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Wiltshire Minerals Local Plan
Quidhampton, Salisbury
Agricultural Land Classification

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WILTSHIRE MINERALS LOCAL PLAN

QUIDHAMPTON, SALISBURY

AGRICULTURAL LAND CLASSIFICATION

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WILTSHIRE MINERALS LOCAL PLAN: QUIDHAMPTON, SALISBURY

AGRICULTURAL LAND CLASSIFICATION SURVEY

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. The fieldwork at Quidhampton, Salisbury adjacent to the existing chalk pit was completed in April 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 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: Quidhampton

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (9.9 ha)
3a	4.5	45.5	45.5
3b	5.4	54.4	54.5
TOTAL	9.9	100	100

Two soil types were found related to the underlying geology. The upper part of the site was stony and experiences a moderate droughtiness and workability limitation restricting the area to Subgrade 3a. The rest of the area has a thin topsoil over chalk, which despite evidence of rooting imposes a moderate droughtiness limitation and is Subgrade 3b.

1. INTRODUCTION

An Agricultural Land Classification (ALC) Survey was carried out in April 1995 at Quidhampton, Salisbury adjacent to the existing chalk pit on behalf of MAFF as part of its statutory role in the preparation of the Wiltshire Minerals Local Plan. The fieldwork covering 9.9 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 9 auger borings were examined and 2 soil profile pits used to assess subsoil conditions.

The published provisional one inch to the mile ALC map of this area (MAFF 1974) shows the grade of the site to be Grade 3 and is at a reconnaissance scale.

The area was also surveyed in 1977 at a scale of 1:25,000 and mapped as Subgrade 3a.

The recent survey supersedes these maps 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: Quidhampton

Grid Reference		SU 109 313
Altitude (m)		65
Accumulated Temperature (day °)		1482
Average Annual Rainfall (mm)		821
Overall Climatic Grade		1
Field Capacity Days		182
Moisture deficit (mm):	Wheat	105
	Potatoes	97

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 occupies south-east sloping land. The maximum slope measured was 5°. The highest land in the north is at 95 m AOD and the lowest land adjacent to the railway is at 65 m AOD. At the time of survey the northern field was planted with cereals and the southern field, a former surface oil tank storage site (masonry now removed), in rough grass.

4. GEOLOGY AND SOILS

The geology of the site is shown on the published 1:50,000 scale Drift geology map, Sheet 298, Institute of Geological Sciences 1976. The majority of the site is mapped as Upper Chalk of Upper Cretaceous origin, with a small area of recent Valley Gravels in the north.

The soils were mapped by the Soil Survey of England and Wales in 1983 at a reconnaissance scale of 1:250,000. This map shows the site as urban. The nearest soils are mapped as the Carstens Association. These are described as well drained fine silty over clayey, clayey and fine silty soils, which are often very flinty.

The soils found during the recent survey form 2 types. In the north overlying the Valley Gravels stony soils exist. The stone content rises from 29% (8% >2 cm) in the topsoil to 60% in the lower subsoil. The stones are in a matrix of heavy clay loam. In the south heavy clay loams and heavy silty clay loams lie over fractured chalk.

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: Quidhampton

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (9.9 ha)
3a	4.5	45.5	45.5
3b	5.4	54.4	54.5
TOTAL	9.9	100	100

Subgrade 3a

The higher land is well drained and is Wetness Class I (see Appendix 3). The texture throughout the profiles is heavy clay loam. This imposes a moderate workability limitation on the soils. These soils are stony as described in Section 4. A moderate droughtiness limitation also exists.

Subgrade 3b

The lower land has a greater droughtiness limitation caused by the presence of chalk high in the profile. The topsoils in this area are heavy clay loams and heavy silty clay loams. Rooting was observed into the chalk in a soil profile pit. Many very fine roots were seen to 50 cm and then a few observed to at least 70 cm. Included in this unit is the southern field where it was reported that all masonry associated with the former oil storage tanks had been removed. No evidence to contradict this was seen although ploughing the field may reveal otherwise.

Resource Planning Team
Taunton Statutory Unit
May 1995

APPENDIX 1

REFERENCES

INSTITUTE OF GEOLOGICAL SCIENCES (1976) Drift Edition, Sheet 298, Salisbury, 1:50,000.

MAFF (1974) Agricultural Land Classification Map, Sheet 167, 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).

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Quidhampton	Pit 1	0°	Cereals	Av Rainfall: 821 mm ATO: 1482 day °C	Valley Gravel
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 182 Climatic Grade: 1 Exposure Grade: 1	SOIL SAMPLE REFERENCES
22/95	26/4/95	SU 1095 3172	GMS		RPT/GMS499

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size, Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	26	HCL	10YR32	8% HR >2cm 21% HR >2mm 29% HR Total (S+D)	None	None	WMSAB	Friable	-	Good	MVF		Clear Smooth
2	46	HCL	10YR42	8% HR >2cm 42% HR >2mm 50% HR Total (S+D)	None	None	WMSAB	Friable	Good	Good	MVF		Clear Smooth
3	80+	HCL	10YR43	15% HR >2cm 45% HR >2mm 60% HR Total (S+D)	None	None	WMSAB	Friable	Good	Good	FVF		

Profile Gleyed From: Not gleyed

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: 1

Wetness Grade: 3a

Available Water	Wheat:	101 mm
	Potatoes:	78 mm
Moisture Deficit	Wheat:	105 mm
	Potatoes:	97 mm
Moisture Balance	Wheat:	-4 mm
	Potatoes:	-19 mm
Droughtiness Grade:		3A* (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Workability

Remarks:

Structure in Horizons 2 and 3 largely determined by stones.
* ECC boreholes show chalk occurs within 120cm. This will improve drought grade.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Quidhampton	Pit 2	3°E	Cereal	Av Rainfall: 821 mm ATO: 1482 day °C	Upper Chalk
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 182 Climatic Grade: 1	SOIL SAMPLE REFERENCES
22/95	26/4/95	SU1092 3150	GMS	Exposure Grade: 1	RPT/GMS500

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size,Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	27	HCL	10YR42	1% HR >2cm 4% HR >2mm 10% CH >2mm 5% HR Total 10% CH Total (S+D)	None	None	WMSAB	Friable	-	Good	MVF	Yes	Abrupt Smooth
2	70+	Chalk	White	Few flints	None	None					MVF to 50cm. Few observed to bottom of pit	Yes	

Profile Gleyed From: Not gleyed

Depth to Slowly Permeable Horizon: No SPL

Wetness Class: I

Wetness Grade: 3a

Available Water Wheat: 81 mm

Potatoes: 87 mm

Moisture Deficit Wheat: 105 mm

Potatoes: 97 mm

Moisture Balance Wheat: -24 mm

Potatoes: -10 mm

Droughtiness Grade: 3B (Calculated to 70 cm)

Final ALC Grade: 3b

Main Limiting Factor(s): Droughtiness

Remarks:

Fractured chalk with flints. Soil staining to bottom of pit.

SOIL PLASTICITY RECORDING SHEET

ANNEX 2

SITE DATA

Grid Ref	SU1131		Site Name	Quidhampton, Salisbury		LPA	Salisbury		
AAR	821	ATO	1482	FCD	182	MD (wheat)	105	MD (potatoes)	97

SOIL PIT DATA

	PIT ONE SOIL SERIES Carstens			PIT TWO SOIL SERIES Carstens			PIT THREE SOIL SERIES		
DEPTH	TEXTURE	PLASTIC Y/N	COMMENTS	TEXTURE	PLASTIC Y/N	COMMENTS	TEXTURE	PLASTIC Y/N	COMMENTS
10 cm	HCL	Y	))	HCL	N				
20 cm	HCL	Y	))	HCL	N				
30 cm	HCL	Y	) Once) stones	Chalk	N				
40 cm	HCL	Y	) were) removed						
50 cm	HCL	Y	))						
60 cm	HCL	Y	))						