

## AGRICULTURAL LAND CLASSIFICATION

### POSTLANDS ESTATE, CROWLAND, LINCOLNSHIRE

#### 1. BACKGROUND

1.1 The site, an area of 170.9 hectares, is the subject of an application for an airport with associated amenities. MAFF undertook a semi-detailed survey of the site in September 1991 to assess agricultural land quality. 80 soil inspections were carried out using a Dutch auger and 3 soil inspection pits were also dug to assess subsoil conditions.

#### 2.0 AGRICULTURAL LAND CLASSIFICATION (ALC)

2.1 The published Provisional 1:63360 scale Agricultural Land Classification Map Sheet No 123 (MAFF, 1974) shows the survey area as Grade 2. The current survey was undertaken to provide a more detailed ALC of the area.

#### 3.0 SITE PHYSICAL CHARACTERISTICS

##### Climate

3.1 Climate data for the site was obtained from the published agricultural climatic dataset (Met. Office, 1989). This indicates that the site has an annual rainfall of 544 mm (21.4"). This also indicates that field capacity days are 93 and moisture deficits are 119 mm for wheat and 114 mm for potatoes. Median accumulated temperature above 0°C January to June ATO is 1446 (Day °C). These climatic characteristics do not impose any climatic limitation to agricultural land quality on the survey site.

##### Relief

3.2 The land surveyed is level and occupies a low lying position at an altitude of 1-2 m AOD. The area is traversed by a number of low ridges

called rodhams which mark the position of silt filled former creeks. Gradient and altitude do not constitute limitations to the ALC grade.

#### 4.0 SOIL PHYSICAL CHARACTERISTICS

##### Geology

- 4.1 The published 1:50,000 scale solid and drift edition Geology map No 148 (Peterborough) shows the majority of the site to be Quaternary older marine alluvium over Oxford Clay (Jurassic) with small areas of silt filled creeks in marine alluvium.

##### Soils

- 4.2 No detailed soils map exists for the area. However the reconnaissance scale 1:250,000 soil map "Soils of Eastern England" (Soil Survey of England and Wales, 1983) indicates the occurrence of the Wallasea 2 soil association\*. Field survey observations broadly confirmed these findings identifying 3 main soil types on site.
- 4.3 Over the majority of the site soils have developed directly from marine alluvium and comprise clay, silty clay or occasionally clay loam topsoils over heavy clay occasionally silty clay subsoils (frequently the clay percentage of the clay topsoils exceeds 50%). Due to the presence of reed channels within the subsoil these profiles are permeable and free draining and are assessed mainly as wetness class II. (Wetness class II occurs where the subsoil reed channel network is intact, but damaged slightly immediately below the plough layer by continued cultivations, consequently causing some very slight impedance to subsoil drainage). Profiles are stone free and typically non or only very slightly calcareous throughout.

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\* Wallasea 2 Association: Deep stoneless clayey soils calcareous in places. Some deep calcareous silty soils. Flat land area with low ridges often giving a complex soil pattern. Groundwater controlled by ditches and pumps.

4.4 The second key soil type occurs in areas of slightly lighter, but generally variable soils on or close to rodhams (particularly minor rodhams). These soils occur fringing an area of light marine silt soils in the vicinity of Queen's Bank Farm (see paragraph 4.5) and extend southwestwards through Guthlac's Cottages to the main Crowland-Spalding Road. They also occur in smaller areas in the central-south and southeastern parts of the site. Profiles in these areas are variably calcareous and typically comprise heavy clay loam or silty clay loam topsoils (occasionally medium clay loam) over similar and/or lighter textured subsoils. In some areas profiles may overlies heavy clay at depth. Soil drainage is principally assessed as wetness class I and II.

4.5 The third key soil type is relatively limited in extent, confined chiefly to areas of light marine silt soils in the vicinity of major rodham networks. These occur in the immediate vicinity of Queen's Bank Farm and in the northwest corner of the site. (They are also believed to adjoin much of the southern boundary of the site.) Profiles in these areas are mainly calcareous and comprise fine sandy loam, sandy silt loam or medium clay loam textures to one metre depth. These soils contain a particularly well developed reed channel network within the subsoil, and are assessed as wetness class I. Although similar soils occur at random locations elsewhere on site, they cover too small an area to delineate.

## 5. AGRICULTURAL LAND CLASSIFICATION

5.1 The definitions of the Agricultural Land Classification (ALC) grades are included in appendix 1.

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

AGRICULTURAL LAND CLASSIFICATION		
Grade	ha	%
1	5.8	3.4
2	33.5	19.6
3a	130.4	76.3
Urban	<u>1.2</u>	<u>0.7</u>
Total	<u>170.9</u>	<u>100.0</u>

### 5.3 Grade 1

The land graded 1 occurs in areas of light marine silt soils on well developed rodham networks (see paragraph 4.5). The soils hold large reserves of plant available water, are free draining, easily worked, and capable of producing high yields of a wide range of crops.

### 5.4 Grade 2

This land occurs on or close to rodham networks in areas of transitional soil types (see paragraph 4.4). Soil drainage is assessed principally as wetness class I or II and the land is limited by minor workability, and/or summer droughtiness constraints. The level of yield of crops grown is generally high but may be lower or more variable than Grade 1.

### 5.5 Grade 3a

This occurs extensively over the site on heavy clay soils developed from marine alluvium (see paragraph 4.3). Soil drainage is assessed principally as wetness class II and the land is limited chiefly by workability constraints, deriving mainly from the particularly heavy and intractable nature of the topsoil. The land is capable of consistently producing moderate to high yields of a narrow range of arable crops.

### 5.6 Urban

Farm buildings from Queens Bank Farm were mapped as urban.

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## **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.

### **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.

## References

GEOLOGICAL SURVEY OF ENGLAND AND WALES, 1984. Solid and drift edition Geology sheet 158 (Peterborough), scale 1:50,000.

MAFF, 1974. Agricultural Land Classification Map No 123, scale 1:63,360.

MAFF, 1988. Agricultural Land Classification of England and Wales (Revised Guidelines and Criteria for Grading the Quality of Agricultural Land) Alnwick.

METEOROLOGICAL OFFICE, 1989. Climate data extracted from the published agricultural climatic dataset.

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