

PHYSICAL CHARACTERISTICS REPORT CORPORATING  
AGRICULTURAL LAND CLASSIFICATION  
LAND ADJACENT TO THE VALLEY BELT, TROWSE, NORFOLK

1.0 INTRODUCTION

1.1 A soil and Agricultural Land Classification survey was carried out over 8.8 hectares of land adjacent to the Valley Belt Plantation, Trowse, Norfolk, in connection with a proposed spoil tip site by Phelan Contracting Ltd.

1.2 MAFF surveyed the site in February 1990 at an auger boring density of 3 borings per 2 hectares. These auger borings have been supplemented by detailed subsoil information recorded from two soil pits.

2.0 SITE PHYSICAL CHARACTERISTICS

Climate

2.1 The climate data for the site was obtained from the published agricultural climatic dataset (Met Office 1989). This indicates for the sites mid range altitude (20 m AOD) the annual average rainfall is 607 mm (23.9"). This dataset also indicates that field capacity days are 115 and moisture deficits are 120 mm for wheat and 112 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 The site traverses a valley feature with steep slopes (20°) on the northern side, within the Valley Belt plantation. At higher elevations of 25 m AOD the agricultural land is dissected by small dry valleys giving rise to slopes which are commonly in excess of 8° which limits this land to subgrade 3b. On the southern half of the site the land rises gently from the valley floor (at 10 m AOD) towards the electricity lines (15 m AOD) at the south western boundary of the site.

3.0 AGRICULTURAL LAND CLASSIFICATION

3.1 The definition of the agricultural land classification grades are included in Appendix 1.

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

AGRICULTURAL LAND CLASSIFICATION

Grade	ha	%
2	3.07	35.0
3a	2.86	32.5
4	0.98	11.1
Non Agricultural	1.89	21.4
<u>TOTAL</u>	8.80	100.0

3.3 Irrigation

The site is regularly irrigated which significantly enhances the potential of the lightly textured soils which characterise the site. The ALC grades assigned to the site have taken into account the reduction in drought risk afforded by irrigation. However on the strip of land between the Valley Belt Plantation and the north western boundary irrigation has not been taken into account. This is due to a combination of steep slopes and light textured soils resulting in a higher than normal standard of management being required to prevent severe water erosion of this land.

Grade 2

3.4.1 The overriding limitation to grade on this land is droughtiness. Land towards the centre of the site has been graded 2. These soils have slightly heavier topsoils and subsoils. They are freely draining (Wetness class I) and with irrigation are slightly droughty.

### Subgrade 3a

- 3.4.2 The remaining area of lower lying land has been graded 3a. Lighter textured soils and slight subsoil stoniness result in a moderate droughtiness limitation. Locally topsoil stone ranges from 10-15% which excludes areas of heavier topsoil and subsoil textures from being grade 2.

### Grade 4

- 3.4.3 The strip of land described in paragraph 3.3 has been graded 4. Topsoil and subsoil stone content combined with the sandy soil textures results in a severe droughtiness limitation.

- 3.5 A full description of soil physical characteristics are given below.

## 4.0 SOIL PHYSICAL CHARACTERISTICS

### Geology

- 4.1 The published 1:50,000 scale drift edition Sheet No 161 and the 1:25,000 scale sand and gravel resources sheet TG20 shows the survey area to comprise four geological deposits. The land to the south western side is shown as boulder clay. A narrow strip of alluvium runs through the middle of the site, with a small area of Upper Chalk appearing to the north of this along the track. The remaining escarpment area and the higher land to the north is mapped as Norwich Crag.

- 4.2 The Soil Survey of England and Wales have mapped the area on two occasions. Firstly, in 1973 at a scale of 1:100,000 and secondly, in 1983 at a reconnaissance scale of 1:250,000. These maps show the occurrence of Burlingham 3 Association (\*1). During this survey a more detailed inspection of the site was carried out.

(\*1) Burlingham 3 Association. Deep fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Some similar fine or coarse loamy over clayey soils. Some well drained coarse loamy over clayey, fine loamy and sandy soils.

4.3 Two soil mapping units occur over the site and they are described overleaf.

## SOIL MAPPING UNIT A

Topsoil	Texture	:	sandy loam or loamy sand
	Colour	:	dark brown (10YR 3/3)
	CaCO <sub>3</sub>	:	slightly calcareous
	Stone	:	typically 5-10%, comprising small and medium subangular flints. Stonier (up to 15%) patches occur locally)
	Roots	:	common fine and very fine roots
	Boundary	:	abrupt and smooth.
	Depth	:	30/35 cm
Upper Subsoil	Texture	:	Sandy loam or loamy sand or occasionally sand clay loam or medium sand
	Colours	:	typically strong brown or dark yellowish brown (7.5YR 4/6 or 10YR 4/6)
	CaCO <sub>3</sub>	:	Slightly calcareous or calcareous
	Stone	:	typically 0-10% flints (occasionally up to 20% in the upper subsoil 30-50 cm)
	Structure	:	moderately developed medium and coarse subangular blocky
	Consistence	:	very friable, occasionally friable
	Roots	:	common fine and very fine
	Boundary	:	Abrupt and smooth.
	Depth	:	typically 60 cm
Lower subsoil	Texture	:	Typically medium sand or loamy sand occasionally sandy loam or sandy clay loam
	Colour	:	Typically strong brown or yellowish brown (7.5YR 4/6, 10YR 5/6)
	Stones	:	typically 10% flints (except in areas of weathered chalk).

Structure : fine and medium subangular blocky,  
weakly developed (medium sand only)  
Consistence : very friable (medium sand)  
CaCO<sub>3</sub> : Calcareous  
Roots : few to common fine and very fine  
Boundary : clear and smooth (except over chalk)  
Depth : 60/120 cm

Chalk (where it exists) 60-100 cm : Where the soil overlies chalk the chalk is well weathered. This material has a 'fudgy' appearance texturing to a well bodied sandy loam to a medium (silty) clay loam. The material varies in colour from relatively white chalk (10YR 8/3) to yellowish brown (10YR 5/6) matrix material which often has rooting to depth.

## SOIL MAPPING UNIT B

Topsoil	Texture	:	Loamy sand or medium sand
	Colour	:	Dark brown, 10YR 3/3 or 10YR 3/2
	CaCO <sub>3</sub>	:	Slightly calcareous
	Stone	:	Typically 5-10% but occasionally up to 25% flints
	Roots	:	Common fine and very fine
	Boundary	:	Abrupt and smooth
	Depth	:	Typically 30-35 cm
	Upper Subsoil	Texture	:
Colour		:	dark yellowish brown. (10YR 4/6)
CaCO <sub>3</sub>		:	Slightly calcareous
Stone		:	slightly stony typically 10-15%
Structure		:	Structureless - single grain or weakly developed medium subangular blocky
Consistence		:	loose or very friable
Depth		:	80 cm
Lower subsoil		Texture	:
	Colour	:	(dark) yellowish brown 10YR 4/6 or 10YR 5/6
	CaCO <sub>3</sub>	:	slightly calcareous
	Stone	:	Slightly to moderately stony or gravelly material
	Structure	:	Structureless single grain or weakly developed medium subangular blocky
	Consistence	:	loose or very friable
	Depth	:	120 cm

Gravelly material:- very stony medium or coarse sand.

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## References

GEOLOGICAL SURVEY OF GREAT BRITAIN (1975). 1:50,000 scale map sheet no 161, Norwich, Solid and Drift Edition.

INSTITUTE OF GEOLOGICAL SCIENCES (1971). 1:25,000 scale The sand and gravel resources of the country south east of Norwich, Norfolk - Resource sheet TG20.

MAFF (1988). Agricultural Land Classification of England and Wales.

METEOROLOGICAL OFFICE (1989). Climatological data for Agricultural Land Classification.

SOIL SURVEY OF ENGLAND AND WALES (1973). 1:100,000 scale, Soils of Norfolk.

SOIL SURVEY OF ENGLAND AND WALES (1983). 1:250,000 scale. 'The soils of Eastern England'.



## Appendix 1

### 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 will affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. When 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 crop.

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.