

8ECS 4707D

D22/95

Parkgate Farm, Purton
Agricultural Land Classification
and
Site Physical Characteristics

Prepared for MAFF by
G M Shaw
ADAS Statutory Unit
Bristol

PARKGATE FARM, PURTON
AGRICULTURAL LAND CLASSIFICATION
AND SITE PHYSICAL CHARACTERISTICS

CONTENTS

	Page
SUMMARY	1
1. INTRODUCTION	2
2. CLIMATE	2
3. RELIEF AND LANDCOVER	2
4. GEOLOGY AND SOILS	3
5. AGRICULTURAL LAND CLASSIFICATION	3
6. SOIL RESOURCES	3
APPENDIX 1 References	4
APPENDIX 2 Description of the grades and subgrades	5
APPENDIX 3 Definition of Soil Wetness Classes	7
MAPS	

PARKGATE FARM, PURTON

AGRICULTURAL LAND CLASSIFICATION SURVEY AND SITE PHYSICAL CHARACTERISTICS

SUMMARY

The survey was carried out by ADAS on behalf of MAFF as part of its statutory role in the preparation of the Wiltshire Minerals Local Plan and covers the area included in an ad hoc planning application for a clay extraction landfill site made to Wiltshire County Council. The fieldwork at Parkgate Farm, Purton was completed in May 1995 at a scale of 1:10,000. Data on climate, soils, geology and from previous Agricultural Land Classification (ALC) Surveys was used and is presented in the report. The distribution of grades within the application site is shown on the accompanying ALC map and summarised below. *Information is correct at this scale but could be misleading if enlarged.*

Distribution of ALC grades: Parkgate Farm, Purton

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (29.4 ha)
3b	29.4	100	100
TOTAL	29.4	100	100

All of the site has been mapped as Subgrade 3b. These soils have a moderate wetness limitation imposed by heavy topsoils and slowly permeable subsoils.

1. INTRODUCTION

An Agricultural Land Classification (ALC) Survey was carried out in May 1995 at Parkgate Farm, Purton on behalf of MAFF as part of its statutory role in the preparation of the Wiltshire Minerals Local Plan and covers the area included in an ad hoc planning application for a clay extraction and landfill site made to Wiltshire County Council. The original fieldwork covering 50.9 ha of land was conducted by ADAS at a scale of 1:10,000 with approximately one boring per hectare of agricultural land. A total of 51 auger borings were examined and 2 soil profile pits used to assess subsoil conditions. The application site covers 29.4 ha and within this area 30 auger borings and one soil profile pit were located.

The published provisional one inch to the mile ALC map of this area (MAFF 1973) shows the grades of the site at a reconnaissance scale. The application site is shown as Grade 4 with Grade 3 land to the south of the site on the higher land.

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 no overall climatic limitation.

Table 1: Climatic Interpolations: Parkgate Farm

Grid Reference	SU077 890
Altitude (m)	85
Accumulated Temperature (day °)	1434
Average Annual Rainfall (mm)	706
Overall Climatic Grade	1
Field Capacity Days	159
Moisture deficit (mm):	
Wheat	104
Potatoes	95

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 land adjacent to the railway is flat at an altitude of 85 m AOD. At the time of survey all the fields were in pasture except for a field in the west which was planted with cereals.

4. GEOLOGY AND SOILS

The geology of the site is shown on the published 1:63,360 scale Solid and Drift geology map, Sheet 252, Institute of Geological Sciences 1974.

The site is mapped as Jurassic Oxford Clay with an area of Alluvium in the north-west.

The soils were mapped by the Soil Survey of England and Wales in 1983 at a reconnaissance scale of 1:250,000. Two soils are shown on this map; a central band running SW-NE of the Wickham Association flanked by Denchworth Association on either side. These soils are similar with slowly permeable layers and are seasonally waterlogged. A mix of loamy and clayey soils can be expected.

The soils found during the recent survey are typical of the mapped Associations. The depth to the slowly permeable layers varies but the soils are generally gleyed from the surface.

5. AGRICULTURAL LAND CLASSIFICATION

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

Table 2: Distribution of ALC grades: Parkgate Farm

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (29.4 ha)
3b	29.4	100	100
TOTAL	29.4	100	100

Subgrade 3b

All of the site is mapped as Subgrade 3b. These soils are poorly drained and are Wetness Class III and IV (see Appendix 3). The variation in Wetness Class is caused by the presence of an upper subsoil in some profiles which is too porous and too well developed to be a slowly permeable layer. Other profiles do not have this layer and are the worst Wetness Class. The topsoil textures are generally heavy silty clay loams with occasional clays. Clay subsoils are typical of the site.

6. SOIL RESOURCES

The areas referred to can be found on the accompanying Soil Resource map.

"Topsoil" is defined as the organic rich surface horizon. The topsoil at the site is Heavy Silty Clay loam with occasional clays. Over the whole site the topsoil depth was found to vary between 20 cm and 30 cm. The median and mode depths is 30 cm. The topsoil has a weakly developed medium subangular blocky structure with a friable consistence.

A topsoil resource of 88,200 m³ is available as shown in Table 3.

Table 3: Topsoil Resources

Map Unit	Depth (cm)	Area (ha)	Soils	Volume (m ³)
A	30	29.4	HZCL, C	88,200

"Subsoil" is defined as the less organic rich lower horizons. Clay subsoil is found across the site and extends to 120 cm. These clays have moderate structural condition. Parts of the site have an upper subsoil which has a moderately developed coarse subangular blocky structure and is friable. Other clay horizons have moderately developed coarse angular blocky structure.

A subsoil resource of 264,600 m³ is available distributed as shown in Table 4.

Table 4: Subsoil Resources

Map Unit	Depth (cm)	Area (ha)	Soils	Volume (m ³)
A	30-120 cm	29.4	C	264,600

Resource Planning Team
Taunton Statutory Unit
May 1995

APPENDIX 1

REFERENCES

INSTITUTE OF GEOLOGICAL SCIENCES (1974) Solid and Drift Edition, Sheet 252, Swindon, 1:63,360.

MAFF (1973) Agricultural Land Classification Map, Sheet 157, 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).