

**ST AUSTELL LOCAL PLAN: SOUTHERN DISTRIBUTOR ROAD
AGRICULTURAL LAND CLASSIFICATION**

REPORT OF SURVEY

1. Introduction

In February 1990 a detailed Agricultural Land Classification (ALC) survey was carried out over 108 hectares along the southern edge of St Austell, Cornwall. The request for survey information was made in connection with the preparation of the St Austell Local Plan and the allocation of land to industrial/residential use within the boundary of the proposed southern distributor route.

The ALC system provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on its use for agriculture. Classification was made according to MAFF's revised guidelines and criteria for grading agricultural land which have been operational from 1.1.1989. Field work was conducted by Resource Planning Group staff at an approximate auger sampling density of one auger sample point (ASP) per hectare; a total of 88 borings and 2 soil pits were examined. The distribution of ALC grades and the location of the various soil borings and soil pits are shown on the accompanying ALC and ASP maps which have been produced at a scale of 1:10,000. The information is accurate at this scale, but any enlargement of the ALC information would be misleading.

Table 1: Distribution of ALC Grades

Grade	Area (ha)	% of Survey	% of Agricultural Area
.3A	75.5	70.0	78.9
3B	19.5	18.1	20.4
4	0.7	0.6	0.7
Non-Agric	3.8	3.5	<u>100%</u> (95.7 ha)
Urban	6.0	5.6	
Farm Bldgs	2.4	2.2	
	<u>107.9</u> ha	<u>100%</u>	

2. Climate

Detailed assessments of the prevailing climate were made at three representative locations. These assessments were made by interpolation from a 5 - km database and are illustrated in Table 2 below.

The Agricultural effects of overall climate are assessed by reference to the two important climatic parameters, average annual rainfall (a measure of the overall wetness of a site) and accumulated temperature (a measure of the relative warmth of a locality). Table 2 reveals that the higher land on the site, on the west and east, does in fact suffer from an overall climatic limitation and can therefore be graded no higher than Grade 2, and that it is only the lowerlying central part of the site (below approximately 50 metres) which is unaffected by climate.

Table 2: Climatic Interpolations

	Location 1	Location 2	Location 3
Grid Reference	20280514	20030518	20140517
Height (m)	74	95	30
Accumulated Temperature (° days)	1554	1531	1605
Average Annual Rainfall (mm)	1180	1220	1177
Field Capacity (days)	232	238	232
Moisture Deficit, Wheat (mm)	87	82	92
Moisture Deficit, Potatoes (mm)	77	70	82
Climatic Grade	2	2	1

The local climatic factor, **exposure**, has only a limited effect on parts of the site. The majority of the survey area occupies the upper and lower slopes of north and north-east facing crests and as such, are protected from the effects of strong winds from the south-west. Two limited areas are affected. The land adjacent to Tregorrick Road on the southern fringe above 80-85 metres is at worst slightly exposed (Grade 2); the land at Middle Quarry in the west at 85-90 metres occupies an exposed crest top location and can therefore be graded no higher than Sub-grade 3A.

3. Topography and Geology

The site is dominated by the characteristic slate and limestone deposits of this area, with only minor intrusions of Greenstone, and with alluvium fringing the St Austell River and its minor tributary which extends east along Sawles Road.

Gradient is an active limitation throughout much of the site. Figure 1 is a thematic map which highlights those areas where a gradient limitation prevails and also records the locations where slope was measured by hand-held clinometre. All measurements were made over a 25 metre length, normal to the slope. Microrelief is nowhere felt to be an additional limitation.

Areas of both Sub-grade 3B and Grade 4 have been identified on the basis of gradient.

4. Agricultural Land Classification

Sub-grade 3A: the uniform geology has given rise to similar soils over the site, as is exemplified in the profile descriptions for the two soil pits. As such, a common physical limitation, workability, affects the majority of the site. Given the high Field Capacity value of the area, over 225 FC days, soils in Wetness Class I which have Medium Clay Loam (MCL) topsoil textures are immediately limited to no better than Sub-grade 3A; this is the case for all the 3A mapped areas. The typical MCL soils grade into heavy clay loams and soft micaceous clays; the lower subsoils of clay may exhibit strong ochreous weathering colours and have high slate stone contents (+ 50%) but show no clear evidence of any prolonged waterlogging. Pit 1 also illustrates the worst scenario whereby the stoney clay prevents root penetration below approximately 60 cm. In these circumstances the 3A classification is confirmed by a slight droughtiness limitation.

Sub-grade 3B and Grade 4: with the exception of the tributary floodplain running east along Sawles Road all 3B and 4 map units have gradient as the single most limiting factor. Along the tributary a minor stretch of 3B has been identified where Wetness Class II soils occur (deep gleying but no slowly permeable layer (SPL)). This area has also been affected by recent regrading and bank strengthening of the stream and had waterlogged surface layers at the time of field inspection (presumably due to surface compaction); normal farm management should rectify this present problem.

The western edge of the St Austell River has Wetness Class III soils (shallow gleying but with no SPL) that are placed in Sub-grade 3B because their slightly lighter topsoil textures, Medium Sandy Silt Loam, places them in the same workability band as Wetness Class II Medium Clay Loams.

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE	Av Rainfall :- 1554 ATO :- 1180 FC Days :- 232 Climatic grade:- 2	PARENT MARIAL
Tregorrick Road St Austell BFCS 3436	1	5° North-facing 70 metre Altitude	Winter Cereals		Slate

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	0-31	10YR43	MCL	2% sst (slate, visual)	None							None	Clear (Colour change and more stone)
Sub 1	31-45	7.5YR66	HCL	25% sst (sieve) 5% vsst (visual) slate	None	Assumed good subsoil structure due to high stone content				Few		None	Gradual indistinct
Sub 2	45-65+	7.5YR64	C soft micaceous	approx 50% (+2 mm; visual; slate)	None	Difficult to assess due to high stone content which forms dense platy layers with compact soil between				None (difficult to penetrate below approx 50 cm)		None	
Soil Pit dug to 65 cm; Augering to 75 cm revealed continuation of Sub 2; Impenetrable below													

Depth to Slowly Permeable Horizon :- None observed Within 75 cm Not gleyed	Available Water	Wheat :- 87 mm Assuming roots cannot penetrate Potatoes :- below 60 cm (worst scenario)	Final ALC Grade :- 3A
Wetness Class :- No evidence of Wetness WCI	Moisture Deficit	Wheat :- 87 mm Potatoes :-	Main Limiting Factor(s) :- Workability (related to topsoil texture (MCL) at this high FC Day Level (232); droughtiness
Wetness Grade :- 3A	Moisture Balance	Wheat :- 0 mm Potatoes :-	
RPG0023/WJC	Droughtiness Grade	:- 3A	Remarks :- The area is at worst slightly exposed. It is below a 90 metre crest and has local evidence of pruning above 15/20 feet.

SITE NAME	PROFILE NUMBER	SLOPE AND ASPECT	LAND USE	Av Rainfall :- 1220 ATO :- 1531 FC Days :- 238 Climatic grade:- 2	PARENT MARIAL
Middle Quarry St Austell BFCS 3436	2	5°, NE-facing Sheltered	Ploughed		Slate

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	0-20	10YR43	MZCL	2% sst hard, visual	None							None	Slight colour change; indistinct
Sub 1	20-38	10YR44	MCL	2% sst hard, visual	None	Weak MSAB (lot of FSAB rubbish)		Good	V Friable			None	Distinct Colour change
Sub 2	39-90+	7.5YR66 (7.5YR64 below 60 cm)	HCL	2% vsst slate, visual	None	Weak MSAB		Good	Friable			None	
Pit dug to 90 cm; further augering revealed soft micaceous clay (10YR64; strong ochreous weathering colours; 25% vsst, slate)													

Depth to Slowly Permeable Horizon :- Not gleyed	None present	Available Water	Wheat :- Not limiting	Final ALC Grade :- 3A
Wetness Class :- I		Potatoes :-		
Wetness Grade :- 3A		Moisture Deficit	Wheat :-	Main Limiting Factor(s) :- Workability
		Potatoes :-		
		Moisture Balance	Wheat :-	
		Potatoes :-		Remarks :-
RPG0023/WJC		Droughtiness Grade :-		