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PHYSICAL CHARACTERISTICS REPORT INCORPORATING
AGRICULTURAL LAND CLASSIFICATION
LAND AT POTTON, BEDFORDSHIRE

1.0 INTRODUCTION

1.1 A Soil and Agricultural Land Classification survey was carried out over 21.1 hectares of land to the north of Potton, Bedfordshire in connection with a proposed sand and gravel extraction.

1.2 MAFF surveyed the site in March 1990 at an auger boring density of approximately one per hectare. These auger borings were supplemented by detailed subsoil information recorded from two soil pits.

2.0 SITE PHYSICAL CHARACTERISTICS

Climate

2.1 The climatic data for the site was obtained from the published agricultural climatic dataset (Met Office 1989). This indicates for the site's median altitude (52m AOD) the annual average rainfall is 552 mm (22.5"). This dataset also indicates that field capacity days are 95 and moisture deficits are 119 mm for wheat and 114 mm for potatoes. These climatic characteristics do not impose any climatic limitation on the ALC grading of the survey site.

Altitude and Relief

2.2 Land falls very gently from the north west corner at 56m AOD to 50m AOD, adjacent to the caravan site. Gradient and altitude do not constitute limitations to the ALC grade.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The definition of the agricultural land classification grades are included in Appendix 2.

3.2 The table below shows the breakdown of the ALC grades for the survey area.

AGRICULTURAL LAND CLASSIFICATION

Grade	ha	%
3a	5.1	24.2
3b	16.0	75.8
TOTAL	21.1	100.0

3.3.1 Subgrade 3a

A narrow tract of land of 5.1 ha, towards the south west corner of the site, has been graded 3a. The soils are moderately droughty and typically comprise very slightly to slightly stony sandy loam topsoils over sandy loam or loamy sand upper subsoils which overlie very slightly to slightly stony sand at depth. The occurrence of iron cemented sandstone in varying densities throughout the soil profile combined with the coarse textures have a moderate limiting effect on the water holding capacity of this soil. As a result droughtiness is the major limitation to the ALC grade.

3.3.2 Subgrade 3b

The majority of the land has been graded 3b. The soils are significantly droughty* and typically comprise loamy sand over sand at depth. As with the soils described in paragraph 3.3.1 stone content varies considerably both vertically within the profile and laterally across this area. As a result of the combination of coarse textures and stone content, a significant droughtiness limitation excludes the land from being a higher grade.

* At a few locations less droughty variants of this soil type occur, however they cover too small an area to delineate separately.

4.0 SOIL PHYSICAL CHARACTERISTICS

Geology

4.1 The published 1:253,440 scale drift edition map sheet No 16 and the 1:250,000 scale solid geology map entitled 'East Midlands', sheet No 52°N 02°W show the survey area to comprise Lower Greensand.

4.2 The Soil Survey of England and Wales have mapped the area at a reconnaissance scale of 1:250,000 on a map entitled 'Soils of Eastern England'. This shows the occurrence of the Frilford Association (*1).

4.3 Two soil mapping units were delineated and these are described in Appendix 1.

JULY 1990

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(*1) Frilford Association. Deep well drained sandy and coarse loamy soils. Some ferruginous sandy and some coarse loamy soils affected by groundwater.

APPENDIX 1

SOIL MAPPING UNIT 1

Topsoil	Texture	:	Loamy medium sand occasionally medium sandy loam
	Colour	:	dark yellowish brown (10yr 4/4)
	$CaCO_3$	:	Non calcareous
	Stone	:	Typically 0-5% iron cemented sandstone fragments
	Boundary	:	Sharp and irregular
	Roots	:	Common fine and very fine
	Depth	:	30/40 cm
Upper subsoil	Texture	:	Loamy medium sand or medium sand
	Colour	:	Brown to strong brown (7.5YR 4/4, 7.5YR 4/6)
	$CaCO_3$	:	Non calcareous to very slightly calcareous
	Stone	:	0-20% iron cemented sandstone
	Structure	:	Weakly developed medium subangular blocky
	Consistence	:	Friable to very friable
	Porosity	:	Less than 0.5% biopores but many fine pores
	Boundary	:	Gradual and smooth
	Depth	:	55/60 cm (where present)
Lower subsoil	Texture	:	medium sand
	Colour	:	Reddish yellow (7.5YR 6/8)
	$CaCO_3$	:	Non calcareous or very slightly calcareous
	Stone	:	Typically 0-10% iron cemented sandstone but local concentrations occur within the horizon
	Structure	:	Weakly developed medium subangular blocky
	Consistence	:	Very friable

	Porosity	:	Less than 0.5% biopores but many very fine pores
	Roots	:	few fine and very fine
	Depth	:	120 cm

SOIL MAPPING UNIT 2

Topsoil	Texture	:	Medium sandy loam or occasionally loamy medium sand
	Colour	:	Dark brown to dark yellowish brown (10YR 3/3 or 10YR 4/4)
	$CaCO_3$	:	Non calcareous
	Stone	:	Typically 1-3% iron cemented sandstone
	Roots	:	Common fine and very fine
	Boundary	:	Abrupt and wavy
	Depth	:	30/35 cm
Upper Subsoil	Texture	:	Sandy loam or loamy sand
	Colour	:	Brown to strong brown (7.5YR 4/6, 7.5YR 4/4)
	$CaCO_3$	:	Very slightly calcareous or non calcareous
	Stone	:	Typically 0-10% iron cemented sandstone but greater localised concentrations occur within horizons
	Structure	:	Weakly developed coarse subangular blocky
	Consistence	:	Friable
	Boundary	:	Gradual wavy
	Depth	:	45-60 cm
Lower Subsoil	Texture	:	Medium sand or occasionally sandy clay loam, sandy loam or loamy sand
	Colour	:	Reddish yellow (7.5YR 6/6, 7.5YR 6/8)
	Stone	:	Typically 0-10% iron cemented sandstone
	Structure	:	Weakly developed coarse subangular blocky (sand only)
	Consistence	:	Very friable
	Depth	:	120 cm

Appendix 2

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 with affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. When more demanding crops and 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 yield 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.

References

GEOLOGICAL SURVEY OF ENGLAND AND WALES (1953)
Sheet No 16 Solid and Drift geology 1:253,440 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. Climatic Data extracted from the Agricultural climatic dataset.

SOIL SURVEY OF ENGLAND AND WALES 1983. "The soils of Eastern England" Sheet 4, 1:250,000 scale.