8FCS 6359A

16/96

Naas, Lydney

Agricultural Land Classification
May 1996

Resource Planning Team
Taunton Statutory Group
ADAS Bristol

Job Number 16/96
Commission 1178
MAFF Reference EL 14/306

Ministry of Agriculture, Fisheries and Food
Land Use Planning Unit

NAAS, LYDNEY

AGRICULTURAL LAND CLASSIFICATION SURVEY

CONTENTS

		Page
INTRODUCTION		1
SUMMARY		1
CLIMATE		2
RELIEF AND LAND COVER		3
GEOLOGY AND SOILS		3
AGRICULTURAL LAND CLASSIFICATION AND MAP		4
REFERENCES		7
APPENDIX I	Description of the Grades and Subgrades	8
APPENDIX II	Definition of Soil Wetness Classes	10
APPENDIX III	Survey Data:	11
	Sample Point Location Map	
	Pit Descriptions	
	Boring Profile Data	
	Boring Horizon Data	
	Abbreviations and Terms used in Survey Data	

NAAS, LYDNEY

AGRICULTURAL LAND CLASSIFICATION SURVEY

INTRODUCTION

1. This report presents the findings of a semi-detailed Agricultural Land Classification (ALC) survey of 148.2 ha of land around the settlement of Naas, to the South East of Lydney. Field survey was based on 62 auger borings and three soil profile pits, and was completed in April 1996.

2. The survey was conducted by the Resource Planning Team of ADAS Taunton Statutory Group on behalf of the MAFF Land Use Planning Unit as part of its statutory role in the preparation of the Forest of Dean Local Plan.

3. Information on climate, geology and soils, and from previous ALC surveys was considered and is presented in the relevant sections. The published regional ALC map (MAFF, 1977), shows most of the site at a reconnaissance scale as Grade 3 and an area of Grade 2 land to the south of Naas. The western part of the site was previously surveyed in 1982 at a scale of 1:25 000 (ADAS, 1982). The current survey uses the Revised Guidelines and Criteria for grading the quality of agricultural land (MAFF, 1988) and supersedes any previous ALC survey. Grade descriptions are summarised in Appendix I.

4. The land adjacent to the current site, on the other side of the by-pass, has previously been surveyed (ADAS; 1994a, 1994b, 1994c). The findings of these surveys were taken into account during the current survey.

5. At the time of survey land cover was mainly permanent and long-term grassland. Several other fields were being used for winter cereal production. Land which was not surveyed included part of Kears Wood and a couple of copses. Houses and farmsteads were also not surveyed.

SUMMARY

6. The distribution of ALC grades is shown on the accompanying 1:10 000 scale ALC map. The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas. Areas are summarised in the Table 1.

7. Over 80 % of the agricultural land which was surveyed is mapped as best and most versatile, with a quarter of the site being Grades 1 and 2. The non best and most versatile land tends to occur, on the steeper areas and those with poorer drainage conditions, close to Plummer's Brook.

Table 1: Distribution of ALC grades: Naas

Grade	Area (ha)	% Surveyed Area (128.7 ha)
1	20.6	16.0
2	24.4	19.0
3a	61.6	47.9
3b	17.4	13.5
4	4.7	3.7
Other land	19.5	
Total site area	148.2	

8. The block of Grade 1 land has no limitation to its agricultural versatility as the soil is deep and well drained. The Grade 2 land has minor drought and workability limitations to its versatility. These occur where the profiles have increased stone contents in the subsoil, and where there are medium clay loam and medium silty clay loam topsoil textures respectively. The dominant grade of the site is Subgrade 3a where the land has a moderate wetness limitation. This is due to the presence of clayey subsoil horizons which have a low porosity and therefore impede the drainage of the land.

9. The land alongside Plummer's Brook in the Subgrade 3b and Grade 4 areas has moderate and severe wetness limitations respectively. Areas of land with gradients greater then 7° are limited in their versatility due to restrictions on the safe and accurate use of some agricultural machinery. This applies to most of the Subgrade 3b land to the south of Plummer's Brook and all of it to the north of the brook.

CLIMATE

10. Estimates of climatic variables for this site were derived from the published agricultural climate dataset "Climatological Data for Agricultural Land Classification" (Meteorological Office, 1989) using standard interpolation procedures. Data for key points around the site are given in Table 2 below.

11. Since the ALC grade of land is determined by the most limiting factor present, overall climate is considered first because it can have an overriding influence by restricting land to a lower grade despite more favourable site and soil conditions. Parameters used for assessing overall climate are accumulated temperature, a measure of relative warmth and average annual rainfall, a measure of overall wetness. The results shown in Table 2 indicate that there is no overall climatic limitation.

12. Climatic variables also affect ALC grade through interactions with soil conditions. The most important interactive variables are Field Capacity (FC) days which are used in assessing soil wetness and potential Moisture Deficits calculated for wheat and potatoes, which are compared with the moisture available in each profile in assessing soil droughtiness limitations. These are described in later sections.

Table 2: Climatic Interpolations: Naas

Grid Reference		SO 652 032	SO 649 020
Altitude (m)		35	20
Accumulated Temperature (day °C)		1494	1513
Average Annual Rainfall (mm)		837	854
Overall Climatic Grade		1	1
Field Capacity Days		186	189
Moisture deficit (mm):	Wheat	97	99
	Potatoes	88	90

Grid Reference		SO 643 022	SO 654 024
Altitude (m)		10	35
Accumulated Temperature (day °C)		1524	1495
Average Annual Rainfall (mm)		852	837
Overall Climatic Grade		1	1
Field Capacity Days		189	186
Moisture deficit (mm):	Wheat	100	97
	Potatoes	92	88

RELIEF

13. Altitude ranges from 10 metres at Plummer's Brook to 37 metres at Cliff Farm. Most of the land is gently and moderately sloping (gradients of 2-3° and 4-7°) which are not limiting. There are areas of land which are strongly sloping, gradients of 8-9°. These are to the north of Naas Court and Cliff Farm and have a moderate limitation on the agricultural use of the land.

GEOLOGY AND SOILS

14. The underlying geology of the site is shown on the published geology map (IGS, 1974) as comprising mainly of River Gravel from the First and Third Terraces. There is also narrow band of alluvium running along the valley of Plummer's Brook. To either side of the alluvium and to the east of Naas the land is underlain by rocks of the St. Maughan's Group, Old Red Sandstones. A small area to the north of Cliff Farm is also underlain by Old Red Sandstones but from the Raglan Marl group. Evidence from the soil types found in the current survey suggests that the area of River Gravel from the Third Terrace, around Cliff farm and to the north of the dismantled railway line, may not be as distinct from the areas of Old Red Sandstones. Soil types identified as being derived from gravel and alluvium were also found during the survey.

15. Soils were mapped by the Soil Survey of England and Wales (SSEW) at a reconnaissance scale of 1:250 000 (SSEW, 1983). This shows that the site has three main soils types. The land between Crump Farm and Kears Wood consists of soils from the Bromyard Association while the main part of the survey area, from Kears Wood to Naas

Court has soils mapped from the Whimple 1 Association. The land to the south and west of Naas Court contains soils from the Newnham Association. There is also a small area of soils from the Fladbury 1 Association mapped along Plummer's Brook.

16. The soils from the Bromyard Association are described as being well drained reddish fine silty soils over shale and siltstone. Some similar soils have slowly permeable subsoils and slight seasonal waterlogging and others, as in this case, are well drained course loamy soils over limestone. The soils from the Newnham Association are also described as well drained reddish course and fine loamy soils over gravel, some of which can be affected by groundwater. These are in contrast with the reddish fine loamy soils over clayey and slowly permeable subsoils of the Whimple 1 Association which suffer from slight seasonal water logging. The soils along Plummer's Brook, from the Fladbury 1 Association, are described as stoneless clayey soils, in places calcareous, variably affected by groundwater.

17. The soils found during the current survey were very similar to those described by the SSEW. The southern part of the site consists of well drained soils over gravel similar to those of the Newnham Association, with most of the remainder consisting of reddish loams and clays with slowly permeable subsoils from the Whimple 1 Association. A small area of poorly drained clayey soils was found adjacent to Plummer's Brook. The area of better draining soils from the Bromyard Association, in-between Crump Farm and Kears Wood, may be slightly smaller than mapped by the SSEW.

AGRICULTURAL LAND CLASSIFICATION

18. The distribution of ALC grades found by the current survey is shown on the accompanying 1:10 000 scale map and areas are summarised in Table 1. The detail of information shown at this scale is appropriate to the intensity of field survey but could be misleading if enlarged or applied to small areas.

Grade 1

19. The land mapped as Grade 1 has no limitation to its agricultural land use. The profiles typically have medium sandy silt loam topsoils over deep medium sandy loam subsoils, as shown by Pit 1. Some mottling was found in the soil profile pit but this started below 40 cm so the profiles were assessed as Wetness Class I (see Appendix II). Although a few of the auger borings in this mapping unit were impenetrable the soil profile pit showed that the stone content in the lower subsoil was only 23% hard rocks by volume. Due to the relatively low moisture deficit values (see Table 2) for the site this does not cause a droughtiness limitation.

Grade 2

20. The Grade 2 mapping unit adjacent to Naas House is similar to the Grade 1 land. It is also well drained but the profiles typically have medium clay loam topsoils over medium sandy loam subsoils. These topsoils textures interact with the local climate, specifically the FC days, to cause a minor workability limitation. This limits the amount of time during which the soil will be in a suitable condition for cultivation, trafficking by machinery or grazing by livestock is restricted. Therefore the range of agricultural uses will also be slightly restricted. This mapping unit is not completely uniform. There are some small areas of land which have a minor drought limitation where the soil can not fully meet the potential crop moisture

requirement throughout the year. Other small areas have a moderate wetness limitation were the drainage is impaired by the slow porosity of clay subsoils but they can not be mapped at this detail of survey.

21. The land mapped as Grade 2 around Plummer's Farm and to the north of Plummer's Farm also suffers from a combination of minor workability and drought limitations. These profiles are very similar to those around Naas House and those identified during surveys carried out on the northern side of the by-pass in 1994. They have medium clay loam topsoils leading to the workability limitations and increasing amounts of gravel in the lower subsoils causing the drought limitation. A previous soil profile pit (ADAS, 1994a) indicates that the soil horizons can have by volume 16 % hard rock in the topsoil and up to 35 % hard rock in the subsoils. All of the profiles in this mapping unit are well drained and were assessed as Wetness Class I.

Subgrade 3a

22. This is the predominant grade within the survey with the profiles having a moderate wetness limitation. The profiles typically have medium clay loam and medium sandy silt loam topsoils over reddish heavy clay loam upper subsoils and reddish heavy clay loam or clay lower subsoils. The clay horizons were found to have a low porosity which impedes the drainage of the profiles. The amount of ochreous mottling and manganese concretions found in the clay horizon and immediately above it is evidence of this. Typically these slowly permeable layers were found to begin below 55 cm and with the profiles being gleyed above 40 cm they were assessed as Wetness Class III. Soil profile pits 2 and 3 were dug in this mapping unit to confirm the grading.

23. Some of the land mapped as Subgrade 3a to the west of Naas Court is close to being Subgrade 3b. These profiles have slowly permeable layers starting at around 50 cm and are on the borderline between Wetness Classes III and IV. It is possible that at a more detailed level of survey some small areas of Subgrade 3b land would be mapped. Similarly the Subgrade 3a land to the north of the dismantled railway is slightly variable in grade due to the varying depth to the slowly permeable clay. Small areas of Grade 2 and Subgrade 3b land have been included within this mapping unit.

Subgrade 3b

24. The land mapped as Subgrade 3b along the southern side of the working railway mainly has a moderate limitation to its agricultural use due to its gradient. The gradients found during the survey of 8-9° will restrict the safe and accurate use of some agricultural machinery. The small area mapped between the two railway courses near Kears Wood also has a moderate limitation due to gradient.

25. The land immediately south of Naas Crossing, on both sides of Naas Lane has a moderate wetness limitation. They have medium clay loam topsoils over clay subsoils which have a low porosity. These profiles were assessed as Wetness Class IV due to the presence of gleying above 40 cm and the slowly permeable clay horizons typically starting at 45 cm.

Grade 4

26. The two small mapping units of Grade 4 both have severe wetness limitation to their agricultural use. The profiles typically have thin medium clay loam or heavy clay loam topsoils over heavy clay loam and clay subsoils. There is gleying present nearly to the surface and slowly permeable layers start at around 25 cm. They were therefore assessed as Wetness Class IV which in combination with the texture of the top 25 cm of the profiles leads to this grading.

Huw Lloyd Jones
Resource Planning Team
Taunton Statutory Group
ADAS Bristol
14 May 1996

REFERENCES

ADAS RESOURCE PLANNING TEAM, (1982) Agricultural Land Classification Survey of Lydney, Scale 1: 25 000, Reference 25. ADAS Bristol.

ADAS RESOURCE PLANNING TEAM, (1994a) Agricultural Land Classification Survey of Lydney, Scale 1: 10 000, Reference 37/94. ADAS Bristol.

ADAS RESOURCE PLANNING TEAM, (1994b) Agricultural Land Classification Survey of Rodley Manor, Lydney, Scale 1: 10 000, Reference 45/94. ADAS Bristol.

ADAS RESOURCE PLANNING TEAM, (1994c) Agricultural Land Classification Survey of Lydney Golf Course, Scale 1: 10 000, Reference 79/94. ADAS Bristol.

INSTITUTE OF GEOLOGICAL SCIENCES (1974) Sheet 233, Monmouth, 1:50 000 series, Solid and Drift edition. IGS, London.

HODGSON, J M (Ed) (1974) Soil Survey Field Handbook, Technical Monograph No 5. Soil Survey of England and Wales, Harpenden.

HODGSON, J M (In preparation) Soil Survey Field Handbook, Revised edition.

MAFF (1977) 1:250 000 series Agricultural Land Classification, South West Region. MAFF Publications, Alnwick.

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. Meteorological Office, Bracknell.

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

SOIL SURVEY OF ENGLAND AND WALES (1984) Soils and Their Use in South West England, Bulletin No 14. SSEW, Harpenden.

APPENDIX I

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 (e.g. 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.

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

APPENDIX II

DEFINITION OF SOIL WETNESS CLASSES

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile.

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.

APPENDIX III

ABBREVIATIONS AND TERMS USED IN SURVEY DATA

Soil pit and auger boring information collected during ALC survey is held on a computer database and is reproduced in this report. Terms used and abbreviations are set out below. These conform to definitions contained in the Soil Survey Field Handbook (Hodgson, 1974).

1. Terms used on computer database, in order of occurrence.

GRID REF: National 100 km grid square and 8 figure grid reference.

LAND USE: At the time of survey

WHT:	Wheat	**SBT:**	Sugar Beet	**HTH:**	Heathland
BAR:	Barley	**BRA:**	Brassicas	**BOG:**	Bog or Marsh
OAT:	Oats	**FCD:**	Fodder Crops	**DCW:**	Deciduous Wood
CER:	Cereals	**FRT:**	Soft and Top Fruit	**CFW:**	Coniferous Woodland
MZE:	Maize	**HRT:**	Horticultural Crops	**PLO:**	Ploughed
OSR:	Oilseed Rape	**LEY:**	Ley Grass	**FLW:**	Fallow (inc. Set aside)
POT:	Potatoes	**PGR:**	Permanent Pasture	**SAS:**	Set Aside (where known)
LIN:	Linseed	**RGR:**	Rough Grazing	**OTH:**	Other
BEN:	Field Beans	**SCR:**	Scrub		

GRDNT: Gradient as estimated or measured by hand-held optical clinometer.

GLEY, SPL: Depth in centimetres to gleying or slowly permeable layer.

AB (WHEAT/POTS): Crop-adjusted available water capacity.

MB (WHEAT/POTS): Moisture Balance. (Crop adjusted AP - crop potential MD)

DRT: Best grade according to soil droughtiness.

If any of the following factors are considered significant, 'Y' will be entered in the relevant column.

MREL:	Microrelief limitation	**FLOOD:**	Flood risk	**EROSN:**	Soil erosion risk
EXP:	Exposure limitation	**FROST:**	Frost prone	**DIST:**	Disturbed land
CHEM:	Chemical limitation				

LIMIT: The main limitation to land quality. The following abbreviations are used:

OC:	Overall Climate	**AE:**	Aspect	**EX:**	Exposure
FR:	Frost Risk	**GR:**	Gradient	**MR:**	Microrelief
FL:	Flood Risk	**TX:**	Topsoil Texture	**DP:**	Soil Depth
CH:	Chemical	**WE:**	Wetness	**WK:**	Workability
DR:	Drought	**ER:**	Erosion Risk	**WD:**	Soil Wetness/Droughtiness

ST: Topsoil Stoniness

TEXTURE: Soil texture classes are denoted by the following abbreviations:-

S:	Sand	**LS:**	Loamy Sand	**SL:**	Sandy Loam
SZL:	Sandy Silt Loam	**CL:**	Clay Loam	**ZCL**	Silty Clay Loam
ZL:	Silt Loam	**SCL:**	Sandy Clay Loam	**C:**	Clay
SC:	Sandy clay	**ZC:**	Silty clay	**OL:**	Organic Loam
P:	Peat	**SP:**	Sandy Peat	**LP:**	Loamy Peat
PL:	Peaty Loam	**PS:**	Peaty Sand	**MZ:**	Marine Light Silts

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

F: Fine (more than 66% of the sand less than 0.2mm)
M: Medium (less than 66% fine sand and less than 33% coarse sand)
C: Coarse (more than 33% of the sand larger than 0.6mm)

The clay loam and silty clay loam classes will be sub-divided according to the clay content: **M:** Medium (< 27% clay) **H:** heavy (27 - 35% clay)

MOTTLE COL: Mottle colour using Munsell notation.

MOTTLE ABUN: Mottle abundance, expressed as a percentage of the matrix or surface described.

F: few <2% **C:** common 2 - 20% **M:** many 20 - 40% **VM:** very many 40%+

MOTTLE CONT: Mottle contrast

F: faint - indistinct mottles, evident only on close inspection
D: distinct - mottles are readily seen
P: *Prominent - mottling is conspicuous and one of the outstanding features of the* horizon.

PED. COL: Ped face colour using Munsell notation.

GLEY: If the soil horizon is gleyed a 'Y' will appear in this column. If slightly gleyed, an 'S' will appear.

STONE LITH: Stone Lithology - One of the following is used.

HR:	All hard rocks and stones	**SLST:**	Soft oolitic or dolimitic limestone
CH:	Chalk	**FSST:**	Soft, fine grained sandstone
ZR:	Soft, argillaceous, or silty rocks	**GH:**	Gravel with non-porous (hard) stones
MISST:	Soft, medium grained sandstone	**GS:**	Gravel with porous (soft) stones
SI:	Soft weathered igneous or metamorphic rock		

Stone contents are given in % by volume for sizes >2cm, >6cm and total stone >2mm.

STRUCT: The degree of development, size and shape of soil peds are described using the following notation

Degree of development	**WK:**	Weakly developed	**MD:**	Moderately developed
	ST:	Strongly developed		
Ped size	**F:**	Fine	**M:**	Medium
	C:	Coarse	**VC:**	Very coarse
Ped Shape	**S:**	Single grain	**M:**	Massive
	GR:	Granular	**AB:**	Angular blocky
	SAB:	Sub-angular blocky	**PR:**	Prismatic
	PL:	Platy		

CONSIST: Soil consistence is described using the following notation:

L: Loose **VF:** Very Friable **FR:** Friable **FM:** Firm
VM: Very firm **EM:** Extremely firm **EH:** Extremely Hard

SUBS STR: Subsoil structural condition recorded for the purpose of calculating profile droughtiness:

G: Good **M:** Moderate **P:** Poor

POR: Soil porosity. If a soil horizon has poor porosity with less than 0.5% biopores >0.5mm, a 'Y' will appear in this column.

IMP: If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropriate horizon.

SPL: Slowly permeable layer. If the soil horizon is slowly permeable a 'Y' will appear in this column.

CALC: If the soil horizon is calcareous with naturally occurring calcium carbonate exceeding 1% a 'Y' will appear this column.

2. Additional terms and abbreviations used mainly in soil pit descriptions.

STONE ASSESSMENT:

VIS: Visual **S:** Sieve **D:** Displacement

MOTTLE SIZE:

EF: Extremely fine <1mm **M:** Medium 5-15mm

VF:	Very fine 1-2mm>	**C:**	Coarse >15mm
F:	Fine 2-5mm		

MOTTLE COLOUR: May be described by Munsell notation or as ochreous (OM) or grey (GM).

ROOT CHANNELS: In topsoil the presence of 'rusty root channels' should also be noted.

MANGANESE CONCRETIONS: Assessed by volume

N:	None		**M:**	Many	20-40%
F:	Few	<2%	**VM:**	Very Many	>40%
C:	Common	2-20%			

STRUCTURE: Ped Development *

WA:	Weakly adherent	**M:**	Moderately developed
W:	Weakly developed	**S:**	Strongly developed

POROSITY:

P:	Poor - less than 0.5% biopores at least 0.5mm in diameter
G:	Good - more than 0.5% biopores at least 0.5mm in diameter

ROOT ABUNDANCE:

The number of roots per $100cm^2$:		Very Fine and Fine	Medium and Coarse
F:	Few	1-10	1 or 2
C:	Common	10.25	2 - 5
M:	Many	25-200	>5
A:	Abundant	>200	

ROOT SIZE

VF:	Very fine	<1mm	**M:**	Medium	2 - 5mm
F:	Fine	1-2mm	**C:**	Coarse	>5mm

HORIZON BOUNDARY DISTINCTNESS:

Sharp:	<0.5cm	**Gradual:**	6 - 13cm
Abrupt:	0.5 - 2.5cm	**Diffuse:**	>13cm
Clear:	2.5 - 6cm		

HORIZON BOUNDARY FORM: Smooth, wavy, irregular or broken.*

* See Soil Survey Field Handbook (Hodgson, 1974) for details.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
NAAS, LYDNEY	PIT 1 (ASP63)	0°	Winter Wheat	Av Rainfall: 854 mm ATO: 1513 day °C	River Gravels
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 189 Climatic Grade: 1 Exposure Grade: -	SOIL SAMPLE REFERENCES
16/96	23.4.96	SO 651 018	HLJ/GMS		RPT/HLJ/230

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	MZSL	10YR43	<1% HR (VIS)	None	None	-	-	-	Good	CF + VF	-	Abrupt smooth
2	42	MSL	75YR56	1% HR > 2 cm (S) 1% HR < 2 cm (VIS) 2% HR TOTAL	None	None	MCSAB	Friable	Moderate	Good	CVF	-	Clear smooth
3	58	MSL	05YR63	1% HR > 2 cm (VIS) 1% HR < 2 cm (VIS) 2% HR TOTAL	CDFO (7.5YR58)	Common	MCSAB	Friable	Moderate	Good	CVF	-	Gradual smooth
4	110	MSL	05YR54	20%. 2 cm (S) 3% < 2 cm (S + D) 23% HR TOTAL	None	None	MMSAB (MCSAB in places)	Friable	Good	Good	FVF	-	-

Profile Gleyed From: 42 cm

Depth to Slowly Permeable Horizon: No spl

Wetness Class: I

Wetness Grade: 1

Available Water Wheat: 155 mm

Potatoes: 112 mm

Moisture Deficit Wheat: 99 mm

Potatoes: 90 mm

Moisture Balance Wheat: 56 mm

Potatoes: 22 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 1

Main Limiting Factor(s):

Remarks:

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
NAAS, LYDNEY	PIT 2 (ASP 35)	1° North West	PGR	Av Rainfall: 854 mm ATO: 1513 day °C	Old Red Sandstone
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 189 Climatic Grade: 1	SOIL SAMPLE REFERENCES
16/96	23.4.96	SO 653 023	HLJ/GMS	Exposure Grade: -	RPT/HLJ/231

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	26	MCL	7.5YR44	1% HR (VIS)	None	None	-	-	-	Good	MF,VF	-	Gradual wavy
2	50	HCL	7.5YR54	5% HR at top of hozison (VIS)	None	None	MCSAB	Friable	Moderate	Good	MF,VF	-	Gradual smooth
3	68	HCL	05YR54	2% HR (VIS)	CDMO (05YR56)	Common	WCSAB	Friable	Moderate	Good	CVF	-	Below water!
4	100+	HCL	05YR46	None	CDMO (05YR56)	Many	Waterlogged (probably WCSAB with some MCSAB observed)	Friable	Moderate	? Poor	FVF	-	-

Profile Gleyed From: 50 cm

Depth to Slowly Permeable Horizon: 68 cm

Wetness Class: II/III

Wetness Grade: 3a

Available Water Wheat: 153 mm

Potatoes: 114 mm

Moisture Deficit Wheat: 99 mm

Potatoes: 90 mm

Moisture Balance Wheat: 54 mm

Potatoes: 24 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wetness

Remarks: Water seeping into pit above Horizon 4
This horizon is waterlogged therefore the exact structure and porosity were not clearly seen.

SITE NAME	PROFILE NO.	SLOPE AND ASPECT	LAND USE		PARENT MATERIAL
Naas, Lydney	Pit 3 (ASP 38/39)	0°	Fallow (Set-Aside)	Av Rainfall: 854 mm ATO: 1513 day °C	Old Red Sandstone
JOB NO.	DATE	GRID REFERENCE	DESCRIBED BY	FC Days: 189 Climatic Grade: 1	SOIL SAMPLE REFERENCES
16/96	23.4.96	SO 645 022	GMS/HLJ	Exposure Grade:	RPT/GMS/530

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	22	MSZL	05YR42	1% HR (visual)	None	-	-	-	-	Good	CF	-	Abrupt smooth
2	67	HCL	05YR53	5% HR > 2cm (visual)	CDFO (7.5YR58)	Common	WCSAB (to MCSAB)	Friable	Moderate	Good	FVF	-	Clear wavy
3	80+	C	2.5YR46 (2.5YR54)	None	CDMO (Patchy) (7.5YR58)	Few	WCSAB	Firm	Moderate	Poor	FVF	-	-

Profile Gleyed From: 22 cm

Depth to Slowly Permeable Horizon: 67 cm (H3 not gleyed)

Wetness Class: III

Wetness Grade: 3a

Available Water Wheat: 143 mm

Potatoes: 115 mm

Moisture Deficit Wheat: 99 mm

Potatoes: 90 mm

Moisture Balance Wheat: 44 mm

Potatoes: 25 mm

Droughtiness Grade: 1 (Calculated to 120 cm)

Final ALC Grade: 3a

Main Limiting Factor(s): Wetness

Remarks: Water seeping into pit above Horizon 3.