Comm/s 32/90

PHYSICAL CHARACTERISTICS REPORT INCORPORATING AGRICULTURAL LAND CLASSIFICATION

LAND ADJACENT TO THE B1149 ROAD NEAR HOLT, NORFOLK

1. BACKGROUND

1.1 The survey site comprises 18.2 hectares which are subject to an application by Ennemix Development Ltd, for the extraction of sand and gravel at Holt, Norfolk. MAFF surveyed the site in August 1990 in order to assess the agricultural land quality and the soil physical characteristics. This survey was conducted at an auger boring density of one per hectare and supplemented by five soil inspection pits in order to assess subsoil conditions.

2. SITE PHYSICAL CHARACTERISTICS

2.1 Climate

Climate data for the site was obtained from the published agricultural climatic dataset. (Met Office, 1989). This indicates that for the site's median altitude of 62m AOD the annual average rainfall is 690mm (28.2"). This data also indicates that field capacity days are 144 and moisture deficits are 106mm for wheat and 98mm for potatoes. These climatic characteristics do not impose any climatic limitations on the ALC grading of the site.

2.2 Altitude and Relief

The site falls gently towards the south eastern corner and ranges in altitude from 59m to 65m AOD. As a result gradient and altitude do not impose any limitations to the ALC grade.

3. AGRICULTURAL LAND CLASSIFICATION

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

3.2 The table below shows the ALC grade for the survey area.

	Agricultural Land Classification	
Grade	ha	%
2	9.6	52.7
3a	2.0	11.0
3b	6.5	35.8
Agricultural Buildings	0.1	0.5
TOTAL	18.2	100.0

3.3 Irrigation

The majority of the site is regularly irrigated significantly enhancing the potential of the light soils which characterise the site. Although the south eastern corner of the site is not irrigated at present, there is sufficient water available to irrigate this area too. The ALC grade assigned to the survey area takes into account the reduction in drought risk afforded by irrigation.

3.4 Grade 2

The majority of the site has been graded 2. This land is associated with coarse loamy soils which have variable quantities of profile flints (described in paragraph 4.2.1). These soils have a greater depth of better bodied textures and lower topsoil and subsoil stone contents than those graded 3a and 3b. Adequate irrigation water is available to supplement the water available to crops grown on this land and as a result the profiles are slightly droughty. Slight droughtiness, and in some areas topsoil stone, excludes the land from grade 1.

3.5 Subgrade 3a

The south eastern corner of the site has been graded 3a. These coarse loamy soils, (described in paragraph 4.2.2) have a topsoil stone content of 10 - 15%* which acts as a moderate impediment to cultivation, harvesting and crop growth.

The combination of slightly stony topsoils with moderately to extremely stony subsoils and light textures results in a low-moderate profile water holding capacity. With the reduction in drought risk afforded by irrigation these soils are moderately droughty. Topsoil stone and/or droughtiness are the overriding limitations to the grade.

3.6 Subgrade 3b

Three areas of subgrade 3b have been delineated.

3.6.1 All three areas of land graded 3b are associated with the stonier variant of the soils described in paragraph 4.2.2. These soils are freely draining (Wetness Class I) and the significant droughtiness risk, caused by the light soil textures and profile stone is ameliorated, to a degree, by irrigation. However the presence of moderately stony* topsoils results in a significant impediment to cultivation, harvesting and root growth as well as increasing production costs by causing wear and tear on implements and tyres. As a result the topsoil stone is the overriding limitation to the ALC grade.

4.0 SOIL PHYSICAL CHARACTERISTICS

Geology

4.1 The published geology map 1/4" to 1 mile drift edition, sheet No 12, shows the survey area to comprise sand and gravel deposits.

* At a few locations more stony or less stony topsoils occur however they cover too small an area to delineate separately at this scale.

Soils

4.2 The survey area has been mapped on two occasions firstly at 1:100,000 scale (1973) and secondly at a reconnaissance scale of 1:250,000 (1983). These maps show the survey site to comprise Wick 3 Association**.

During this survey a detailed inspection of the soils identified two soils types.

Soil Type 1

4.2.1 (Refer to Appendix 1)

These soils are located in the central part of the site. Profiles typically comprise very slightly or slightly stony medium sandy loam topsoils over similar upper subsoils which become very slightly to moderately stony loamy medium sands at variable depths. Occasional sandy or sandy clay loam horizons may occur within the lower subsoils. Profiles are freely drained (Wetness Class 1) and commonly calcareous throughout.

Soil Type 2

4.2.2 (Refer to Appendix 1)

Soil type 2 is a stonier variant of soil type 1. Profiles typically comprise slightly to moderately stony, medium sandy loam topsoils over moderately to very stony, sandy loam or loamy sand upper subsoils. These overlie moderately to very stony or(occasionally extremely stony) sands, loamy sands or sandy loams at depth. These profiles are freely draining (Wetness Class 1) and commonly calcareous throughout.

RESOURCE PLANNING GROUP

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** Wick 3 Association. Deep, well drained coarse loamy often stoneless soils. Some similar sandy soils. Complex patterns locally.

SOIL PHYSICAL CHARACTERISTICS

SOIL TYPE 1

Topsoil	Texture	:	Medium sandy loam
	Stone	:	Very slightly to slightly stony (0 - 10% greater than 2cm)
	Depth	:	35/40cm
Upper subsoil	Texture	:	Medium sandy loam
	Stone	:	Very slightly to slightly stony
	Structure	:	Weakly developed coarse subangular blocky
	Consistence	:	Friable
	Depth	:	70/90cm
Lower subsoil	Texture	:	Loamy medium sand with occasional sand or sandy clay loam horizons
	Stone	:	Very slightly to moderately stony
	Structure	:	Weakly developed medium subangular blocky
	Consistence	:	Very friable
	Depth	:	120 cm

SOIL TYPE 2

Topsoil	Texture	:	Medium sandy loam
	Stone	:	Slightly to moderately stony (10 - 25%)
	Depth	:	35 cm
Upper subsoil	Texture	:	Medium sandy loam or loamy medium sands, occasionally sand
	Stone	:	Moderately to very stony
	Structure	:	Too stony to assess
	Depth	:	45/65 cm
Lower subsoil	Texture	:	Sand, loamy sand or sandy loam
	Stone	:	Moderately to very stony, occasionally extremely stony
	Structure	:	Too stony to assess
	Depth	:	120 cm

All profiles are calcareous throughout.

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.

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,

References

GEOLOGICAL SURVEY OF ENGLAND AND WALES (1933).
Drift edition geology map sheet 12.
Scale ¼" to 1 mile.

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

METEOROLOGICAL OFFICE (1989). Climatic Data extracted from the published Agricultural Climatic Dataset.

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

SOIL SURVEY OF ENGLAND AND WALES (1983). "The Soils of Eastern England" Sheet 4, Scale 1:250,000.