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Forest of Dean Local District Plan

AGRICULTURAL LAND CLASSIFICATION
REPORT OF SURVEY

Resource Planning Team
Taunton Statutory Unit

June 1994

ADAS

FOREST OF DEAN DISTRICT LOCAL PLAN

AGRICULTURAL LAND CLASSIFICATION

Report of Survey

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FOREST OF DEAN DISTRICT LOCAL PLAN

AGRICULTURAL LAND CLASSIFICATION

Report of Survey

1. SUMMARY

159.3 ha of land around Coleford, Lydney and Staunton were surveyed in April, May and June 1994 using the MAFF Agricultural Land Classification (ALC). The surveys were carried out on behalf of MAFF as part of its statutory role in the preparation of the Forest of Dean Local Plan.

A report for 8 objector sites around these settlements was submitted in April 1994, but additional adjacent land has now been surveyed to extend the area under consideration and to enable comparison between sites, and this report combines all sites surveyed so far in 1994. The maps and areas also relate to all sites combined.

Fieldwork was carried out by ADAS Resource Planning Team, Taunton Statutory Unit, at a scale of 1:10,000. The information is correct at this scale but any enlargement would be misleading.

The distribution of ALC grades identified in the survey areas is detailed for each site in the appropriate section and illustrated on the accompanying maps.

Distribution of ALC grades: Coleford sites

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (117.6 ha)
Grade 2	60.5	39.6	53.7
3a	29.4	18.4	25.0
3b	24.4	13.7	18.5
4	3.3	2.1	2.8
Urban	2.2	1.4	
Non-agricultural	38.5	24.2	
Ag buildings	1.0	0.6	
TOTAL SURVEY AREA	159.3		

79% of the agricultural land was found to be best and most versatile, with minor and moderate limitations due to wetness and workability with an overall climatic limitation to Grade 2. More serious limitations of wetness and workability caused downgrading of much of the remainder to Subgrade 3b.

Distribution of ALC grades: Lydney sites

Grade	Area (ha)	% of Survey Area	% of Agricultural Land	(79.4ha)
Grade 2	24.3	26.4	30.7	
3a	35.1	38.0	44.1	
3b	20.0	21.7	25.2	
Urban	5.6	6.0		
Non-agricultural	5.5	6.0		
Woodland	1.1	1.2		
Ag buildings	0.7	0.7		
TOTAL SURVEY AREA	92.3			

75% of the agricultural land was found to be best and most versatile, with minor and moderate limitations mainly due to wetness and workability which when more serious cause further downgrading to Subgrade 3b.

Distribution of ALC grades: Staunton sites

Grade	Area (ha)	% of Survey Area	% of Agricultural Land	(4.3 ha)
Grade 1	4.3	60.5	100.0	
Urban	2.8	39.4		
TOTAL SURVEY AREA	7.1			

Agricultural land on these small sites was mapped as Grade 1, although some variation was noted.

2. INTRODUCTION

258.7 ha of land around Coleford, Lydney and Staunton were surveyed in April, May and June 1994 using the MAFF Agricultural Land Classification (ALC). The surveys were carried out on behalf of MAFF as part of its statutory role in the preparation of the Forest of Dean Local Plan.

A report for 8 objector sites around these settlements was submitted in April 1994, but additional land has now been surveyed and this report covers all sites surveyed so far in 1994. The maps and areas also relate to all sites combined.

The fieldwork was carried out by ADAS Resource Planning Team, Taunton Statutory Unit, at a scale of 1:10,000, with one auger sample point approximately every hectare and a soil profile examination pit approximately every 20 ha, a total of 247 auger points and 11 soil pits. Details of the findings of the surveys and the distribution of grades are detailed below for each site. The information is correct at the published scale but any enlargement would be misleading.

The published provisional 1" to one mile ALC maps (MAFF, 1974 etc) show the grades of the sites at a reconnaissance scale, but this is considered inadequate for Local Plan purposes and the recent survey was undertaken to provide a more detailed representation of the agricultural land quality. It supersedes any previous survey. The recent survey also uses the Revised Guidelines and Criteria for Grading the Quality of Agricultural Land (MAFF, 1988).

The Agricultural Land Classification system 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 Appendix 2.

3. 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 obtained for each site by interpolation from the 5-km grid Agricultural Climate Dataset (Meteorological Office, 1989) and are shown in the details for each site.

The parameters used for assessing overall climatic limitation are accumulated temperature, a measure of the relative warmth of a locality, and average annual rainfall, a measure of overall wetness. Climatic data on Field Capacity Days (FCD) and Moisture Deficits for wheat (MDW) and potatoes (MDP) are also shown. These data are used in assessing the soil wetness and droughtiness limitations referred to in later sections. A description of the Soil Wetness Classes used can be found in Appendix 3.

4. COLEFORD

4.1 159.3 ha of land at several sites including 4 objector sites around Coleford were surveyed in April and June 1994 by examining a total of 157 auger borings and 6 soil profile pits. There is no suitable detailed previous survey.

4.2 Climate

Climatic data for the site was interpolated as described in Section 3. The results are shown below and indicate that there is an overall climatic limitation to Grade 2 at all Coleford sites.

Grid Reference		SO 573119	SO 572104
Altitude (m)		220	175
Accumulated Temperature (day °)		1282	1334
Average Annual Rainfall (mm)		952	955
Overall Climatic Grade		2	2
Field Capacity Days		205	206
Moisture deficit (mm):	Wheat	74	79
	Potatoes	56	63

4.3 Relief and Landcover

Altitude ranges from 175 m to 220 m AOD. Slopes are mainly gentle and gently undulating, with 2 small areas of steeper slopes, where gradients exceeding 7° limit the land to Subgrade 3b and gradients exceeding 11° limit the land to Grade 4.

At the time of survey, landcover was mainly grass with some brassica cropping at Owen Farm.

4.4 Geology and Soils

The published 1:50,000 scale solid and drift geology map, sheet 233 (Geological Survey of England and Wales, 1978), indicates that the site is underlain by mixed carboniferous deposits, with sandstone on the higher parts and various deposits of limestone and limestone shale on the lower slopes.

Soils mapped by the Soil Survey of England and Wales (1983) indicate soils of the Neath and Dunkeswick Associations on the northern sites and Neath and Crwbin Associations on the southern sites. Neath soils are described as well drained fine loamy soils, often over rock. Some fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Steep slopes occur locally. Dunkeswick soils are described as slowly permeable seasonally waterlogged fine loamy and fine loamy over clayey soils, associated with similar clayey soils. Crwbin Association is described as very

shallow and shallow well drained loamy soils over limestone, often on steep slopes. Limestone pavement and other rock exposures may be common.

This distribution is largely borne out by the current survey, although part of the Berry Hill Farm site has been restored after opencast mining reported to have taken place some 25 years ago.

4.5 Agricultural Land Classification

The distribution of ALC grades identified in the survey is shown on the accompanying ALC map and summarised in the table below. The information is correct at the scale shown but any enlargement would be misleading.

Distribution of ALC grades: Coleford sites

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (117.6 ha)
Grade 2	60.5	39.6	53.7
3a	29.4	18.4	25.0
3b	24.4	13.7	18.5
4	3.3	2.1	2.8
Urban	2.2	1.4	
Non-agricultural	38.5	24.2	
Ag buildings	1.0	0.6	
TOTAL SURVEY AREA	159.3		

Grade 2

Where disturbed and restored after opencast mining, a variable content of soft sandstone has been included in the subsoil. This was assessed at the pit site by sieving and water displacement and was found not to cause a droughtiness limitation. However, at other auger survey points where the profile had not been disturbed, there may be a slight wetness limitation with gleying evident at variable depths or a slight limitation due to workability where heavier topsoil textures occur. At other points where there is no evident soil limitation, the overall climatic limitation causes downgrading to Grade 2.

At the Owen Farm site several auger borings proved impenetrable at around 50 cm. Examination of a pit in this unit revealed around 50% large sandstone stones at this depth, yet droughtiness is still not the main limitation.

Subgrade 3a

Small areas of Subgrade 3a have been found on the main sites and at Poolway Farm where a minor wetness limitation is indicated by gleying,

giving Wetness Class II or III, with sandy silt loam or medium clay loam topsoil textures. A soil profile pit at the Berry Hill Farm site revealed extensive mottling below 42 cm, but no slowly permeable layer at this point.

The 3a mapping unit at Owen Farm includes isolated 3b profiles where a local SPL appears.

Subgrade 3b

This grade is mapped where slopes are found between 8 and 11°, or where a moderate wetness limitation occurs, with a slowly permeable layer giving rise to Wetness Class IV. The depth at which the SPL is found is locally variable and this mapping unit includes some isolated 3a profiles.

Areas of Grade 3b land in the northern fields at site 495 have been recently planted to amenity woodland, but this is not shown on the ALC map.

Grade 4

Small areas of land with severe limitations due to steeper slopes, in places up to 14°, are found at 2 sites. A small area of low-lying ground with a severe wetness limitation is found at the Poolway Farm site, where a slowly permeable layer giving rise to Wetness Class IV combines with a heavy silty clay loam topsoil texture, but this is a small area and has been included in the 3b mapping unit.

Other Land

Small areas of other land categories relate to residential areas and farm buildings, apart from the Forest Hills Golf Course and a recreation ground near Owen Farm which are shown as non-agricultural land.

5. LYDNEY

5.1 92.3 ha of land at 2 objector sites together with adjacent land at Rodley Manor Farm and at Lydney Golf Course, all lying to the south-east of Lydney was surveyed in April and June 1994 by examining a total of 85 auger borings and 5 soil profile pits. Although the land had been surveyed at 1:25,000 in 1982, this was considered inadequate for present purposes.

5.2 Climate

Climatic data for the site was interpolated as described in Section 3. The results are shown below and indicate that there is no overall climatic limitation. No local climatic limitations were noted.

Grid Reference	SO 652027	SO 644040
Altitude (m)	15	70
Accumulated Temperature (day °)	1517	1454
Average Annual Rainfall (mm)	823	877
Overall Climatic Grade	1	1
Field Capacity Days	184	193
Moisture deficit (mm): Wheat	100	92
Potatoes	92	80

5.3 Relief and Landcover

Altitude ranges from 15 to 70 m AOD.

Slopes are gentle to very gentle and are not limiting, with drainage to the Severn Estuary to the south.

At the time of survey, landcover was mainly grass and winter cereals, with mown amenity grass on the golf course.

Although golf courses are normally regarded as non-agricultural, it is considered that in this case the surface irregularities caused by the bunkers and greens could be reinstated to agricultural use with relatively little earth moving.

5.4 Geology and Soils

The published 1:50,000 scale solid and drift geology map, sheet 233 (Geological Survey of England and Wales, 1978), indicates that the sites are underlain by lower old red sandstone with superficial deposits of river gravels over much of the centre and south of the sites.

Soils mapped by the Soil Survey of England and Wales (1983) indicate soils of the Bromyard Association at the north end of the site, with Whimple 1 and Newnham over the remainder of the sites. Bromyard Association is described

as well drained, reddish fine silty soils over shale and siltstone. Some similar soils with slowly permeable subsoils and slight seasonal waterlogging and some well drained coarse loamy soils over sandstone. Risk of water erosion. Whimple 1 is described as reddish fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging. Associated with similar well drained soils, some over gravel.

Newnham Association is described as well drained reddish coarse and fine loamy soils over gravel, locally deep. Some similar soils may be affected by groundwater.

5.5 Agricultural Land Classification

The distribution of ALC grades identified in the survey is shown on the accompanying ALC map and areas are summarised in the table below. The information is correct at the scale shown but any enlargement would be misleading.

Distribution of ALC grades: Lydney sites

Grade	Area (ha)	% of Survey Area	% of Agricultural Land	(79.4ha)
Grade 2	24.3	26.4	30.7	
3a	35.1	38.0	44.1	
3b	20.0	21.7	25.2	
Urban	5.6	6.0		
Non-agricultural	5.5	6.0		
Woodland	1.1	1.2		
Ag buildings	0.7	0.7		
TOTAL SURVEY AREA	92.3			

Grade 2

Areas mapped as Grade 2 suffer a minor limitation due to difficulties of wetness and workability, as in the centre of the site where a medium clay loam topsoil is found. The droughtiness limitation caused by stone content in the river gravel deposits was less than expected, with maximum stone contents of up to 35% as recorded as pit 1 causing only a minor droughtiness limitation to Grade 2.

Subgrade 3a

Soils classified as Subgrade 3a have a moderate limitation, as described in Appendix 2, commonly due to wetness, where pits reveal a slowly permeable layer in the lower subsoil, Wetness Class III. Other profiles in the south

showed extensive gleying in the subsoil but without a slowly permeable layer, also Wetness Class III.

Subgrade 3b

Areas graded 3b mainly suffer a moderate wetness limitation, the survey revealing a slowly permeable layer at fluctuating levels on the subsoil, generally Wetness Class IV and giving rise to Subgrade 3b when combined with a medium clay loam topsoil.

A small area to the south-west of Crump Farm had a slightly more serious slope limitation.

Other Land

Urban land includes sections of roads, a disused railway, a section of new road under construction which now cuts through the centre of the site, and extended domestic gardens.

Non-agricultural land includes two small areas of woodland and the primary school playing fields.

Agricultural buildings are also shown.

6. STAUNTON

6.1 7.1 ha of land at Staunton were surveyed in April 1994 by examining a total of 5 auger borings. The site had not previously been surveyed in detail.

6.2 Climate

Climatic data for the site was interpolated as described in Section 3. The results are shown below and indicate that there is no overall climatic limitation. No local climatic limitations were noted.

Grid Reference		SO 787291
Altitude (m)		22
Accumulated Temperature (day °)		1494
Average Annual Rainfall (mm)		666
Overall Climatic Grade		1
Field Capacity Days		146
Moisture deficit (mm):	Wheat	111
	Potatoes	104

6.3 Relief and Landcover

Altitude ranges from 20 m to 25 m AOD.

Slopes are gentle to very gentle and are not limiting.

At the time of survey, landcover was mainly grass with some arable cropping.

6.4 Geology and Soils

The published 1:50,000 scale solid and drift geology map, sheet 216 (Geological Survey of England and Wales, 1988), indicates that the sites are underlain by rocks of the Mercia Mudstone Group, previously known as Keuper Marl.

Soils mapped by the Soil Survey of England and Wales (1983) indicate soils of the Whimple 3 Association, reddish fine loamy or fine silty over clayey soils with slowly permeable subsoils and slight seasonal waterlogging.

6.5 Agricultural Land Classification

The distribution of ALC grades identified in the survey is shown on the accompanying ALC map and areas are summarised in the table below. The information is correct at the scale shown but any enlargement would be misleading.

Distribution of ALC grades: Staunton sites

Grade	Area (ha)	% of Survey Area	% of Agricultural Land (43 ha)
Grade 1	4.3	60.5	100.0
Urban	2.8	39.4	
TOTAL SURVEY AREA	7.1		

Grade 1

Although some variation was found between auger borings, these small sites have been mapped as Grade 1.

Other Land

Remaining land was found to be in urban use.

APPENDIX 1

REFERENCES

GEOLOGICAL SURVEY OF ENGLAND AND WALES, 1978, Solid and Drift edition, sheet 233, Monmouth, 1:50,000 scale

GEOLOGICAL SURVEY OF ENGLAND AND WALES, 1988, Solid and Drift edition, sheet 216, Tewkesbury, 1:50,000 scale

MAFF (1967) Agricultural Land Classification Map, sheet 142, Provisional 1:63,360 scale

MAFF (1968) Agricultural Land Classification Map, sheet 143, Provisional 1:63,360 scale

MAFF (1971) Agricultural Land Classification Map, sheet 155, 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), published climatic data extracted from the agroclimatic dataset, compiled by the Meteorological Office

SOIL SURVEY OF ENGLAND AND WALES (1983), sheet 5, Soils of South-west England, 1:250,000 scale

APPENDIX 2

DESCRIPTION OF ALC 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.

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 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

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 landcover types, eg buildings in large grounds, and where may be shown separately. Otherwise, the most extensive cover type will usually be shown.

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

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).

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SOIL PLASTICITY RECORDING SHEET

ANNEX 2

SITE DATA

Grid Ref	SO 641025		Site Name	Lydney Golf Course		LPA	Forest of Dean DC		
AAR	859 mm	ATO 1512		FCD	190	MD (wheat)	99	MD (potatoes)	90

SOIL PIT DATA

	PIT ONE SOIL SERIES Newnham			PIT TWO SOIL SERIES			PIT THREE SOIL SERIES		
DEPTH	TEXTURE	PLASTIC Y/N	COMMENTS	TEXTURE	PLASTIC Y/N	COMMENTS	TEXTURE	PLASTIC Y/N	COMMENTS
10 cm	MZCL	N	Failed to form ball						
20 cm	MZCL	N	Ball failed						
30 cm	C	N	Ball failed						
40 cm	C	N	Cylinder failed						
50 cm	C	N	Cylinder failed						
60 cm	C	Y	3 mm with care						

15.6.94)
P Barnett)

I suggest that the form should identify surveyor and date: this would enable analysis for these variables.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Lydney Golf Course	Pit 1 (ASP 9)	2° NW	PGR	Av Rainfall: 859 mm ATO: 1512 day °C FC Days: 190 Climatic Grade: 1 Exposure Grade:	Lower Old Red Sandstone
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY		SOIL SAMPLE REFERENCES
79.94	15.6.94	SO 641025	P Barnett		PB143

Horizon No.	Lowest Av. Depth (cm)	Texture	Matrix (Ped Face) Colours	Stoniness: Size,Type, and Field Method	Mottling Abundance, Contrast, Size and Colour	Mangan Concs	Structure: Ped Development Size and Shape	Consistence	Structural Condition	Pores (Fissures)	Roots: Abundance and Size	Calcium Carbonate Content	Horizon Boundary: Distinctness and form
1	25	MCL	75YR43	2% >2cm (S) 4% <2cm (S+D) 6% HR	0	0	-	-	-	-	MF, VF	0	Clear smooth
2	57	C	75YR43 (75YR53)	0 (Vis)	CFFOM	C	MCSAB	FM	M	P			
3	90+	C	75YR43 (75YR53)	0 (Vis)	MFFOM	C	WCAB	FM	P	P	FV, VF	0	

Profile Gleyed From: 25

Depth to Slowly Permeable Horizon: 57

Wetness Class: III

Wetness Grade: 3a

VP336-13

Available Water Wheat: 135 mm

Potatoes: 113 mm

Moisture Deficit Wheat: 99 mm

Potatoes: 90 mm

Moisture Balance Wheat: +36 mm

Potatoes: +23 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): We

Remarks:

79-94 FOREST OD DEAN DISTRICT LOCAL PLAN (Hydney)

	HA	ACRES	% AGRICULTURAL LAND	% TOTAL LAND
Grade 1	0.0	0.0	0.0	0.0
Grade 2	24.3	60.2	30.7	26.4
Subgrade 3a	35.1	86.6	44.1	38.0
Subgrade 3b	20.0	49.5	25.2	21.7
Grade 4	0.0	0.0	0.0	0.0
Grade 5	0.0	0.0	0.0	0.0
Total Agri. Land =	79.4	196.3	100	86.1
Urban	5.6	13.8	-	6.0
Non-Agricultural	5.5	13.6	-	6.0
Woodland	1.1	2.7	-	1.2
Ag-Buildings	0.7	1.7	-	0.7
Open Water	0.0	0.0	-	0.0
Land Not Surveyed	0.0	0.0	-	0.0
Total Site Area =	92.3	228.0	-	100.0