

## AGRICULTURAL LAND CLASSIFICATION AND SOIL PHYSICAL CHARACTERISTICS

## HATFIELD PEVEREL, ESSEX

## 1. BACKGROUND

- 1.1 The site, an area of 22.1 hectares, is the subject of an application for the extraction of sand and gravel by Redland Aggregates Ltd. The site forms two areas which lie east of the village of Hatfield Peverel, Essex. MAFF surveyed the site in October 1989 to assess the agricultural land quality and the soil physical characteristics.

## 2. SITE PHYSICAL CHARACTERISTICS

Climate

- 2.1 Climate data for the site was obtained from the published agricultural climatic dataset. (Met Office, 1989). This indicates that for the site's mid range altitude of 35 m AOD, the annual average rainfall is 561 mm (22.1"). This data also indicates that field capacity days are 100 and moisture deficits are 126 mm for wheat and 124 mm for potatoes. These climatic characteristics do not impose any climatic limitation on the ALC grading of the site.

Altitude and Relief

- 2.2 The area adjacent to Hatfield Peverel village lies fairly level at an altitude of 40 m AOD. The second area falls gently from 35 m to 30 m AOD towards the northeastern corner of the site. Gradient and altitude do not constitute limitations to the ALC grade.

## 3. AGRICULTURAL LAND CLASSIFICATION (refer to ALC map)

- 3.1 The definitions of the Agricultural Land Classification (ALC) grades are included in Appendix 2.

3.2 The table below shows the breakdown of the ALC grades for the land at Hatfield Peverel.

Grade	AGRICULTURAL LAND CLASSIFICATION	
	ha	%
2	16.0	73
3a	3.4	15
Non agricultural	2.7	12
TOTAL	<u>22.1</u>	<u>100</u>

3.3 GRADE 2

The majority of the site has been graded 2. Soils typically comprise deep fine loams which contain many pores to depths of 55/120cm+. Soils were assessed as freely or relatively freely draining (wetness class I or II). The presence of such soil textures in this low rainfall area has a slight limiting effect on the available water capacity of these soil profiles. Where soils are freely draining or have sandy silt loam topsoils, the slight droughtiness imperfection restricts this land to grade 2; whilst where soils, with medium clay loam topsoils, have been assessed as Wetness Class II both minor drainage and droughtiness limitations exclude this land from grade 1.

3.4 SUBGRADE 3a

At the lower elevations to the north of the site the remainder of the land has been graded 3a. The soils are calcareous and typically comprise deep heavy clay loams which may overlies clays at depth. Below this, at certain locations, (75/120 cm+) soils may merge into gravelly material. Soil profile pit observations indicate the presence of a slowly permeable subsoil horizon (35cm+, ie wetness class III). Reduced subsoil permeability and heavy topsoil textures combine to impose moderate wetness and workability limitations on the agricultural potential of this land; thus the land is restricted to subgrade 3a.

### 3.5 Non Agricultural

A flooded gravel pit has been mapped as Non Agricultural.

## 4. GEOLOGY AND SOILS

4.1 The published 1:50,000 scale drift edition geology map No 241 (Chelmsford) shows the survey area to comprise mainly brickearth deposits with smaller outcrops of boulder clay and London Clay at the lower elevations.

4.2 The Soil Survey of England and Wales have mapped the soils in the Hatfield Peverel area at a reconnaissance scale of 1:250,000. This map, entitled "The soils of Eastern England", shows the occurrence of mainly the Hamble 2 Association (\*1), with a smaller area of Hanslope Association (\*2) to the north east. During this survey a more detailed inspection of the soils was carried out.

Two main soil types occur over the site.

#### 4.2.1 Soil Type A (refer Appendix 1 and Soil Map).

The majority of the soils have been mapped as soil type A. They typically comprise medium clay loam or sandy silt loam topsoils over medium clay loams which may merge into heavy clay loams at depth.

#### 4.2.2 Soil Type B (refer to Appendix 1 and Soil Map)

The remaining finer textured soils have been mapped as soil type B. They are calcareous and typically comprise deep heavy clay loams which may overlies clays at depth. Occasionally the subsoils may contain chalk fragments or sand lenses. At depth (75/120 cm) the soils may overlies gravelly material which comprises very stony sandy clay loams.

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(\*1) Hamble 2 Association: Deep stoneless well drained silty soils and similar soils affected by groundwater, over gravel locally. Usually flat land.

(\*2) Hanslope Association: Slowly permeable calcareous clayey soils. Some slowly permeable non-calcareous clayey soils.

## APPENDIX 1

### SOIL PHYSICAL CHARACTERISTICS

#### SOIL TYPE A (refer soil map)

Topsoil	texture	:	medium clay loam or sandy silt loam
	depth	:	30/32 cm
Upper subsoil	texture	:	medium clay loam
	structure	:	weakly or moderately developed medium prisms, few coarse; friable consistence
	mottles	:	none
	depth	:	55/60 cm
Lower subsoil	texture	:	medium clay loam or occasionally heavy clay loam
	structure	:	moderately developed coarse prisms or weakly developed coarse subangular blocky; friable consistence
	mottles	:	none - common distinct ochreous
	depth	:	120 cm

#### SOIL TYPE B (refer soil map)

Topsoil	texture	:	heavy clay loam
	calcareous:		yes
	depth	:	30 cm (occasionally 40 cm)
Upper subsoil	texture	:	heavy clay loam
	calcareous:		yes
	structure	:	moderately developed medium prisms; friable consistence
	mottles	:	common distinct ochreous, gleying present
	depth	:	70 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 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.

## References

GEOLOGICAL SURVEY OF ENGLAND AND WALES 1975:

Solid and Drift Edition Geology Map No 241 (Chelmsford) 1:50,000

INSTITUTE OF GEOLOGICAL SCIENCES 1972 'The Sand and Gravel Resources of the county around Witham Essex' Mineral Assessment Report No 72/6. 1:25,000.

INSTITUTE OF GEOLOGICAL SCIENCES, 1973 'The sand and Gravel Resources of the county around Terling, Essex' Mineral Assessment Report No 73/5. 1:25,000.

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 published climatic dataset.

SOIL SURVEY OF ENGLAND AND WALES, 1983: Soils of Eastern England Sheet No 4 Scale 1:250,000.