Location of Scheduled Ancient Monuments.

SAM no.	SAM Name	Type	Distance from site	Direction from site
PE153	Plumstone Mountain Round Barrow	Prehistoric Funerary and Ritual	1850 metres	East
PE022	Tump Round Barrow	Prehistoric Funerary and Ritual	1200 m	North East
PE266	Rhyndaston Fawr Standing Stone	Prehistoric Funerary and Ritual	400m	North
PE363	Brandy Brook Camp	Prehistoric Domestic and Defensive	1100m	West
PE271	Slade Camp	Prehistoric Domestic and Defensive	1000m	South
PE221	Castle Mound	Medieval and Post Medieval Secular	1750m	North

Table 3 Scheduled Ancient Monuments.

There are no Listed Buildings in the vicinity of the study area and no Conservation Areas. In addition there are no sites of historic events or with historic associations in the vicinity.

2.6 Agriculture

The Provisional 1:25000 scale Agricultural Land Classification Map shows the southern third of the site as Provisional Grade 5 with the remainder as Grade 3.

The National Assembly for Wales advises that the Provisional ALC maps are largely reconnaissance in nature, as they were originally produced in the late 1960's / early 1970's to provide

strategic guidance on land quality for planners. For this reason, the information is not definitive.

A subsequent ALC survey carried out in 1993 (Survey 047/93) included an assessment of the western 25% of the site. This demonstrated that that part of the field is a combination of Subgrades 3a and 3b.

For the purposes of this application, it has been extrapolated that the land is a mixture of grades 3a and 3b.

2.7 Traffic

Access to the quarry is taken from an unclassified road that runs north to south past the quarry, and meets with other local roads that connect the village of Roch to the south-west, and Hayscastle Cross to the east. From Roch it is possible to take the A487 west to St David's (approximately 14 kilometres) or south to Haverfordwest. From Hayscastle Cross, the B4330 travels the 10km southwards into Haverfordwest, and then on to Milford Haven.

All the roads in the immediate vicinity of the quarry have minimal traffic flows. Most HGV movements are related to agriculture/horticultural activities, and are at such a level that congestion does not arise.

Condition 22 of the 1997 'Review of Old Minerals Permissions' (ROMP) Conditions requires that before the commencement of operations to meet any "large contract", the Applicant will undertake to agree routes for HGVs associated with such jobs.

The Applicants would be happy to continue with this arrangement should permission be forthcoming for this proposal.

3.0 THE PROPOSED DEVELOPMENT

3.1 Introduction

The proposed development at the extension site would proceed as a logical continuation of operations at the existing quarry. In terms of quarrying methods, production, material-type and output, there will be no substantive change from the existing operations. These activities are themselves tightly controlled by conditions imposed in 1997 as a result of the ROMP permission (reference NP/131/97/DET).

The development would involve the phased extraction of some 1.65 million tonnes of igneous rock in the period up to 2016, which is the end date of the current planning permission. This would involve a continuation of the current average annual output of some 80,000 – 100,000 tonnes per annum over that period.

The scheme has been designed to embrace 6 main factors, namely:

1. To contain the extension area behind the east-west ridgeline in the centre of the quarry, which would provide a very effective visual and acoustic screen.

2. To relocate the secondary crushing and screening plant into the main quarry bowl, behind the central ridgeline.

3. To continue the use of a mobile primary crushing plant , sited in the vicinity of the working face, which can similarly benefit from the screening and enclosure provided by the central ridgeline and western overburden mound.

4. To reprofile the main western overburden mound to increase it's visual and acoustic screening value in relation to properties to the west.

5. To continue restoration operations around the periphery of the quarry on the worked out quarry faces, and on non operational areas of the quarry floor.

6. To provide for a diverse and attractive restored site with considerable landscape and biodiversity potential.

The development scheme incorporates four main elements of:

(i) The proposed eastern extension of the quarry;

(ii) The extraction of a proportion of the currently permitted reserves to a level of 85 Metres AOD within the north western area of the existing quarry;

(iii) The offer to voluntarily relinquish the existing rights to deepen the quarry in the remaining areas of the existing site, to levels of 85 metres and 70 metres AOD respectively.

(iv) The preparation of a comprehensive restoration strategy for the entire site, which reflects the circumstances which would arise from the more limited deepening of the quarry (point (iii) above).

The existing reserves at the quarry, including deepening to the approved levels, are some 1.5 million tonnes. The currently proposed development would involve the extraction of some 1.65 million tonnes. Effectively, the volume of rock available within the proposed extension area, above 90 metres AOD, is

equivalent to the reserves available in the central/southern area of the existing site within the area which can be deepened from 90 metres AOD to 70 metres AOD. The net increase in reserves would therefore be only some 150,000 tonnes, if, as part of an agreement accompanying a planning permission, the reserves within the central/southern are relinquished. The development would however give rise to a more environmentally acceptable working programme, and, importantly, a much more acceptable and sustainable long term restored landform.

3.2 Phased quarry development scheme

The scheme has been designed to progress in eight operational phases. The first five phases will allow for the 2.9 hectare extension to the east to be worked to a uniform depth of approximately 90 metres AOD. The principle behind the design of the eastward extension of the quarry is to advance the quarry face in five narrow phases. The advantage of this approach is discussed in detail in the landscape appraisal, and has been proposed in order to mitigate any long distance views from the mountains to the south of the site.

Subsequent extraction phases would then be implemented to extract the remaining reserves within the existing permitted quarry area , and with a limited deepening of the base of the quarry from 90m AOD to 85m AOD, partly within the currently proposed extraction area. This scheme would supersede the working scheme approved order the ROMP permission reference NP/131/97/DET. However, for the purposes of clarification, and to achieve a comprehensive extraction and restoration scheme, the remaining area of the quarry has been included within the phasing proposals set out in this application.

Each of the phases are described in more detail below, and are illustrated on Plans 3125:121to 131.

Phase 1

Preliminary operations would involve the reprofiling of the main overburden stockpile on the western side of the quarry, which would be extended northwards, and increased in hight to eliminate the open narrow open vista along the western margin of the quarry.

The first quarrying phase would involve a 30 metre wide extension eastwards from the current working face. The soils and overburden has an average depth of around 2 metres, and therefore, a total of approximately 9,600m^3 of material would be stripped and stored in bunds to the north and south of the extraction phase as illustrated on shown on Plan ref 3125:121. Overburden would be screened through the processing plant, and used as restoration material for the north-west corner of the existing quarry site.

Temporary access to the surface of the extraction phase for initial soil stripping and subsequent drilling is available via the access road which has been created along the southern edge of the application site. This access would also be used to relocate the existing top soil storage mounds from the northern boundary of the existing quarry to a new temporary location on the quarry floor, adjacent to the main overburden stockpile. That top soil would then be available for restoration of the quarry floor, which would commence during phase 3.

Quarrying would progress eastwards from the current operational area, with extraction down to 90m AOD. A mobile primary crushing plant would be sited in the vicinity of the quarry face, which would reduce the stone to an appropriate size for secondary crushing and screening. Vehicle movements between the extraction area, primary crusher and existing secondary screening plant area would use the existing haul road, which

passes to the west of the promontory in the central part of the site.

Phase 2

Soil stripping operations in Phase 2 would commence shortly prior to the completion of extraction of Phase 1. The top soil and sub soil removed from this area would be stored along the northern and southern edges edge of the phase. The screened overburden would be used to progress the restoration of the north-western face.

The working of Phase 2 would be undertaken as an easterly continuation of Phase 1, with extraction to a similar level of 90m AOD. These operations are illustrated on plan ref 3125:122.

Phase 3

Extraction through Phases 3 would be a continuation of the easterly progression of the working face. The soils would be stipped and stored as extensions to the storage mounds along the northern and southern boundaries of the extraction phase. Overburden would be screened and used to progress the restoration of the northern quarry faces, including the new faces exposed along the northern edge of phases 1 and 2.

Concurrent with the extraction of Phase 3, the secondary crushing and screening plant would be relocated into the main quarry area, screened by the east-west central ridge. This would reduce further the potential for noise disturbance to the properties to the south of the quarry, and increase the efficiency of the operations in terms of distance to plant etc.

The area vacated by the secondary plant would then become available as a processed stockpile area. This in turn would reduce the need to accommodate stockpiles on the open area on the quarry floor along the southern margin of the quarry, to the west of the weighbridge. That area would therefore be restored to grassland as a continuation of the restoration works which have been carried out along the south eastern margin of the quarry. This would further improve the visual appearance of the quarry, and provide a maturing context for the remainder of the restoration operations. These operations are illustrated on plan ref 3125:123.

The soils and overburden for these restoration works would be available in the adjoining stockpiles. Care would be taken to utilise material from the inner edge of the main overburden mound in order to ensure that the western screen and narrow "quarry neck" are maintained and their screening value is not compromised.

Phase 4

This phase would continue the activities undertaken in the previous phases, with a soil stripping exercise, followed by extraction within the narrow working area. The soils would be stored in the mounds along the northern and southern boundaries of the phase, with the overburden used to continue the restoration works along the northern boundary of the site.

These operations are illustrated on plan ref 3125:124.

Phase 5

This represents the final eastern phase of the extension area. The soils would be stored in bunds along the eastern edge of the site, with a temporary haul road separating the top soil and sub soil areas. The residual soils would be stored along the southern edge

of the site. Extraction would then proceed as a continuation of previous operations, as illustrated on plan ref 3125:125.

Phase 6

Phase 6 proposes the deepening of the northern area of the quarry from 90 metres AOD to 85 metres AOD. Phases 6a and 6b lie within the existing permitted quarry area, and represent existing permitted reserves. Phase 6c lies within the extension area. During these works, the void would need to be temporarily dewatered, using the existing outflow from the quarry to the Brandy Brook.

The extent of quarrying at the base has been designed to balance the recovery of stone with the desire to create an attractive and diverse restoration scheme, incorporating a shallow water feature. This restoration objective is described in more detail in section 4.0 of this statement.

The margins of the deepened floor of the quarry would be progressively profiled using soils from the temporary storage mounds situated along the southern edge of the extension area, together with any reject rock encountered during the quarrying within phase 6. The progressive removal of the soils from the southern storage mounds would then allow quarrying to progress into the central ridge as phase 7 of the operation.

These operations are illustrated on plan ref nos. 3125:126, 127 and 128.

Phase 7

This phase would remove the central ridgeline and open up the main quarry area to allow the final restoration landform to be created. This phase forms part of the currently permitted working area, but the phasing scheme has provided for it's retention to act as a substantial screen to the quarrying operations elsewhere within the site, until the latter stages of the development. These operations are illustrated on plan ref no 3125:129.

Phase 8

This final phase would remove the narrow ridge of rock along the southern edge of the original secondary plant are a/stockpile area This in turn will facilitate the comprehensive restoration of the site, and allow use of material from the overburden mound alongside the site access road, for the restoration of the margins of the phase and the adjoining base of the quarry. These operations are illustrated on plan ref no 3125:130

3.3 Plant

Until recently the plant site incorporated a primary crusher which was fed by dump trucks depositing excavated rock into a hopper via an access ramp. That operation has been changed by using a mobile primary crushing plant within the main quarry area. This has considerably reduced the noise and general environmental impact associated with the original plant. Stone from that primary crusher is fed by dump trucks to the secondary crusher/screens within the main plant site which is located in the south eastern area of the quarry, to the south of the extension area. That site enjoys the benefit of a well screened and enclosed location within retained rock faces and screen bunds. Aggregate products ranging from 80mm to 10mm in size are then produced as part of that secondary process.

During the first two phases the Applicants intend to retain a similar arrangement of the mobile primary and fixed secondary plant.

During extraction from Phase 3, the secondary plant site would be re-located to the main quarry bowl to increase operational efficiency, and to further reduce the potential for environmental impact. It would lie at greater distance from the residential property in the vicinity of the site notably Rhyndaston Nursery to the south), and benefit from further screening within the enclosed main quarry area. Since there is no intention to increase output levels from the quarry, and the geological properties of the rock in the extension area are similar to those previously worked, the type of plant employed will be broadly similar – there will not be a material intensification in the use or quantity of plant.

3.4 Quarry Entrance

The existing site entrance has benefited from the requirements of Condition 16 of the 1997 ROMP permission.. As a result of those requirements the bellmouth and 30 metres of the access road have been surfaced with concrete.

The site is secured by means of a gate when working is not in progress. As part of the development it is the intention to surface the access road from the site entrance to the weighbridge area.

All vehicles would continue to use the existing site entrance, and the current pattern of traffic movements is expected to continue. Based upon an average annual output of some 75,000 tonnes per annum, and an average load size of 15 tonnes, this equates to an average daily number of 18 loads, or 36 movements.

3.5 Loading Operations

All loading/unloading at Rhyndaston quarry takes place on the quarry floor, or at the plant site, and not at original ground levels. This will continue to be the case in order to ensure that the potential for noise and dust generation is not increased.

3.6 Quarry Waste

A small element of waste arises as a by-product of the recovery process, although this is all sold or blended with other products to minimise wastage. Occasional stockpiles of waste materials form, but these are only temporary and do not lead to any permanent storage or disposal problems. Their size and design means that none will be subject to classification under the Mines and Quarries (Tips) Regulations 1971.

3.7 Site Security and Safety

The rural and relatively remote location of Rhyndaston Quarry is such that trespass onto the site has not proven to be a problem. Condition 65 of the current permission requires the working site to be fenced with a stock proof fence. This practice will continue. Public rights of way pass along the eastern and northern boundaries, but usage is at a low level. The footpath that crosses the southern restored area crosses the main access road, close to its junction with the public highway. The Applicant has undertaken to introduce appropriate signage and fencing at the crossing point to ensure that haul road and footpath users are aware of the potential risk.

3.8 Hours of operation

The current 1997 permission contains 16 conditions relating to the hours of operation.

These conditions are reproduced in full below:

" 3. *On Mondays to Fridays inclusive, except in emergencies to maintain safe quarry working (which shall be notified to the National Park Authority as soon as is practicable) no excavation, backfilling or use of any machinery of vehicle movements associated with the extraction and processing of minerals shall be carried out before 07.30 hours and after 17.30 hours except with the prior written agreement of the National Park Authority.*

4. *On Saturdays except in emergencies to maintain safe quarry working (which shall be notified to the National Park Authority as soon as is practicable) no excavation, backfilling or use of any machinery or vehicle movements associated with the extraction and processing of minerals shall be carried out before 07.30 hours and after 12.30 hours except with the prior written agreement of the National Park Authority.*

5. *On Sundays, Bank Holidays and National Holidays, except in emergencies to maintain safe quarry working, (which shall be notified to the National Park Authority as soon as is practicable) no excavation, backfilling or use of any machinery or vehicle movements associated with the extraction and processing of minerals shall be carried out, except with the prior written agreement of the National Park Authority.*

6. *On Mondays to Fridays, inclusive, no lorry loading and/or sales shall take place on the site except between the hours of 07.00 hours and 18.00 hours.*

7. *On Saturdays no lorry loading and/or sales shall take place on the site except between the hours of 07.00 hours and 13.00 hours.*

8. *On Sundays, Bank Holidays and National Holidays no lorry loading and/or sales shall take place on the site.*

9. *No heavy goods vehicles shall enter the site before 07.00 hours on any day and not at all on Sundays, Bank Holidays and National Holidays.*

10. *No servicing, maintenance and testing of plant shall be carried out at the site between 18.00 hours and 07.00 hours on any day and at no time on Sundays, Bank Holidays or National Holidays except with the prior written agreement of the National Park Authority.*

11 *Notwithstanding conditions 3, 4, 5 and 10 water pumping and environmental monitoring and any other similar activities may be carried out at any time subject to the prior written agreement of the National Park Authority.*

12. *On Mondays to Fridays, inclusive, except in emergencies to maintain safe quarry working (which shall be notified to the National Park Authority as soon as is practicable) no operations on the periphery of the site or at high level, or in unscreened locations, such as the formation, removal or alteration of spoil tips, baffle mounds, screening and storage embankments, formation or maintenance of drainage works, and the stripping and replacement of soils shall be carried out except between 08.00 hours and 17.00 hours without the prior written agreement of the National Park Authority.*

13. *On Saturdays except in emergencies to maintain safe quarry working (which shall be notified to the National Park Authority as soon as is practicable) no operations on the periphery of the site or at high level, or in unscreened locations, such as the formation, removal or alteration of spoil tips, baffle mounds, screening and storage embankments, formation or maintenance of drainage works, and the stripping and replacement of soils shall be carried out except between 08.00 hours and 13.00*

hours without the prior written agreement of the National Park Authority.

14. On Sundays, Bank Holidays and National Holidays except in emergencies to maintain safe quarry working (which shall be notified to the National Park Authority as soon as is practicable) no operations on the periphery of the site or at high level, or in unscreened locations, such as the formation, removal or alteration of spoil tips, baffle mounds, screening and storage embankments, formation or maintenance of drainage works, and the stripping and replacement of soils shall be carried out.

32. On Mondays to Fridays inclusive, and except in emergencies to maintain safe quarry working (which shall be notified to the National Park Authority as soon as practicable) no blasting shall be carried out except between 10.00 hours and 12.00 hours and 14.00 hours and 16.00 hours.

33. On Saturdays, Sundays, Bank Holidays and National Holidays except in emergencies to maintain safe quarry working (which shall be notified to the National Park Authority as soon as practicable) no blasting shall be carried out.

34. On Mondays to Fridays inclusive, and except in emergencies to maintain safe quarry working (which shall be notified to the National Park Authority as soon as practicable) no drilling shall be carried out other than between 08.00 hours and 17.00 hours.

35. On Saturdays except in emergencies to maintain safe quarry working (which shall be notified to the National Park Authority as soon as practicable) no drilling shall be carried out other than between 08.00 hours and 12.00 hours".

In summary, the regular wining and working of minerals can take place between 0730 hours and 17.30 hours, Monday to Friday, and between 0730 hours and 1230 hours on Saturdays. In addition, lorry loading and sales at the site can take place for an additional half of one hour each side of these times.

Conditions 12, 13 and 14 refer to more restrictive hours of working at certain locations in the quarry, particularly at higher levels and at the periphery.

The permitted times for blasting are restricted to between 1000 and 1200 hours and 1400 and 1600 hours, on Mondays to Fridays only.

It is proposed that quarrying and all associated operations as detailed in the existing conditions would continue in accordance with the current permitted hours.

3.9 Blasting

Blasting would continue as at present rates, with one blast approximately every six weeks. On average, each firing provides around 10,000 tonnes of rock.

3.10 Drainage

The principle of the current drainage regime at the quarry would continue, whereby surface water drains to a small settlement lagoon.

In the lagoon, any suspended solids are allowed to settle out, and limited discharges of clean water are made into a narrow channel which leads to the stream that runs east to west along the southern boundary of the quarry. This arrangement has been undertaken for a considerable number of years, and although during phase 6 there will be a slight increase in the limited volume of water which is discharged, this can be adequately

accommodated by the surrounding surface water drainage pattern.

3.11 Output and markets

The development would involve a continuation of current levels of output of approximately 80,000 - 100,000 tonnes per annum. The quarry produces the largest range of quarry products in the area, which are marketed over a radius of up to 35 kilometres. The aggregate products are required for end uses that include ready mixed concrete, pre-stressed concrete products, and top-dressed chippings for use in road surfacing contracts. The market for most of these products are the major towns in the region of Haverfordwest, St David's, Fishguard and Milford Haven.

In addition, the quarry supplies Types 1 and 2 sub-base material, pipe bedding and 20mm ornamental chippings. The latter are an unique product given the local colour of the stone, and have markets over a wider area. The development would maintain these supply patterns, and the proposal does not seek permission to increase production in order to attempt to supply additional extended markets. The key focus of the development is continuity of supply to established customers within an essentially local market.

3.12 Employment

There are currently seven people directly employed at Rhyndaston Quarry, consisting of four involved in the quarrying and processing activities, two associated with sales and accounts, and the Quarry manager. There are also, at any one time, a minimum of five self-employed 'owners/drivers' associated with the haulage of quarry products from the site, of whom three are permanently based at the quarry.

In addition, many tradesmen and businesses rely in part on extraction from Rhyndaston Quarry. Amongst those involved in production are haulage operators, plant servicing and maintenance and blasting contractors. The proposals for the extension to the quarry would require, amongst others, soil stripping and landscape specialists.

The maintenance of existing production levels means that the number of persons employed directly or indirectly as a result of continued quarrying at Rhyndaston will remain broadly consistent throughout the duration of the extraction period. It will therefore continue to be a notable employer in this rural area.

3.13 Alternative Sites and Processes

The Applicants have carefully reviewed a range of alternative options for the development of the quarry. This has included consideration of the terms of the existing permission and the opportunities for expansion in different directions. These alternatives have included:

1. **Extending the quarry to the west.**

   The geology of this area is such that the igneous deposit extends westwards towards the Brandy Brook valley. The field adjoining the current permitted area has the potential to yield a similar amount of reserve to the extraction area. However, any proposal of this nature would be likely to have a greater effect on the local landscape which, towards Brandy Brook, features smaller field patterns, more mature hedgerows, and a greater variety of vegetation. Quarrying in a westerly direction would also result in greater visual impact removing the existing western edge screen. There would also be the potential for greater impact on nature

conservation, , and the setting of the western scarp face at Brandy Brook.

2. **Deepening of the existing quarry**

(a) The southern area of Rhyndaston Quarry has planning permission for extraction to a depth of 70m AOD. However, the operators have thus far only worked the quarry to a depth of approximately 90m AOD. The hydrogeological effects of such deepening would require ongoing monitoring, and the implementation of mitigation measures as appropriate. More significantly, the reworking of the southern area would potentially reintroduce amenity disturbance to the occupiers of Little Rhyndaston Nursery. At its closest point, that property is some 100 metres from the quarry boundary. In addition, However, a deep water feature would be created, which the Applicants consider to be less attractive than the scheme which forms the subject of this application.

(b) The northern part of the existing quarry has permission for deepening to 85m AOD, within a generally rectangular area. Implementation of that scheme would create a rectangular void and a lake which would not integrate particularly well into it's surroundings The currently proposed scheme similarly envisages a modest deepening of part of the area to 85m AOD, but within a wider landform which would allow the resulting lake to be profiled and incorporated into a more imaginative and diverse restoration strategy.

3. **Extension to the north**

The land to the north of the existing quarry, and to the west of Rhyndaston Farm rises sharply. Any furtherexpansion in this direction would increase the exposure of the south-facing working face from the elevated land of Ryndaston, Caffern and Budwell Mountains

3.14 The Preferred Scheme

The final scheme, which forms the subject of this application and ES, has progressed through a series of draft designs, and a thorough examination of alternative options. The exercise has sought to balance a wide range of competing environmental, operational and commercial interests. The final option has attempted to achieve a compromise that:

(i) Avoids quarrying towards the more sensitive western areas;

(ii) reduces the degree of disturbance to the amenity of the owners of Little Rhyndaston Farm;

(iii) provides a logical area for working and a practical area for meaningful and appropriate restoration; and

(iv) ensures the continuity of supply to existing markets, whilst avoiding an extension of time to the lifespan of the quarry.

The preferred option is therefore considered to represent the most logical, economical, practical and environmentally sensitive means of progressing the development. Nevertheless, there would be environmental effects associated with this option, which are considered in more detail in Section 5.0 of this statement.

4.0 THE RESTORATION STRATEGY

The restoration strategy to be applied to the entire quarry, would be implemented in three main phases, outlined below.

4.1 The **Initial Restoration Phase** would be a continuation of those restoration works already underway. These include the restoration of the western and north western quarry faces, using screened overburden and soils, and the retention of rock outcrops in selective locations to add interest and diversity.

4.2 The **Interim Restoration Works** would take place during the course of the extension operations, in order to encourage the early reclamation of the site. These works would include the ongoing restoration of the progressively exposed new face along the northern edge of the extension area; the commencement of restoration of the western/southern area of the quarry floor during phase phase 3; and the phased restoration of the margins of the shallow lake to be created within phase 6. Restoration would be restricted to those areas of the quarry that would not be directly affected by future extraction or associated operations. All interim restoration would be compatible with the aims of the ultimate restoration scheme.

4.3 The **Final Restoration Proposals** are illustrated on drawing 3125:132, and the cross section 3125:133. The restoration strategy is based upon retaining existing features of interest, whether for landscape, geological or ecological reasons, and using the materials available within the quarry to restore part of the site to pasture, and the remainder to a nature conservation and amenity after use. Within the amenity areas, the approach is based on encouraging natural regeneration, but some pit planting of tree and scrub species will also be carried out.

The design will build upon the existing features of the deciduous woodland at Little Rhyndaston wood with woodland planting proposed at the eastern site boundary. This will link the site with the wooded valley and help to integrate it into the landscape setting.

It is intended to retain and encourage development of natural regeneration on scree/talus slopes on the edges of the quarry. The restoration proposals aim to make best use of the materials available within the quarry by re-grading slopes of loose material where necessary, to create naturalistic landforms and avoid smooth regular slopes. Fine materials from within the quarry will be used to dress slopes of coarse material and fill interstitial cavities, in order to establish a growing medium. The variety of talus or scree slopes present will allow a corresponding variety of habitats to be developed.

It is not intended to promote public access to the restored quarry. Public access to the site would be restricted to the existing retained public footpath to the west. Safety would be a paramount consideration associated with the restoration strategy and fencing would be installed to restrict public access to the quarry void.

The material in the southern overburden mound would be mixed with fine loose materials to form a suitable base for natural regeneration of vegetation. This material would be used, both as a planting medium for pocket planting trees in the talus slopes and as a covering to existing or re-graded slopes, allowing regeneration from the seed bank contained within the soil, or from the seed resource in the surrounding vegetation.

The former quarry faces would be restored with a variety of treatments, including the placement of material against the face, the creation of scree slopes and the retention of exposed rock

outcrops, all of which would create specific habitat types. More detailed specifications and proposals for the treatment of individual faces and benches would be produced during the development of the quarry when the respective faces are exposed. This would allow the physical nature of the faces, benches and slopes to be assessed, at which time consideration could be given to the opportunities for selective restoration modelling of the rock exposure at a more detailed level. Opportunities are likely to be available to retain attractive rock outcrops as crags, and to retain naturally occurring crevices and pockets in which different types of vegetation can be established. Similarly, localised small areas and pockets of loose rock would create different conditions for a variety of vegetation types and, in the wider context, would avoid uniformity of restoration treatment, and add landscape interest. Detailed proposals for the rock faces would therefore be determined at a later stage, when the structure of the rock exposures become evident. Those finer details would however be based upon the overall restoration strategy which has been prepared.

4.4 Restoration Landform

The proposed restoration landform is illustrated on 3125-132 and 3125-133 and is based on the ground levels at the end of quarrying. The scheme provides for the creation of a broad landform with restored quarry margins along it's northern, western, and eastern sides, merging into adjoining undisturbed land along it's southern boundary. In particular, it would provide a more attractive and less engineered landform compared to the currently approved scheme..

In the northern part of the quarry, where the deepening to 85 metres AOD would take place, soils and overburden would be used to back fill the edge of the void to create a pond with a gently graded margin. The land around the pond would also have gently gradients, but would be steeper at the base of the rock faces. In these locations, spoil material would be graded against the base of the rock faces to form scree slopes which would regenerate naturally.

In the southern part of the quarry, where the ground level after quarrying will be around 90m AOD, spoil material and striped subsoil and topsoil would be used to restore the area to agricultural pasture. This land would be fairly level at the end of quarrying and spoil material will be used as necessary to ensure that there is a sufficient gradient for adequate drainage. At the southern site boundary with Little Rhyndaston wood, the ground will graded to tie into existing levelsalong the edge of Little Rhyndaston wood.

4.5 Agricultural Restoration

In order to mitigate the temporary loss of agricultural land, it is intended to restore part of the quarry floor to agricultural use as pasture. The objective will be to create a similar soil profile to that which currently exists, and thereby provide agricultural land of an equivalent quality to that which currently exists. This in turn will allow the existing farming practices to be reinstated. The ability to achieve this is made possible because the area proposed for an extension of the quarry contains well-drained, relatively deep soils with additional overburden, which, following screening produces good quality soil forming material.

The successful restoration of the land will depend upon suitable treatment of the soils at stripping, storing and restoring stages. The Applicants have considerable experience of successful and careful soil handling, and the operations would follow established practices, as discussed below.

Soil Stripping

The topsoil to a depth of about 300mm would be stripped using suitable machinery, when in a dry and friable state (ie. not saturated or after rain). The removed soil would be put into temporary storage bunds of no more than three metres height.

The immediate subsoils would be separately stripped to a further depth of approximately 600mm (or deeper if present) and stored in similar bunds.

The remaining overburden would be stripped and, following screening to remove the larger boulders, would be separately stored in clearly recorded bunds. These lower materials would therefore form only a basal subsoil during restoration.

Storage of Bunds

In order to stabilise the loosened material, the bunds would be seeded with grass. This helps stabilise the bunds and provides protection against erosion as well as some structural benefits for the stored soil.

Restoration

Prior to restoration it is important to establish that the quarry floor is dry with no risk of water saturating the restored land creating anaerobic conditions, which would seriously hinder restoration and reduce the quality of the restored land. The quarry floor would also be provided with a gentle fall to assist drainage to a collection pond.

The subsoil would be placed over the quarry floor first. Any large fragments of rock would be removed, to give a surface with as few voids as possible. This will help conserve the following layers.

The subsoil would then be placed evenly over the surface, and again large fragments of rock would be removed. The amount of machinery work over this land would be kept to a minimum, and soil handling would take place in dry conditions and not for 1-2 days after heavy rains to prevent compaction and lower-term structural damage. If necessary, the soil would be loosened mechanically.

The topsoil would then be spread evenly over the surface and prepared for cultivation using standard agricultural equipment.

A detailed methodology for the use of soil materials in a restoration programme would be produced after a detailed assessment of the materials available. In particular, the thickness of the overburden varies across the site and the availability of this material will be assessed in preparing a finished soil profile.

4.6 Scrub Woodland Planting Proposals

It is anticipated that the planting areas would be covered with at least 1m depth of restoration soils to facilitate tree and shrub planting, or the establishment of grassland areas.

Where planting is not undertaken directly into undisturbed naturally occurring soils, restoration soils would be sourced from within the quarry.

The upper 200mm depth of material would comprise of soils or soil forming material less than 50mm diameter with a high percentage of fines; this material would be created from

overburden and/or selective screening of material prior to placement.

The lower restoration soils would be ripped to a depth of 500mm prior to the placement of the final 200mm soil/soil forming material. Where materials, after testing, indicate low levels of nutrients (NPK and other trace elements) and organic material composition, additives would be added as required in accordance with the proposed after-use and management proposals.

Planting details

The proposed planting would consist of trees, shrub and hedge planting utilising exclusively plant species of local provenance. Woodland and scrub and would be planted at a spacing of 1.0 to 1.5m centres. Hedgerows will be planted in two staggered rows 250mm apart with 300mm between plants in rows. All plants would be transplants or container grown shrubs. The areas to be planted will be filled with topsoil to a minimum depth of 300mm, over a minimum of 300mm of subsoil. The species mix will include the following species which occur within the woodland and hedgerows adjacent to the site:

Table 4 Woodland planting Species.

Belula pendula	*20%*
Acer campestre	*15%*
Corylus avellana	*20%*
Crataegus monogyna	*30%*
Rosa canina	*5%*
Salix cinerea	*5%*
Sambucus nigra	*2%*
Viburnum opulus	*3%*

In order to ensure that all planting is compatible with the local gene pool of the area, all plants should be of local provenance as outlined in Forest Practice Note No. 8, entitled 'Using Local Seed Sources for Planting Native Trees and Shrubs', produced by the Forestry Commission (1999).

Monitoring

Regular maintenance of the planting would continue for 5 years after planting. It would include nutrient applications and herbicide treatment or cultivations to discourage competing vegetation from establishing. Wind shelters may be advisable in the form of "tree shelters" and rabbit guards and/or stockproof fencing may also be required. Plant failures would be replaced during the first give years.

4.7 Species rich grassland

Species rich grassland will be established throughout the site in all areas not planted with either scrub or wetland planting. These areas will be restored using subsoil and quarry spoil to maintain low nutrient levels, which will encourage higher levels of species diversity. The seed mix set out in table 5 would be suitable.

Agrostis castellana (Common Bent)	[25% Grass]
Cynosurus cristatus (Crested Dodstail)	
Dactylis glomerata (Cocksfoot)	
Festuca rubra ssp. Litoralis (Slender Creeping Red Fescue)	
Festuca pratensis (Meadow Fescue)	
Trisetum flavescens (Yellow Oat-Grass)	
Achillea millefolium (Yarrow)	[75% Wild flowers]
Centaurea cyanus (Cornflower)	
Galium verum (Lady's Bedstraw)	
Leucanthemum vulgare (Ox-eye Daisy)	
Lotus corniculatus (Birdsfoot Trefoil)	
Plantago lanceolata (Ribwort Plantain)	
Ranunculus acris (Meadow Buttercup)	
Rumex acetosa (Common Sorrel)	

Table 5 Species Rich Grassland: Seed Mix.

4.8 Wet grassland and marginal aquatic

Herbaceous, wetland planting within the wetland area will consist of aquatic and marginal aquatics. Reeds would be established from sections of rhizome and other vegetative material imported from suitable local donor sites, subject to availability. The species listed in table 6 would be suitable:

Carex Spp (sedges)
Juncus Spp (rushes)
Iris pseudacorus (Yellow flag)
Glyceria maxima (Reed grass)
Phragmites australis (Norfolk reed)
Typha angustifolia (Lesser reedmace)
Sparganium erectum (Bur-reed)
Filipendula ulmaria (Meadowsweet)

Table 6 Wet Grassland seed mix.

4.9 Agricultural pasture

Agricultural pasture would be established ithe southern part of the quarry adjacent to the area previous restored to pasture (refer to 3125-132). All areas where agricultural grassland is to be restored will receive pre-seeding application of N:P:K fertilizer. The grass mix is to be suitable for general grazing, which would typically include Perennial Ryegrasses, Fescue and White Clover. The percentages and varieties for each would depend on the type of grazing required. The agricultural grass seed mix would be agreed by the landowner and would depend on the intended use of the pasture.

4.10 Management and aftercare

The strategy for the management and aftercare of the site will seek to ensure the beneficial afteruse of the site. The restoration philosophy is to establish (i) an area of agricultural land at the base of the quarry, of some 4 hectares in extent, which can be actively utilised and managed as part of the farming of the adjoining land holding and (ii) the creation of a variety of habitats on the restored margins of the quarry (ie. the restored benches and faces) which would not require internal active management

beyond the initial aftercare period and (iii) the operation of a shallow, irregular shaped lake as a nature conservation feature.

Over the life of the quarry development, periodic reviews of the restoration would be undertaken. This will comprise an audit of the existing situation, assessment of the restoration processes, recommendations for change to the restoration methodology (if appropriate) and details of forthcoming restoration actions. This review will be submitted to the Mineral Planning Authority and their views will be sought.

Regular maintenance of the planting would continue for 5 years after planting. It will include nutrient applications, where applicable, and herbicide treatment or cultivation, to discourage competing vegetation from establishing. Plant failures will be replaced during the first three years. The management of the species rich grassland will aim to encourage species diversity. The area will be mown once or twice a year with the arisings removed to maintain low nutrient levels within the soil.

A final decision on the details of the afteruse and means of longer term management of the site will be considered at a later stage, and can be controlled by planning condition.

5.0 ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES

This section examines the implications of the proposed operations on those issues that are considered to potentially give rise to environmental effects. The list of topics has been informed by the formal 'screening/scooping opinion' produced by the National Park Authority, which set out the issues which they considered should be addressed in an EIA, together with the Applicants and their agent's experience of circumstances at the quarry. Each issue is examined in terms of the effects, the potential severity of influence, and the measures which are available to mitigate those effects. It concludes by considering the effectiveness of the mitigation measures proposed to reduce or nullify the effects.

The issues considered are:

- Landscape
- Noise
- Vibration
- Traffic
- Dust
- Hydrology and Hydrogeology
- Ecology
- Cultural Heritage
- Agriculture

5.1 Landscape and Visual Assessment

5.1.1 *Scope of the assessment*

This assessment is of the effects of the operational phases of the extension to the existing Rhyndaston Quarry on the landscape of the site and its context, i.e. effects on features assessed as important to the landscape quality, or effects on the landscape character of the site and its setting. It also deals with the effects on views of the site and its setting

The objectives of the assessment are to:

- appraise the landscape of the area which might be affected by the proposed development;
- identify and assess the significance of any environmental impacts associated with the scheme's design, construction or operation;
- describe mitigation measures which could be implemented in order to avoid, reduce or remedy significant adverse effects;
- describe any enhancements of the landscape or visual amenity incorporated in the development proposals
- outline residual impacts, i.e. those impacts remaining after the implementation of mitigation measures (whether adverse or beneficial), and specify their significance;
- Identify any cumulative effects of the development proposal with other proposed developments in the area and identify appropriate mitigation measures.

As a result of the screening/scoping exercise, the assessment focuses on the following:

- Effects on the landscape of the site and its context, i.e. effects on features assessed as important to the landscape quality, or effects on the landscape character of the site and its setting.

- Effects on views of the site and its setting.

The baseline report, which describes the landscape setting, landscape context and topography is set out in Section 2.2 of the ES. This section uses that baseline context to assess the quality of the landscape and visual effects of the development, both during the operation and following restoration. It then draws conclusions as to the significance of the respective effects and impacts.

5.1.2 *Assessment Methodology*

The methodology used for assessing the landscape and visual impacts was based on the recommendations and guidance published by the Countryside Commission, and by The Landscape Institute and the Institute of Environmental Assessment. These are the accepted standards for the assessment of effects of development or other change on the landscape and on visual amenity, and the methodology is summarised in the following paragraphs.

The assessment comprised a combination of desk studies and field surveys, with subsequent analysis, and involved:

- a review of data regarding landscape designations and planning policies for the landscape;
- a site survey and inspection of publicly accessible viewpoints of the site, including a photographic survey. The field surveys for this proposed development were carried out in January 2002
- an assessment of landscape context and setting, receptors and sensitivity, and ability to accommodate change
- a viewpoint analysis of the likely visual impact on the public in the surrounding area, including local residents
- the identification of potential landscape and visual impacts of the proposed development, their magnitude and significance
- consideration of mitigation and enhancement measures to avoid, reduce or remedy significant effects on the landscape or on views
- assessment of the residual effects

For the purposes of the assessment, the quality of the landscape was assessed in accordance with the following criteria:

- *Highest quality:* dramatic features, especially of historic or ecological value, pleasing scale and form, well managed, varied, harmonious, fine and distant views, locally rare character, no poor features or views.
- *Very attractive*: features of historic or ecological value, pleasing form and scale, good views, well managed, varied, harmonious, locally unusual character.
- *Good:* pleasing form and scale, attractive views, varied, well balanced, generally in character with the area.
- *Unexceptional:* similar to many other areas, views unexceptional, monotonous, some poor features but not dominant.

- *Poor:* out of character with surrounding areas, unattractive features or views, dereliction and neglect, poor or inappropriate buildings.

Photographs are provided in Figures L.02 AND 1.03, with the viewpoint locations illustrated on figure L.01. These are designed to assist in describing landscape character and the range of views of the site available, within its zone of visual influence.

5.1.3 ***Visual Amenity.***

Views towards the extension site (refer to Figure 3125 L.02 and L.03)

The zone of visual influence (ZVI) includes those places from which views of the site may be available. The "visual envelope" of the proposed development is shown on drawing 3125 L.01. This represents the approximate extent over which the proposed quarry extension may be seen. In order to assist in the prediction of the extent of the visual envelope, a digital terrain model was generated from Ordnance Survey 10 metre interval contours, and the zone of inter-visibility determined using the method of ray casting. The results were then augmented by observations from the site and surrounding areas. The boundary of the envelope is approximate, and within the visual envelope, buildings, minor changes in topography, woodland, hedgerows and hedgebanks, tree groups or other features, will further influence areas from which the proposed quarry extension may either be screened or visible. It therefore represents a theoretical worst case, and exaggerates the actual extent of visibility of the quarry.

The ZVI of the proposed quarry extension site is limited mainly by the gently undulating topography, which reduces the number of elevated views available (refer to Figure 3125 L.01). The exception is Dudwell Mountain, which offers views from footpaths at up to 165 metres AOD, 50 metres higher than the site, within 1.5km from the site boundary. Existing vegetation, including woodland, groups of trees, hedgebanks and hedgerows further confine the visual envelope from lower elevation areas.

The site cannot be seen from villages within 3km, including Roch and Hayscastle Cross, due to the relative elevation of the settlements, the site and intervening landform. Dudwell Mountain and Rhyndaston Mountain, despite allowing elevated views, screen views of the site from areas beyond. In the case of Rhyndaston Mountain, it obscures many potential views of the site from the south, from within the Pembrokeshire Coast National Park.

The areas from which views of the site are available, where the site forms a recognisable element within the view, are those from within 2km. Photograph 4 shows that even at a distance of 1.8km, the site represents a relatively small-scale element in the view (refer to Figure 3125 L.03). Views available from within 2km of the site can be defined as either elevated or low level. The areas from which elevated views are available are Dudwell Mountain and Rhyndaston Mountain (refer to Appraisal Photographs 1 and 3 on Figure 3125 L.02). Low-level views at a similar elevation to the site are available from the minor road between Hayscastle Cross and Roch, although these locations. Photographs 5 and 6 are typical of views from these areas (refer to Figure 3125 L.03).

Little Rhyndaston Nursery, located 220 metres to the south of the extension site, has limited filtered views of the site through the trees at Little Rhyndaston Wood. At Rhyndaston-fawr, the large-scale agricultural buildings obscure views of the site from the dwelling within the farmstead. A low elevation view of the site is available from the minor road near Barch Farm, although Little Rhyndaston Wood obscures the majority of the site.

Views from the extension site (refer to Figure 3125 L05)

To the north the land rises before falling away to ensure that no long distance views are available. The farmstead of Rhyndaston-fawr dominates these views with its large-scale sheds and associated yards.

Dudwell Mountain is an important feature in views to the east with its distinctive profile and moorland vegetation. Little Rhyndaston wood extends around the site to the east and south to occupy the foreground in these views. This woodland, which follows the stream valley, allows filtered views of Little Rhyndaston Nursery, agricultural fields and Rhyndaston Mountain beyond (refer to 'A' 'B' and 'C' on Figure 3125 L.04).

Views to the west are dominated by the existing quarry, which occupies the foreground in the view. The land slopes away from the site to exclude a large area from view, leaving only the hills at Trefgarn Owen and Rhydygele, more than 2km to the northwest, visible beyond the quarry.

5.1.4 ***Ability to Accommodate Change.***

The landscape resource

The ability of a landscape to accommodate change may be defined as its ability to accept the proposed development "without unacceptable detrimental effects on its character"[1]. This is referred to as the *sensitivity* of the landscape.

The landscape setting of the Pembrokeshire Coast National Park is considered to be *sensitive* to change due to the national importance of the designation, which recognises the aesthetic quality of the landscape.

There are also two designated Areas of Special Landscape Value (ASLV) within 2km of the extension site. The landscape setting of the Dudwell Mountain ASLV and the Brandy Brook ASLV are considered to be *sensitive* to change due to the local importance of these designations, which again recognises the aesthetic quality of the landscape.

People who use the minor roads and public footpaths within the immediate area of the site and to a lesser extent nearby residents, will continue to be aware of quarrying activities occurring and may well observe the eastward advance of the quarry workings. These are considered to be *sensitive* receptors to change because of their proximity to the site.

The character of the landscape of the proposed extension site is partly derived from the wooded valley at Little Rhyndaston Wood. Therefore the degree of impact on the landscape resource of the site will be related to the impacts on Little Rhyndaston Wood, which is regarded as a *sensitive* receptor.

Visual *amenity*

The *sensitivity* of views is affected by factors such as the distance to the viewer, the number of viewers affected, and the importance of the site or proposed development in the overall view. The context of the viewpoint may also contribute to its ability to accommodate change; for example a view from residential properties or from a valued landscape might be regarded as less able to accommodate change, than a view from an industrial context.

The views identified as *sensitive* to the potential impacts of the proposals are:

- from within the Pembrokeshire Coast National Park, at Rhyndaston Mountain, considered to be sensitive due to the national importance of the designation (refer to Appraisal Photographs 1 on Figure 3125 L.02)

- from the minor road between Hayscastle Cross and Roch, considered to be sensitive due to the number of viewers affected and the close proximity of the site (refer to Appraisal Photographs 2 on 3125 L.02)..

- from Dudwell Mountain, within the an Area of Special Landscape Value (ASLV), considered to be sensitive due to the local importance of the designation, which recognises the aesthetic quality of the landscape (refer to Appraisal Photographs 3 on Figure 3125 L.02).

5.1.5 *Landscape Effects*

As identified above, the sensitive receptors are:

- Landscape setting and character of the Pembrokeshire Coast National Park.

- Landscape setting and character of the Areas of Special Landscape Value at Dudwell Mountain and along Brandy Brook.

- Users of Public Rights of Way and minor roads immediately adjacent to the site and to a lesser extent, nearby residents.

- Features contributing to the landscape character of the site, especially the valley to the south containing Little Rhyndaston Wood

The impact of the proposed quarry extension on the landscape setting and character of the Pembrokeshire Coast National Park will be direct as the site is located within the National Park. The impact of the quarry extension will be initially adverse as the quarry forms an increasingly intrusive element within the landscape. In the long term, the proposed restoration of the site will have a beneficial impact, as it will integrate the site with the adjacent stream valley and woodland.

The impact of the proposed quarry extension on the landscape setting and character of the Area of Special Landscape Value (ASLV) at Dudwell Mountain will be indirect as the site is located 800m outside the ASLV. However, the impact of the quarry extension will have a direct impact on the landscape setting of the ASLV as the rolling landscape with wooded valleys within the National Park constitutes a major part of the landscape setting of the ASLV. As such, the impact on the landscape setting will be the same as those for the National Park outlined above.

The potential adverse impacts on the amenity of the nearby residents during quarrying operations will be greatly reduced by the retention of the woodland along the southern boundary of the quarry, and the careful design of the phasing for the proposed extension. There will be a short period of disturbance at the end of quarrying when the rock wall to the south of the quarry extension is removed, with moderate adverse effect. The retention of this rock wall for the greatest part of the operational phase will screen the noise of the operations from Little Rhyndaston Nursery and users of the public footpath to the south.

The valley and vegetation at Little Rhyndaston Wood has been identified as a *sensitive* receptor. This vegetation has been and will continue to be protected during the quarrying period to ensure that it is not damaged. The works do not involve the removal of any of the vegetation around the edge of the site and

the restoration proposals intend to add to it where suitable. Little Rhyndaston Wood will be extended on its northern end to define the edge of the site and help to integrate it with the stream valley to the south. The impact on this wooded stream valley will be beneficial.

5.1.6 *Visual Effects*

The extension site will be open to view from the National Park, from the footpaths within the Area of Special Landscape Value, and from the minor road between Hayscastle Cross and Roch. Section 5.1.4 above identified three viewpoints as representative of the most sensitive views available. These views are described below and the effects of the development on them assessed.

1. **Appraisal Photograph 1 (refer to Figure 3125 L.02): view from public footpath on Rhyndaston Mountain in the Pembrokeshire Coast National Park.**

   Location: 0.5km to the southwest of the site boundary, at an elevation of 122m AOD; refer to Figure 3125 ***L.01 and L.02***

   Existing View

   This view is representative of views from footpaths within the Pembrokeshire Coast National Park on Rhyndaston Mountain. In this view the landform of the area is gently undulating. The land stretches away from the viewer: low lying and gently rolling in the centre of the view with Dudwell Mountain rising to the right. This view is similar to several views from the footpaths on Rhyndaston Mountain. All are elevated, with Dudwell Mountain to the right and the lower land towards Brandy Brook to the left.

The site is located left of centre in this view with the back face of the existing quarry clearly visible. The land rising beyond the quarry forms the horizon in the central part of the view while distant hills are visible to the left and right. The proposed extension site is visible, though it appears as a small sliver, partly screened by the trees at Little Rhyndaston Wood.

View during quarrying

The area of the extension site where phase 1 and 2 occur will be obscured from view by the vegetation at little Rhyndaston Wood. Soil storage mounds along the northern and eastern boundary will be the only visible changes during the first two phases. After 3 to 4 years the extension of the quarry in an easterly direction will become visible. Only a small part of the northern rock face will be visible so soil stripping and the storage mounds will be the main changes apparent in this view during quarrying. Changes in this view will be gradual, as the extension to the quarry will take several years to move across the part of the extension site, which is visible.

The initial restoration of the rock face to the north of the existing quarry will occur during quarrying operations. The removal of the soil storage mounds at the top of this rock face will reduce the visible extent of the face and bring the hedgerow along the RUPP into view.

View after restoration

The restoration proposals occupy a larger proportion of the site in this view than the quarrying operations. After five to ten years the proposed planting will form an extension to Little Rhyndaston Wood and proposed

hedgerows will establish a pattern of agricultural fields. Little Rhyndaston Wood will obscure the base of the rock face along the northern edge of the quarry, which will be graded out using spoil before being planted. This planting will become visible when it develops in front of the rock face to the northern edge of the quarry. The rock face will become less prominent as it weathers naturally and pocket of gorse scrub will develop. The proposed pond and wet grassland within the base of the quarry will not be visible in this view.

Assessment

Due to the close proximity of the site and relative elevation of this viewpoint the proposed quarrying operations and the restoration will be clearly visible. There two main factors that reduce the potential landscape and visual impact of the proposed development: The first is that it is an extension to an existing facility and is not the introduction of a new element into the landscape. The second is that the site is contained by Little Rhyndaston Wood and would not appear to extend across the landscape. The visual impact will be *slight* for the majority of the quarrying operations. During phases 3 to 4, the impact will be *moderate* as quarrying within the extension site becomes visible beyond Little Rhyndaston Wood.

The visual impact of activity associated with implementing the restoration proposals will be *negligible*, as the majority of the work will be contained within the quarry.

2. Appraisal Photograph 2 (refer to Figure 3125 L.02): view from minor road near Tanybryn.

Location: 0.8km to the east of the site boundary, at an elevation of 117m AOD; refer to 3125 ***L.01 and L.02***

Existing View

This view is representative of views from the minor road between Hayscastle Cross and Roch, although not necessarily as it would be seen by vehicular users because the tall hedgebank obscures the site from many locations. There are however, several locations where gaps in the hedgebank and vegetation at field gateways allow open views towards the site. Agricultural fields occupy the foreground in these views with the higher land of the proposed extension site forming the backdrop. The topography of the extension site makes the ground surface clearly visible from this viewpoint. It forms a continuation of the ridgeline from the farmstead Rhyndaston-fawr to Little Rhyndaston Wood. The existing Rhyndaston Quarry cuts into this ridgeline at its southern end where a rock face is visible.

View during quarrying

The landform of the extension site is fairly level on the western side and sloping on the eastern side. This means that changes to the ground surface in the eastern part of the site will be more prominent than similar scale changes in the western part. Therefore, Phase 3 to 5, located in the eastern part of the extension site, will be clearly visible, and Phases 1 and 2 form an insignificant element within this view. During the earlier phases the soil strip and storage mounds will be the main change visible.

During the later phases the lowering of the ground surface will bring the rock face at the western edge of the existing quarry into view. The ridgeline will be removed up to the line of the RUPP, which is by the hedgerow on the horizon in this view.

View after restoration

The proposed woodland planting along the eastern site boundary will become visible as it increases in height. It will obscure activity associated with restoration, as this will be contained by within the quarry. This planting will also obscure elements with the restoration scheme.

Assessment

The progression of the quarry across the extension site would be evident, as it would dramatically increase the extent of the quarry that is visible at present and remove a section of the ridgeline to the east of the existing quarry. Advance planting along the eastern edge of the extension site will reduce the extent of the quarry that is visible. Progressive restoration of the western face of the existing quarry will reduce its prominence in the view and the removal of the storage mounds at the top of the face will reduce its overall height. However, due to the scale of the changes the visual impact in this view will be *moderate*.

3. Appraisal Photograph 3 (refer to Figure 3125 L.02): view from public footpath on Dudwell Mountain within an Area of Special Landscape Value (ASLV).

*Location: 1km to the southeast of the site boundary, at an elevation of 165m AOD; refer to 3125 **L.01 and L.02***

Existing View

This viewpoint is considered to be *sensitive* to change, due to the designation of the area as an Area of Special Landscape Value (ASLV) and the proximity of the site and relative elevation of the viewpoint. In this view the existing Rhyndaston Quarry forms and intrusive element in the centre of the view. The landform of the area is gently undulating with Rhyndaston Mountain, within the National Park, rising to the left. The proposed extension site is located between the existing quarry and the farmstead of Rhyndaston-fawr. This view is similar to several views from the footpaths on Dudwell Mountain as all are elevated with the existing quarry being clearly visible at a lower elevation. The proposed extension site is visible, though contained by Little Rhyndaston Wood and Rhyndaston-fawr.

View during quarrying

From this elevated viewpoint the ground surface of the extension site is clearly visible. Changes to the ground surface, associated with the stripping of topsoil, the formation of the storage mounds and the quarrying operations, will also be clearly visible. During the several phases of the quarry extension will progress gradually across the existing field between the existing quarry and

the farmstead of Rhyndaston-fawr. This lowering of the ground surface will increase the extent to which the rock face at the western and northern edge of the existing quarry will be visible. Advance planting will occur along the eastern boundary during the first phase of the quarry extension, which will develop to obscure the eastern part of the extension site and extend Little Rhyndaston Wood.

View after restoration

The prominent rock face, part of the existing quarry in this view, will have been removed during the later phases of the quarry extension. This would open up views into the quarry making the back face and quarry floor visible. At this stage the quarry would have reached its maximum extent in this view before the start of the restoration operations. Movement of material around the quarry during restoration would be clearly visible in this view.

Assessment

The progression of the quarry across the extension site would be evident. Progressive restoration of the existing quarry faces will reduce the extent of the quarry that is visible. However, the extended quarry will be an extensive element in this view, especially during the later stages of quarrying. Due to the scale of the changes the visual impact in this view will be *moderate*. After the end of quarrying the restoration will begin to integrate the site into its surroundings through the extension of Little Rhyndaston Wood and introduction of agricultural pasture in the base of the quarry. The moderate impact at the end of quarrying will reduce to *negligible* after ten to fifteen years as planting within the restoration scheme establishes.

5.1.7 *Mitigation Measures*

During quarrying operations

The proposed phasing of the quarry extension, which will work in an easterly direction with the retention of the existing quarry rock edge to the south, will minimise the visual impacts of the proposed extension. However, the gradual movement of the quarry face will be visible from some elevated viewpoints and views from the minor road between Hayscastle Cross and Roch. To reduce the impact on these views, soil storage mounds will be established at the top of the rock face on the southern boundary during each phase of quarrying. In addition, the process of forming the extension of the soil storage mound will be managed so as to reduce the prominence of the activities in views.

As the quarry progresses eastwards the northern and western faces of the existing quarry will be progressively restored. The soil storage mounds will be removed from the top of the rock face and spoil will be used to grade out the base and reduce the overall height of the rock faces. Planting will take place in these areas towards the end of quarrying as part of the restoration strategy.

Restoration

The final restoration and after use proposals for the site represent the principal long-term measure in mitigation of potential landscape and visual effects. They are described in detail in Section 4.0, and are shown on Figure 3125 :132 and 133. In summary, the principal features of the restoration will be, as follows:

The features and habitats formed in restoring the site after quarrying is completed will build upon the landscape character

within the site. The restoration design will grade out the steep sides of the quarry and create a landform appropriate to its setting. The quarry floor will drain to a central low point, which will form into a pond. This water feature, with seasonal wetland and low maintenance grassland, will increase the biodiversity of the site.

Woodland and scrub planting will be used to enhance existing vegetation on the southern site boundary and link to existing hedgerows and woodland beyond the site boundary. The majority of the quarry floor will be restored to open grassland for common grazing. These will consist of fields of improved grassland delineated by hedgerows. Small blocks of scrub are proposed along the retained rock faces, and in small blocks around the enclosed agricultural areas, in a similar pattern to that found in the surrounding area.

Management techniques for the vegetation will focus on its nature conservation interest and amenity potential, resulting in substantial beneficial impacts on the biodiversity of the site.

5.2 Noise

5.2.1 *Introduction*

An acoustic appraisal of the proposed development has been undertaken by Vibrock Limited. As part of that exercise, surveys have been carried out to establish existing noise levels in the vicinity of the quarry; noise criteria have been set for the proposed workings; the noise implications of the proposed development have been predicted and assessed; and the scheme has been designed to incorporate the mitigation measures which have been recommended.

The study benefits from a site inspection and background noise level monitoring undertaken on 4th March 2002.

5.2.2 Existing Noise Attenuating Features

In general the quarry is positioned on the north east slope of a river valley, the bottom of which is some 5 - 10m lower than the quarry floor.

Natural land formations combined with previously constructed bunds provide a good level of noise attenuation screening from the quarry operations at certain of the noise sensitive locations. These are mainly the locations positioned to the north and south east of the site.

Due to the natural land form of the valley and the position of the quarry in relation to this, the properties situated to the west of the site are afforded very little natural or constructed screening from the site. The relative levels above ordinance datum of the quarry operations and the sensitive receiver locations further aggravate this situation with regard to the placement of any potential screening.

5.2.3 *General Environs*

The quarry is situated within the Pembrokeshire Coast National Park and is surrounded by open countryside containing isolated residential dwellings. The closest residential properties to the works are Rhyndaston Fawr to the north east of the site, Little Rhyndaston Nursery and Little Rhyndaston Bungalow to the south east, and Barch Farm and Coed-y-Barch to the south west.

The current noise sources present around the area are mainly natural (bird song and agricultural animals) coupled with noise

generated by general agricultural activities. At certain locations some quarry activity was audible although this was mainly at the locations to the south and west of the site.

5.2.4 *Noise terminology*

Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air.

Between the quietest audible sound and the loudest tolerable sound there is a million to one ratio in sound pressure level. It is because of this wide range that a noise level scale based on logarithms is used in noise measurement. This is the decibel or dB scale.

Audibility of sound covers a range of about 0 to 140 decibels (dB) corresponding to the intensity of the sound pressure level. The ability to recognise a particular sound is dependent on the pitch or frequencies present in the source. Sound pressure measurements taken with a microphone cannot differentiate in the same way as the ear, consequently a correction is applied by the noise measuring instrument in order to correspond more closely to the frequency response of the ear which responds to sounds from 20 Hz to 20000 Hz. This is known as 'A weighting' and written as dB(A).

The use of this unit is internationally accepted and correlates well with subjective annoyance to noise.

The logarithmic basis of noise measurements means that when considering more than one noise source their addition must be undertaken in terms of logarithmic arithmetic. Thus, two noise sources each of 40 dB(A) acting together would not give rise to 40 + 40 = 80 dB(A) but rather 40 + 40 = 43 dB(A). This 3 dB(A) increase represents a doubling in sound energy but would be only just perceptible to a human ear.

Table 7 gives typical noise levels in terms of dB(A) for common situations.

Table 7 Typical Noise Levels.

Approximate Noise Level dB(A)	*Example*
0	Threshold of hearing
30	Rural area at night, still air
40	Public library
50	Quiet office, no machinery
60	Normal conversation
70	Inside a saloon car
80	Vacuum cleaner
100	Pneumatic drill
120	Threshold of pain

Noise levels can vary with time according to source activity and indices have been developed in order to be able to assign a value to represent a period of noise level variations and to correspond with subjective response.

The L_{Aeq} or A weighted equivalent continuous noise level index is used to average the noise energy over a period of intermittent noise levels. It is the level of steady sound of equivalent energy and is usually referred to as the ambient noise level.

The L_{A90} index represents the noise level exceeded for 90% of the measurement period and is used to indicate the quieter sections of the measurement period. It is usually referred to as the background noise level.

The L_{Amax} index is the maximum root mean square A weighted noise level occurring during the measurement period.

5.2.5 ***Noise Criteria***

The ambient environmental noise at any location will vary according to the activities in progress around that location. In the vicinity of a busy motorway, for example, the noise level will remain fairly constant due to the relatively steady noise input from road traffic, whereas the noise level close to a source of high noise over short periods, such as an airport, will vary over a much wider range. It is therefore necessary to consider how to quantify the existing noise levels in an area in order to accurately assess the acceptability of the introduction of a new noise source.

The background noise level, defined as the L_{A90} parameter, represents the noise level exceeded for 90% of a measurement period, or the ninety percentile level. It generally reflects the quieter noise level between noise events and generally ignores the effects of short term higher noise level events.

The fifty and ten percentile levels, L_{A50} and L_{A10}, represent the average (50%) noise level and the level exceeded for 10% of the measurement period, respectively. The latter, for example, is commonly used to describe and quantify noise from road traffic.

The equivalent continuous sound pressure level, or L_{Aeq} parameter, is a measure of the average sound energy over a given time period. It will include noise from all contributing sources. Unless the noise level at the receiving point is perfectly steady, the L_{Aeq} will always be higher than the L_{A90} over any one measurement period.

5.2.6 ***MPG 11 - Control Of Noise At Surface Mineral Workings***

MPG 11 is the latest Government advice applicable to the control of noise from surface mineral workings in England and Wales.

MPG 11 recommends the setting of absolute values for noise limits, linked to daytime and night-time working periods, defined as 07:00 - 19:00 hours and 19:00 - 07:00 hours respectively. It also identifies more sensitive evening and dawn periods as being typically 19:00 - 22:00 hours and 06:00 - 07:00 (or 08:00) hours respectively.

MPG 11 introduces the concept of a maximum fixed acceptable noise level of 55 dB $L_{Aeq,\ 1h}$ for daytime operation during the working week and states, in paragraph 34, that this is generally found to be a tolerable level. It also introduces a nominal night-time limit of 42 dB $L_{Aeq,\ 1h}$.

MPG 11 recommends that these noise limits be set in terms of free field noise levels. Consequently only free field noise levels are considered in this report. MPG 11 also states in paragraph 31 that "The Government recognises that there should be sufficient flexibility in the guidance on what these limits should be, so that account can be taken of particular circumstances". The particular circumstances are not specified, but would appear to be locations where particularly low or particularly high background ambient levels exist prior to development.

The document recognises this in paragraph 40, where it states that in some circumstances the setting of nominal limits higher than those quoted above may be considered. The example the Government gives is the case of opencast mining operations,

which are characterised by heavy earth moving machinery moving at or near the surface. MPG 11 states that "a nominal daytime limit at the nearest noise sensitive dwelling within the range 55-60 dB $L_{Aeq,\ 1h}$ for such operations will normally be justified at present". The Government put a date limit, 1998, on this concession.

The document also recognises the converse of the above in paragraph 37, where it indicates that in some circumstances, eg in quieter rural areas, the setting of nominal limits lower than those quoted above may be considered. This may be considered for example where the nominal 55 dB $L_{Aeq,\ 1h}$ level is more than 10 dB above the measured background level.

However, in paragraph 38, the document goes on to say that where the daytime background level is below 35 dB(A), a condition limiting operators to a 10 dB(A) increase over the existing background is unduly restrictive and difficult to achieve. The paragraph concludes, "It would not normally be appropriate to require a daytime limit below 45 dB $L_{Aeq,\ 1h}$, as such a limit should prove tolerable to most people in rural areas.".

5.2.7 *Temporary Sources Of High Noise Levels*

MPG 11 states in paragraph 42 that "It will often be necessary to raise the noise limits to allow temporary but exceptionally noisy phases in the mineral extraction operation, which cannot meet these limits. A prime example would be to allow for the construction of baffle mounds, but there are other activities, including soils stripping, removal of spoil heaps and the construction of new permanent land forms which would merit a temporary raised limit".

In paragraph 61 of the document it is suggested that 70 dB $L_{Aeq,\ 1h}$ (free field) for periods of up to 8 weeks in a year should be considered by MPAs to facilitate this. It also leaves MPAs and mineral operators the ability to negotiate trade-offs between shorter periods of time versus higher noise limits and vice versa.

5.2.8 *Other Noise Criteria*

BS 8233:1999

BS 8233:1999 is the BS Code of practice for sound insulation and noise reduction in buildings. Tables of this document gives examples of design criteria, as maxima for steady intrusive noise, applicable to rooms within dwellings. Living areas (for conversation and listening to radio and TV) should meet a maximum internal L_{Aeq} of 40 dB. This figure is comparable to the 55 dB(A) figure from MPG 11 if one assumes a facade reduction of about 10-15 dB(A) for open windows.

TAN 11 (Wales) 1997

The Technical Advice Note (Wales) no. 11: 1997 (TAN 11) details in Annex B that when assessing the noise levels from construction sites the guidance within BS 5228: Parts 1 - 4 should be used. In particular attention is drawn to Part 1: 1984 (subsequently revised in 1997) "Code of Practice for basic information and procedures for noise and vibration control". This document has been utilised within the subsequent calculations undertaken in relation to this development.

5.2.9 ***Current Planning Conditions dated 17th March 1997***

Condition number 26 of the determination of conditions under schedule 13 of the Environment Act 1995 issued by the Pembrokeshire Coast National Park Authority, dated 20th November 1997 states:

> *"Operations at the Quarry shall be so managed that during the working day the level of noise at noise sensitive properties Barch Farm, Barch Farm Cottage, Coed-y-Barch, Little Rhyndaston Nurseries and Rhyndaston Fawr shall not exceed 48dB$_{(LAeq\ 1\ hr)}$, as measured in accordance with BS 5228: 1984 "Code of practice for Noise Control on Construction and Demolition Sites"*

5.2.10 ***Blast Induced Noise***

Although the majority of energy generated within the atmosphere from any open quarry blast will be of a sub-audible nature, there will also be a component that is audible, ie. at frequencies greater than 20 Hz, and as such can be measured in terms of dB(A).

With the elimination of detonating cord, the characteristic noise of a blast is no longer a sharp crack but rather a dull thump. This is partly due to the detonating sequence and partly due to natural energy dissipation and attenuation.

Peak levels from blasting are comparable to the sort of levels routinely generated by cars etc., only in this case the noise would exist for less than one second and occur relatively infrequently. It is because of this very brief duration and its infrequent occurrence that blast noise is rarely measured in terms of dB(A) but rather looked at as part of the air overpressure generated and measured by the more meaningful parameter of dB.

Vibrock Ltd have confirmed that in their experience, residents soon become accustomed to such noise, and that since the great majority of blast related complaints concern a fear of property damage, once it is clear that such noise is harmless then complaints are unlikely.

5.2.11 ***Noise Level Predictions***

Noise has been defined as sound, which is undesired by the recipient. The effect of noise on the neighbourhood are varied and complicated, including such things as interference with speech communication, disturbance of work, leisure or sleep. A further complicating factor is that in any one neighbourhood some individuals will be more sensitive to noise than others.

A measure that is in general use and is recommended internationally for the description of environmental noise is the equivalent continuous noise level or L_{Aeq} parameter.

In general, the level of noise in the local environs that arises from a development site will depend on a number of factors. The more significant of which are:-

(a) The sound power levels (SWL's) of the plant or equipment used on site.

(b) The periods of operation of the plant on site.

(c) The distance between the source noise and the receiving position.

(d) The presence or absence of screening effects due to barriers, or ground absorption.

(e) Any reflection effects due to the facades of buildings etc.

5.2.12 *Prediction Methodology*

The prediction method used in this study is based upon that outlined within British Standard (BS) 5228: 1997 "Noise and vibration control on construction and open sites".

BS 5228: 1997 incorporates recommendations made in Mineral Planning Guidance Note 11 (MPG 11) "The Control of Noise at Surface Mineral Workings" which was issued in 1993. MPG 11 proposed several modifications to the 1984 version of BS 5228, the most important ones being the option of calculated barrier shielding rather than estimated shielding, the inclusion of attenuation due to soft ground and angle of view corrections.

The maximum barrier attenuation of 10 dB(A) quoted within BS 5228 can be conservative and is recognised as such in section D.3.2.2.1 where it states *"High topographical features and designed and positioned noise barriers could provide greater attenuation"*. Examples of the former are overburden mounds and excavation high walls whilst baffle banks and acoustic fences are examples of the latter.

In order to more accurately estimate the barrier attenuation for this study, the method used in the Calculation of Road Traffic Noise (CRTN) has been employed. This document describes a method for estimating barrier attenuation from thin rigid barriers. Thus, for the purposes of this exercise barrier attenuations have been estimated based on methods within this document.

5.2.13 *Plant Complement*

A list of plant sound power levels (SWL's) from which the noise predictions were made are presented in Table 8.

Table 8 Sound Power Levels.

Plant Description	Type	Quantity	Sound Power Level dB(A)
Drill rig and compressor	Atlas L8	1	111
Primary Face plant	Nordberg 100, Nordberg 170, Kobelco 220 360°	1	119
Loading shovel	Volvo L180	1	109
Secondary plant	Kue Ken 1000, Extec 5000, VIC, Extec TT Screen, CAT 300Kva gen	1	118
Loading shovel	Komatsu WA170	1	106
Soil Strip	Komatsu D65	1	107
Soil Strip	Daewoo 220LC	-	103
Road lorries	-	-	103

The plant complement is based on information provided by Mason Brothers Quarry Products Ltd. The sound power levels used are either from manufacturer's data or from Vibrock's extensive in-house database of sound power levels measured over the years. All measured sound power levels take into consideration where applicable the operation of any reverse warning systems fitted to the plant.

5.2.14 *Noise Prediction Assumptions*

The noise prediction exercises are based on a number of assumptions concerning the working of the site. These assumptions are presented as follows:-

All predictions have been calculated with the combinations of plant working at the closest point to the prediction location. They are therefore worst possible case scenarios which may be of relatively short duration. However, they indicate the maximum L_{Aeq} noise level to which a particular property or group of properties may be exposed during the working of the site. By definition, the worst case situation will occur intermittently over the entire life of the site, thus longer term noise levels perceived outside of the site boundary would normally be significantly less.

For the purposes of this prediction exercise, the above described worst case situation has been considered at all times, thus operations are assumed to be undertaken at their realistic minimum distances and maximum heights. In this exercise only the major operations have been considered as they are likely to have the most impact on the local environs.

Given that all prediction methods are estimates and that in practice measured levels are invariably lower due to the effects of interactions between such things as meteorological conditions and air absorption, these predicted levels are a reasonable representation of the worst case predictions assuming ideal meteorological conditions for sound propagation.

5.2.15 *Survey Method*

The methodology described below was employed during the noise survey. Wherever possible all measurements were undertaken to comply with the requirements of BS 7445: 1991.

At all locations the microphone was placed 1.5 metres above the ground and where possible at least 3.5 metres from the nearest reflecting surface. The sound level meters were programmed to monitor over 15 minute periods and the following parameters were recorded:

L_{A90} in dB
L_{Amax} in dB
L_{Aeq} in dB

Five 2.0 hour noise surveys were undertaken to monitor the existing noise levels in the vicinity of several potentially sensitive properties around the site boundary, with readings being taken during operational site hours.

5.2.16 *Noise Measurement Locations*

The 5 noise sensitive locations are listed in the table 9 below:

Table 9 Noise Measurement Locations.

Location No.	*Description*
1	Adjacent to Little Rhyndaston Nursery
2	Adjacent to Rhyndaston Fawr (Farm)
3	Adjacent to Coed-y-Barch
4	Adjacent to Barch Farm
5	Adjacent to Little Rhyndaston Bungalow

All locations were chosen due to their proximity to the existing operational Quarry and as broadly specified within the current planning conditions as noise sensitive properties.

Locations 1 and 5 were chosen as being representative of the facade of noise sensitive properties to the south east of the proposed development. Location 3 and 4 was chosen for their proximity to the south western boundary of the development. Location 2 was chosen for its proximity to the north western extension area of the development.

The instrumentation listed in table 10 was used for all noise measurements:

Table 10 Instrumentation for noise measurements.

Manufacturer	Description	Type	Serial No.
Cirrus	Integrating Sound Level Meter	CRL 702	021388 & 021753
Cirrus	½" Pre polarised Cond. Microphone	CRL 224	940037 & 940208
Cirrus	Foam Windshield		
Cirrus	Electronic Calibrator	CRL 511D	17771

The following set-up parameters were used on the sound level meters during all noise measurements:

Time Weighting: fast
Frequency Weighting: A
Measurement Period: 15 minutes

The sound level meters were calibrated with the electronic calibrator prior to commencement and on completion of the surveys. No significant drift in calibration was observed.

Noise levels were measured at the locations as detailed below by Mr P. Clayton of Vibrock Ltd on the 4th and 5th March 2002.

1. Adjacent to Little Rhyndaston Nursery - 07:30 to 09:45 on 5th March 2002

2. Adjacent to Rhyndaston Fawr - 07:30 to 09:15 on 5th March 2002

3. Adjacent to Coed-y-Barch - 10:00 to 12:00 on 5th March 2002

4. Adjacent to Barch Farm - 10:15 to 12:15 on 5th March 2002

5. Adjacent to Little Rhyndaston Bungalow - 12:00 to 14:00 on 5th March 2002

Weather conditions were noted during the survey periods.

Monday 4th March 2002

It was noted as being mild (9°C) with 100% cloud cover and a very slight wind of less than 1.0 ms^{-1}.

Tuesday 5th March 2002

It was noted as being mild (9°C) with periodic sunny spells and 30% cloud cover. A north westerly wind of up to 3.0 ms^{-1} (Average 2.0ms^{-1}) was also recorded.

Summaries of the results of the noise surveys of existing noise levels around the proposed development and typical sound power levels of plant used in the noise predictions are presented in Tables 1 and 2 respectively, within appendix 2 to the ES.

5.2.17 ***Noise Assessment***

Summaries of the absolute worst case noise levels predicted for each phase of the proposed extension area to each of five locations are given in Tables 3.1 to 3.5, within appendix 2. This is provided together with an indication as to the difference between the predicted and measured existing levels, the 48 dB $L_{Aeq,\ 1h}$ criterion recommended within the Determination of Conditions for the existing works ref: NP/131/97/DET. The results are further compared to the 55 dB $L_{Aeq.\ 1h}$ and 70 dB $L_{Aeq.\ 1h}$ allowances as detailed within the guidance of MPG 11, for each of the identified noise sensitive properties.

Location 1. Little Rhyndaston Nursery

Existing Ambient Noise Level

Referring to Table 1.1 (appendix 2), the average weekday daytime background noise level, $L_{A90\ 2hr}$ is some 42.4 dB, with measurements in the range 40.8 to 44.1 dB per individual 15 minute period. The corresponding average weekday daytime $L_{Aeq.\ 2h}$ is in the region of 48.8 dB comprising of 15 minute measurements in the range 48.1 to 50.0 dB.

The noise climate during the day was influenced mainly by natural noise sources in the form of bird song, together with some low level audible quarry noise.

Predicted Operational Noise Levels

A suite of calculations has been undertaken for this location predicting the noise levels within each phase of the proposed extension works, the results of which are listed in Table 3.1. (appendix 2).

The maximum estimated noise levels, not surprisingly, will occur when major activities are being undertaken at their closest approach to this property, whilst being afforded a reduced amount of acoustic screening. It is anticipated that this will occur during the normal operations within the phase 7 area of works of the proposed extension.

The calculated estimate of the maximum noise level occurring during this phase of the works is in the region of 47.4 dB $L_{Aeq.\ 1h}$. This is some 1.4 dB (A) below the existing L_{Aeqs} measured at this location and 0.6 dB (A) below the current allowable level of 48 dB $L_{Aeq.\ 1h}$.

Furthermore the calculated L_{Aeq} is some 7.6 dB (A) below the 55 dB $L_{Aeq.\ 1h}$ criterion of MPG 11, the normally justified limit for operations at surface mineral extraction sites.

This maximum predicted noise level is when operations are at the southernmost limit of excavation within phase 7. We have assumed that the drill rig is operating on the top level with the face shovel operating on the bench below. When extraction

operations are undertaken further away then estimated worst case noise levels will be reduced as barrier and distance attenuation increases.

Table 3.1 indicates that, without exception, all major operations on the proposed development produce estimated worst case noise levels that are below the 55 dB $L_{Aeq,1h}$ criterion of MPG 11, the normally justified limit for mineral extraction operations.

Furthermore no worse case calculated value exceeded the current planning limit of 48 dB $L_{Aeq\ 1hr}$ during any phase of the proposed extension works as calculated for Little Rhyndaston Nursery.

Location 2. Rhyndaston Fawr

Existing Ambient Noise Level

The information contained within Table 1.2 (appendix 2) confirms that the average daytime background noise level, $L_{A90\ 2hr}$ is 50.5 dB, made up of 15 minute period measurements ranging between 48.4 to 54.0 dB. The corresponding average daytime $L_{Aeq,\ 2h}$ is in the region of 57.4 dB comprising of 15 minute measurements in the range 54.7 to 59.3 dB (A).

At this location the noise climate during the day is significantly influenced by the local agricultural activities occurring on and around the farm coupled with naturally generated noise in the form of bird song. It was noted by the consultant undertaking the survey that no quarry noise was audible at this location.

Predicted Operational Noise Levels

A suite of calculations has been undertaken for this location predicting the noise levels within each phase of the proposed extension works, the results of which are listed in Table 3.2 (appendix 2)

From the above calculations it is evident that the worst case scenario occurs during the soil strip activities of phase 4. Within this phase the soil stripping plant will be required to operate at its closest approach to this property than at any other time within the proposed extension area. It has been calculated that a noise level of 47.6 dB $L_{Aeq\ 1hr}$ will occur, at this time.

As detailed within Table 3.2 (appendix 2) this predicted level is some 9.8 dB (A) below the current measured $L_{Aeq\ 2hr}$ levels, 0,4 dB (A) below the current planning condition and some 7.4 dB (A) below the 55 dB $L_{Aeq.\ 1h}$ as detailed within MPG 11.

At Rhyndaston Fawr, the predicted noise levels from both soil strip activities and normal quarry operations occurring on site during all phases of the works are, without exception, within both the 48 dB $L_{Aeq.\ 1h}$ current planning conditions and the 55 dB $L_{Aeq.\ 1h}$ criterion of MPG 11.

Location 3. Coed-y-Barch

Existing Ambient Noise Level

Table 1.3 (appendix 2) confirms that the average daytime background noise level, $L_{A90\ 2hr}$ is 29.9 dB, with 15 minute measurements in the range 27.4 to 31.8 dB. The corresponding average daytime $L_{Aeq,\ 2h}$ is 37.1 dB comprising of 15 minute measurements in the range 32.9 to 39.6 dB.

At this location the noise climate during the survey day was influenced by natural noise sources and existing quarry noise.

Predicted Operational Noise Levels

A suite of calculations has been undertaken for this location predicting the noise levels within each phase of the proposed extension works, the results of which are listed in Table 3.3 (appendix 2).

With reference to the above calculations it is apparent that the worst case scenario for Coed-y-Barch occurs when the soil strip activities are undertaken at closest approach within phase 1 of the proposed extension. It has been calculated that a level of 50.1 dB $L_{Aeq\ 1hr}$ would occur during this worst casing moment.

This level is below both the 70 dB $L_{Aeq,\ 1h}$ normally justifiable limit for temporary operations and the 55 dB $L_{Aeq,\ 1h}$ limit justifiable for mineral extraction operations of MPG 11.

During the soil stripping activities within the proposed extension area the resulting noise affecting Coed-y-Barch will reduce through phases 1 to 5, with only phases 1 and 2 exceeding the current planning condition of 48 dB $L_{Aeq,\ 1h}$. During the soil strip of phase 7 the works again proceed closer to this property and the noise level increases, although only to a level of 46.6 dB $L_{Aeq,\ 1h}$. At no time during the soil stripping works of the proposed extension does the predicted noise level exceed either the 55 dB $L_{Aeq,\ 1h}$ or the 70 dB $L_{Aeq,\ 1h}$ criterion of MPG 11.

Again with reference to Table 3.3 (appendix 2) it is apparent that under normal operating conditions (i.e. no soil strip activity) at no time does the predicted worst case moments, within any phase of the extension, exceed the current planning condition limit of 48 dB (A). It is further evident that no predicted levels exceed the 55 dB $L_{Aeq,\ 1h}$ as detailed within MPG 11.

Location 4. Barch Farm

Existing Ambient Noise Level

Table 1.4 (appendix 2) confirms that the average daytime background noise level, $L_{A90\ 2hr}$ is 31.2 dB, with 15 minute measurements in the range 29.2 to 32.7 dB. The corresponding average daytime $L_{Aeq,\ 2h}$ is in the region of 50.5 dB comprising of 15 minute measurements in the range 45.9 to 54.1 dB.

At this location the noise climate during the day was mainly influenced by natural noise sources like birdsong and periodic overhead aircraft. It was noted by the consultant undertaking the survey that no quarry noise was audible at this location.

Predicted Operational Noise Levels

A suite of calculations has been undertaken for this location predicting the noise levels within each phase of the proposed extension works, the results of which are listed in Table 3.4 (appendix 2).

From the above calculations it is evident that the worst case predicted noise levels will occur during the soil strip operations of phase 1 of the proposed extension. It is predicted that during this worst case moment a level of 46.2 dB $L_{Aeq,\ 1h}$ will occur. It is noted that this level is some 4.3 dB (A) below the current measured level, 1.8 dB (A) below the current planning condition of 48 dB $L_{Aeq,\ 1h}$,and below both the 55 dB $L_{Aeq,\ 1h}$ and 70 dB $L_{Aeq,\ 1h}$ criterion of MPG 11.

During the normal operating conditions (no soil stripping activities) at no time do the predicted worst case noise levels at this location exceed either the current planning condition of 48 dB $L_{Aeq,\ 1h}$ or the 55 dB $L_{Aeq,\ 1h}$ guidance of MPG 11. .

Location 5. Little Rhyndaston Bungalow

Existing Ambient Noise Level

Table 1.5 (appendix 2) confirms that the average daytime background noise level, $L_{A90\ 2hr}$ is 41.3 dB, with 5 minute measurements in the range 37.3 and 45.0 dB. The corresponding average daytime $L_{Aeq,\ 2h}$ is in the region of 47.5 dB comprising of 15 minute measurements in the range 44.0 to 50.7 dB.

At this location the noise climate during the day of the survey was influenced by local traffic movements and natural birdsong, noise was also evident from the quarry and periodic quarry road traffic.

Predicted Operational Noise Levels

A suite of calculations has been undertaken for this location predicting the noise levels within each phase of the proposed extension works, the results of which are listed in Table 3.5 (appendix 2).

With reference to the above mentioned Table it is apparent that the worst case predicted noise levels will occur during the normal quarry operations within phase 7 of the proposed extension when a level of 48.3 dB $L_{Aeq,\ 1h}$ is predicted. This level is only 0.3 dB (A) above the 48 dB $L_{Aeq,\ 1h}$ allowable level under the current planning conditions although it is some 6.7 dB (A) below the 55 dB $L_{Aeq,\ 1h}$ limit justifiable for mineral extraction operations of MPG 11.

It is further noted that the 0.3 dB (A) above the current planning condition of 48 dB $L_{Aeq\ 1hr}$ would be imperceptible to the human ear.

The worst case moment occurs during phase 7 as a direct result of the removal of the screening attributable to the rock mass that is the phase 7 works. This subsequently opens up the aspect onto the primary crushing and loading plant, this coupled with the proximity of said operations to Little Rhyndaston Bungalow are detailed as the reasons for this exceedance.

Maximum estimated noise levels from the soil stripping activities occur during phases 5 and 7 of the proposed extension but do not exceed either the 55 dB $L_{Aeq,\ 1h}$ or the 70 dB $L_{Aeq,\ 1h}$ criterion of MPG 11.

5.2.18 ***Additional Factors***

MPG 11 recognises that wind can significantly affect noise propagation and states in paragraph 24 that "...MPAs and operators may recommend that a fixed allowance of 2 dB(A) should be incorporated in predictive modelling" as a penalty for an adverse wind. There is no reference as to how this allowance was concluded and indeed it is stated earlier in the same paragraph "... such factors [wind direction and temperature inversions] are too unpredictable for general advice to be given on how they should be included in predictive models...". There is no allowance for the developer or MPA to subtract 2 dB(A), or indeed any amount, from the predicted levels to properties upwind of the development (ie a beneficial prevailing wind).

Vibrock do not consider that the present state of knowledge concerning the effect of wind on noise propagation is adequate to easily and accurately quantify such an effect. The Institute of

Acoustics also took this stance in its response to the Department of the Environment concerning Draft MPG 11.

5.2.19 ***Site Traffic***

It is generally accepted that noise level changes of 3 dB(A) are the minimum perceptible under normal conditions. Hence large variations in traffic flow numbers are needed before any noticeable change in traffic noise levels occur.

For example, a total traffic flow increase of 50% leads to a traffic noise increase of 1.8 dB, barely noticeable to the human ear, and less than the 3 dB considered as a significant change by DETR in reference to traffic noise assessments.

It is our understanding that the proposed number of vehicular movements associated with the development of the proposed extension areas will not alter significantly as compared to those due to present operations.

5,2.20 ***Noise Conclusions***

A visual survey of the proposed extension areas has been made and existing ambient noise levels measured at five noise sensitive locations around the proposed development. Measurements were 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, CRTN , MPG 11 and including the assumptions embodied in section 5 of this document, have been made to five noise sensitive locations around the proposed extension areas and these have been assessed against criteria in MPG 11 and the current planning conditions for Rhyndaston Quarry ref.: NP/131/97/DET.

It should be noted that all the predicted noise levels in this report refer to worst case scenarios, when operations are undertaken at their closest distances to sensitive properties and therefore have the greatest influence on the noise levels at these locations. These worst case noise predictions may only last for a few weeks or even days throughout the envisaged working life of the proposed extension areas.

From the results discussed in earlier sections it is apparent that estimated worst case noise levels from quarrying operations:

(a) Without exception do not exceed the 55 dB $L_{Aeq,\ 1h}$ criterion, considered a normally justifiable limit for mineral extraction operations in MPG 11.

(b) Without exception do not exceed the 70 dB $L_{Aeq,\ 1h}$ criterion considered a normally justifiable limit for temporary operations at surface mineral extraction sites in MPG 11.

(c) Do not exceed by a perceptible level (3 dB (A) within human hearing (MPG 11)) the current planning condition of 48 dB $L_{Aeq,\ 1h}$.

With reference to the predicted noise levels occurring throughout the life span of the proposed extension at location 3, Coed-y-barch, the following is apparent. As a direct result of the lack of natural screening features afforded by the lay of the intervening land it would be prudent to construct a screening bund of sufficient height and length such to obscure direct vision between this property and the working plant. This has been assumed within all calculations with the bund being approximately positioned in the area of the existing stock pile.

It should be borne in mind that the positioning of said bund is crucial, with the maximum attenuation resulting from a bund positioned close to the noise source, even to the extent of temporary resource stockpiles being positioned directly adjacent to working plant.

Where possible the screening provided by the working/previously worked quarry faces should be utilised in order to reduce emitted noise from primary, secondary and all other smaller plant.

With the above noise control recommendations implemented, and the exercise of reasonable engineering control over general site operations, the proposed extension areas at Rhyndaston Quarry should be able to be worked by Mason Brothers Quarry Products Ltd. within the noise criteria considered by MPG 11 to be normally justified for mineral extraction operations.

5.2.21 ***Recommendations***

The following are recommended as positive statements of the maximum noise level which could be permitted without giving rise to the likelihood of complaint:-

During the permitted working hours the free field Equivalent Continuous Noise Level ($L_{Aeq,\ 1h}$) for the period due to rock extraction and processing, excluding topsoil and subsoil stripping and other works in connection with landscaping, shall not exceed 55 dB(A) as recorded at any inhabited property.

Topsoil and subsoil stripping and other works in connection with landscaping shall not exceed 70 dB $L_{Aeq,\ 1h}$ free field at any inhabited property and be limited to a period not exceeding 8 weeks at any one property.

5.3 Vibration

5.3.1 *The effects of blasting*

The quarrying of rock, in this case igneous rhyolite hornfels requires blasting in order to fracture the original rock into fragments that can be crushed into smaller sizes for eventual use. When the explosive detonates within a borehole stress waves are generated causing very localised distortion and cracking. Outside of this 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.

The applicants and their blasting contractors have considerable experience and knowledge of the conditions at Rhyndaston and the factors which influence ground vibration, such as site geology, blast type and design, and routinely monitor vibration from all blasts at the quarry.

Vibration is also generated within the atmosphere where the term "air overpressure" is used to encompass both its audible and sub-audible frequency components. Air overpressure is similarly influenced by blast type and design, but meteorological and atmospheric conditions, over which the operator has no control can also influence the intensity of air overpressure at any given location.

It is important to emphasise that for any given blast it is very much in the operator's interest to always reduce vibration, both ground and airborne, to the minimum possible in that this substantially increases the efficiency and hence economy of the blast.

5.3.2 ***Vibration criteria***

(a) ***Damage levels***

(i) Ground vibration

Detailed research has been undertaken into the effects of vibration , and the levels of vibration necessary to produce structural damage to property. Such damage to residential type proerties is conventionally divided into three main categories of:

Cosmetic or threshold: the formation of hairline cracks or the growth of existing cracks in plaster, drywall surfaces or mortar joints.

Minor: the formation of large cracks or loosening and falling of plaster ondrywall surfaces or cracks through bricks/concrete blocks.

Major or structural: damage to structural elements of a building.

The United States Bureau of Mines (USBM) are deemed to be the foremost authority on the subject, and following an extensive research programme in the 1970's they determined that that vibration values well in excess of 50mms^{-1} are necessary to produce structural damage to residential type structures. The onset of cosmetic damage can be associated with lower vibration levels, and vibration values were seen to be from 19-50mms^{-1}.

Ongoing research has not altered these original findings, which have been embraced by the British Standards Institution's structural damage committee. This investigation has culminated in British Standard 7385:Part 2: 1993, Evaluation and Measurement for Vibration in Buildings, entitled Guide to Damage Levels from Groundborne Vibration.

British Standard 7385 gives guide values to prevent cosmetic damage to property. Between 4Hz and 15Hz, a guide value of 15-20mms^{-1} is recommended, whilst above 40Hz the guide value is 50mms^{-1}. These vibration criteria reconfirm those of the USBM.

(b) ***Perception levels***

The fact that the human body is very sensitive to vibration can result in subjective concern being expressed at energy levels well below the threshold of damage.

A person will generally become aware of blast induced vibration at levels of around 1.5mms^{-1}, although under some circumstances this can be as low as 0.5mms^{-1}. Even though such vibration is routinely generated within any property and is also entirely safe, when it is induced by blasting activities it can give rise to subjective concern. Such concern is also frequently the result of the recent discovery of cracked plaster or brickwork that in fact has either been present for some time or has occurred due to natural processes.

The British Standards Institution have produced a document relevant to such a discussion entitled BS 6472: 1992, British Standard Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz). Blasting vibration is specifically mentioned within Appendix C of this document. The document also discussed how and where to measure vibration. This appendix recommends that a satisfactory magnitude of blasting vibration at residential type property is 8.5mms^{-1} at a 90% confidence level, with an absolute limit of 12.7mms^{-1}.

The latest Government guidance on this subject is given within MPG 9, 1992 and MPG 14, 1995, where a range of between 6 to 10 mms^{-1} at a 95% confidence level is suggested, as measured over any period of 6 months, at vibration sensitive buildings with no individual blast exceeding 12 mms^{-1}.

The above criteria accord with the advice contained within the most recent DETR publication on the matter, entitled "The Environmental Effects of Production Blasting from Surface Mineral Workings", 1998.

In February 2002, the National Assembly for Wales published a consultation draft 'Minerals Technical Advice Note' on 'Aggregates'. The draft confirms the results of long established research and advice regarding the levels of vibration likely to give rise to structural and cosmetic damage, and suggests planning conditions which may be imposed to control vibration and air overpressure.

These 'conditions' suggest that ground vibration as a result of blasting operations should not exceed a peak particle velocity of 6mms ppv in 95% of all blasts measured over any three month period, and no individual blast to exceed a peak particle velocity of 8.5 mms ppv.

Objections have been raised by representatives of the quarry industry, (including the Quarry Products Association and the Applicants), to the unnecessarily restrictive vibration levels suggested in the draft condition. The levels are at variance with the longstanding advise set out in other published documents referred to above, and would, if implemented, result in either a loss of resources through sterilisation of margins, or an unnecessary increase in costs and/ or blasting frequency since there would need to be a greater number of smaller blasts to yield the same volume of rock.

The National Assembly are currently in the process of reviewing representations which have been made, and there can therefore be no guarantee that the final version of the 'TAN' will include the same advice. The Applicants therefore consider that only limited weight should be afforded to the draft advice at this stage.

5.3.3 Rhyndaston Quarry: Blasting Conditions

Rhyndaston Quarry currently operates to a condition (no. 36 of planning permission NP/131/97/DET) requiring that the ground vibration measured as peak particle velocity in any one of three orthogonal planes shall not exceed 8.5mm per second. 95% of all blasts measured over any period of 6 months, and that no individual blast shall exceed a peak particle velocity of 12mm/sec as measured at vibration sensitive buildings.

This condition is consistent with the advice set out in MPG9 and MPG14 and and has been complied with on site.

Two additional conditions relating to blasting were also attached to the 1997 permission, which require the quarry operator to submit and implement schemes for the monitoring of blasting (Condition 37), and for a methodology to minimise air pressure (Condition 38).

Both schemes were submitted to Pembrokeshire Coast National Park Authority on 8 April 1998. The blast monitoring scheme (Condition 38) establishes that:

"1. *The blasting parameters are initially correct ie. the position of the blast holes though laser profiling using a Pulsar 500 laser accurate to ±20mm.*

2. *The blast holes, when drilled, are then re-checked using the Pulsar down the hole probe which correlates the profiled information to the probe which correlates the profiled information to the probe, thereby ensuring that the drilling is accurate and also to enable the shot firer to draft the blasting specification which is necessary.*

3. *The blast holes are then loaded to the specification drafted, in accordance with the Quarries Explosive Regulations 1988, the Control of Explosives Act 1991, and the QPTC Guidelines Series No. 3.*

4. *A monitoring station is installed at the weighbridge of the quarry where a V401 seismograph is placed to measure seismic air blast results of an individual blast. The V401 seismograph is accurate to ±1dB(L)."*

By way of response, the National Park Authority sought (by letter dated 28 May 1998) the additional requirement that if the vibration and peak over pressure levels exceed the figure in Condition 36, then the operators will investigate the matter and address the problem by considering:

"a) all aspects of the shot-fire design;
b) assessment of previous records; and
c) any other appropriate measures.

Whatever action is taken must ultimately result in the level being brought back within the specified level.

The records would need to be kept at the site office and be available for inspection by officers of the County Council and National Park Authority at anytime within working hours".

These additions were accepted on behalf of the Applicants in a letter dated 1 March 1999.

With regard to Condition 38, and the methodology required to reduce air overpressure, an undertaking was made to reduce the impact by:

"a) eliminating surface lines of detonating cord;
b) eliminating detonating cord though the top stemming;
c) using sufficient top stemming;
d) using bottom initiation;
e) beeping instantaneous charge weights to a minimum;
f) ensuring initiation patterns have suitable delays".

This condition was discharged by virtue of a letter from the National Park Authority dated 28 May 1998.

All of the procedures required pursuant to Conditions 37 and 38 have been implemented in full by the Applicant, in conjunction with the requirement (in Condition 39) to sound an audible warning prior to any blasting operations.

5.3.4 *Mitigation measures*

It is considered that similar conditions to those complied with on the site will be sufficient to control the effect of blasting within the extended area of Rhyndaston Quarry. The current blasting regime would be maintained, and there is no reason to infer any chsnge to current circumstances or any adverse future effects associated with vibration of air overpressure.

5.4 Traffic

The continuation of existing movement levels serving Rhyndaston Quarry will have no adverse effect on access arrangements to the local road network.

5.4.1 ***Mitigation measures***

The proposed extension would not result in an increase in traffic flows, and therefore the network would continue to cater adequately with the reduced levels of usage. Nevertheless, the Applicants will adhere to the current requirement to notify the NPA of any large contracts to be supplied by the quarry which might give rise to short term extraordinary traffic movements.

5.5 Dust

5.5.1 ***Introduction***

Dust is defined as very fine particles of suspended material, and is present into the atmosphere in the form of a wide range of natural and manmade sources. As the dust disperses in the atmosphere, deposition of particles takes place. Deposition rates show a wide variation dependent upon, for example, the nature of the source material, the meteorological conditions, and the concentration and particle size of the source material. For this reason, measured dust levels have a wide range, and long term monitoring is required in order to demonstrate these variations.

The extent of dust dispersal depends on a range of factors including particle size, wind speed, dry weather conditions, and surface roughness e.g. the extent of tree cover. The greatest proportion of dust will be deposited within 100 metres of the source, although this tends to be the larger particles (> 30 microns). Larger sized mineral particles in excess of 75 microns are not readily transported in the air and, if disturbed, normally fall under gravity within several metres of them source, except in very severe weather conditions. Smaller particles (10 – 30 microns) are likely to travel further, although, as a result of dilution effects, the extent of dust deposition at distances of over 250 metres from the source is likely to be low.

5.5.2 ***Potential for dust generation***

Dust emissions can arise from mineral sites as a result of operational activities, and wind erosion of exposed surfaces. The amount of dust that is raised is highly dependent upon a number of interrelated factors, which include:

- The nature of the material;
- The prevailing meteorological conditions;
- The activities being undertaken;
- The influence of any on site mitigation measures.

During the operations at Rhyndaston Quarry, the two main activities with the potential to generate dust are a) soil stripping, and b) extraction and mineral haulage.

Although it is difficult to quantify dust generation accurately, the following measures will assist in reducing the potential for dust nuisance.

5.5.3 ***Mitigation Measures***

a) ***During Soil Stripping***

Soil stripping will take place prior to extraction, with the soils to be placed in temporary storage mounds and bunds., as described in Section 3 above.

In accordance with NAW Agriculture Department requirements for soil handling, the soils would not be moved in extreme wet or dry conditions, in order to avoid damage to the soil structure by smearing or compaction. During very dry conditions, consideration would be given to suspension of soil handling operations if wind speeds give rise to dust generation that could cause a nuisance to dust sensitive locations in the vicinity of the

site, particularly during dry and windy conditions. These principles would be followed for both initial soil stripping and handling, and subsequently during soil handling operations at the restoration stage.

Temporary soil storage bunds will be profiled to minimise wind erosion, and grass-seeded. The existing conditions relating to soil stripping and handling applicable to the site are complied with, and the Applicants consider them to be reasonable and appropriate in respect of this proposal specifically, Condition 56 requires that at least 72 hours notice is given to the National Park Authority prior to the commencement of stripping operations. Conditions 57 and 59 requires the removal of top soil and subsoil from all areas of the quarry required for operations, including for the location of soil bunds. Condition 58 set s out the requirements of the former Welsh Office in respect of soil stripping, and formation, and subsequent maintenance. Condition 61 requires the separate storage and signage of different types of soils. This condition has been complied with in relation to existing soil storage at the site, and the principles would continue in relation to the proposed additional soil stripping and storage.

b) ***During Extraction and mineral haulage***

All processing and loading operations would take place at quarry floor level, and thus most dust would be contained within the quarry. The most common cause of dust generation at mineral working sites is internal haulage movements. The current operations are subject to several conditions imposed to control dust arisings from such operations.

Condition 17 requires the best practicable means to restrict the generation of dust, including provision for all haul roads and access roads to be watered during dry weather by means of plant referred to in Condition 18.

Previous concerns about mud and dust on the public highway have been dealt with be means of surfacing the bellmouth, but Condition 19 also requires sweeping when appropriate.

Importantly, if permission is granted for the proposed extension, then the Applicants would be prepared to surface the remainder of the access road from the bellmouth to the quarry weighbridge.

Condition 20 requires that all movement of material on the site ceases in the event that mitigation measures prove to be ineffective in extreme circumstances.

The Applicants intend to continue to comply with these, or similar conditions, in the event of the successful outcome of this application. In addition, the proposed relocation of the plant site during Phase 3 would serve to minimise haulage and thus reduce potential dust generation. At that stage, stockpiling of material would be predominantly located within the main quarry area, and would benefit from the additional screening provided by the enclosed location.

All HGVs carrying rock from the site are sheeted prior to leaving the site. This again is a well-established practice which significantly reduces the potential for material being blown or falling from vehicles on to the public highway.

The site management would be responsible for ensuring that all dust mitigation activities were undertaken to a satisfactory level, and instructions will be issued to all vehicle drivers and site operators.

The effective control of airborne dust emissions requires the maintenance and proper use of equipment. Maintenance will be carried out in accordance with the manufacturers' recommendations on all plant to ensure that it operates at optimum efficiency.

Any malfunction or breakdown leading to abnormal emissions will be dealt with promptly and operations will be adjusted or suspended until normal working can be restored.

The Quarry Manager, or his appointed deputy, will exercise day-to-day control on site at all times. He will have particular responsibility for ensuring full compliance with the conditions attached to the planning permission for the extension.

Specifically, the Site Manager will assume control, either personally or by delegation to suitable trained and responsible staff, of:

(i) vehicle movements;
(ii) loading, tipping and materials handling operations;
(iii) mineral extraction;
(iv) operation of dust suppression measures; and
(v) inspection and maintenance of all plant and equipment.

The monitoring of operations with the potential to cause airborne dust emissions will be regularly undertaken by the Site Manager. This will predominantly take the form of personal visual assessments. Should visible dust be generated, the Site Manager will act promptly to identify the source of the dust and take the necessary corrective action.

If necessary, the Site Manager will instruct the suspension of any operation causing unacceptable visible dust emissions until such time as the situation has been resolved. Site staff will be instructed to inform the Site Manager whenever significant visible dust emissions are observed, or appear likely to occur, as a result of any site operations.

A complaints procedure will be established to ensure that any nuisance being caused to local residents is dealt with effectively. A register of complaints will be kept on site to record all concerns made either directly to the Site Manager or via the National Park Authority. Each complaint will be investigated and the Site Manager will take appropriate action.

5.6 Hydrology and hydrogeology

5.6.1 *Background*

An assessment of the hydrological conditions in the vicinity of Rhndaston Quarry was undertaken by Steve Bennett, Groundwater Consultant in August 2001. That assessment was carried out to consider the effects of quarrying the floor of the existing quarry from the current base of 90 metres AOD to 85 metres AOD, which would be below the seasonal water table.

That assessment concluded that *"local lowering of groundwater level by up to 5 metres on a temporary basis is unlikely to have any significant impact on the water table remote from the quarry. The presence of the deeply incised stream flowing through Little Rhyndaston Wood offers an effective hydraulic boundary to any influence being possible to the south of the quarry."*

However, the assessment noted the presence of a borehole at Rhyndaston Farm and the spring fed catchpit at Rhyndaston Villa , which are important water sources drawing water from higher elevations than the quarry floor level. The presence of a borehole

at Little Rhyndaston Nursery to the south west of the quarry was also noted. It was therefore recommended that a programme of regular monitoring of those features be initiated in order to assess the effects of ongoing quarrying.. This recommendation was accepted, and formally proposed as part of a monitoring scheme required by conditions 43 and 44 of the planning permission (ref NP/131/97/DET).

5.6.2 ***Hydrological Assessment.***

The peripheral hydrological monitoring data that is was recommended by routinely collected are:

- Depth to groundwater level in the 150mm diameter 28.1m deep borehole at Rhyndaston Fawr Farm to the north of the proposed extension area
- Depth to groundwater level in the 150mm diameter 33.5m deep borehole at Little Rhyndaston Nursery to the west-south-west of the quarry
- Visual observation of level/flow in a catchpit system of concrete rings at Rhyndaston Villa Arm.

The monitoring data to date are set out in Appendix 1. This monitoring will continue throughout the period of the proposed development. The groundwater level data show a typical pattern of winter accession from October, consequent on rainwater recharge to the system. This pattern is somewhat masked by pumping, hence the perceived importance of collecting a long and accurate record so that level variations are clearly understood. This is reflected in the proposed working scheme which delays extraction below the base of the quarry until the latter phases of the overall development.

The existing permission which allows some excavation down to a level of 70mOD in the central/southern area would involve excavation to below the level of the stream flowing east to west to the immediate south of the quarry. It would also involve permanent and substantial lowering of a water table that currently sits at about 90mOD in the quarry, and 95mOD or more in the borehole at Rhyndaston Fawr Farm to the north. The offer by the Applicants to relinquish this element of the current permission has been influenced by that context, and the desire to undertake a more environmentally acceptable quarrying and extraction scheme.

Within the northern part of the current quarry, excavation is permitted to 85mOD, that is some 5m below the local water table level. The small lagoon in this area has been excavated to about this level. Rather than excavate the whole of this area below the water table, a more limited area of sub water table excavation is envisaged within this existing area of the quarry, and within part of the proposed extension area.

The proposed extension to the east involves several phases (phases 1-5) of extraction progressing eastwards, the subsequent removal of the existing east-west ridge of rock, and the remaining area (phases 7and 8), down to the current quarry floor level of 90mOD. None of these phases will impact on the water table in the vicinity, as the water table level, apart from isolated pockets of water stored in fractures, will be the same or similar to the floor level in the current quarry.

It is proposed that over a limited area of about 2.5ha, with a footprint in both the existing northern quarry and the proposed extension that further excavation (phase 6) should take place down to 85mOD by limited dewatering. During this limited dewatering phase it is possible that the groundwater level at Rhyndaston Fawr Farm could be drawn down, perhaps by 2m or

so. There would remain a substantial depth of water in the well. Subsequent recovery to a wetland feature would result in recovery of groundwater level.

5.6.3 *Hydrological Conclusions*

The proposed easterly extension of Rhyndaston Quarry, with limited excavation beneath the water table level, is seen as presenting minimal or negligible hydrological impact during excavation. It is seen as likely to lead to a quarry restoration plan that is less sterile than that seen at many quarries, subject to suitable profiling of the water feature lake (as discussed in section 4 of the ES).

Currently permitted quarry working in part of the quarry to 70mOD could give rise to an adverse effect on the hydrological environment in both the short term and the long term. It would also result in a less acceptable restoration scheme.

If quarry working is permitted within the extension area, with limited sub water table working as proposed, then the continued working and restoration of the quarry should be regularised within this permission. Although working over a limited area down to 85mOD is seen as presenting a very low risk of any adverse impact during dewatering, it is recommended that the monitoring programme be continued by condition, and subject to periodic review.

5.7 Ecology

The working and restoration schemes that forms part of this application will provide the potential to enhance nature conservation interests in the area.

The periphary of the quarry will be restored in order to encourage the creation of semi-natural habitats, such as woodland, wetland and grassland. In due course a long-term management plan for the quarry will be prepared which includes consideration of the end-uses which will principally be agricultural uses incorporating new habitats of wildlife value, notably the shallow wetland feature.

The nature conservation interest of the application site is relatively low. In contrast, the working and restoration schemes contain the potential to increase the value. No specific mitigation measures are necessary as part of the proposed development to reduce ecological impacts, but a key component of the restoration proposals is the objective to enhance the ecological value of the site via the implementation of the phased restoration proposals.

5.8 Cultural Heritage

5.8.1 *Context*

The Cultural Heritage Assessment has concluded that there are no known archaeological features within the study area, and that there is low potential for the existence of currently unrecorded archaeological features.

5.8.2 *Mitigation measures*

In view of the absence of any evidence that the study area contains elements of archaeological significance, it is considered that no further assessment is required. The Applicants would however be content to accept a planning condition which required a "watching brief" during soil stripping operations, in order to record any features which may be uncovered.

5.9 Agriculture

5.9.1 *Farming Circumstances*

The farming operations that take place on agricultural land are generally of lesser importance than land quality considerations, but do influence the effect of the classification on the structure of the farm. In other words, an assessment can be made of whether the loss of 'best and most versatile' land will have an irrevocable effect on the ability of the farm to operate as a viable unit.

The study areas is part of a farm of a large farm unit. There are no farm buildings on the site that would be affected by the development, and the use of the nearby farm buildings will not be prejudiced. There is no irrigation system in place in this area, it having a high annual rainfall, and off-site water supplies will be unaffected.

5.9.2 *Impact Assessment*

The area proposed for a lateral extension of Rhyndaston Quarry potentially best and most versatile land (grade 3a) Due to the uniformity of the land quality, there is no potential for designing an extension to the existing quarry that would avoid the loss of such land quality. However, the existence of high quality land need not necessarily prevent the extension of the quarry, in view of (a) the small area of land involved, and (b) the restoration scheme which would provided for the restoration of a larger area to agricultural land of potentially similar quality.

The extension area is situated at the southern extreme of the farm landholding. Therefore there are no implications for the rest of the farm in terms of severance or the ability to continue agriculture use on the surrounding land.

5.10 Assessment of likely effectiveness of mitigation measures

5.10.1 *Overview of environmental effects*

The proposed development involves an extension to an existing quarry, and the progressive restoration of the site to a mixture of agriculture and amenity/nature conservation lakes. This is an entirely conventional development, using well established extraction and restoration techniques.

In common with all mineral development schemes, there are potential environmental effects which must be addressed. The Applicant's have recognised the importance of these issues, and have carefully reviewed all relevant impacts which might arise.

The resulting Environmental Impact Assessment has confirmed that there are a number of potential environmental effects which require the implementation of measures to reduce their overall impact. Central to those mitigation measures is the phased nature of the working and restoration scheme, and the implementation of additional noise screening measures.

This section of the ES presents a summary of the key environmental issues, and where appropriate considers the likely effectiveness of the mitigation measures which have been proposed. Overall conclusions are then drawn.

5.10.2 *Landscaping measures*

The proposed working scheme that forms part of this application would involve increasing the area of working whilst reducing the overall depth of excavation. The final landform created would be suitable to return a large area of the site to agricultural use, which would not be possible if the quarry was excavated to greater depth.

In addition to an improvement in the restoration land uses, the landscape proposals can be integrated into the existing landscape fabric to a greater extent than possible following excavation to a greater depth. This is because the majority of the land would be restored to a variety of habitats including woodland, scrub, species rich grassland and scree. These habitat types are common in the locality of the site, which would allow them to become integrated into the landscape. The inclusion of the pond within the scheme offers an opportunity to create an area of open water, an important habitat for species diversity that is not common in this part of Pembrokeshire.

5.10.3 ***Noise controls***

A review of current operations has concluded that the development could proceed in accordance with the noise criteria limits set out in MPG11, and do not exceed by a perceptible level the limits set out in the current planning permission for quarrying at the site. The temporary operations such as soil stripping are similarly calculated to be within the criteria levels for such operations, and would in any event be completed over a short time period.

5.10.4 ***Vibration***

There is no reason to suppose that the extension of Rhyndaston Quarry is likely to result in any increase or significant decrease in vibration levels as the working progresses. The vibration levels would therefore be similar to those currently experienced, which are controlled by planning conditions, and an approved monitoring scheme. It is therefore suggested that the existing vibration monitoring scheme would be applicable to the proposed operations within the application site.

5.10.5 ***Dust***

The dust suppression system currently in place is well-established, and is dealt with by (i) planning conditions requiring the best practicable means to minimise dust pollution; (ii) an authorisation required by the Environment Protection Act; and (iii) by general good practice. No specific alterations to the existing dust control measures are deemed to be necessary, and none are therefore proposed as part of the current operation. Benefits would however arise from the proposal to surface that quarry access road. The management and reporting procedures have been clearly set out in paragraph 5.5.3, and will allow the effectiveness of the dust control system to be monitored, and additional measures undertaken as appropriate.

5.10.6 ***Hydrogeology***

The easterly extension of the quarry, above 90 metres AOD would give rise to no material effects on the groundwater regime of the locality. Similarly, the limited extent of deepening to 85 metres AOD would have minimal or negligible impact. In hydrological terms, the scheme is preferable to the development which is currently permitted, which involves more substantial deepening operations over a larger area, to greater depths, and over a more prolonged time period. The restoration scheme is also preferable with a shallow lake which would have considerable amenity and nature conservation potential.

5.10.7 ***Conclusions***

The results of the assessment confirm that there is no single constraint or impact, or combination of impacts which should objectively prevent the scheme from proceeding. This positive conclusion is reinforced by the wider benefits of the scheme in

terms of the more sensitive working scheme which is now proposed and which would replace the currently permitted scheme; the lack of any substantive increase in permitted reserves; and the ability to complete the development within the same timescale as currently permitted.

The Applicant's overall conclusion is that in the context of the these factors, and the advice which they have received on environmental effects, and the measures available to mitigate those effects, the balance weighs heavily in favour of the positive advantages of the development.

6.0 THE POLICY FRAMEWORK

6.1 Plan Background

The site lies within the administrative area of the Pembrokeshire National Park Authority. The 'development plan for the area comprises the Dyfed Structure Plan and the North Pembrokeshire Local Plan, although the Local Plan does not include mineral policies. Additional policy advise is set out in Minerals Planning Policy Wales (MPPW) 2000, with draft advise on 'Aggregates' incorporated in a consultation draft TAN issued by the National Assembly in February 2002.

The National Park Authority are in the process of preparing a Unitary Development Plan jointly with Pembrokeshire County Council, and a deposit draft plan was issued for consultation in May 2002, with representations required by 5th July 2002. The representations will then be considered, modifications will be made to the plan and a local plan inquiry will be convened to consider unresolved objections, probably in the spring/summer of 2003.

6.2 Minerals Planning Policy Wales

6.2.1 Minerals Planning Policy Wales (MPPW) establishes the land use planning policy guidance of the National Assembly for Wales in relation to mineral extraction and related development in Wales. The guidance is material to decisions on individual planning applications.

6.2.2 The overriding objective is to provide a sustainable pattern of mineral extraction by adhering to 5 key principles to be considered in development control matters.

These key principles are to:

a) Provide mineral resources to meet society's needs and to safeguard resources from sterilisation
b) Protect areas of importance to natural or built heritage
c) Limit the environmental impact of mineral extraction
d) Achieve high standard restoration and beneficial after-use
e) Encourage efficient and appropriate use of minerals and the re-use and recycling of suitable materials

6.2.3 With regards to (a), and the requirement to "provide mineral resources", the extension to Rhyndaston Quarry would enable the continuation of the supply of a valuable resource to the local economy. The material from the quarry is utilised in the construction industries of South West Pembrokeshire, and the grant of permission for the extension would ensure that a local source is available to the market. That resource would be worked within the same overall timescale as the current planning permission, but in a more environmentally acceptable way.

6.2.4 The protection of the natural environment and the built heritage (objective b) is fundamental to the proposal. This Environmental Statement has demonstrated that despite its location in the National Park, there will be relatively minor implications on the landscape, which can reasonably and effectively be mitigated. The nature of the site is such that there are relatively few environmental constraints inherent on the land.

6.2.5 The current planning permission allows for the extraction of some 1.5 million tonnes of rock, largely through deepening the existing quarry from 90 metres AOD to 85 and 70 metres AOD. These operations can take place in accordance with the current planning permission and its conditions. However, the Applicants have concluded that a more acceptable development scheme could take place via a modest lateral extension and a voluntary reduction in the area to be deepened.. The scheme would not

materially alter the volume of reserves available for extraction ,and as noted above, it would not extend the currently permitted timescale of operations. However, the working areas would be capable of considerably enhanced screening as part of the currently proposed development, and amenity benefits associated with eliminating the resumption of quarrying on the open area on the site frontage. The development has therefore been expressly conceived as means of limiting the environmental impact of quarrying (objective c).

6.2.6 The ES has also concluded that the extension area is capable of being restored to a high standard and that a beneficial after-use can be achieved in accordance with objective d). Again the scheme has been expressly designed to rpoduce a more attractive, sustainable and bio-diverse restoration scheme compared to that which would emerge via the currently approved scheme. This would result from the broadening out of the landform, and the replacement of deep water lakes with a shallow landscaped lake of considerable amenity and nature conservation potential. The restoration scheme would be progressively implemented as much as possible to minimise the overall effect of the operations, and has been designed to maximise nature conservation opportunities in association with the surrounding landscape and landform.

6.2.7 The operators of Rhyndaston Quarry encourage the efficient use of minerals (objective e) in order to reduce uneconomic wastage. Effectively, there is no wastage at the quarry. With regards to the use of minerals being an appropriate one, the material from Rhyndaston is an important element to the local supply of construction aggregates, and it is the Applicants commercial interest to ensure that the end products are marketed to the highest possible specification and thus end use.

6.2.8 MPG Wales also reiterates the longstanding advice that minerals developments should not take place in National Parks save in exceptional circumstances. It therefore confirms that all mineral applications in such areas should be subject to the most rigorous examination, and be demonstrated to be in the public interest before being allowed to proceed. It advises that this exercise would normally include an assessment of:

- "the need for the development in terms of UK considerations of mineral supply;
- the impact on the local economy of permitting the development or refusing it;
- whether alternative supplies can be made available at reasonable cost, and the scope for meeting demand in some other way;
- the detrimental effect of the proposals on the environment and the landscape and the extent to which that can be moderated; and
- in the case of extensions to existing quarries and other mineral extraction sites, the extent to which the proposals would achieve an enhancement to the local landscape and provide for nature conservation and biodiversity."

6.2.9 It is important to emphasise that there is no embargo on mineral extraction in the National Park. The requirement is to consider applications on their merits, but to subject them to very careful scrutiny, via a "rigorous examination" to consider the landscape, environmental and other effects of the development. The above topics are clearly not exhaustive of the relevant issues to consider, nor can they be assumed to apply in equal weight, either individually or to individual sites. Nevertheless, in response to these topics it is considered that:

- Recently published figures in the draft 'Joint UDP for Pembrokeshire' suggests that the current reserve of hard rock in the county amounts to some 44.5 million tonnes. This figure has been queried as part of the consultation response. However, it is apparent that the reserves are unequally distributed between sites, and that several will exhaust their reserves in the short to medium term, whilst others have longer term futures.

  It is simplistic and misleading to presume that the longer term sites will automatically be able to fulfil demand which was previously served by existing sites which become exhausted, particularly with such a limited number of permitted sites, some of which operate at very low outputs or intermittently.

  In any event, the proposed extension at Rhyndaston would not increase the level of overall reserves., and as a consequence it would have no effect on the overall county landbank of reserves.

- The quarry currently employs some 4 personnel direct, with 5 indirectly employed, together with other tradesmen who rely in part upon Rhyndaston Quarry for employment . This is not inconsiderable in such a rural area. The jobs would however continue if permission is refused in that the operators would then exploit the remaining reserves at depth within the existing quarry.

- The quarry has an established market primarily in south Pembrokeshire, and the reserves within the extension area would allow those markets to continue to be served. In the absence of access to reserves within the extension area, the markets would be served by other reserves at depth within the existing quarry.

- This ES has concluded that the development could proceed with no material adverse effect on the landscape or other environmental interests: indeed it has contended that there would be positive benefits compared to the working and restoration scheme which is currently approved at the existing site.

- It follows that the Applicants contend that the landform and land uses associated with the restoration scheme would give rise to a positive enhancement to the local landscape, and provide considerable nature conservation and bio diversity opportunities.

The overall conclusion is that the development fully complies with the issues and requirements within the topics which are conventionally considered as part of a "rigorous assessment". In many respects this is a unique development in that its principal focus is an attempt to continue the operation in a more environmentally acceptable way, and to improve the long term landform and land uses which are to be introduced as part of the restoration scheme. The Applicants therefore respectfully suggest that these positive issues should become the principal focus of the "rigorous examination".

6.3 Minerals Planning Policy Wales: Consultation Draft Technical Advice Note – Aggregates.

A consultation draft 'Aggregates TAN' was published by the National Assembly for Wales in February 2002, and representations were invited by mid May. Numerous comments and objections have been submitted, including objections from the applicant company and the Quarry Product Association. The National Assembly are currently in the process of reviewing those representations prior to publishing a final version of the TAN.

Paragraphs 44 and 49 of the draft TAN reiterate the longstanding advise that mineral extraction should not take place in National Parks save in exceptional circumstances, and that applications should be subject to a rigorous examination. However, paragraph 51 of the draft TAN introduces contradictory advice in suggesting that "there is no need to permit proposals for the extraction of general aggregates from (National Parks) in Wales." It continues by noting that any applications would need to be accompanied by a demonstration that "alternative resources that would be environmentally acceptable for extraction are not available."

The suggestion that there is a need for operators to demonstrate that alternative resources, that would be environmentally acceptable for extraction, are not available, is not only an onerous requirement but, in practice, is impossible to achieve with the degree of certainty which is implied. In the absence of comprehensive information on all potential deposits, and an appraisal of the environmental acceptability of extraction of such individual deposits, arguments could always be advanced that alternative sites might be available. It is for this reason that MPGW requires a more general appraisal of the need for the development in terms of mineral supply, and whether alternatives can be made available at reasonable cost, together with wider considerations of need to include the impact on the local economy (MPGW paragraph 21).

In the case of the proposed development at Rhyndaston, the applicants are entirely content for the proposal to be the subject of a 'rigorous examination'. However, that examination cannot be pre-judged by a premature conclusion suggested by the TAN that there is "no need" for the development. Moreover, there is requirement via MPGW to undertake a more general appraisal of the need for the development which, in this instance, would include the environmental merits of the proposed scheme compared to the currently permitted scheme. The consideration of 'alternative resources' can in those terms be focused upon the principal alternative which would simply involve the applicants exercising their right to continue working the quarry in accordance with the currently permitted scheme.

Objections have also been submitted to draft advice in the TAN relating to land banks, buffer zones, quarry vibration and noise limits, and it is respectfully suggested that limited weight should be afforded to the draft advice until final decisions are made on the TAN. Even then, the advice would become one material consideration, which would not take precedence over other material considerations relating to individual applications.

6.4 Dyfed Structure Plan

The Dyfed Structure Plan Alterations no. 1, adopted in November 1990, remains the development plan for the area, pending the adoption of the Pembrokeshire Joint UDP.

The plan contains a specific chapter on minerals, with 31 separate policies, of which policies M1, M2 and M5 appear to be particularly relevant.

Policy M1 lists a series of criteria against which planning applications for mineral extraction will be considered, with respect to which the applicants make the following comments:

1. The site is not constrained by high quality agricultural land. In any event, the overall restoration scheme makes provision for the return of a significant area of the site to agricultural use.

2. There are no known features of ecological importance within the proposed extension area.

3. The development would continue the existing access arrangement and pattern of vehicle movements.

4. There are very few residential properties in the immediate vicinity of the site, and the potential effect on the amenities of those properties, particularly in terms of noise, has been carefully considered as part of the EIA.

5. The effect on hydrogeological interests has been carefully considered, and no adverse effects are predicted. Ongoing monitoring will however continue.

6. The development would not result in an increase in overall reserves, or the timescale of the operation.

7. The development could proceed in accordance with conventional criteria and operational practices for the control of noise, dust and vibration.

Policy M2 confirms that there is a presumption against new mineral working or "substantial extensions" to existing workings in the Pembrokeshire Coast National Park. This development, with a gross site area of 2.9 hectares, cannot be regarded as a "substantial extension". Moreover, as noted above, the extension would not materially increase the overall volume of available reserves, by virtue of the offer to relinquish the rights to exploit a proportion of the currently permitted reserve.

Policy M5 requires provision for planned working and restoration to a beneficial after use. These issues are considered in sections 3 and 4 of this ES, and the applicants contend that the requirements are fully discharged. Moreover, the restoration scheme would provide an attractive and appropriate mixture of after uses, which would enhance the biodiversity value of the locality.

6.5 Joint Unitary Development Plan for Pembrokeshire: 2000 - 2016

A deposit draft version of the UDP was published for consultation in April 2002, with responses required by 5 July 2002. Representations will be submitted by the Applicants expressing concern about the content of the minerals chapter 6.8. In those circumstances, and in view of the preliminary stage which the plan has reached in its progress towards adoption, only limited weight can be afforded to its content at this stage.

The draft UDP makes provision to consider planning applications for mineral developments on their merits, subject to criteria set out in Policy 85. The accompany text notes that there may be circumstances where a proposal might be submitted to "replace a permitted reserve which is difficult to work, for a variety of reasons, in which case the life of the site will not be unduly prolonged. If accepted the Local Planning Authorities will seek to restrict the working of an historical reserve through a legal agreement." (paragraph 6.8.17).

This is broadly the situation at the application site, albeit that the rationale of the development is based upon the desire to exploit reserves in a more environmentally acceptable way, rather than any inherent difficulties in working the remaining permitted reserve. However, the principle of not prolonging the life of the site, and restricting the working of part of the existing reserve through a legal agreement are entirely applicable to the proposed development.

The Proposals Map identifies the application site as an area where planning applications are anticipated during the plan period, albeit the plan does not make any commitment to granting permissions for extraction within the area. Any such application would need to be considered against the conventional requirements for a "rigorous examination" (paragraph 6.8.19 of the UDP, and referred to above), and the criteria set out in Policy 85.

In response to Policy 85, we make the following comments:

1. The mineral would continue to supply established markets for which there is an identified need. Whilst recycled/ alternative materials have a role to play, they cannot meet all specifications, and are in short supply in the County (reference paragraph 6.8.8 of the UDP). It is acknowledged that the market could be supplied by existing reserves at the quarry: however, the essence of the proposal is to supply the market via a more environmentally sensitive scheme.

2. The development is of a small scale, and would not result in an increase in production.

3. As noted above, the development has been expressly designed to minimise environmental effects in terms of noise vibration, dust and groundwater considerations, and would generate less overall impact that the currently approved scheme.

4. There would be no alterations to current traffic movements, which are readily accommodate by the local highway network.

   (Items 5 and 6 not applicable).

7. The site would be progressively restored to an attractive and beneficial after use, as discussed in section 4.0 of this statement.

6.6 Policy conclusions

The applicants recognise that the site lies within the Pembrokeshire Coast National Park, where very strict planning controls are exercised over new developments. Nevertheless, existing and emerging planning policy does not place an embargo upon mineral extraction in the National Park but requires the effects of development to be very carefully considered, and "rigorously examined".

The applicants consider that the environmental effects of the development can be successfully mitigated, and that the amenity and landscape benefits represent important positive material considerations which fully satisfy the requirements of both national and local planning policy. In those circumstances, the applicants respectfully contend that the development is in accordance with planning policy, and should be entitled to receive a planning permission.

7.0 SUMMARY AND CONCLUSIONS

This statement provides a detailed objective analysis of the potential environmental effects which would be associated with the development, the measures available to mitigate those effects, and the likely effectiveness of the mitigation measures. The statement also describes the details of the proposed development, the conceptual restoration strategy and the policy framework within which the proposal will be considered.

The statement has been prepared in order to assist the determining planning authority and other interested parties to reach a decision on the merits of the development and the environmental implications associated with it. It summarises the results of very careful, detailed and systematic research into each of the potential environmental effects of the development and, where relevant, sets out conventional modern methods of mitigating the effects.

The general conclusion reached by the statement is that there are adequate mitigating measures available to ensure that the development could proceed without giving rise to unacceptable environmental effects.

In a wider planning policy context the statement concludes that the development could proceed in accordance with the national and local planning policies for the area. Moreover, the development would not result in any material increase in reserves, nor would it extend the timescale beyond that which is currently permitted (2015). The scheme would however result in a more environmentally acceptable working programme, and a more attractive long term landform and after uses. These are considered to be strong material considerations in favour of planning permission being granted.

The statement has been prepared in order to assist the National Park Authority and other interested parties to reach a decision on the merits of the development and the environmental implications associated with it. The Applicants therefore look forward to further discussions as part of the application process.