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CAMBORNE AND REDRUTH LOCAL PLAN

AGRICULTURAL LAND CLASSIFICATION

REPORT OF SURVEY

1 Introduction

In October 1991 a detailed Agricultural Land Classification (ALC) was carried out, to the north of Camborne, at Tehidy and Illogan and south of Camborne at Penhallick and at Sandy Lane, Redruth, as part of MAFF's statutory input to the revision of the Camborne and Redruth Local Plan

The field work was conducted by members of the Resource planning Group at a scale of 1 10,000, with an approximate soil observation density of one auger boring per hectare The survey supercedes the previous surveys of part of this area at 1 25,000 scale, being at a more detailed level and carried out under the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF 1989)

The ALC provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural 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 is detailed for each survey area and illustrated on the accompanying ALC maps The information is accurate at the scale of mapping but any enlargement would be misleading Each of the areas surveyed is dealt with individually in the following sections

The surveys show that there are significant amounts of high quality laid around all the sites though Sandy Lane, Redruth, and the exposed slopes towards Portreath are of a lower grade but still considered best and most versatile land

2 Sandy Lane, Redruth

A total of 69 borings and 2 soil pits were examined at Sandy Lane, Redruth The distribution of grades found are detailed in table 1 and illustrated on the accompanying map The information is accurate at the scale shown but any enlargement would be misleading

Table 1 Distribution of ALC grades, Sandy Lane, Redruth

Grade	Area	% Survey Area	% Agricultural Land
2	5 2	6 0	8 0
3A	53 8	62 2	82 5
3B	5 6	6 5	8 6
4	0 6	0 7	0 9
Non Agric	12 0	13 8	100% (65 2 ha)
Urban	8 3	9 6	
Farm bdgs	1 0	1 2	
TOTAL	86 5	100%	

2 1 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

To assess any overall climatic limitation, estimates of important climatic variables were obtained for the site by interpolation from the 5 km Met Office/MAFF database (Met Office/MAFF/SSLRC 1989) The indicative parameters used for assessing such a limitation are accumulated temperature (a measure of the relative warmth of a locality) and average annual rainfall (a measure of overall wetness) The results shown in table 2 reveal that there is a climatic limitation across the survey area restricting the land to grade 2 at best

Above 140 m there is an important workability variation related to field capacity days (FCD) FCD is a meteorological parameter which estimates the duration of the period when the soil moisture deficit is zero, that is when rainfall exceeds evapotranspiration The FCD level and topsoil texture affect the soils workability Thus, below 140 m around Sandy Lane where the FCD are below 225 in value, a medium clay loam topsoil in wetness class I may qualify for grade 2 but, above 140 m, and hence above 225 FCD, it can be no better than grade 3a

Slight exposure was observed over part of the site but this imposed no greater limitation than other factors

Table 2 Climatic Interpolation, Sandy Lane, Redruth

Grid Reference	SW710416	SW713430	SW715431
Height	185	145	135
Accumulated Temperature (^{O} days)	1440	1484	1495
Average Annual Rainfall (mm)	1223	1170	1163
Field Capacity (Days)	235	226	225
Moisture deficit, Wheat (mm)	71	78	79
Potatoes (mm)	54	63	65
Overall Climatic Grade	2	2	2

2 2 Grade 2

All the grade 2 land is restricted to below 140 m being the height at which there is a critical change in the FCD value in terms of workability (described in 2 2) The soils in this area have medium clay loam topsoils so below 140 m they are eligible for grade 2 if there is no evidence of wetness (ie wetness Class I) as in the case here MCL topsoils lie above HCL subsoils which are stoney increasing with depth

2 3 Sub-Grade 3A

The majority of the survey area has been graded as sub-grade 3A Below 140 m the land classified as sub-grade 3A has evidence of slight wetness in the form of gleying with the top 40 cm There are no slowly permeable layers in these soils, so they fall into wetness Class III With medium clay loam topsoils and FCD values of 225 or less they are sub-grade 3A

Above 140 m the soils classified as sub-grade 3A do not experience any wetness limitation nor does the stone content rising *from* 2% *volume hard rock* in the upper subsoils to 30% in the lower subsoils restrict the available water for crops in the soil (Stone volumes measured by sieving from a soil profile pit) The soils are assigned to wetness Class I A typical soil profile in this unit has MCL topsoils to 50 cm or more with HCL to depth The organic content of the topsoil is up to 10%

2 4 Sub-Grade 3B

There are several small areas of sub-grade 3B Near to Channel View Farm, Heathfield and Long Stratton there are restricting gradients for machinery This restricts the versatility of the land For the gradients present >7° and up to 11° the land is downgraded to 3B

The remaining areas of 3B are suffer a wetness limitation Here there is evidence of wetness in the form of gleying within 40 cm of the surface They are assigned to wetness Class III The profiles are similar to the soils elsewhere in the survey area These areas of wetness are similar to those in the sub-grade 3A area except the higher FCD value downgrades than by one sub-grade to 3B

2 5 Grade 4

There is a small area near Heathfield where gradients exceed 11° and so with the increased restriction on the safe use of machinery these slopes are downgraded to grade 4

3 Tehidy and Illogan

An area of 396 ha was surveyed around Tehidy, Illogan and Portreath A total of 300 borings and 8 soil pits were examined The distribution of grades found are detailed in table 3 and illustrated on the accompanying map

Table 3 Distribution of ALC grades around Tehidy and Illogan

Grade	Area (ha)	% of Survey Area	% of Agricultural Land
2	249 9	63 2	77 4
3a	41 6	10 5	12 9
3b	26 6	6 7	8 2
4	4 3	1 1	1 3
5	0 7	0 2	0 2
Urban	27 8	7 0	100% (323 1 ha)
Non Agric	40 4	10 2	
Farm Bldgs	4 3	1 1	
TOTAL	395 6	100%	

3 1 Climate

A climatic interpolation as previously described was carried out for the survey area The results (shown in Table 4) reveal that there is no climatic limitation across the survey area Local risks of exposure exist on the northern slopes open to the sea around Portreath

Table 4 Climatic Interpolations Tehidy and Illogan

Grid Reference	SW674424	SW662435	SW652431	SW658445	SW 676444
Height (m)	100	90	55	85	45
Accumulated Temperature (° days)	1537	1548	1588	1554	1599
Average Annual Rainfall (mm)	1094	1050	1025	1021	1040
Field Capacity (Days)	214	206	202	201	205
Moisture deficit wheat (mm)	87	91	96	93	96
potatoes (mm)	75	80	87	83	86
Overall Climatic grade	1	1	1	1	1

3 2 Grade 2

The majority of the survey area has been classified as grade 2 The topsoils are medium clay loams and the soils show no evidence of wetness so are placed in wetness Class I Typical soil profiles have medium clay loams to 30 cm with 2-10% hard stones Beneath the subsoils are variable in texture, medium clay loams, heavy clay loams or clays The stone content rises with depth to around 30% silty stones The stone content does not impose a droughtiness problem on the soils The FCD value for the area means that despite medium clay loam topsoils and wetness Class I, the soils are restricted to grade 2 This workability limitation is the result of restrictions on the timing of cultivations and grazing without causing damage to the soil structure Such damage could impede free drainage of the soil

3 3 Sub-Grade 3A

The block of sub-grade 3A land to the north of Illogan from Watergate to Avary Court has a heavy clay loam topsoil which makes it more difficult to work The opportunities for cultivations are reduced in comparison to a medium clay loam This area is therefore downgraded to sub-grade 3A Apart from the topsoil texture the soils are similar to elsewhere in the survey area

The area of 3A between Avary Court and Portreath has been downgraded to 3A because of the risk of exposure The wind can be funnelled up the valley and off the sea will be salt laden These factors will be undesirable for the growth of sensitive horticultural crops

The remaining areas of 3A below Whitfield Farm and Tehidy Hospital have a slightly wetter soil water regime and show evidence of waterlogging that will effect crop growth The wetness is in the form of gleying and depending on the depth to the gleying the soils are assigned to wetness Classes II or III With medium clay topsoils these soils are restricted to sub-grade 3A for the local FCD value of around 210

3 4 Sub-Grade 3B

The area of 3B land below Merrose Farm is wetter than that near Tehidy Hospital The heavy clay loam topsoils lie above clay subsoils which are gleyed within 40 cm of the surface These soils therefore fall into wetness Class III and are classified as 3B on a wetness limitation

The remaining areas of grade 3B are limited by gradients These slopes over 7° restrict the safe use of cultivation machinery and increase the risk of soil erosion if cultivated

3 5 Grade 4 and 5

All the areas of grade 4 land have limiting gradients restricting the use of certain machinery and reducing the versatility of the land to primarily grazing Those areas graded as grade 5 have a more severe gradient limitation

4 Penhallick

A total of 32 ha were surveyed around Penhallick, Camborne 22 borings were examined and the distribution of the grades found is shown in Table 5 and illustrated on the accompanying ALC map

Table 5 Distribution of ALC grades, Penhallick

Grade	Area	% Survey Area	% Agricultural Land
2	17 0	53 1	60 5
3a	8 0	25 0	28 5
3b	3 1	9 7	11 0
Urban	3 0	9 4	100% (28 1 ha)
Non Agric	0 6	1 9	
Farm Bldgs	0 3	0 9	
TOTAL	32 0	100%	

4 1 Climate

A climatic interpolation as previously described was carried out for the survey area The results (shown in Table 5) reveal that a climatic limitation exists for part of the site

Above 125 m the site is restricted to grade 2 at best by the Climatic regime

Table 5 Climatic Interpolations Penhallick

Grid Reference	SW670407	SW672450	SW673404
Height (m)	115	120	130
Accumulated Temperature (° days)	1520	1515	1503
Average Annual Rainfall (mm)	1122	1129	1139
Field Capacity (Days)	219	220	222
Moisture deficit, wheat (mm)	85	84	82
potatoes (mm)	71	70	68
Overall climatic grade	1	1	2

4 2 Grade 2

Over half the survey area has been classified as grade 2 Here the soils show no evidence of wetness and are assigned to wetness Class I The soils have medium clay loam or medium silty clay loam topsoils with increasingly heavy subsoils, heavy clay loams and clays stone contents down the profile increase from around 2% hard rocks in the topsoil to 10% hard rock in the lower subsoils These contents do not impose a droughtiness limitation on the soils The combination of topsoil texture, wetness class and FCD value mean the land can be graded no better than grade 2 It is the workability of the soil that causes this limitation ie the number of days when the soil is in a suitable condition for cultivation, trafficking by machinery or grazing by livestock

4 3 Sub-Grade 3A

The block of 3A land has been downgraded from grade 2 (the soils are the same as in the area of grade 2) because of an exposure risk which would affect sensitive horticultural crops and soft fruits This reduces the versatility of the land The open nature of these northern facing areas increases the risk of cold winds which could cause stress to livestock or damage crops

4 4 Sub-Grade 3B

The remaining parts of the survey area are restricted to 3B caused by gradients which reduce the safe and efficient use of some machinery The risk of soil erosion is increased if cultivation occurs on steeper land The versatility of this land is reduced by the gradients present