

# CASE STUDY 1

## STONE QUARRYING IN THE MENDIP HILLS, SOMERSET



<b>TITLE:</b>	<b>STONE QUARRYING IN THE MENDIP HILLS, SOMERSET</b>
<b>ISSUE:</b>	The use and need for mineral aggregates and positive and negative impact of their extraction on the Mendip Hills.
<b>RESOURCES:</b>	Photographs of old and recent quarry operations; extracts from planning policy documents; extracts from Local Planning Authority papers; newspaper cuttings dealing with local quarrying issues; views of different interest groups.
<b>TASKS:</b>	<ul style="list-style-type: none"><li>● Assessing the points for and against quarry operations in the Mendips</li><li>● Comparing quarrying operations in the Mendips with those in other locations within the South West.</li></ul>
<b>ROLE:</b>	Students can assume the role of: <ul style="list-style-type: none"><li>● A planning officer preparing a report on a planning application for a proposed quarrying operation</li><li>● A mineral operator putting the case for a new quarry extension</li><li>● A member of a local environmental group opposed to local quarry developments</li><li>● A resident in a local community affected by lorry movements generated by the quarry operations.</li></ul>
<b>ISSUES:</b>	The environmental impact of quarrying (noise, dust, effects on fauna/flora/landscape and water resources) as against the beneficial effects for the local economy (jobs, training etc) and the national/regional/local need for mineral resources.
<b>OPTIONS:</b>	To support or oppose future quarrying operations in the Mendips or another quarry operation elsewhere in the Region.
<b>DECISION:</b>	The difficult task of weighing up all the options and coming to a decision for or against a proposed quarrying development.

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### INTRODUCTION

At the start of the new Millennium, stone continues to play an important role in shaping our environment. Indeed this is a continuation of a role played for many centuries.

Today the extraction, processing and transport of stone is a complex issue. On the one hand it supplies materials to meet many of society's needs and creates employment, but on the other hand it can have significant impact upon the environment and local communities.

This case study explores some of these issues which apply both in the Mendip Hills area in Somerset and also with other quarrying activities in the South West Region. It focuses in particular on the quarrying of Mendip limestone rock, but the issues involved apply to many different types of rock, including the extraction of sand and gravel.

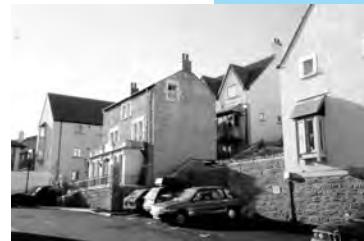


### THE NEED FOR STONE PRODUCTS

Stone products are required to meet many different needs of society.

Aggregates (crushed rock and sand & gravel) are essential for use in concrete for building:

- Housing
- Schools
- Hospitals
- Shopping Centres
- Industrial Premises
- Roads
- Bridges



Quarried blocks of stone are also used when cut, shaped and carved for facing buildings. Rough blocks are also used as rock armour in sea defences.



Quarried stone is also used for less direct purposes, involving many industrial processes:

- Iron and steel production
- Chemical processes
- Plastics
- Paint
- Cosmetics
- Toothpaste

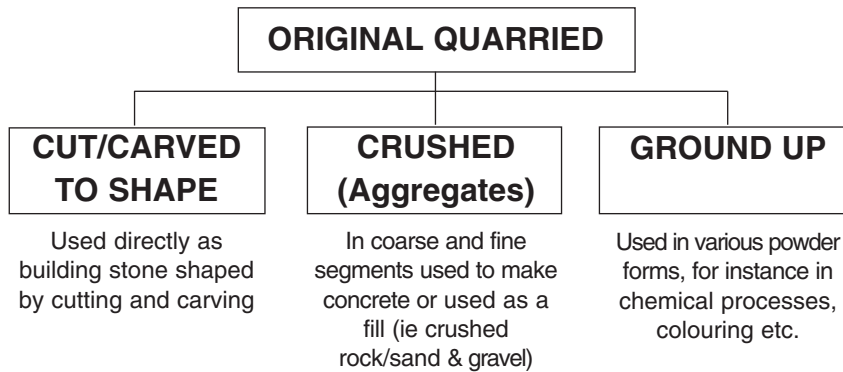


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### HOW ARE STONE PRODUCTS USED?



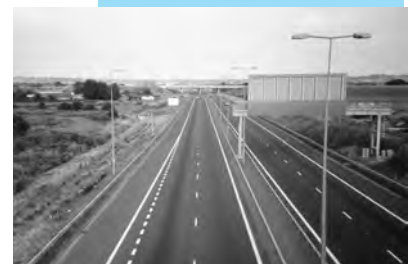
### HOW MUCH ROCK IS USED?

Increasing living standards together with economic growth creates demand for quarried stone materials in its different forms (cut to shape, crushed or ground).

According to the quarry industry, consumption of such materials in Britain in the mid 1990s was some 255 million tonnes per year, equivalent to 4.5 tonnes for every man, woman and child. Nevertheless, this British consumption was still well below that of the USA, France and Germany where it is over 6.5 tonnes per person. In the South West Region, consumption per person is slightly below the British average.

### WHY ARE AGGREGATES NEEDED?

The two basic types of aggregates - hard rock and sand & gravel - are largely used for different purposes; they are not interchangeable for many end uses. In particular, the current technical requirements for road building mean that sand & gravel is rarely used. However, hard rock crushed aggregate, such as that derived from Mendip limestone, has the major advantage that it is strong material, giving roads the required strength to withstand the weight of traffic. Most new roads are also now surfaced with macadams and asphalts, largely manufactured from crushed hard rock.



Lesser quality stone is also used in the construction of road embankments, for instance such stone from the Mendips was used in the construction of the approach roads to the new Second Severn Crossing Bridge.

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### HOW IS THE DEMAND MET AND WHERE?

Mineral deposits such as hard rock and sand & gravel can only be worked in locations where they occur naturally. The mineral wealth of Britain is not uniformly distributed across the country. South east of a line from Flamborough Head in Yorkshire to Portland Bill in Dorset there is virtually no hard rock suitable for crushed hard rock aggregates. Also in this area, available reserves of sand & gravel are being rapidly depleted.

To maintain supplies and meet continued demand, many areas throughout the country therefore import aggregates, either to supplement local output or to meet the need for products not available locally.

The Mendip Hills in Somerset are one of the nation's principal sources of high quality hard Carboniferous limestone rock. This rock was deposited in shallow seas over 300 million years ago. Some 1100 hectares have planning permission for quarrying in the Mendips. In addition to supplying local needs in Somerset and the South West, the Mendips are also the source of large quantities of crushed rock exported to the South East Region which has no natural hard rock deposits. The South East also imports crushed rock from the area north of Bristol, the East Midlands and to some degree, Scotland, Wales and Ireland.

Whilst Somerset supplies crushed hard limestone rock to the South East from the Mendips, it has itself to obtain sand & gravel from other areas, such as, Devon, Dorset and the Bristol Channel. It is clear therefore that demand and supply of aggregates has to be considered at a national and regional level.

### COULD ROCK SUPPLIES BE OBTAINED FROM OTHER PARTS OF THE SOUTH WEST?

Different hard rocks are available in other parts of the South West Region, for instance, granites in Devon and Cornwall. These deposits are a source of hard rock for local use in these areas, but relatively little is used for supplies to other parts of the South West or to the South East, principally because of the distances involved, the resulting high cost of transport and the relatively low value of the crushed rock.



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### HOW ARE AGGREGATES MOVED FROM QUARRIES TO WHERE THEY ARE REQUIRED?

Most aggregates in the form of crushed rock or sand & gravel are transported by lorries on the road network. However, where large volumes are involved and loads originate from a concentrated area, such as the Mendip Hills, rail facilities are used. Two railheads are currently in use in the Mendips, one at Whatley Quarry and one at Torr Quarry, both west of Frome. A large percentage of the crushed hard rock aggregates taken to the South East goes by train.



### COULD MORE RECYCLED MATERIAL BE USED?

Materials that have been used before can sometimes be used instead of newly quarried rock; (ie it can be recycled). These recycled materials include pulverised fuel ash, blast furnace slag, china clay sand and demolition waste. However many of these materials cannot be used for certain projects because they do not meet the technical requirements, (eg durability) or because the cost of transporting them to locations where they are needed is too high.



### ENVIRONMENTAL ISSUES

The quarrying, processing and transport of minerals including hard rock aggregates and sand & gravel can have significant effects upon the environment.

These effects can include:

- Visual impact of quarries upon the landscape
- Dust, noise and vibration from quarrying processes (ie blasting, crushing etc)
- Transport of minerals by lorries - noise, vibration and dust
- Effect of quarrying upon plants and wildlife.

These issues are all being addressed in relation to the quarrying of limestone in the Mendip Hills.

Today, with the widespread concerns about the future of the countryside, mineral operators are taking great care to minimise the impact of their operations on the rural environment and local communities. Most have environmental codes of practice and liaise with local authorities aiming to ensure that the operations are as acceptable as possible in these sensitive areas. These codes of practice are often imposed by the local authority when planning permission is granted. Inevitably though, conflicting views prevail about many of these issues.

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Action taken by mineral operators, often as a result of planning requirements, includes:

- **Landscaping**

In many cases quarry workings are screened from view by landscaped banks - often planted with mature trees, shrubs and plants. These can help screen the quarrying activities and also create good wildlife habitats, enhancing the local ecology. Such actions can go some way to compensating for the inevitable impact of quarry working on local flora and fauna.



- **Dust Control**

Inevitably the blasting, processing and transport of rock products can produce large amounts of dust. To tackle and reduce this problem, most new processing plants are now enclosed and water spraying is undertaken in many areas - eg on road ways within the quarry area. Lorry wheel cleansing facilities reduce the amount of mud and dust carried on to public roads. In practice some of the dust control measures are not always fully successful and problems do arise.

- **Noise and Vibration reduction**

Quarry operations can be noisy and create vibrations. Reduction techniques include careful siting of processing plants, appropriate cladding of buildings and the fitting of silencers to static and moving machinery. At night, flashing reversing lights replace 'bleepers' on quarry vehicles.



- **Control of Operations**

The hours of operation can be controlled through the terms of the planning permission (eg Monday - Friday: 7.00-17.00 hrs; Saturday: 9.00-13.00 hrs; Sunday: no working)



Blasting can be a sensitive issue, particularly where residential areas are nearby. It can cause considerable vibration in nearby properties particularly if the rock has cracks or fissures along which the vibration travels (eg in limestone). However modern techniques seek to ensure that vibration levels are kept to a minimum. Most quarries now carry out fewer but more effective explosions - perhaps only one or two a day at pre-determined times.

- **Impact upon Surface and Underground Water**

The actual extraction of rock can have a considerable impact upon both surface water streams and also underground water sources (or aquifers). The latter impact occurs because suitable rock for quarrying is often located at or below the local water-table. This issue has been of a particular concern in the Mendips

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where the underground water is a source of drinking water supply to nearby cities, towns and villages, including parts of the Bristol conurbation. Another particular concern has been the possible polluting effects of deep quarrying in the Mendips on the hot water springs in Bath to the north. However working with the local Councils and the Water companies, mineral operators seek at all times to prevent these water related problems.

- **Transport**

The transport of aggregates and many rock products can be just as difficult a problem as the environmental impact in or close to the quarry itself. Problems caused by lorry traffic through communities both close to and more distant from the quarry can be very sensitive issues; however, in recent years improvements to road networks have often enabled mineral operators to direct vehicles away from both built up areas and unsuitable narrow country lanes. Such improvements have in many cases been jointly planned and financed by local highway authorities and the mineral operators themselves.



The concentration of quarrying at a small number of large quarries in the Mendips has, in recent years, permitted mineral operators to invest significantly in rail transport facilities. Rail depots, track and special trains and locomotives now haul large quantities of stone; a single train carrying 3000 tonnes of quarry products is equivalent to about 150 heavy goods vehicles. In the Mendips rail haulage is particularly important with stone being taken from both Whatley and Torr Quarries.



- **Restoration and After-Use**

Old sites of mineral working which have been left to regenerate naturally often provide good, relatively undisturbed habitats for flora and fauna - indeed several such sites in the Mendips have been designated as Sites of Special Scientific Interest by English Nature, the Government's nature conservation agency.



Modern quarrying techniques today incorporate phased restoration of worked out areas in parallel with continuing extraction. New planting techniques encourage rapid establishment of vegetation. Some completed quarries may become nature reserves or open spaces for leisure and recreation, while others may be backfilled and returned to agricultural use.

A further option that is often considered is use of a former quarry as a location for the disposal of waste. Such proposals can bring as much, or even more, controversy than the original mineral extraction operations.

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### ECONOMIC ISSUES

The quarrying industry plays a vital role both nationally and locally in meeting society's needs. In Somerset the community, particularly in and around the Mendips, benefits in a number of ways.

For many years quarrying has provided a good range of job opportunities; in the mid 1990s some 2500 people were employed in quarrying and associated activities in the Mendips. Quarrying is very much part of the traditional skills and culture in the Mendip community. Many other jobs are also dependent on the industry for a good proportion of their businesses; (eg transport firms). The minerals industry itself also offers apprenticeships and sponsored places in further education, in many cases at local colleges.



### THE LOCAL COMMUNITY

The quarrying industry has estimated that the total revenue from the Mendip quarries is some £150 million per year of which it is estimated that some £40 million goes directly into the local economy through employee income and their expenditure with local shops and other suppliers.

As major employers, the quarry operators in the Mendips have long standing links with local schools and colleges; the industry provides a number of placements for work experience each year. Also many local organisations such as schools, clubs and charities can also benefit both in terms of financial assistance and the provision of construction materials.



### RESOLVING THE ISSUES

The above sections illustrate that quarrying highlights many difficult issues, some of which are conflicting:

- Need for the products - both locally and nationally
- Environmental impact of the operations and the measures taken to reduce this impact
- The local economic and community benefits

The key fact is that all operations associated with quarrying require **Planning Permission**; issues considered when the planning application is submitted include:

- The extraction of stone - methods of operation, operating hours etc.
- The measures taken to reduce the environmental impact; noise, dust etc
- The means of transport.

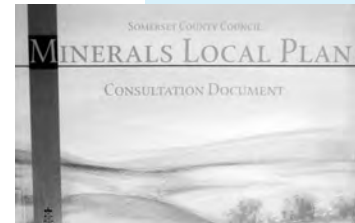
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### WHO IS INVOLVED IN THE PLANNING PROCESS AND IN MAKING DECISIONS?

- The **Mineral Operators** who submit planning applications for quarrying operations. Such applications must normally be accompanied by an Environmental Statement setting out the measures proposed to be taken to reduce the inevitable environmental impact.



- The **Local Planning Authority (LPA)** which takes the decision on the planning application - normally in relation to mineral operations this is the County or Unitary Council relating to the location where the proposed operations are to take place; (eg in relation to the Mendips, Somerset County Council). These planning authorities when taking the decision, must weigh up all the factors such as the local and national need for the extracted stone, the environmental impact of the operations, the local economic benefits and views of the local community. In making these judgements they may well refer to local planning documents which they have previously adopted (eg a Minerals Local Plan). When planning permission is granted, conditions are attached setting out requirements which must be met, for example restriction on hours of working, landscaping requirements, limits on noise levels etc. The LPA subsequently monitors operations and, if conditions are not being met, enforcement action can be taken to ensure that they are.

Form T, and C, P, 3

Somerset County Council 

TOWN & COUNTRY PLANNING ACT, 1990

THE COUNTY COUNCIL OF SOMERSET, being the COUNTY PLANNING AUTHORITY for the said Administrative County, HEREBY GRANT CONDITIONAL PERMISSION pursuant to the provisions of the Town and Country Planning Act, 1990 to the following application as described in the plans and drawings submitted.

NO: 109122/002 DATED: 10th February 1995

APPLICANT: ARC (Southern)

AGENT: DAVID THOMAS

PROPOSAL: CONTINUED QUARRYING & PROCESSING OF LIMESTONE AT WHATLEY QUARRY, AND EXTENSION TO QUARRY (35ha) TOGETHER WITH THE FORMATION OF A RESERVOIR AT SNATCH BOTTOM AND IMPROVEMENTS TO HOLWELL ROAD (GRID REF: ST7150-4750)

LOCATION: Whatley Quarry, Whatley, Nr FROME, Somerset.

Permission is granted subject to the following conditions:-

**COMMENCEMENT**

- 1 The development to which this permission relates shall be begun before the expiration of five years beginning with the date of this permission. "Commencement" for the purposes of this permission means the start of any works involving the siting and working of a quarry, or the use of Chantry Lane.  
Reason: To comply with Section 91 of the Town and Country Planning Act 1990.
- 2 Written notification of the date of commencement of the development shall be sent to the Mineral Planning Authority (MPA) within 7 days of such commencement.  
Reason: To comply with Section 91 of the Town and Country Planning Act 1990.

*have immediate effect.*

- The **Government, through the Secretary of State for the Environment, the Regions and Transport**. This involvement usually applies if the mineral operator's planning application is refused by the local planning authority or agreed but with conditions unacceptable to the operator. The Secretary of State will give a decision on an application after a Public Inquiry has been held before an Inspector. At the inquiry all the different arguments both for and against the proposed operations are examined. Again the policies in the Local Plan will be a key issue, but also national government policies on mineral issues.

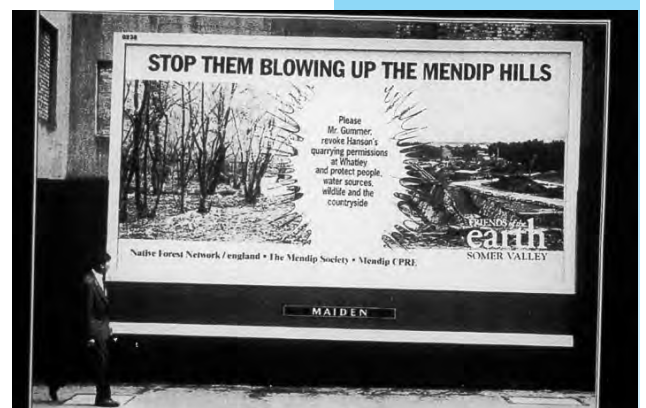
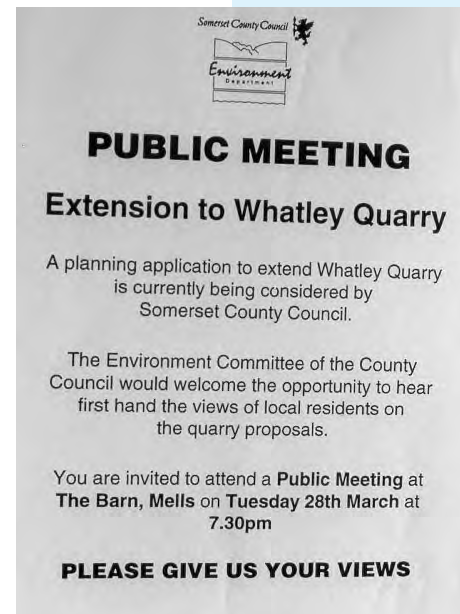
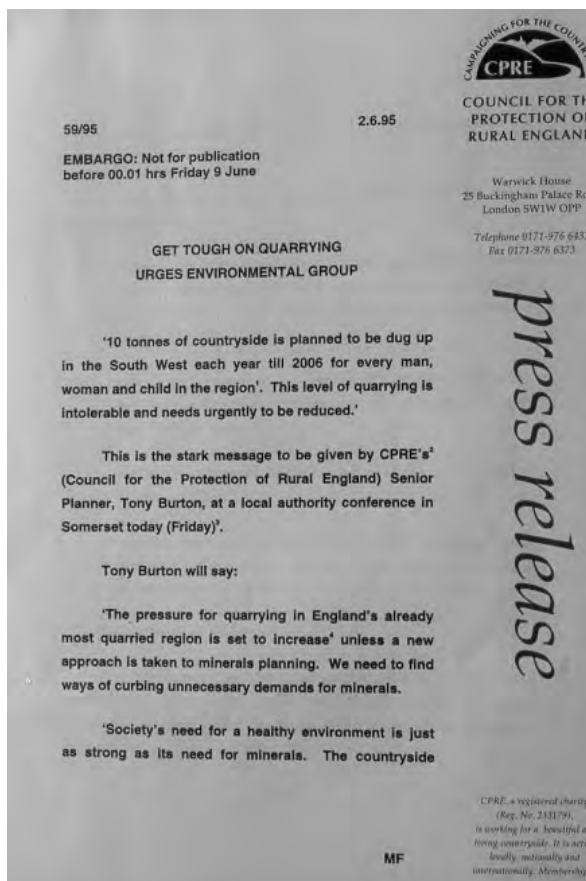
MINERALS POLICIES	
General	
M1	Minerals development will not be permitted where it can be demonstrated that the need for the mineral could reasonably be met at lower environmental cost by the use of secondary or recycled material.
M2	Minerals development will not be permitted in any AONB unless it can be demonstrated that the development is essential in terms of national considerations of mineral supply and of significant benefit to the local economy. Before permission is granted it must be shown that satisfactory measures have been incorporated to mitigate against adverse effects upon the landscape and in the case of extensions to existing quarries, that the proposal will achieve an enhancement to the local landscape.
M3	Applications in, or likely to affect, nationally or internationally designated sites of nature conservation interest will be subject to the most rigorous examination. Permission will not be given where the need for the mineral could be met from an undesignated site and where in particular, acceptable restoration and aftercare of the site cannot be assured.
M4	Minerals development will not be permitted where the adverse sensory effects

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- The **general public** through local councils (eg Parish Councils), environmental interest groups, local chambers of trade, village/town groups and individuals. These groups/ individuals are able to make comments both when the initial planning application is being considered by the local planning authority and also, if appropriate, at the later Public Inquiry. The participation of these groups and individuals can often be in the form of major local campaigns usually against the proposed development but sometimes significant support can also be voiced, particularly by those who may be dependent on quarrying for their job and livelihood. Those involved in such inquiries must present evidence to support the points they are making



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### ROLE OF THE PLANNING OFFICER

The Planning Officer working for a Local Planning Authority is involved in a number of ways during the processes described above:

- Preparation of a **Minerals Local Plan**; this sets out policies regarding the location of, and conditions required for the future working of minerals
- Assessment of **Planning Applications**; reporting on these to the Local Planning Authority Committee, usually recommending approval or refusal of the application
- **Negotiating with the Mineral Operator**; seeking clarification on the proposals and possible improvements/changes
- **Monitoring the operations**; to ensure that the planning conditions are being met and if necessary, initiating enforcement action
- **Explaining the proposals** to the local community and organisations (eg Parish Council)
- **Defending the Local Planning Authority's decision** at a **Public Inquiry** if permission is refused.

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### QUESTIONS AND TASKS

#### A. QUARRYING IN THE MENDIPS

Take on the role of a planning officer preparing a report on a planning application seeking the development of a new quarry in the Mendips. Set out the various points that need to be considered from the economic, social/community and environmental view point using the resources provided in this case study. Recommend whether or not planning permission should be granted or refused; if granted, what conditions should be imposed, and if refused, state the reasons why this should be the case.

#### B. A LOCAL QUARRY

Select a local quarry operation in your own area or in another location you know; describe the quarry operations involved. Investigate and assess its contribution to the local economy and the environmental impact (eg dust, noise, lorry movements). Compare the issues raised with those in the Mendips using the material in this case study. If different issues are involved, they should be described and explained.

#### C. DIFFERENT VIEWS/ROLES

Based on the material in this case study, set out on the schedules provided the various issues/concerns of both the quarry operators and environmental interest groups in the Mendips.

### EAST MENDIP STUDY CENTRE

For further information and assistance on issues included in this case study, the East Mendip Study Centre can provide valuable resources. The Centre is owned and managed by Hanson Aggregates and is based near the Company's Whatley Quarry. It is equipped with educational materials which could be useful in undertaking these tasks.

There is a classroom which has graphic displays, a projector and screen, maps of the area and reference books. Field work takes place over large areas of land owned by Hanson, with woodland, streams and former quarry workings.

For further information, contact the Study Centre on 01373 452 515.

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### D.1 QUARRY OPERATORS

Points in support of quarrying activities in the Mendips

1.	
2.	
3.	
4.	

### D.2 ENVIRONMENTAL INTEREST GROUPS

Points of concern or objections to quarrying activities in the Mendips

1.	
2.	
3.	
4.	

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### TEACHERS' SHEET

#### D.1 QUARRY OPERATORS

Points in support of quarrying activities in the Mendips

1.	National/regional/local need for stone (eg for building houses/schools/hospitals/roads)
2.	Measures taken to reduce environmental impact (eg landscaping, dust suppression, limited times for blasting)
3.	Benefits to the local economy (eg creation of local jobs, spending power of employees, training opportunities) Retention of local traditional skills
4.	Measures taken to ensure lorries transporting mineral aggregates only use suitable roads and avoid impact as far as possible on local communities Also rail transport used to transport large quantities of quarried stone.

#### D.2 ENVIRONMENTAL INTEREST GROUPS

Points of concern or objections to quarrying activities in the Mendips

1.	Impact upon the local plants and wildlife (eg quarrying to take place in areas which are Sites of Special Scientific Interest)
2.	Visual impact upon the landscape - quarrying results in open scars in the attractive Mendip Hills which are used by local people and visitors for recreation and leisure
3.	Environmental impact of lorry movements/noise/dust on local communities
4.	Possible impact upon surface/underground water resources