AGRICULTURAL LAND CLASSIFICATION AND SOIL PHYSICAL CHARACTERISTICS

PASTURE HOUSE AND PODE HOLE FARMS, THORNEY, CAMBS

## 1. BACKGROUND

1.1 The site, an area of 108.6 hectares, is the subject of an application, by Steetley Quarry Industries, for the extraction of sand and gravel near Thorney, Cambridgeshire. MAFF surveyed the site in summer 1991 to assess the agricultural land quality and the soil physical characteristics.

1.2 On the Ministry's published 1:63360 scale provisional ALC map 123 (MAFF, 1974) the site is mapped as mainly grade 3 with smaller areas of grade 2 towards the east. Since this map is of a reconnaissance nature designed primarily for strategic planning purposes, the current survey was undertaken to provide more detailed information on land quality for the site.

## 2.0 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 the site's annual average rainfall is 555 mm (21.8"). It also shows that field capacity days are 95 and moisture deficits are 122 mm for wheat and 118 mm for potatoes. Climate is not a limitation to the ALC grade.

### Altitude and Relief

2.2 The site comprises a fairly level plateau ranging in altitude from 2 to 4 m AOD. Gradient and altitude do not constitute limitations to the ALC grade.

## 3.0 AGRICULTURAL LAND CLASSIFICATION (refer to ALC map)

3.1 Relatively equal proportions of grade 2 and subgrade 3a have been mapped. A precise breakdown of the ALC grades in hectares and % terms is provided below.

| | AGRICULTURAL LAND CLASSIFICATION | |
|---|---|---|
| Grade | ha | % |
| 2 | 50.6 | 47 |
| 3a | 58.0 | 53 |
| Total | 108.6 | 100 |

The definition of the ALC grades is included in Appendix 1.

Grade 2

3.2 Land adjacent to the A47(T) road and the southern edge of the site has been graded 2. This land comprises mainly soils of soil type 1 with smaller areas of soil type 2 and 3 (described in paragraphs 4.2.1, 4.2.2 and 4.2.3 respectively). Profiles are typically fine loamy to depth over gravelly material from a minimum of 75 cms+*. The occurrence of fine textures and gravel at depth has a slight limiting effect on the available moisture capacity of this soil. Consequently droughtiness is the chief limitation to the ALC grade.

Subgrade 3a

3.3 The remainder of the site has been graded 3a. This land is mainly associated with the shallower variant of soils of Soil Type 1 and 2 (described in paras 4.2.1 and 4.2.2). In summary the soils typically comprise fine loams of moderate depth over gravelly material (generally 50/70 cm+). The presence of profile flints particularly overlying and within the gravelly horizon imposes a moderate restriction on this land to retain water for crop growth. As a result droughtiness imperfections limit the land to subgrade 3a (good quality agricultural land).

* To the east topsoils are organic (soil type 3) and often the gravelly material is encountered above 75 cms depth.

## 4.0 SOIL PHYSICAL CHARACTERISTICS

Geology

4.1 The published 1:50,000 scale geology sheet 158 (Peterborough, Geol. Survey 1984) shows the site to comprise mainly first river terrace gravels with a very narrow deposit of Oxford Clay adjacent to the eastern edge.

4.2 The current detailed soil survey shows the occurrence of three main soil types on site.

Soil Type 1 (refer to Appendix 2 and Soil Types Map)

4.2.1 These soils cover the majority of the site, equating to an area of approximately 87.7 hectares (81%). They typically comprise medium clay loam topsoils over sandy clay loam or heavy clay loams which become lighter and stonier 50/60 cms+ (textures generally medium sandy loams). Upper horizons are variably very slightly stony whilst the gravelly horizons, encountered 50/100 cms+, typically comprise 50% flints in a matrix of loamy medium sand.

Soil Type 2 (refer to Appendix 2 and Soil Types Map)

4.2.2 The south western edge of the site comprises a heavier soil and equates to 12.1 hectares (11%). Profiles typically comprise heavy clay loam topsoils over heavy clay loam or clay upper subsoils. Gravelly material is encountered below 60/100 cms and forming a narrow layer above this profiles generally become slightly stony and lighter in texture (namely sandy clay loam or heavy clay loams).

Soil Type 3 (refer to Appendix 2 and Soil Types Map)

4.2.3 These organic derived soils cover the smallest area, occurring to the east for 8.8 hectares (8%). Topsoils are organic, typically consisting of organic medium or heavy clay loams with 7 to 8% organic matter. Upper horizons comprise sandy clay loams or sandy clays over similar textures or gravelly material. Depth to the gravel deposits ranges from 60 to 100 cms.

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REFERENCES

GEOLOGICAL SURVEY OF GREAT BRITAIN 1984, Solid and drift edition geology Sheet 158 (Peterborough) 1:50,000 scale.

MAFF, 1974. Agricultural Land Classification Sheet 123 Provisional. Scale 1:63360.

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

METEOROLOGICAL OFFICE, 1989. Published climatic data extracted from the agroclimatic dataset, compiled by the Meteorological Office.

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 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.

Appendix 2

SOIL PHYSICAL CHARACTERISTICS

PASTURE HOUSE & PODE HOLE FARMS, THORNEY, CAMBS

SOIL TYPE 1 (87.7 hectares)

| | | | |
|---|---|---|---|
| TOPSOIL | Texture | : | medium clay loam |
| | Stone | : | ranges from 3 to 5% small and medium flints |
| | Depth | : | 30 cm |
| UPPER SUBSOIL | Texture | : | sandy clay loam or heavy clay loam |
| | Stone | : | ranges from 3 to 5% small flints |
| | Structure | : | moderately developed coarse subangular blocky |
| | Consistence | : | conditions too dry to assess |
| | Porosity | : | approximately 0.5% biopores |
| | Depth | : | 50/60 cm |
| LOWER SUBSOIL/ GRAVELLY MATERIAL | Texture | : | sandy loam or sandy clay loam or gravelly material* |
| | Stone | : | 10% small flints |
| | Structure | : | weakly developed coarse subangular blocks |
| | Consistence | : | conditions too dry to assess |
| | Depth | : | 50/100 cm |

* GRAVELLY MATERIAL : typically comprises 50% flints in a loamy medium sand matrix. Occurs in soil profile below depths of 50/100 cms+.

SOIL TYPE 2 (12.1 hectares)

| | | | |
|---|---|---|---|
| TOPSOIL | Texture | : | heavy clay loam |
| | Stone | : | 3 to 5% small and medium flints |
| | Depth | : | 30 cm |

| | | | |
|---|---|---|---|
| UPPER SUBSOIL | Texture | : | heavy clay loam or clay |
| | Stone | : | ranges from 2 to 5% small flints |
| | Structure | : | moderately developed coarse subangular blocky |
| | Consistence | : | friable/firm |
| | Porosity | : | approximately 0.5% biopores |
| | Depth | : | 50/60 cm |
| LOWER SUBSOIL/ GRAVELLY MATERIAL | Texture | : | heavy clay loam, sandy clay loam or gravelly material* |
| | Stone | : | ranges from 6 to 10% small flints, typically 7% |
| | Structure | : | moderately developed coarse subangular blocky |
| | Consistence | : | friable/firm |
| | Porosity | : | approximately 0.6% biopores |
| | Depth | : | 70/100 cm |
| *GRAVELLY MATERIAL | | : | typically occurs from 60/100 cms, and comprises 50% flints in a matrix of loamy medium sand. |

**SOIL TYPE 3 (8.8 hectares)**

| | | | |
|---|---|---|---|
| TOPSOIL | Texture | : | organic heavy clay loam or medium clay loams |
| | Stone | : | 1 to 2% flints |
| | Depth | : | 30 cm |
| UPPER SUBSOIL | Texture | : | sandy clay loam or sandy clay |
| | Stone | : | 1 to 2% small flints |
| | Structure | : | weakly or moderately developed coarse subangular blocky |
| | Consistence | : | too dry to assess |
| | Porosity | : | approximately 2% biopores |
| | Depth | : | 60/70 cm |

| | | | |
|---|---|---|---|
| LOWER SUBSOIL/ GRAVELLY MATERIAL | Texture | : | sandy clay loam or gravelly material* |
| | Stone | : | 1 to 2% small flints |
| | Structure | : | as above |
| | Consistence | : | too dry to assess |
| | Depth | : | 80/100 cm |

*GRAVELLY MATERIAL : typically occurs below 60/100 cm and comprises 50% flints in a matrix of loamy medium sand.