

AGRICULTURAL LAND CLASSIFICATION INCORPORATING SITE PHYSICAL CHARACTERISTICS

LAND AT CRABTREE ROAD, COLSTERWORTH, LINCS

1.0 BACKGROUND

1.1 Land on this 15ha restored ironstone working was inspected on the 7th August 1991 in connection with landfill proposals. Due to the dry and very stony condition of soils at the time of survey, inspection of subsoils by hand auger was rendered impossible. Consequently the depth and condition of topsoils was assessed by small pits excavated by spade at pre-prescribed sampling points. The condition of subsoils was assessed by reference to four deeper pits excavated by CB and located at regular intervals across the site. The restored land comprises most of the central and eastern part of the site, which is characterised by a convex, south facing slope which terminates abruptly at the derelict 6 metres high face of the previous excavation. From the top of the face, the land rises gently over a short distance to the southern site boundary. A small area of raised, generally level land (c3ha) to the west of the existing excavation face, at the western end of the site, remains unworked.

2.0 AGRICULTURAL LAND CLASSIFICATION

The site is graded 3b. Although individual sampling points within the restored area are or approach grade 4, these occur too randomly to permit separate delineation. The land is principally limited by stoniness and droughtiness constraints; although the moderately steep break in slope (measured at 9°) between the worked and unworked areas is also excluded from a higher grade by gradient imperfections.

3.0 SITE PHYSICAL CHARACTERISTICS

Relief

The highest land at 135 metres AOD occurs on the small area of generally level, unworked land to the west of the site. A moderately steep break in slope (measured at 9°) marks the junction with the areas of worked and subsequently restored land in the central and eastern parts of the site.

The land in this area is dominated by a convex south facing slope which falls from a little over 130m AOD to a little under 125m AOD at the base of the derelict excavation face, which constitutes the lowest altitude on site. Gradient only constitutes a limitation to land quality at the steeper break in slope located between the worked and unworked areas, where gradient effectively limits land quality to 3b.

Climate

- 3.2 Site specific climate data has been interpreted from information contained in the 5km grid dataset compiled by the Meteorological Office. This shows average annual rainfall to be approximately 644mm (25 3/8") which is low by national standards. Field capacity days at 132 are also relatively low. The accumulated temperature for the North Witham area is approximately 1298°C. This parameter measures the cumulative build up of warmth available for crop growth and in conjunction with rainfall has an influence on the development of soil moisture deficits. Soil moisture deficits of 96mm and 85mm are recorded for wheat and potatoes respectively.

4.0 SOIL PHYSICAL CHARACTERISTICS

Geology

- 4.1 The geology of this area is shown on the 1:63,360 scale geology map, sheet 143 (Bourne). This shows the majority of the site (pre-working) to comprise glacial boulder clay drift overlying Lower Lincolnshire Limestone. A small area (approximately 2ha) of the southeastern corner comprises Lower Estuarine Series.

Soils

- 4.2 Two main soil types were identified on site, their boundaries coinciding with the worked and unworked land.

SOIL TYPE I (12.8 HECTARES)

This occurs over the worked and restored areas and comprises of shallow topsoils over overburden .

Topsoil	Texture	:	medium or heavy silty clay loam and clay loam
	Caco ₃	:	strongly calcareous
	Colour	:	dark yellowish brown, (10YR4/4)
	Stone >1cm	:	in the range 15-25% soil volume comprising multisized limestone fragments
	>2cm	:	in the range 10-20% soil volume, plus occasional very large "boulders" at or near the surface
	Depth	:	in the range 18-25cm, typically 18-20cm
	Structure	:	cultivation zone - not applicable
	Boundary	:	clear smooth lower boundary
	Roots	:	many fine and very fine roots
	Overburden	:	typically comprises rubbly broken limestone in the range 35-60% of soil volume interspersed with rather compacted strongly calcareous heavy clay loam, (2.5YR 4/4 or 5/4). Due to the very stony nature of the overburden, soil structural condition was indeterminate, although consistence was recorded to be firm to moderately strong and porosity was typically less than .5% biopores. Rooting was typically recorded as common fine and very fine roots to 60cm (maximum depth of soil pit). Below 60cm depth the proportion of large "bouldery" stones increased and root frequently appeared to diminish slightly. This zone may be preceded by a narrow (5-10cm) horizon of rubbly

limestone (25-50% of soil volume)
interspersed with strongly calcareous
heavy clay loam (7.5YR 5/4).

Structure , within this horizon was
intermediate, although the
matrix consistence was recorded to be
firm, and porosity was typically >.5%
biopores.

SOIL TYPE II (3.9 HECTARES)

Topsoil Texture : medium or heavy silty clay loam
CaCO₃ : strongly calcareous
Colour : dark greyish brown (10YR4/2)
Stone >1cm : typically comprises 15-20% soil volume
comprising small and medium limestone
fragments
Stone >2cm : typically comprises 10-15% soil volume
Depth : in the range 20-25cm
Structure : cultivation zone - not applicable
Boundary : clear, smooth lower boundary
Roots : many fine and very fine roots

Upper

Subsoil Texture : heavy silty clay loam
CaCO₃ : strongly calcareous
Colour : strong brown (7.5YR4/6)
Stone : 65% total stone comprising loosely
bedded, shattered limestone
Depth : approximately 60cm
Structure : indeterminate - too stony
Consistence : friable
Porosity : >.5% biopores
Boundary : merging into less weathered limestone
rock
Roots : common fine and very fine
Weathered limestone : present below approximately 60cm depth

August 1991

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