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North Cornwall District Local Plan
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Agricultural Land Classification

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MAFF

NORTH CORNWALL DISTRICT LOCAL PLAN

AGRICULTURAL LAND CLASSIFICATION

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NORTH CORNWALL DISTRICT LOCAL PLAN

AGRICULTURAL LAND CLASSIFICATION SURVEY

SUMMARY

The survey was carried out by ADAS on behalf of MAFF as part of its statutory role in the preparation of the North Cornwall District Local Plan The fieldwork covered sites at:-

Westheath Road, Bodmin,
Kings Hill, Bude,
Padstow,
Moor Farm, Poughill, Bude
Green Hill, Wadebridge

The detailed survey was completed in February 1996 at a scale of 1:10,000. Data on climate, soils, geology and from previous Agricultural Land Classification (ALC) Surveys was used and is presented in the report. The distribution of grades is shown on the accompanying ALC maps and is summarised below. Information is correct at this scale but could be misleading if enlarged.

Distribution of ALC grades: Westheath Road, Bodmin

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (2.0 ha)
3a	2.0	100	100

The whole site was found to be Subgrade 3a, borderline 3b, with a moderate limitation due to workability. Although evidence of wetness was found, it was not considered sufficient to meet the definition of gleying within 70cm, as would be required to downgrade to 3b.

Distribution of ALC grades: Kings Hill, Bude

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (1.4 ha)
3b	1.4	100	100

The site was strictly assessed as Subgrade 3b, owing to a moderate wetness limitation with 175 Field Capacity days. However the same soil characteristics observed for part of the site could be considered a severe limitation in the presence of only marginally colder and wetter climatic conditions (176 FC days), which would be Grade 4.

Distribution of ALC grades: Padstow

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (4.0 ha)
3a	1.9	33	47
3b	2.1	36	53
Not surveyed	1.8	31	
TOTAL	5.8		

47% of the surveyed site was found to be Subgrade 3a, mainly with a moderate limitation due to droughtiness. The remainder of the site had a more serious limitation due to gradient causing downgrading to Subgrade 3b.

Distribution of ALC grades: Moor Farm, Poughill,

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (2.4 ha)
3a	2.4	100	100

The site was assessed as Subgrade 3a, with variable moderate limitations mainly due to wetness, although the survey also included one boring found to be Grade 2.

Distribution of ALC grades: Green Hill, Wadebridge

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (7.7 ha)
2	3.7	43	48
3a	3.4	39	44
3b	0.6	7	8
Other Land	0.9	10	
TOTAL	8.6		

92% of the agricultural land was found to be best and most versatile with minor limitations due to workability and moderate limitations due to droughtiness. A small part of the site was found to have a more serious moderate limitation due to gradient causing downgrading to Subgrade 3b.

1. INTRODUCTION

An Agricultural Land Classification (ALC) Survey was carried out in February 1996 at 5 sites in North Cornwall on behalf of MAFF as part of its statutory role in the preparation of the North Cornwall District Local Plan. The fieldwork covering 18.4 ha of land was conducted by ADAS at a scale of 1:10,000 with at least one boring per hectare of agricultural land and at least 3 borings per site. A total of 25 auger borings were examined and 5 soil profile pits used to assess subsoil conditions.

The published provisional one inch to the mile ALC maps of this area (MAFF 1961, 1971) show the grades of the sites at a reconnaissance scale as Grade 3 with a small area of Grade 2 at the Wadebridge Site.

None of the sites had been surveyed previously.

The recent survey supersedes any previous information, as it was carried out at a more detailed level and using the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF 1988). These guidelines provide 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 Appendix 2.

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 a lower grade despite other favourable conditions.

Estimates of climatic variables were interpolated from the published agricultural climate dataset (Meteorological Office 1989). The parameters used for assessing overall climate 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 the relevant tables for each site indicate there is no overall climatic limitation except at Bodmin where an overall climatic limitation restricts the land to Grade 2.

Climatic data on Field Capacity Days (FCD) and Moisture Deficits for wheat and potatoes are also shown. These data are used in assessing the soil wetness and droughtiness limitations referred to in later sections.

3. WESTHEATH ROAD, BODMIN SITE

3.1 2.0 hectares of land between Westheath Road and the railway line at Bodmin were surveyed at detailed density in February 1996 by examining 3 auger borings and one soil profile pit.

3.2 Climate

Climatic data for the site was interpolated as described in Section 2. The results are shown below and indicate that there is an overall climatic limitation to Grade 2. However, no local climatic limitations were noted.

Table 1: Climatic Interpolations: Westheath Road

Grid Reference	SX 055663
Altitude (m)	65
Accumulated Temperature (day °)	1557
Average Annual Rainfall (mm)	1179
Overall Climatic Grade	2
Field Capacity Days	231
Moisture deficit (mm): Wheat	85
Potatoes	73

3.3 Relief and Landcover

Altitude ranges from 60 to70m AOD, with both gentle and moderate slopes which are not limiting.

At the time of survey the land was ploughed.

3.4 Geology and Soils

The geology of the site is shown on the published 1:50,000 scale drift geology map, sheet 347, Institute of Geological Sciences 1982, as Middle Devonian Staddon Grit.

The soils were mapped by the Soil Survey of England and Wales in 1983 at a reconnaissance scale of 1:250,000 as Denbigh 2 Association. These are described as well-drained fine loamy soils over slate or slate rubble. This was largely confirmed by the recent survey, although stones of hard rock were also found in the topsoil and upper subsoil.

3.5. Agricultural Land Classification

The distribution of ALC grades is shown in Table 2 and on the accompanying ALC map. This information could be misleading if shown at a larger scale.

Table 2: Distribution of ALC grades: Westheath Road, Bodmin

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (2.0 ha)
3a	2.0	100	100

Subgrade 3a

The four observation points were reasonably consistent, with medium clay loam topsoil and heavy clay loam subsoil becoming increasingly silty with depth. Stone content, mainly shale was found to be variable but at the pit site increased with depth to 43%. All profiles showed some evidence of wetness between 40cm and 70cm, although a close examination in the pit showed that this was marginally insufficient to meet the ALC definition of gleying. Therefore all observation points were assessed as Wetness Class I, wetness grade 3a with a moderate limitation due to restricted workability in the presence of relatively cold and wet climatic influence (231 FC days). Evidence of intermittent iron pan formation was found at auger point 2 and in the pit.

4 KINGS HILL, BUDE SITE

4.1 1.4 hectares of land opposite Kings Hill industrial estate on the south side of Bude was surveyed at detailed density in February 1996 by examining 3 auger borings and one soil profile pit.

4.2 Climate

Climatic data for the site was interpolated as described in Section 2. The results are shown in the table below and indicate that there is no overall climatic limitation. In addition no local climatic limitations were noted.

Table 3: Climatic Interpolations: Kings Hill, Bude

Grid Reference	SS217052	SS217052
Altitude (m)	30	33
Accumulated Temperature (day °)	1576	1573
Average Annual Rainfall (mm)	843	846
Overall Climatic Grade	1	1
Field Capacity Days	175	175
Moisture deficit (mm): Wheat	103	103
Potatoes	95	95

4.3 Relief and Landcover

Altitude ranges from 25 to 35m AOD with gentle to moderate slopes which are not limiting.

At the time of survey landcover was winter oats. The field had recently been drained with random drains at around 1.8m depth.

4.4 *Geology and Soils*

The geology of the site is shown on the published 1:50,000 scale solid and drift geology map, Sheet 323, Institute of Geological Sciences 1974, as Upper Carboniferous, mainly sandstone of the Bude Formation.

The soils were mapped by the soil survey of England and Wales in 1983 at a reconnaissance scale of 1:250,000 as Neath Association. These are described as well drained fine loamy soils often over rock, with small patches of similar soils with slowly permeable subsoils and slight seasonal waterlogging.

Soils found in the current survey were distinctly poorly drained and developed on silty clay parent material, evidently derived from weathering shale.

4.5 Agricultural Land Classification

The distribution of ALC grades is shown in Table 4 and on the accompanying ALC map. This information could be misleading if shown at a larger scale.

Table 4: Distribution of ALC grades: Kings Hill, Bude

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (1.4 ha)
3b	1.4	100	100

Subgrade 3b

The four observation points revealed some variation in topsoil texture with some medium clay loam and some tending to heavy silty clay loam. All were grey-brown in colour (10YR53) and three were assessed as gleyed from the surface with common dark ochreous mottles. All were assessed as Wetness Class IV with a slowly permeable layer starting at around 20cm, although the pit indicated that this may be marginally porous to around 30cm, and extending in every case to at least 50cm.

5 PADSTOW SITE

5.1 4.0 hectares of land at Trevenham Farm were surveyed at detailed density in February 1996 by examining 4 auger sample points and 1 soil profile pit.

A second site to the south of Trecerus Industrial Estate was not surveyed as the owner, Mrs Ingrams, would not permit access. She was not aware that her land was being considered for inclusion in the Local Plan and was indignant that somebody should promote its development without consulting her.

It may be worth noting that a second site at Trevenham Farm, under the same ownership is reported to be currently under consideration for use as a supermarket site. This is part of a field to the north west of Trevenham Farm and was not surveyed at the present time except to note that it has no gradient limitation.

5.2 Climate

Climatic data for the site was interpolated as described in Section 2. The results are shown below and indicate that there is no overall climatic limitation. In addition no local climatic limitations were noted.

Table 5: Climatic Interpolations: Padstow

Grid Reference	SW916748	SW917746
Altitude (m)	50	25
Accumulated Temperature (day °)	1574	1603
Average Annual Rainfall (mm)	903	886
Overall Climatic Grade	1	1
Field Capacity Days	180	178
Moisture deficit (mm): Wheat	98	102
Potatoes	89	94

5.3 Relief and Landcover

Altitude ranges from 15 to 55m AOD with south to south by east facing slopes ranging from gentle to strong.

At the time of survey landcover was grass for grazing by sheep and horses.

5.4 Geology and Soils

The geology of the site is shown on the published 1:50,000 scale solid and drift geology map, Sheet 335-6, Institute of Geological Sciences 1976, as Devonian grey slates.

The soils were mapped by the Soil Survey of England and Wales in 1983 at a reconnaissance scale of 1:250,000 as Powys Association. These are described as shallow well drained loamy soils over rock. This was largely borne out by the current survey.

5.5 Agricultural Land Classification

The distribution of ALC grades is shown in Table 6 and on the accompanying ALC map. This information could be misleading if shown at a larger scale.

Table 6: Distribution of ALC grades: Padstow

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (4.0 ha)
3a	1.9	33	47
3b	2.1	36	53
Not surveyed	1.8	31	
TOTAL	5.8		

Subgrade 3a

Soils examined at five observation points were found to be variable, typically Subgrade 3a with a moderate droughtiness limitation, although one at the top of the slope had a more serious moderate droughtiness limitation borderline 3b. At the foot of the slope one auger boring in a deeper profile showed only a minor droughtiness limitation. However, on such a small area all has been mapped as 3a following the evidence of the pit where accurate assessment of the shale stone content showed a rather higher soil matrix than had been indicated by the auger borings.

Subgrade 3b

A large central part of the site was found to be strongly sloping, a more serious moderate gradient limitation indicating Subgrade 3b.

Other Land

The second site, which was not surveyed, was however observed to be gently sloping and relatively close to the Trecerus site which was surveyed in 1995. This had been found to be a mixture of Subgrade 3a and Grade 2.

6 MOOR FARM, POUGHILL SITE

6.1 2.4 hectares of land, a field to the west of Moor Farm buildings on the north site of Poughill was surveyed at detailed density in February 1996 by examining four auger borings and one soil profile pit.

6.2 Climate

Climatic data for the site was interpolated as described in Section 2. The results are shown below and indicate that there is no overall climatic limitation. In addition no local climatic limitations were noted.

Table 7: Climatic Interpolations: Moor Farm, Poughill

Grid Reference	SS218083	SS219082
Altitude (m)	60	75
Accumulated Temperature (day °)	1541	1524
Average Annual Rainfall (mm)	927	943
Overall Climatic Grade	1	1
Field Capacity Days	190	193
Moisture deficit (mm): Wheat	97	94
Potatoes	87	84

6.3 Relief and Landcover

Altitude ranges from 55 to 70m AOD with mainly gentle and moderate slopes which are not limiting.

At the time of survey landcover was permanent grass for grazing.

6.4 Geology and Soils

The geology of the site is shown on the published 1:50,000 scale solid and drift geology map, Sheet 307-308, Institute of Geological Sciences 1978, as Upper Carboniferous sandstone of the Bude Formation.

The soils were mapped by the Soil Survey of England and Wales in 1983 at a reconnaissance scale of 1:250,000 as Neath Association. These are described as well drained fine loamy soils over rock with small patches of similar soils with slowly permeable subsoils and slight seasonal waterlogging.

These characteristics were largely borne out by the current survey.

6.5 Agricultural Land Classification

The distribution of ALC grades is shown in Table 8 and on the accompanying ALC map. This information could be misleading if shown at a larger scale.

Table 8: Distribution of ALC grades: Moor Farm, Poughill

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (2.4 ha)
3a	2.4	100	100

Subgrade 3a

The five soil observations were somewhat variable, four of them indicating a moderate wetness limitation with three of them having a slowly permeable layer in the lower subsoil, although at variable depth. One boring was found to be Wetness Class I and with medium clay loam topsoil, a minor limitation due to workability, but this was included in the overall assessment as Subgrade 3a.

7 GREEN HILL, WADEBRIDGE SITE

7.1 8.6 hectares of land at Above Town Farm, Green Hill were surveyed at detailed density in February 1996 by examining 11 auger borings and one soil profile pit.

7.2 Climate

The climatic data for the site was interpolated as described in Section 2. The results are shown below and indicate that there is no overall climatic limitation. In addition, no local climatic limitations were noted.

Table 9: Climatic Interpolations: Green Hill, Wadebridge

Grid Reference	SX001724	SX001722
Altitude (m)	50	30
Accumulated Temperature (day °)	1573	1596
Average Annual Rainfall (mm)	1059	1031
Overall Climatic Grade	1	1
Field Capacity Days	209	205
Moisture deficit (mm): Wheat	89	93
Potatoes	78	83

7.3 Relief and Landcover

Altitude ranges from 20 to 50m AOD with mainly gentle and moderate slopes which are not limiting, although one small strip was found to be strongly sloping. To the west of the survey site, the remains of two small fields still in agricultural use appeared to be moderately steep.

Landcover at the time of survey was mainly cereal stubble, although one field had been ploughed and a small area to the south of the buildings was unutilised grass. The survey area was divided into four main field parcels.

7.4 Geology and Soils

The geology of the site is shown on the published 1:50,000 scale solid and drift geology map, Sheet 335-336, Institute of Geological Sciences 1976, as Devonian grey slates with an intrusion of diabase and epidiorite across the site.

The soils were mapped by the Soil Survey of England and Wales in 1983 at a reconnaissance scale of 1:250,000 as Powys Association with Trusham Association on the north slopes of the site. Powys Association is described as shallow well-drained loamy soils over rock developed on slatey mudstone and silt stone, whereas Trusham Association in described as well-drained fine loamy soils over deeply weathered rock developed on basic igneous and metamorphic rocks.

The current survey found the above description of Powys Association developed on Devonian grey slates to be the most generally appropriate. Even where the soil was found to be deeper and redder in colour, as at the pit sites, any stone content was found to be mainly of shale origin.

7.5 Agricultural Land Classification

The distribution of ALC grades is shown in Table 10 and on the accompanying ALC map. This information could be misleading if shown at a larger scale.

Table 10: Distribution of ALC grades: Green Hill, Wadebridge

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (7.7 ha)
2	3.7	43	48
3a	3.4	39	44
3b	0.6	7	8
Other Land	0.9	10	
TOTAL	8.6		

Grade 2

The small area of Grade 2 is found at the top of the hill, including the pit site, with minor limitations mainly due to workability of the medium clay loam topsoils. Assessment of the stone content at the pit site confirmed that despite a considerable stone content, in this case 25% in the upper subsoil increasing to over 60% below 70 cm, the climatic conditions of the site are such that the profile has to be conspicuously shallow before a moderate droughtiness limitation becomes evident.

Laboratory analysis of topsoil texture showed that, at the pit site at least, this was borderline to heavy clay loam, so that the grading of this mapping unit should be regarded as borderline Subgrade 3a.

Subgrade 3a

Much of the rest of the site was found to be mainly Subgrade 3a with a moderate limitation due to droughtiness. Typical profiles showed mainly grey shale from around 40cm similar to Horizon 3 in the pit. However, the mapping unit does include at least one deeper Grade 2 profile.

Subgrade 3b

A small area was found to be a strongly sloping bank with slopes of 8-10°, indicating a more serious moderate limitation due to gradient.

Other land

This category includes sections of road, domestic garden and rough ground, and disused farm buildings.

Resource Planning Team
Taunton Statutory Unit
February 1996

APPENDIX 1

REFERENCES

ADAS Resource Planning Team Reports of Agricultural Land Classification Survey:

1991 Bodmin Planning Guideline Areas, Scale 1:15 000, Ref 23.91

1992 Newton's Margate Farm, Bodmin, Scale 1:10 000, Ref 42.92

1994 North Cornwall District Local Plan. Sites at Bude, Launceston and Wadebridge, Scale 1:10 000, Ref 32-24.94.

1995 Trecerus, Padstow, Scale 1:10 000, Ref 56.95.

INSTITUTE OF GEOLOGICAL SCIENCES (1976), Solid and Drift Edition, Sheet 335-336, Trevose Head and Camelford, 1:50 000.

INSTITUTE OF GEOLOGICAL SCIENCES (1982), Drift Edition, Sheet 347, Bodmin, 1:50,000.

INSTITUTE OF GEOLOGICAL SCIENCES (1974), Solid and Drift Edition, Sheet 323, Holworthy, 1:50,000.

MAFF (1961) Agricultural Land Classification Map, Sheet 185, Provisional 1:63,360 scale.

MAFF (1971) Agricultural Land Classification Map, Sheet 174, Provisional 1:63,360 scale.

MAFF (1988) Agricultural Land Classification of England and Wales Revised Guidelines and Criteria for grading the quality of agricultural land, MAFF Publications, Alnwick.

METEOROLOGICAL OFFICE (1989) Climatological Data for Agricultural Land Classification.

SOIL SURVEY OF ENGLAND AND WALES (1983) Sheet 5, Soils of South West England, 1:250,000 scale.

APPENDIX 2

DESCRIPTION OF GRADES AND SUBGRADES

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 most 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.

Land not surveyed

Agricultural land which has not been surveyed.

Other land

Where other land is shown on recent ALC maps, it may include any of the following categories, which are no longer distinguished:

Urban land: 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 or 'soft' uses where most of the land could be returned relatively easily to agriculture, including: private park land, 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, including 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 including lakes, ponds and rivers as map scale permits.

Source: MAFF (1988) Agricultural Land Classification of England and Wales Revised Guidelines and Criteria for Grading the Quality of Agricultural Land, MAFF Publications, Alnwick.

Other land definition amended January 1996.

APPENDIX 3

DEFINITION OF SOIL WETNESS CLASSES

Wetness Class I

The soil profile is not wet within 70 cm depth for more than 30 days in most years.

Wetness Class II

The soil profile is wet within 70 cm depth for 31-90 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 90 days, but not wet within 40 cm depth for more than 30 days in most years.

Wetness Class III

The soil profile is wet within 70 cm depth for 91-180 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 70 cm for more than 180 days, but only wet within 40 cm depth for between 31 and 90 days in most years.

Wetness Class IV

The soil profile is wet within 70 cm depth for more than 180 days but not within 40 cm depth for more than 210 days in most years or, if there is no slowly permeable layer within 80 cm depth, it is wet within 40 cm depth for 91-210 days in most years.

Wetness Class V

The soil profile is wet within 40 cm depth for 211-335 days in most years.

Wetness Class VI

The soil profile is wet within 40 cm depth for more than 335 days in most years.

Notes: The number of days specified is not necessarily a continuous period. 'In most years' is defined as more than 10 out of 20 years.

Source: Hodgson, J M (in preparation), Soil Survey Field Handbook (revised edition).