

BROCKHILL QUARRY, NAUNTON
AGRICULTURAL LAND CLASSIFICATION

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BROCKHILL QUARRY, NAUNTON

AGRICULTURAL LAND CLASSIFICATION SURVEY

SUMMARY

The survey was carried out by ADAS on behalf of MAFF as part of its statutory role in response to an application to extend existing quarrying operations at the site. The fieldwork at Brockhill Quarry was completed in December 1994 at a scale of 1:10,000. Data on climate, soils and geology was used and is presented in the report. The distribution of grades is detailed below and illustrated on the accompanying ALC map. Information is correct at this scale but could be misleading if enlarged.

Distribution of ALC grades: Brockhill Quarry

Grade	Area (ha)	% of Survey Area	% of Agricultural Land	
3a	1.2	9	9	
3b	9.9	72	73	
4	2.4	18	18	
Urban	0.1	1		
TOTAL	13.7	100	100	(13.5 ha)

Most of the site consists of well drained, calcareous, stony soils with heavy textured topsoils, and is graded as 3b. An area of extremely stony soils in the south is graded as 4. A small area of less stony soils along the western edge is graded as 3a due to topsoil workability.

1. INTRODUCTION

An Agricultural Land Classification (ALC) Survey was carried out in December 1994 at Brockhill Quarry, Naunton on behalf of MAFF as part of its statutory role in response to an application to extend quarrying operations at Brockhill Quarry. The fieldwork covering 13.7 ha of land was conducted by ADAS at a scale of 1:10,000 (approximately one boring per hectare of agricultural land). A total of 8 auger borings were examined. Visual topsoil stoniness assessments were made at 6 other locations, and by sieving at 3 locations.

The published provisional one inch to the mile ALC map of this area (MAFF 1963) shows the grades of the site at a reconnaissance scale to be grade 3.

The recent survey supersedes this map having been carried out at a more detailed level and using the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF 1988). These guidelines provide a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The grading takes account of the top 120 cm of the soil profile. A description of the grades used in the ALC system can be found in Appendix 2.

2. CLIMATE

The grade of the land is determined by the most limiting factor present. The overall climate is considered first because it can have an overriding influence on restricting land to a lower grade despite other favourable conditions.

Estimates of climatic variables were interpolated from the published agricultural climate dataset (Meteorological Office 1989). The parameters used for assessing overall climate are accumulated temperature (a measure of the relative warmth of a locality) and average annual rainfall (a measure of overall wetness). The results shown in Table 1 indicate there is an overall climatic limitation which restricts the land to Grade 2.

Table 1: Climatic Interpolations: Brockhill Quarry

Grid Reference		SP 134 240
Altitude (m)		210
Accumulated Temperature (day °)		1275
Average Annual Rainfall (mm)		783
Overall Climatic Grade		2
Field Capacity Days		178
Moisture deficit (mm):	Wheat	79
	Potatoes	62

Climatic data on Field Capacity Days (FCD) and Moisture Deficits for wheat and potatoes are also shown. These data are used in assessing the soil wetness and droughtiness limitations referred to in later sections.

3. RELIEF AND LANDCOVER

The site slopes from an elevation of 210 m AOD in the north to 195 m AOD in the south. The slopes are not limiting. The area to the south was not cultivated at the time of the survey. The rest of the site was under arable production.

4. GEOLOGY AND SOILS

The geology of the site is shown on the published 1:50,000 scale solid and drift geology map, sheet 217 British Geological Survey 1978.

The site is underlain by Great Oolite Limestone with the exception of the south eastern corner which is underlain by Fullers Earth.

The soils were mapped by the Soil Survey of England and Wales in 1983 at a reconnaissance scale of 1:250,000.

Most of the site is shown as being covered by soils of the Evesham Association. These are slowly permeable clayey soils associated with shallow well drained brashy calcareous soils over limestone. The southern part of the site is mapped as Elmton 1 Series which is also described as shallow well drained brashy calcareous soils over limestone.

No slowly permeable soils were found during the recent survey, and almost the entire site was covered by shallow, stony, well drained calcareous soils. A small area to the east had been disturbed and used for landfill. To the west a small area was relatively stone-free, apparently due to previous quarry operations.

5. AGRICULTURAL LAND CLASSIFICATION

The distribution of ALC grades is shown in Table 2 and on the accompanying ALC map. The information could be misleading if shown at a larger scale.

Distribution of ALC grades: Brockhill Quarry

Grade	Area (ha)	% of Survey Area	% of Agricultural Land	
3a	1.2	9	9	
3b	9.9	72	73	
4	2.4	18	18	
Urban	0.1	1		
TOTAL	13.7	100	100	(13.5 ha)

Subgrade 3a

This is a small area on the western side of the site. Stone contents are much lower than over the remainder of the site, being less than 10% in the topsoil and subsoil. The soils are well drained, and have a topsoil texture of heavy clay loam. This topsoil texture, in conjunction with the high value of field capacity days for the site (178 FCD) leads to a grade of 3a due to workability limitations.

Subgrade 3b

Most of the site falls into this grade. Topsoil stones >2 cm in diameter account for between 10% and 25% of the topsoil in this unit. Where topsoil stones exceeds 15% the land is downgraded to 3b because of stoniness.

The topsoil texture in this region varies from heavy clay loam to clay. Where the topsoil texture is clay the land is downgraded to 3b because of workability.

Grade 4

The southern part of the site, adjacent to the track, is downgraded to Grade 4 because of topsoil stoniness. In this area there is 40% stones with a diameter >2 cm in the topsoil, and over 10% stones larger than 6 cm.

Urban

This area is the track and car park next to the quarry buildings.

Resource Planning Team
Taunton Statutory Unit
16 January 1994

APPENDIX 1

REFERENCES

BRITISH GEOLOGICAL SURVEY (1978) Solid and Drift Edition, Sheet 217 1:50,000.

MAFF (1963) Agricultural Land Classification Map, Sheet 144, Provisional 1:63,360 scale.

MAFF (1988) Agricultural Land Classification of England and Wales (Revised Guidelines and Criteria for grading the quality of agricultural land), Alnwick.

METEOROLOGICAL OFFICE (1989) Climatological Data for Agricultural Land Classification.

SOIL SURVEY OF ENGLAND AND WALES (1983) Sheet 5, Soils of South West England, 1:250,000 scale.

APPENDIX 2

DESCRIPTION OF GRADES AND SUBGRADES

Grade 1 - excellent quality agricultural land

Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly include top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

Grade 2 - very good quality agricultural land

Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1.

Grade 3 - good to moderate quality agricultural land

Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.

Subgrade 3a - good quality agricultural land

Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.

Subgrade 3b - moderate quality agricultural land

Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass, or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

Grade 4 - poor quality agricultural land

Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (eg cereals and forage crops) the yields of which are variable. In most climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land.

Grade 5 - very poor quality agricultural land

Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

Descriptions of other land categories used on ALC maps

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: private park land, public open spaces, sports fields, allotments and soft-surfaced areas on airports/airfields. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Agricultural buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg polythene tunnels erected for lambing) may be ignored.

Open water

Includes lakes, ponds and rivers as map scale permits.

Land not surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above landcover types, eg buildings in large grounds, and where may be shown separately. Otherwise, the most extensive cover type will usually be shown.

Source: MAFF (1988) Agricultural Land Classification of England and Wales (Revised Guidelines and Criteria for Grading the Quality of Agricultural Land), Alnwick.

APPENDIX 3

DEFINITION OF SOIL WETNESS CLASSES

Wetness Class I

The soil profile is not wet within 70 cm depth for more than 30 days in most years.

Wetness Class II

The soil profile is wet within 70 cm depth for 31-90 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but not wet within 40 cm depth for more than 30 days in most years.

Wetness Class III

The soil profile is wet within 70 cm depth for 91-180 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31 and 90 days in most years.

Wetness Class IV

The soil profile is wet within 70 cm depth for more than 180 days but not within 40 cm depth for more than 210 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.

Wetness Class V

The soil profile is wet within 40 cm depth for 211-335 days in most years.

Wetness Class VI

The soil profile is wet within 40 cm depth for more than 335 days in most years.

Notes: The number of days specified is not necessarily a continuous period. 'In most years' is defined as more than 10 out of 20 years.

Source: Hodgson, J M (in preparation), Soil Survey Field Handbook (revised edition).