

A40 LONGFORD TO M50 (GORSLEY) IMPROVEMENT - EXTENSION AREA
 AGRICULTURAL LAND CLASSIFICATION (ALC): REPORT OF SURVEY

1. INTRODUCTION

Sixty-six hectares of land near Gorsley were graded under the Agricultural Land Classification (ALC) system in March 1992. The survey was an extension to the area previously surveyed in June and July 1991.

The fieldwork was carried out by ADAS's Resource Planning Team (Wessex Region) at a scale of 1:10,000 (approximately one sample point every hectare). The information is correct at the scale shown but any enlargement would be misleading. A total of 32 borings and 2 soil pits were examined.

The ALC provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agriculture use. The grading takes account of the top 120 cm of the soil profile. A description of the grades used in the ALC System can be found in the appendix.

The distribution of ALC grades identified in the survey area is detailed below and illustrated on the accompanying maps.

Table 1 Distribution of ALC Grades: Site 1

Grade	Area (ha)	% of Survey Area	% of Agricultural Land
2	2.0	7.5	57.1
3b	0.9	3.3	25.8
4	0.6	2.3	17.1
Non Ag	22.5	84.6	100%
Urban	0.6	2.3	
Total	26.6	100%	

Table 2 Distribution of ALC Grades: Site 2

Grade	Area (ha)	% of Survey Area	% of Agricultural Land
1	9.3	25.3	29.3
2	5.0	13.6	15.7
3a	5.6	15.3	17.6
3b	10.3	28.1	32.4
4	1.6	4.4	5.0
Non Ag	2.0	5.4	100%
Urban	2.9	7.9	
Total	36.7	100%	

2. 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 climatic information obtained for the previous survey was re-used. The results shown in Table 3 indicate that there is no climatic limitation across the survey area.

Table 3 Climatic Interpolations:

	Site 1	Site 2
Grid Reference	S0675266	S0708264
Height (m)	75	35
Accumulated Temperature ($^{\circ}$ days)	1438	1483
Average Annual Rainfall (mm)	765	759
Overall Climatic Grade	1	1
Field Capacity (Days)	165	164
Moisture Deficit, Wheat (mm)	101	106
Potatoes (mm)	92	98

3. Agricultural Land Classification

The distribution of ALC grades identified in the survey area is detailed in Section 1 and shown on the accompanying ALC maps. The information is correct at the scale shown but any enlargement would be misleading.

SITE 1:

Grade 2

The area of Grade 2 in the north east of the site typically has a Medium Clay Loam or Medium Silty Clay Loam topsoil to a depth of 30 cm. The subsoil is a heavier texture of Clay which has evidence of gleying. These soils have been placed in Wetness Class 2 and with a topsoil of Medium Clay Loam or Medium Silty Clay Loam are classified as Grade 2. The soils are deep and with a small amount (2%) of hard stones throughout the profile.

The area of Grade 2 in the centre of the site typically has a topsoil of Medium Silty Clay Loam. The subsoil is a Medium Clay Loam until 40 cm depth after which it becomes a Medium Sandy Loam. The soil is deep and there is no stone within the profile. The second subsoil is gleyed at a significant depth and consequently the soil has been placed in Wetness Class 2. With a topsoil of Medium Silty Clay Loam the soil is classified as Grade 2.

The area of Grade 2 in the south of the site typically has a topsoil of Medium Sandy Loam with a similar subsoil. The soil is deep, with 50% of soft, argillaceous or silty rocks in the subsoil. The main limitation is of droughtiness. This causes a restriction in the water available to crops.

Sub-grade 3b

The most northerly area of Sub-grade 3b land in the site is classified according to the gradient of the slope. It was found to be in the range of 8-11°. Such land is not suitable for specialised agricultural machinery including precision seeding and harvesting equipment and so it has been placed in this sub-grade.

The remaining area of Sub-grade 3b land typically has a Medium Clay Loam topsoil. The first subsoil horizon is a Heavy Clay Loam which then grades into a second subsoil horizon of Clay. The soil is deep and stone free. However, the main limitation is of wetness. The soil is gleyed at a depth of 30 cm and the subsoil becomes slowly permeable, which further impedes drainage, at a depth of 40 cm. The soil has been placed in Wetness Class 4 and with a Medium Clay Loam topsoil this causes the final sub-grade to be 3b. Wetness places a restriction on the versatility of the land as it adversely affects plant growth and imposes restrictions on cultivations and grazing by livestock.

Grade 4

Both map units identify areas of locally steep slopes (12-18°). Such land is not suitable for specialised agricultural machinery.

SITE 2:

Grade 1

The soils of this grade mostly have Medium Sandy Loam topsoils. The first subsoil is of a similar texture, however there is some variability below this horizon. The second subsoil can vary between a Medium Sandy Loam, become heavier and change to a Medium Clay Loam or become sandier and alter to a Heavy Medium Sand or a Medium Sand.

A small area of the Grade 1 land has a Sandy Clay Loam topsoil with a similar subsoil. This may grade into a second subsoil horizon of Heavy Clay Loam or Clay.

The Grade 1 land found closest to the stream has a Medium Clay Loam topsoil and a heavier subsoil of either Heavy Clay Loam or Clay. Despite being adjacent to a stream, wetness was not a limitation.

These soils are developed over sandstone and are typically a red colour, they are deep, stone-free and exhibit no evidence of soil wetness. Given these textures and the good subsoil structural conditions, these profiles contain adequate reserves of available water for crop roots.

Grade 2

The soils within this grade have 3 kinds of profile. Firstly, in the east of the site the topsoils are either a Medium Sandy Loam or Medium Sandy Silt Loam. The subsoil is heavier and grades into either a Medium Clay Loam or a Heavy Clay Loam. The lower subsoil is of Clay. The soils are deep and stone free. Wetness is the main limitation for this soil. Mottles are found as evidence of gleying in the subsoil and the clay subsoil horizon impedes drainage as it is slowly permeable. The soils are placed in Wetness Class 3 and with their topsoil textures can be graded no higher than Grade 2. Wetness places a restriction on the versatility of the land as it adversely affects plant growth and imposes restrictions on cultivations and grazing by livestock.

Secondly, in the west of the site the topsoil is typically a Medium Clay Loam and the subsoil of Heavy Clay Loam. The soils are deep and stone free. The limitation is of soil wetness and the soils are placed in Wetness Class 2. The soils are gleyed and also may have a slowly permeable subsoil which impedes drainage.

Thirdly, the topsoil is typically a Medium Sandy Loam. The subsoils become sandier changing to a Loamy Medium Sand or a Medium Sand. The soils are deep and stone free, the limitation here is of droughtiness. The soil texture of the profile causes a restriction in the amount of available water which can be exploited by crop roots.

Sub-Grade 3a

There are 2 kinds of soil profile within this sub-grade. Firstly, in the west of the site the topsoils are typically a Loamy Medium Sand, with a similar subsoil. The soils are deep with a small amount (2%) of hard stones in the lower subsoil. Pit 1 describes this soil type. The soils have a good structure but droughtiness is the main limitation. The soil texture of the profile causes a restriction in the amount of available water which can be exploited by crop roots.

Secondly, in the centre of the site the topsoils are typically of Medium Clay Loam. The subsoils increase in heaviness from a Heavy Clay Loam to a Clay. Pit 2 describes this soil type. The main limitation is of wetness. There is evidence of gleying in the subsoils and the slowly permeable clay horizons impede drainage in the subsoil horizons. The soils have been placed in Wetness Class 3. This wetness places a restriction on the versatility of the land as it adversely affects plant growth and imposes restrictions on cultivations and grazing by livestock.

Sub-grade 3b

A small area of this map unit delineates soils with a more severe wetness limitation than the 3a profiles outlined above. The extra degree of soil waterlogging is related to shallow slowly permeable horizons. The topsoil is a Medium Clay Loam, and the subsoil Clay.

Most of the 3b map unit is of areas where gradient is locally limiting ($8-11^{\circ}$). Such land is not suitable for specialised agricultural machinery including precision seeding and harvesting equipment.

Grade 4

This map unit identifies an area of locally steep slopes which range from $12-18^{\circ}$.

SOIL PIT DESCRIPTION

Site Name : A40/M50 LONGFORD,GLOUCS Pit Number : 1P

Grid Reference: Average Annual Rainfall : 759 mm
 Accumulated Temperature : 1483 degree days
 Field Capacity Level : 164 days
 Land Use : Maize
 Slope and Aspect : 04 degrees SE

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 28	LMS	05YR44 00	0	0		
28-100	LMS	25YR36 00	0	0		FGR
100-120	LMS	25YR36 00	0	2		FGR

Wetness Grade : 1 Wetness Class : I
 Gleying : 000 cm
 SPL : No SPL

Drought Grade : 3A APW : 108mm MBW : 2 mm
 APP : 077mm MBP : -21 mm

FINAL ALC GRADE : 3A
 MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : A40/M50 LONGFORD,GLOUCS Pit Number : 2P

Grid Reference: Average Annual Rainfall : 759 mm
 Accumulated Temperature : 1483 degree days
 Field Capacity Level : 164 days
 Land Use : Permanent Grass
 Slope and Aspect : degrees SE

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 25	MCL	05YR44 00	0	0		
25- 42	HCL	05YR54 00	0	0	F	MCSAB
42-100	C	05YR54 00	0	0	C	MCP

Wetness Grade : 3A Wetness Class : III
 Gleying : 000 cm
 SPL : 042 cm

Drought Grade : 2 APW : 118mm MBW : 12 mm
 APP : 109mm MBP : 11 mm

FINAL ALC GRADE : 3A
 MAIN LIMITATION : Wetness

DESCRIPTION OF THE GRADES AND SUB-GRADES

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 include 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 moist 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.

Descriptions of other land categories used on ALC maps

Urban

Built-up or 'hard' uses with relatively little potential for a return to agriculture including: housing, industry, commerce, education, transport, religious buildings, cemeteries. Also, hard-surfaced sports facilities, permanent caravan sites and vacant land; all types of derelict land, including mineral workings which are only likely to be reclaimed using derelict land grants.

Non-agricultural

'Soft' uses where most of the land could be returned relatively easily to agriculture, including: private parkland, public open spaces, sports fields, allotments and soft-surfaced areas on airports/airfields. Also active mineral workings and refuse tips where restoration conditions to 'soft' after-uses may apply.

Agricultural buildings

Includes the normal range of agricultural buildings as well as other relatively permanent structures such as glasshouses. Temporary structures (eg polythene tunnels erected for lambing) may be ignored.

Open water

Includes lakes, ponds and rivers as map scale permits.

Land not surveyed

Agricultural land which has not been surveyed.

Where the land use includes more than one of the above land cover types, eg buildings in large grounds, and where map scale permits, the cover types may be shown separately. Otherwise, the most extensive cover type will usually be shown.