

**BILSTHORPE PROPOSED VILLAGE DEVELOPMENT**

**AGRICULTURAL LAND CLASSIFICATION**

**Report of Survey**

**1. SUMMARY**

Eighty-five hectares of land to the south of Bilsthorpe were graded under the Revised Agricultural Land Classification System in Autumn 1991. Over two-thirds of the agricultural land was found to be sub-grade 3a, a further quarter to be sub-grade 3b, with a small area classified as grade 2.

**2. INTRODUCTION**

The survey area of eighty-five hectares lies south of Bilsthorpe. The existing urban area forms the northern boundary of the site. The site is bounded by the former Minerals Railway in the east, and agricultural land in the south and west. The survey was carried out as part of MAFF's statutory role in response to an ad hoc planning application to the Local Planning Authority.

The site was surveyed in 1991 using the MAFF Revised Agricultural Land Classification System, with soils being augered to a depth of 100 cm at 100 m grid intersections. Additional profiles were described as necessary to determine land quality boundaries and several soil pits were dug to examine soil structure.

**3. CLIMATE**

The grade of the land is determined by the most limiting factor present. The overall climate is considered first because it can have an overriding influence on restricting land to lower grades, despite other favourable conditions.

The main parameters used in the assessment of the climatic limitations are the Average Annual Rainfall (AAR), as a measure of overall wetness, and the Accumulated Temperature above 0°C for the period January to June (ATO) as a measure of warmth. The figures for AAR and ATO indicate that there are no climatic limitations on this site.

#### 4. SITE LIMITATIONS

The assessment of site factors is primarily concerned with the way topography influences the use of agricultural machinery and hence the cropping potential of the land.

To the south of Hage's Wood the land is gently undulating between 75 and 84 m. North of the wood, the land lies at a minimum altitude of 67 m in a valley which runs north-east to south-west across the site. On either side of this valley the land rises to over 75 m, with gradient being the limiting factor where slopes exceed 7 degrees.

#### 5. SOIL LIMITATIONS

The solid geology of the site is dominated by Pebble Beds. The soils derived from this parent material include slightly stony medium sandy loams or more typically loamy medium sand topsoils with sand or occasionally weathering sandstone at depth. Stoniness is a limiting factor for these soils on the plateau near Hage's Wood, where stones larger than 2 cm in diameter exceed 15% of the topsoil volume.

In the south of the site Keuper Waterstones are prominent and the soils are typified by medium clay loam/sandy clay loam topsoils over heavy clay loam/clay. In the valley, north of Hage's Wood, the soils have been derived from alluvial drift and are typified by clay topsoils over sandy clay loam to clay subsoils.

## 6. INTERACTIVE LIMITATIONS

The interactions between climate, site and soil determines whether a soil will be prone to wetness, droughtiness or erosion.

Seasonal waterlogging affects soil workability and crop yields, hence wetness is an important parameter in the classification of land. It is measured by reference to climate particularly field capacity days, soil wetness and topsoil texture. This site is at field capacity for approximately 141 days. Some of the soils have gley morphology within 40 cm and are slowly permeable within 38 cm of the surface. These soils fall into Wetness Class IV. Other soils are gleyed within 40 cm and are slowly permeable within 66 cm of the surface, falling into Wetness Class III. Occasional profiles fall into Wetness Class II being gleyed below 40 cm and having a slowly permeable layer below 48 cm.

The majority of soils on this site fall into Wetness Class I. These soils do not exhibit gley morphology and do not have a slowly permeable layer within 100 cm. They are light textured and prone to drought. A soil's susceptibility to drought is measured by the amount of water the profile can hold (AP) in comparison to the potential soil moisture deficit for the area (MD). In this area the moisture deficit for wheat is 102 mm and for potatoes is 91 mm.

## 7. LAND USE

At the time of survey (Autumn 1991) the fields to the north of Hage's Wood were fallow following a crop of oilseed rape. To the south of this wood the land was under sugarbeet.

## 8 AGRICULTURAL LAND CLASSIFICATION

Land quality ranges from grade 2 to sub-grade 3b.

### 8.1 Grade 2

This grade is found in the south of the site accounting for 2.5 ha and 3% of the site. It includes slightly stony medium sandy loam/sandy clay loam topsoils, which typically overlie sandy clay loam subsoils with loamy medium sand/medium sand at depth. These soils fall into Wetness Class I with no evidence of gleying in the profile to at least 50 cms. In dry years crop yields may be slightly reduced due to a lack of available water, but these soils are very flexible and capable of supporting a wide range of crops. In some areas clay occurs at depth below sandy clay loam and these profiles are too poorly drained for a higher grade. The absence of gleying within the top 40 cm and a slowly permeable layer at approximately 65 cm places these soils within Wetness Class II.

### 8.2 Sub-grade 3a

This sub-grade is mapped extensively to include 59.1 ha and 70% of the site. In the southern and eastern parts of the site the soils are too poorly drained for a higher grade showing distinct gleying in the profiles at depths below 30 cm and slowly permeable layers below 40 cm. These soils are characterised by sandy clay loam/medium clay loam topsoils overlying heavy clay loam and clay. These soils fall into Wetness Class III. However, the majority of the sub-grade 3a land includes the Pebble Bed soils and these soils have slightly stony (6-15% stones) medium sandy loam or more usually loamy sand topsoils passing into sand subsoils within 45 cm. Drought is the main limitation to the agricultural use of these soils but the current irrigation

practice and adequate supply of irrigation water for the range of crops grown, allows these soils to be classified as sub-grade 3a.

Isolated profiles of grade 2 and sub-grade 3b occur within the land mapped as sub-grade 3a, but these areas were too small to map separately at this scale.

### 8.3 Sub-grade 3b

This sub-grade occupies 19.4 ha and accounts for 23% of the site. The two areas of sub-grade 3b land located south of Hage's Wood are limited by soil wetness. The soils typically have medium clay loam topsoils which usually pass into heavy clay loam or clay subsoils. The moderately heavy topsoil textures and the proximity of slowly permeable clay to the surface mean that these soils fall into Wetness Class IV. The sub-grade 3b soils, found in the valley, are typified by clay topsoils over sandy clay loam to clay subsoils. These soils fall into either Wetness Class III or Wetness Class IV.

The smallest area of sub-grade 3b soils occurs on the plateau near Hage's Wood, where the topsoil is more stony than typical, with stones larger than 2 cm in diameter exceeding 15% of the topsoil volume. The area of sub-grade 3b soil immediately south of the valley is limited by moderately steep slopes. To the north of the valley, gradient is also a limiting factor, but some profiles are limited by drought, with weathering sandstone being found within 60 cm of the surface. The soils in these areas are typified by loamy sand topsoils passing into sand within 40 cm.

### 8.4 Non-agricultural Land and Woodland

The remaining 3.5 hectares of the survey area include a playing field and a woodland.

BREAKDOWN OF ALC GRADES

GRADE	AREA	% OF SURVEY AREA	% AGRICULTURAL LAND
2	2.5	3.0	3.1
3a	59.1	69.9	72.9
3b	19.4	23.0	24.0
Non AG	2.2	2.6	
Woodland	<u>1.3</u>	<u>1.5</u>	
TOTAL	84.5	100.0	

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