

LIZARD LOCAL PLAN: ST KEVERNE, CORNWALL

AGRICULTURAL LAND CLASSIFICATION

REPORT OF SURVEY

1. In September 1990 a detailed Agricultural Land Classification (ALC) survey was conducted around the eastern and southern fringes of St Keverne in Cornwall. The survey was requested as part of MAFF's statutory consultation on the Lizard Local Plan; a total of 37 hectares was surveyed. The fieldwork was carried out by members of the Resource Planning Group (SW Region) at an approximate auger sampling density of 1.5 borings per hectare; 50 auger borings and 2 soil pits were described.

The location of the soil pits and the auger sample points is shown on the Auger Sample Point Map, and the distribution of the ALC grades and sub-grades is shown on the ALC map. Table 1 provides the statistics on land quality.

Table 1: Distribution of grades and Sub-grades

Grade	Area (ha)	% of Survey Area	% of Agricultural Area
2	27.0	72.4	83.6
3B	4.15	11.1	12.8
4	1.15	3.1	<u>3.6</u>
Non-Agric	3.2	8.6	
Urban	1.6	4.3	32.3 ha
Agric Bldgs	<u>0.2</u>	<u>0.5</u>	
	37.3 ha	100%	

2. **Climate:** Detailed assessments of the prevailing climate were obtained by interpolation from a Met Office/MAFF 5 km grid dataset for two representative locations (see Table 2). The two parameters used to assess the effect of overall climate are average annual rainfall (a measure of overall wetness) and accumulated temperature (a measure of the relative warmth of a locality). The two assessments show that there is no overall climatic limitation affecting the site.

Table 2: Climatic Interpolations

Grid Reference	: 1787 0207	1792 0214
Altitude (m)	: 95	75
Average Annual Rainfall (mm)	: 1090	1088
Accumulated Temperature ($^{\circ}$ days)	: 1549	1572
Field Capacity (days)	: 212	211
Moisture Deficit, Wheat (mm)	: 94	96
Moisture Deficit, Potatoes (mm)	: 84	87

The site was also not generally affected by any minor climatic factors such as exposure except at ASP No. 47 where the upper crest slope location and the north-easterly aspect produces a slight exposure risk (but which still permits grade 2 land).

3. **Grade 2:** The majority of the agricultural land has been placed in this grade, with little variation in the soils observed across the site - medium clay loam topsoils grade into heavy clay loams in the lower subsoils with low stone contents throughout the profile and no evidence of wetness (Wetness Class 1). Soils developed on crests show signs of fresh weathering higher up the profile (micaceous stony clays) but all the soils on the site have good root penetration to depth and contain high resources of available water.

The active limitation is soil workability. Despite the fact that the soils are in Wetness Class 1, the high local FC Day values (+ 210 days) in combination with the topsoil textures limit the soils to Grade 2 (see Table 6, Revised Guidelines).

Grades 3B and 4: All these map units have been defined with gradient as the single most limiting factor.

References: Met Office (1989) Climatological Data for Agricultural Land Classification

Agricultural Land Classification of England and Wales, MAFF (1988)

DESCRIPTION OF THE GRADES AND SUBGRADES

The ALC grades and subgrades are described below in terms of the types of limitation which can occur, typical cropping range and the expected level and consistency of yield. In practice, the grades are defined by reference to physical characteristics and the grading guidance and cut-offs for limitation factors in Section 3 enable land to be ranked in accordance with these general descriptions. The most productive and flexible land falls into Grades 1 and 2 and Subgrade 3a and collectively comprises about one-third of the agricultural land in England and Wales. About half the land is of moderate quality in Subgrade 3b or poor quality in Grade 4. Although less significant on a national scale such land can be locally valuable to agriculture and the rural economy where poorer farmland predominates. The remainder is very poor quality land in Grade 5, which mostly occurs in the uplands.

Descriptions are also given of other land categories which may be used on ALC maps.

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 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: golf courses, 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.

Woodland

Includes commercial and non-commercial woodland. A distinction may be made as necessary between farm and non-farm woodland.

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.

SOIL PROFILE DESCRIPTIONS: EXPLANATORY NOTE

(i) TEXTURE:-

Soil texture classes are denoted by the following abbreviations (all Upper case*):

S	Sand
LS	Loamy Sand
SL	Sandy Loam
SZL	Sand Silt Loam
ZL	Silt Loam
MZCL	Medium Silty Clay Loam
MCL	Medium Clay Loam
SCL	Sandy Clay Loam
HZCL	Heavy Silty Clay Loam
HCL	Heavy Clay Loam
SC	Sandy Clay
ZC	Silty Clay
C	Clay

For the sand, loamy sand, sandy loam and sandy silt loam classes the predominant size of sand fraction may be indicated by the use of prefixes, thus:

F	fine (more than $\frac{2}{3}$ of sand less than 0.2 mm)
C	coarse (more than $\frac{1}{3}$ of sand greater than 0.6 mm)
M	medium (less than $\frac{2}{3}$ fine sand and less than $\frac{1}{3}$ coarse sand)

The sub-divisions of clay loam and silty clay loam classes according to clay content are indicated as follows:-

M	medium (less than 27% clay):
H	heavy (27-35% clay)

Other possible texture classes include:

P	Peat
SP	Sandy Peat
LP	Loamy Peat
PL	Peaty Loam
PS	Peaty Sand
MZ	Marine Light Silts

* There are two exceptions to the Upper Case rule:-

- The prefix "Calc" is used to identify naturally calcareous soils containing more than 1% Calcium Carbonate
- For organic mineral soils, the texture of the mineral fraction is prefixed by "Org".

(ii) STRUCTURE:-

Nature and size of structural units are denoted by the following abbreviations:

SAB Subangular Blocky
AB Angular Blocky
P Prismatic

(single grain, granular and platy are not abbreviated)

F Fine
M Medium
C Coarse
VC Very Coarse

eg Weak MSAB = Weakly developed medium subangular blocky

(iii) OTHER

f = few = less than 2% of the matrix or surface described
c = common = 2-20% of the matrix or surface described
m = many = 20-40% of the matrix or surface described
vm = very many = +40% of the matrix or surface described

f = faint = indistinct mottles, evident only on close examination
d = distinct = although not striking, the mottles are readily seen
p = prominent = the mottles are conspicuous, and the mottling is one of the outstanding features of the horizon

gm = grey mottling
om = ochreous mottling

eg cdom = common distinct ochreous mottles

ppf = pale ped faces
mn = manganese

st = stones 6 cm
sst = stones 2-6 cm
vsst = stones 2 cm

WC = Wetness Class (use Roman numerals, eg WC IV)
SPL = Slowly Permeable Layer
WT = Water Table
I = Impenetrable if used in Depth Column
IMP = Impenetrable if used in soil profile notes
(IMP 2 x 40 cm = 2 additional borings, both impenetrable at 40 cm)
ASP = Auger Sample Point

SITE NAME Lizard Local Plan St Keverne, Cornwall BFCS 3437	PROFILE NUMBER 1	SLOPE AND ASPECT 2° W-facing	LAND USE Temp Grass	Av Rainfall :- 1090 ATO :- 1549 FC Days :- 212 Climatic grade:- 1	PARENT MATERIAL Gabbro
	DATE 11/9/90	GRID REFERENCE			

Horizon Number	Lowest Av Depth	Matrix and Ped Face Colours	Texture	Stoniness: Size, Shape, Type, and Field Method	Mottling Abundance, Contrast Size and Colour	Structure: Development Size and Shape	Pores and Fissures	Structural Condition	Consistence	Roots Abundance Size and Nature	Calcium Carbonate Content	Mangan Concs etc	Horizon Boundary: Distinctness and Form
Topsoil	0-21	10YR43	MCL	Negligible	Not mottled	FSAB		Friable		Good common root penetration			
Subsoil 1	21-47	10YR44	MZCL	Negligible	Not mottled	Weak MSAB	> 0.5%	Good	Friable	Good common root penetration			
Subsoil 2	47-71	10YR56 some ochreous weathering colours	HCL	2% vsst;visual	Not mottled	Weak CSAB	> 0.5%	Moderate	Friable	Common roots			
Subsoil 3	71-80+	10YR 54	Micaceous Clay	10% vsst;visual	Not mottled	Weak CSAB	> 0.5%	Moderate	Friable	Common			
Pit dug to 80 cm; augering to 1.2 m reveals continuation of Subsoil 3													

Depth to Slowly Permeable Horizon :-	Not gleyed No SPL	Available Water	Wheat :- Not limiting	Final ALC Grade :- 2
			Potatoes :-	
Wetness Class :-	I	Moisture Deficit	Wheat :-	Main Limiting Factor(s) :- Workability
			Potatoes :-	
Wetness Grade :-	2	Moisture Balance	Wheat :-	
			Potatoes :-	Remarks :-
RPG0023/WJC		Droughtiness Grade :-		

SITE NAME Lizard Local Plan St Keverne, Cornwall 8FCS 3437	PROFILE NUMBER 2	SLOPE AND ASPECT 3° Upslope; 5° Down, NW	LAND USE Temp Grass	Av Rainfall :- 1088 ATO :- 1572 FC Days :- 211 Climatic grade:- 2	PARENT MATERIAL Gabbro
	DATE 12/9/90	GRID REFERENCE			

Horizon Number	Lowest Av Depth	Matrix and Ped Face Colours	Texture	Stoniness: Size, Shape, Type, and Field Method	Mottling Abundance, Contrast Size and Colour	Structure: Development Size and Shape	Pores and Fissures	Structural Condition	Consistence	Roots Abundance Size and Nature	Calcium Carbonate Content	Mangan Concs etc	Horizon Boundary: Distinctness and Form
Topsoil	0-21	10YR42	MCL	-	fdom	Not compacted				Good common root penetration			Gradual indistinct
Subsoil 1	21-66	10YR43	MCL	2% vsst; hard, visual	Not mottled	Weak FSAB	> 0.5%	Good	Friable	Good common root penetration			Clear colour change
Subsoil 2	66-80+	10YR54	HCL	30% sst; hard, visual	Not mottled	Difficult to assess structure due to high stone content				Good common root penetration			
						Weak FSAB	> 0.5%	Good	V Friable				

Depth to Slowly Permeable Horizon :- No SPL	Not gleyed	Available Water	Wheat :- 131 mm (stopping at 80 cm)	Final ALC Grade :- 2
Wetness Class :- I		Potatoes :-		Main Limiting Factor(s) :- Workability
Wetness Grade :- 2		Moisture Deficit	Wheat :- 94 mm	
		Potatoes :-		
		Moisture Balance	Wheat :- +37 mm	Remarks :-
		Potatoes :-		
RPG0023/WJC		Droughtiness Grade	:- 1	

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LIZARD LOCAL PLAN; St Keverne, Cornwall

SOIL PROFILE DESCRIPTION

8FCS 3437

Date of Survey 10-12.9.90

NO	TEXTURE	COLOUR	DEPTH (CM)	SOIL PROFILE NOTES	TOPOGRAPHY NOTES
1	MCL	10YR43	0-30	cdom; surface feature	
	MCL	10YR44	30-90+	not mottled; WCI	
2	MCL	10YR53	0-25	cdom	
	MCL	10YR43	25-65	not mottled	
	MCL	10YR54	65-90+	and 10YR64; cdom; not gleyed; WCI	
3	MZCL	10YR53	0-30	cdom	
	MZCL	10YR53	30-48	slightly greyer than topsoil; cdom	
			I	(x2); poss gleyed < 40 cm; WCIII	
4	MCL	10YR43	0-35		
	MCL	10YR44	35-70		
	MCL	10YR66	70-90+	some ochreous weathering colours WCI	
5	MZCL	10YR43	0-25	cdom	
	MZCL	10YR44	25-60		
	MZCL	10YR56	60-85+	WCI	
6	MCL	10YR43	0-25		
	MCL	10YR44	25-50		
			I	(2nd Imp at 30 cm)	
7	MCL	10YR43	0-20		
	MCL	10YR43	20-30	fdom	
	MZCL	10YR44	30-65	fdom	
	HZCL	10YR44	65-70		
	HZCL	10YR54	70-85	WCI	
			I		
8	MCL	10YR43	0-30		
	MCL	10YR44	30-60		
			I	too stony to penetrate when dry	
9	MCL	10YR43	0-20	cdom	
	MCL	10YR44	20-72		
			I	2nd Imp at 40 cm; too stony	

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Date of Survey

NO	TEXTURE	COLOUR	DEPTH (CM)	SOIL PROFILE NOTES	TOPOGRAPHY NOTES
10	MCL	10YR43	0-25	cdom	
	MCL	10YR43	25-55		
			I	too stony to penetrate when dry	
11	MCL	10YR52	0-20	cdom	flat stream edge;
	HCL	10YR62	20-40	cdogm	occasional boulder
			I	(2 others Imp at 32cm; solid)	outcrop
				WCIII at best	
12	MCL	10YR43	0-25		6° slope
	MCL	10YR44	25-55		
	MCL	10YR56	55-80+	2% vsst; WCI	
13	MZCL	10YR53	0-30		
	MZCL	10YR43	30-45		
	HCL	10YR56	45-80+	10% vsst; weathering material; some ochreous weathering colours;	
				WCI	
14	MCL	10YR44	0-10	cdom	
	MCL	10YR44	10-60		
	MCL	10YR56	60-75		
			I	too stony to penetrate. WCI	
15	MCL	10YR44	0-25		
	MCL	10YR44	25-80+	slightly paler	
				WCI	
16	MCL	10YR44	0-25		
	MCL	10YR44	25-45		
			I	(2nd attempt imp after 30 cm) WCIII	
17	MCL	10YR43	0-20		
	MCL	10YR44	20-50		
	MCL	10YR54	50-60	some ochreous weathering colours	
			I	WCI	

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NO	TEXTURE	COLOUR	DEPTH (CM)	SOIL PROFILE NOTES	TOPOGRAPHY NOTES
18	MZCL	10YR54	0-25		
	MZCL	10YR44	25-70		
	MZCL	10YR54	70-80+	few ochreous weathering colours	
19	MZCL	10YR54	0-25	very dry soil	
	MZCL	10YR44	25-50		
	MZCL	10YR54	50-75	few ochreous weathering colours	
			I	2% vsst; too stony to penetrate	
20	MZCL	10YR54	0-30		
	MZCL	10YR56	30-60	5% vsst	
			I	too stony to penetrate when dry	
21	MCL	10YR43	0-30		
	MCL	10YR44	30-60		
			I	too stony to penetrate when dry	
22	MCL	10YR43	0-25		
	MCL	10YR44	25-60		
	MZCL	10YR44	60-80+	few ochreous weathering colours WCI	
23	MCL	10YR54	0-30		
	MCL	10YR44	30-60+	WCI	
24	MCL	10YR44	0-25		
	MCL	10YR44	25-35	few ochreous weathering colours	
	MCL	10YR44	35-70+	WCI	
25	MCL	10YR54	0-25	few ochreous mottles	
	MCL	10YR44	25-75	no mottles	
	MCL	10YR44	75+	some paler mottles WCI	

SOIL PROFILE DESCRIPTION

Date of Survey

NO	TEXTURE	COLOUR	DEPTH (CM)	SOIL PROFILE NOTES	TOPOGRAPHY NOTES
26	MCL	10YR44	0-35		
	MCL	10YR44	35-50	slightly paler matrix colour. Prob deeper	
			I	WCI	
27	MCL	10YR54	0-30		
	MCL	10YR44	30-35		
			I	WCIII	
28	MZCL	10YR43	0-30		
	MZCL	10YR44	30-60		
	HZCL	10YR54	60-80+	2% vsst, hard; WCI	
29	MZCL	10YR44	0-30		
	MZCL	10YR44	30-80+	slight colour change; WCI	
30	MZCL	10YR42	0-20	cdom	6½-7° slope
	MZCL	10YR43	20-60		
			I	too stony to penetrate when dry	
31	MZCL	10YR43	0-30		6° slope
	MZCL	10YR44	30-50		
			I	too stony to penetrate when dry	
32	MZCL	10YR54	0-32		6-6½° slope
			I	(x2) too stony to penetrate when dry	
33	MZCL	10YR54	0-25		
	MZCL	10YR44	25-55	few ochreous weath colours from 40cm	
	HZCL	10YR54	55-62	5% vsst, shillet	
			I	too stony to penetrate when dry	
34	MZCL	10YR43	0-25		
	MZCL	10YR44	25-50		
	HZCL	2.5Y62	50-80+	WCI	

AGRICULTURAL LAND CLASSIFICATION

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Date of Survey

NO	TEXTURE	COLOUR	DEPTH (CM)	SOIL PROFILE NOTES	TOPOGRAPHY NOTES
35	MZCL	10YR43	0-30		
	MZCL	10YR44	30-58		
			I	too stony to penetrate when dry	
36	MZCL	10YR43	0-30		
	MZCL	10YR43	30-80+	slight colour change; WCI	
37	MCL	10YR43	0-10	cdom	
	MCL	10YR43	10-55		
	MCL	10YR44	55-65		
			I	too stony. WCI	
38	MCL	10YR43	0-15		
	MCL	10YR43	15-75	2% vsst	
	MCL	10YR54	75+	gritty weathering material	
				WCI	
39	MCL	10YR44	0-30		
	MCL	10YR44	30-85	slightly darker. 2% vsst	
				WCI	
40	MZCL	10YR43	0-30		
	MZCL	10YR43	30-80+	WCI; slight colour change	
41	MZCL	10YR43	0-30		
	MZCL	10YR44	30-80+	WCI	
42	MCL	10YR43	0-25		
	MCL	10YR44	25-80	WCI	
43	MCL	10YR43	0-30		6° slope
	MCL	10YR44	30-60		
			I	too stony to penetrate when dry	
44	MCL	10YR43	0-20		
	MCL	10YR54	20-60		
	MZCL	10YR44	60-85+	WCI	

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NO	TEXTURE	COLOUR	DEPTH (CM)	SOIL PROFILE NOTES	TOPOGRAPHY NOTES
45	MZCL	10YR44	0-25		
	MCL	10YR43	25-65		
	MCL	10YR58	65-85+	15-20% vsst; WCI	
46	MCL	10YR44	0-30		
	MCL	10YR46	30-50		
	MCL	10YR56	50-60		
	HCL	10YR56	60-80+	5% vsst; WCI	
47	MCL	10YR43	0-25		6° slope
	MCL	10YR43	25-55		poss slightly exposed
	MCL	10YR46	55-70		upper crest slope
	MCL	10YR66	70-80+		
48	MCL	10YR44	0-30		6½-7° slope
	MCL	10YR44	30-60	only slight colour change through profile	not exposed
	MCL	10YR44	60-80+	WCI	
49	MCL	10YR43	0-30		
	MCL	10YR44	30-70		
	MZCL	10YR56	70-100+	WCI	
50	MCL	10YR43	0-30+		9° slope