STATEMENT OF PHYSICAL CHARACTERISTICS

HERMITAGE FARM, OARE,
NEWBURY, BERKSHIRE

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ADAS Reading

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1. INTRODUCTION

1.1 In November 1992, 24.8 ha of land was surveyed in connection with proposals for sand extraction and restoration under the 1981 Minerals Act. ADAS was commissioned by MAFF to determine the land quality and site physical characteristics of the land affected by the proposals.

1.2 The site is situated to the north east of Newbury, Berkshire, immediately to the north west of the village of Oare and the M4 motorway. An existing mineral working lies to the south of the site.

1.3 The survey work was carried out at a detailed level of one boring per hectare. A total of 23 auger borings and one soil inspection pit were described in accordance with MAFF's revised guidelines and criteria for grading the quality of agricultural land (MAFF, 1988).

Land-Use

1.4 At the time of survey, the land was in stubble remaining from a previous linseed crop.

2. PHYSICAL FACTORS AFFECTING LAND QUALITY

Relief

2.1 The land lies at an altitude of 120-140 m AOD, falling gently towards the south. Nowhere on the site, does gradient or altitude represent a limitation to agricultural land quality.

Climate

2.2 Estimates of climatic variables relevant to the assessment of agricultural land quality were obtained by interpolation from a 5 km grid database (Met. Office, 1989) for representative locations in the survey area.

Climatic Interpolation

Grid Reference	SU 495 750	SU 496 743
Altitude (m, AOD)	140	120
Accumulated Temperature (° days, Jan-June)	1368	1391
Average annual rainfall (mm)	703	699
Field Capacity Days	149	149
Moisture deficit, wheat (mm)	101	103
Moisture deficit, potatoes (mm)	90	93

2.3 There is no overall climatic limitation on this site. However, climatic factors, specifically the number of days when soils are at field capacity and the crop adjusted moisture deficits, will interact with soil factors to influence soil wetness and droughtiness limitations.

Geology and Soils

2.4 British Geological Survey, Sheet 267, Hungerford (1947) shows the northern part of the site to be underlain by Eocene Reading Beds, whilst Cretaceous Upper Chalk underlies the southern most part.

2.5 Soil Survey of England and Wales, Sheet 6, Soils of South-East England (1983) shows the site to comprise soils of the Frilford association. These soils are described as, 'argillic brown sands' (SSEW, 1984), which are permeable, and well drained, but may occasionally be affected by groundwater.

2.6 Detailed field examination of the site indicates the presence of predominantly sandy soils similar to those described by the Soil Survey. These are probably derived from Reading Beds. There was no evidence of the chalk geology mapped by the British Geological Survey.

3. AGRICULTURAL LAND CLASSIFICATION

3.1 The ALC grading of the survey area is determined by the interaction between soil and climatic factors, giving rise to a soil droughtiness limitation.

The distribution of ALC grades is shown on the attached ALC map and the area and extent is given in the table below. The map has been drawn at a scale of 1:5000. It is accurate at this scale but any enlargement may be misleading.

Distribution of Grades

	Area (ha)	% total agricultural land
Grade 3a	2.22	9
3b	21.63	91
Total agricultural area	23.85	100
Woodland	0.95	
Total area of site	24.80 ha	

3.2 Appendix 1 gives a general description of the grades and land use categories identified in this survey.

3.3 Grade 3a

A small unit of good quality, grade 3a land has been mapped towards the centre of the site.
Profiles typically comprise non-calcareous sandy loam topsoils which overlie similar upper subsoils and pass to heavier textures, such as sandy clay loam or clay below about 45 cm. Profiles tend to be very slightly stony throughout, although very stony horizons containing about 50% flints by volume were occasionally present below 75 cm. Typically gleying was evident between 45 and 90 cm depth and slowly permeable horizons were encountered from 45 cm. Thus, wetness class III or II is appropriate.
These soils are limited by slight wetness and/or droughtiness. In addition, the map unit was found to be relatively variable which has also been a consideration in the grading of the land.

3.4 Grade 3b

The majority of the site has been graded as 3b, moderate quality agricultural land.
Profiles typically comprise non-calcareous loamy sand topsoils overlying similar textures or sand in the subsoil. Very slight stoniness (ie. up to 2% flints by volume) was evident throughout the soil profile and across the site. These soils are freely draining being assigned to wetness class I accordingly.
The land is limited by severe drought risk arising from the sandy nature of the soils which will be very poor in terms of the retention of soil moisture and nutrients. As a result, crops will be prone to severe drought stress, particularly during the summer months.

4. SOIL RESOURCES

Soil Units: Consideration for Restoration

4.1 The following section describes the soil resources available on the site. Topsoils were generally uniform across the site but subsoils were found to vary as illustrated by the subsoil map which accompanies the ALC map. It should be emphasised that this map is not a soil stripping map, but merely an illustration of the soil resources which may be available for restoration.

4.2 Topsoils

One topsoil unit was identified. It comprises an average 28.8 cm of dark greyish brown (10YR 4/2) medium sandy loam or, more commonly, loamy medium sand. These topsoils are non-calcareous and were occasionally found to be very slightly stony having up to 2% flints by volume.

4.3 Subsoils

Two subsoil units were identified.

Unit 1

This unit extends across much of the site. It comprises an average 91.2 cm of loamy medium sand or medium sand which may be very slightly stony having up to 2% flints by volume. The unit is variable in colour although most commonly yellowish brown (10YR 5/4 and 10YR 5/6) and very pale brown (10YR 7/4). These subsoils show no evidence of drainage imperfections and are well aerated and rooted.

This subsoil unit has good structures in the upper subsoil, it being composed of moderately well developed coarse sub-angular and angular blocky peds of friable consistence. The lower subsoil is considered to be moderately structured, being dominantly single grain in nature.

The pit described at Appendix 2 is typical of this subsoil unit.

Unit 2

This unit comprises an average 91.2 cm of yellowish brown (10YR 5/4 and 10YR 5/7), pale brown (10YR 6/3) or very pale brown (10YR 7/4), medium sandy loam, passing to sandy clay loam or clay. In general this subsoil unit is only very slightly stony (ie, 1-2% flints by volume), although occasional profiles were found to be very stony in the lower subsoil below about 75 cm. Evidence of imperfect drainage in the form of mottling and gleying below 45 cm was found within this unit. Profiles were assigned to wetness class II or III depending on depth to gleying and slowly permeable clay horizons.

Due to the variability and limited extent of this subsoil unit, the structural condition of the unit was not assessed.

SOURCES OF REFERENCE

- British Geological Survey (1947) Sheet 267, Hungerford.

- MAFF (1988) Agricultural Land Classification of England and Wales : Revised guidelines and criteria for grading the quality of agricultural land.

- Meteorological Office (1989) Climatic datasets for Agricultural Land Classification.

- Soil Survey of England and Wales (1983) Sheet 6, Soils of South-East England.

- Soil Survey of England and Wales (1984) Bulletin 15, Soils and their use in South-East England.

APPENDIX 1
DESCRIPTION OF THE GRADES AND SUBGRADES

The ALC grades and subgrades are described below in terms of the types of limitation which can occur, typical cropping range and the expected level and consistency of yield. In practice, the grades are defined by reference to physical characteristics and the grading guidance and cut-offs for limitation factors in Section 3 enable land to be ranked in accordance with these general descriptions. The most productive and flexible land falls into Grades 1 and 2 and Subgrade 3a and collectively comprises about one-third of the agricultural land in England and Wales. About half the land is of moderate quality in Subgrade 3b or poor quality in Grade 4. Although less significant on a national scale such land can be locally valuable to agriculture and the rural economy where poorer farmland predominates. The remainder is very poor quality land in Grade 5, which mostly occurs in the uplands.

Descriptions are also given of other land categories which may be used on ALC maps.

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 includes 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 moist 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 parkland, 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.

Woodland

Includes commercial and non-commercial woodland. A distinction may be made as necessary between farm and non-farm woodland.

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 land cover types, eg buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will usually be shown.

APPENDIX II

SOIL PIT DESCRIPTION

Site Name : HERMITAGE FM, NEWBURY Pit Number : 10P

Grid Reference: SU

Average Annual Rainfall : 703 mm
Accumulated Temperature : 1391 degree days
Field Capacity Level : 149 days
Land Use :
Slope and Aspect : 01 degrees S

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 28	LMS	10YR42 00	2	2		
28- 78	MS	10YR54 00	0	2		MDCSAB
78-120	MS	10YR74 00	0	0		SINGLE

Wetness Grade : 1

Wetness Class : I
Gleying : cm
SPL : No SPL

Drought Grade : 3B

APW : 68 mm MBW : -25 mm
APP : 52 mm MBP : -51 mm

FINAL ALC GRADE : 3B
MAIN LIMITATION : Droughtiness