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Hampshire Minerals Plan
Omission Site 11 Adlam's Plantation,
Ibsley
Agricultural Land Classification
ALC Map and Report
November 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

HAMPSHIRE MINERALS PLAN

OMISSION SITE 11 ADLAM'S PLANTATION, IBSLEY

1 Summary

- 1.1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality for a number of sites in Hampshire. The work forms part of MAFF's statutory input to the Hampshire Minerals Plan.
- 1.2 Site 11 comprises approximately 13 hectares of land north of the village of Ibsley in Hampshire. An Agricultural Land Classification (ALC) survey was carried out in November 1994. The survey was undertaken at a detailed level of approximately one boring per hectare. A total of 12 borings and two soil inspection pits were assessed in accordance with MAFF's 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 its use for agriculture.
- 1.3 The work was carried out by members of the Resource Planning Team in the Guildford Statutory Group of ADAS.
- 1.4 At the time of the survey the agricultural land on the site was under grass. The area marked as woodland includes Adlam's Plantation. Areas marked as urban include a tarmac road and a processing site for mineral development.
- 1.5 The distribution of grades and subgrades is shown on the attached ALC map and the areas are given in the table below. The map has been drawn at a scale of 1:10,000. It is accurate at this scale but any enlargement would be misleading. This map supersedes any previous ALC survey information for this site.

Table 1 Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Land
2	1.7	13.4	16.0
3a	8.9	70.1	<u>100%</u> (10.6 ha)
Woodland	1.1	8.6	
Urban	1.0	7.9	
Total area of Site	<u>12.7</u>	<u>100%</u>	

- 1.6 Appendix I gives a general description of the grades, subgrades and land use categories identified in the survey. The main classes are described in terms of the type of limitation that can occur, the typical cropping range and the expected level and consistency of yield.

1 7 The majority of the agricultural land on the site has been classified as Subgrade 3a good quality land with soil droughtiness as the main limitation Soil profiles typically comprise medium sandy loam or medium clay loam topsoils which overlie medium sandy loam or heavy clay loam upper subsoils Lower subsoils tend to comprise gravelly medium sandy loams which are moderately stony becoming very stony with depth The combination of soil textures structures stone contents and the local climatic regime means that there is a moderate restriction on the amount of profile available water for plant growth This will affect the level and consistency of crop yields such that a classification of Subgrade 3a is appropriate due to a droughtiness limitation Towards the east of the site soils become very stony deeper in the profile and therefore the aforementioned restrictions on profile available water are lessened Consequently this land is classified as Grade 2 very good quality due to a slight droughtiness limitation

2 Climate

2 1 The climatic criteria are considered first when classifying land as climate can be overriding in the sense that severe limitations will restrict land to low grades irrespective of favourable site or soil conditions

2 2 The main parameters used in the assessment of an overall climatic limitation are average annual rainfall as a measure of overall wetness and accumulated temperature (degree days Jan-June) as a measure of the relative warmth of a locality

2 3 A detailed assessment of the prevailing climate was made by interpolation from a 5km gridpoint dataset (Met Office 1989) The details are given in the table below and these show that there is no overall climatic limitation affecting the site

2 4 However climatic factors do interact with soil factors to influence soil wetness and droughtiness limitations The climate at this locality is relatively warm and moist in regional terms

2 5 No local climatic factors such as exposure or frost risk are believed to affect the site

Table 2 Climatic Interpolation

Grid Reference	SU 151 098
Altitude (m)	25
Accumulated Temperature (degree days Jan June)	1535
Average Annual Rainfall (mm)	866
Field Capacity (days)	179
Moisture Deficit Wheat (mm)	108
Moisture Deficit Potatoes (mm)	102
Overall Climatic Grade	1

3 Relief

3 1 The site is flat lying at an altitude of 25m AOD

4 Geology and Soils

- 4 1 The relevant geological sheet (BGS 1976) shows the site to be underlain by Valley Gravel
- 4 2 The published Soil Survey map (SSEW 1983) shows the soils on the site to comprise those of the Hucklesbrook association. These are described as well drained coarse loamy and some sandy soils commonly over gravel. Some similar permeable soils affected by groundwater (SSEW 1980)
- 4 3 Detailed field examination found the soils to be well drained typically comprising loamy textures which become sandy and stonier with depth

5 Agricultural Land Classification

- 5 1 Table 1 provides the details of the area measurements for each grade and the distribution of each grade is shown on the attached ALC map
- 5 2 The location of the soil observation points are shown on the attached sample point map

Grade 2

- 5 3 An area of land (1.7ha) towards the south-east of the site has been classified as Grade 2 very good quality land with soil droughtiness as the main limitation. Soil profiles in this mapping unit tend to be deeper than elsewhere on the site proving impenetrable to the auger at depths of between 65-70cm principally as a result of flinty subsoils. Profiles typically comprise medium clay loam or medium sandy loam topsoils and upper subsoils overlying medium sandy loam lower subsoils. Profile stone contents tend to increase with depth with slightly stony (6-10% total flints) topsoils and upper subsoils overlying moderately stony (20% total flints) lower subsoils. Profiles are well drained and are assigned to Wetness Class I. For the purpose of calculating profile available water observations from Pit 1 have been used to estimate soil conditions below the impenetrable depths within this mapping unit. Consequently these soils show a slight restriction upon profile available water due to a combination of soil textures, stone contents and the local climatic regime. This will have an effect upon the level and consistency of crop yields such that a classification of Grade 2 is appropriate.

Subgrade 3a

- 5 4 The majority of the agricultural land on the site has been classified as Subgrade 3a good quality land with soil droughtiness as the main limitation. Soil profiles within this mapping unit proved impenetrable to the auger at depths of between 28-50cm due to stony subsoils. Therefore two soil inspection pits were dug to assess the nature of the subsoils. Pit 1 towards the north of the site found the soil profile to consist of a slightly stony (10% total flints) medium sandy loam topsoil overlying a moderately stony (25% total flints) medium clay loam upper subsoil. The lower subsoil was found to comprise a medium sandy loam with varying stone contents containing 35% total flints from 43-75cm increasing to 45% from 75-120cm. The described soils profile at Pit 2 is relatively similar except that both the topsoil and upper subsoil are of a medium clay loam texture.

and the medium sandy loam lower subsoil is more stony containing 50% total flints Profiles were found to be well drained at both pit locations and were therefore assigned to Wetness Class I

- 5 5 A combination of soil textures structures and the local climatic regime means that at both pit locations there is a restriction upon profile available water which can have an affect upon the level and consistency of crop yields With regard to the impenetrable soil observations elsewhere in this mapping unit it has been assumed that similar soil conditions to those exhibited in the pits prevail below these impenetrable depths Therefore an overall classification of Subgrade 3a is appropriate due to a moderate droughtiness limitation

ADAS Ref 1508/275/94
MAFF Ref EL 15/107

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1976) Sheet No 314 Ringwood 1 50 000 Series (drift edition)

MAFF (1988) Agricultural Land Classification of England and Wales Revised guidelines and criteria for grading the quality of agricultural land

Meteorological Office (1989) Climatological Data for Agricultural Land Classification

Soil Survey of England and Wales (1983) Sheet 6 Soils of South-East England 1 250 000 and accompanying legend

APPENDIX I

DESCRIPTION OF THE 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 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 or horticultural crops can usually be grown but on some land of this 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 land.

Grade 3 Good to Moderate Quality Land

Land with moderate limitations which affect the choice of crops, the timing and type of cultivation, harvesting or the level of yield. When 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 the 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 severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

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 parkland public open spaces sports fields allotments and soft-surfaced areas on airports 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 eg buildings in large grounds and where map scale permits the cover types may be shown separately Otherwise the most extensive cover type will be shown

APPENDIX II

FIELD ASSESSMENT OF SOIL WETNESS CLASS

SOIL WETNESS CLASSIFICATION

Soil wetness is classified according to the depth and duration of waterlogging in the soil profile. Six soil wetness classes are identified and are defined in the table below.

Definition of Soil Wetness Classes

Wetness Class	Duration of Waterlogging ¹
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years ²
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 only wet within 40 cm depth for 30 days in most years
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 present within 80 cm depth it is wet within 70 cm for more than 180 days but only wet within 40 cm depth for between 31-90 days in most years
IV	The soil profile is wet within 70 cm depth for more than 180 days but not wet within 40 cm depth for more than 210 days in most years or if there is no slowly permeable layer present within 80 cm depth it is wet within 40 cm depth for 91-210 days in most years
V	The soil profile is wet within 40 cm depth for 211-335 days in most years
VI	The soil profile is wet within 40 cm depth for more than 335 days in most years

Soils can be allocated to a wetness class on the basis of quantitative data recorded over a period of many years or by the interpretation of soil profile characteristics, site and climatic factors. Adequate quantitative data will rarely be available for ALC surveys and therefore the interpretative method of field assessment is used to identify soil wetness class in the field. The method adopted here is common to ADAS and the SSLRC.

¹The number of days specified is not necessarily a continuous period

²In most years is defined as more than 10 out of 20 years

APPENDIX III

SOIL PIT AND SOIL BORING DESCRIPTIONS

Contents

Soil Abbreviations - Explanatory Note

Soil Pit Descriptions

Database Printout - Boring Level Information

Database Printout - Horizon Level Information

SOIL PROFILE DESCRIPTIONS EXPLANATORY NOTE

Soil pit and auger boring information collected during ALC fieldwork is held on a computer database. This uses notations and abbreviations as set out below.

Boring Header Information

- 1 **GRID REF** National 100 km grid square and 8 figure grid reference
- 2 **USE** Land use at the time of survey. The following abbreviations are used

ARA Arable	WHF Wheat	BAR Barley
CER Cereals	OAT Oats	MZE Maize
OSR Oilseed rape	BFN Field Beans	BRA Brassicae
POT Potatoes	SBF Sugar Beet	FCD Fodder Crops
LIN Linseed	IRT Soft and Top Fruit	FLW Fallow
PGR Permanent Pasture	LEY Ley Grass	RGR Rough Grazing
SCR Scrub	CIW Coniferous Woodland	DCW Deciduous Wood
HTH Heathland	BOG Bog or Marsh	FLW Fallow
PLO Ploughed	SAS Set aside	OTH Other
HRT Horticultural Crops		
- 3 **GRDNT** Gradient as estimated or measured by a hand held optical clinometer
- 4 **GLEYSPL** Depth in centimetres (cm) to gleying and/or slowly permeable layers
- 5 **AP (WHEAT/POTS)** Crop adjusted available water capacity
- 6 **MB (WHEAT/POTS)** Moisture Balance (Crop adjusted AP - crop adjusted MD)
- 7 **DRT** Best grade according to soil droughtiness
- 8 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		
- 9 **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		

Soil Pits and Auger Borings

1 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)

2 MOTTLE COL Mottle colour using Munsell notation

3 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% +

4 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

5 PED COL Ped face colour using Munsell notation

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

7 STONE LITH Stone Lithology - One of the following is used

HR	all hard rocks and stones	SLST	soft oolitic or dolomitic limestone
CH	chalk	FSST	soft fine grained sandstone
ZR	soft argillaceous or silty rocks	GH	gravel with non-porous (hard) stones
MSST	soft medium grained sandstone	GS	gravel with porous (soft) stones
SI	soft weathered igneous/metamorphic rock		

Stone contents (>2cm, >6cm and total) are given in percentages (by volume)

- 8 **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

- 9 **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

- 10 **SUBS STR** Subsoil structural condition recorded for the purpose of calculating profile droughtiness **G** good **M** moderate **P** poor

- 11 **POR** Soil porosity If a soil horizon has less than 0.5% biopores >0.5 mm, a 'Y' will appear in this column

- 12 **IMP** If the profile is impenetrable to rooting a 'Y' will appear in this column at the appropriate horizon

- 13 **SPL** Slowly permeable layer If the soil horizon is slowly permeable a 'Y' will appear in this column

- 14 **CALC** If the soil horizon is calcareous, a 'Y' will appear in this column

- 15 Other notations

APW available water capacity (in mm) adjusted for wheat
APP available water capacity (in mm) adjusted for potatoes
MBW moisture balance wheat
MBP moisture balance potatoes

SAMPLE NO	GRID REF	ASPECT USE	--WETNESS--		-WHEAT-		-POTS-		M REL		EROSN	FROST	CHEM	ALC	COMMENTS
			GRDNT	GLEY SPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	
1	SU15201010	PGR	000		1	1	43	65	43	-59	4			DR 3A	I28 SEE1P
1P	SU15301000	PGR	000		1	1	114	6	88	-14	3A			DR 3A	
2	SU15301010	PGR	000		1	1	59	49	59	-43	3B			DR 3A	I40 SEE1P
2P	SU15200980	PGR	000		1	1	113	5	89	-13	3A			DR 3A	
3	SU15201000	PGR	000		1	1	53	-55	53	-49	4			DR 3A	I35 SEE1P
4	SU15301000	PGR	000		1	1	57	51	57	-45	4			DR 3A	I40 SEE1P
5	SU15401000	PGR	000		1	1	91	17	98	-4	3A			DR 2	I65 SEE1P
6	SU15200990	PGR	000		1	1	71	37	71	-31	3B			DR 3A	I50 SEE2P
8	SU15400990	PGR	000		1	1	94	14	103	1	3A			DR 2	I70 SEE2P
9	SU15100982	PGR	000		1	1	50	58	50	-52	4			DR 3A	I30 SEE2P
10	SU15200980	PGR	000		1	1	66	42/66		-36	3B			DR 3A	I45 SEE2P
11	SU15300980	PGR	000		1	1	55	53	55	-47	4			DR 3A	I37 SEE2P
12	SU15100970	PGR	000		1	1	73	35	73	-29	3B			DR 3A	I50 SEE2P
13	SU15240973	PGR	000		1	1	93	15	101	-1	3A			DR 2	I65 SEE2P

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED COL	--- STONES ---			STRUCT/ CONSIST	SUBS			SPL	CALC
				COL	ABUN	CONT		GLEY	>2	>6		LITH	TOT	STR		
1	0-20	ms1	10YR42 00					0	0	HR	5					
	20-28	ms1	10YR42 00					0	0	HR	15		M			IMP[FLINTS
1P	0-26	ms1	10YR42 00					5	0	HR	10	MDCSAB	FR			
	26-43	mc1	10YR42 43					0	0	HR	25		M			
	43-75	ms1	75YR42 00					0	0	HR	35		M			
	75-120	ms1	75YR43 53					0	0	HR	45		M			GRAVELLY
2	0-22	mc1	10YR42 00					6	0	HR	10					
	22-40	mc1	10YR42 00					0	0	HR	20		M			IMP FLINTS
2P	0-28	mc1	10YR42 00					8	0	HR	11	MDCSAB	FR			
	28-47	mc1	75YR42 00					0	0	HR	25		M			
	47-55	ms1	75YR42 00					0	0	HR	35		M			
	55-120	ms1	75YR42 00					0	0	HR	50		M			GRAVELLY
3	0-23	mc1	10YR42 00					5	0	HR	8					
	23-35	ms1	10YR42 00					0	0	HR	20		M			IMP FLINTS
4	0-25	ms1	10YR42 00					8	0	HR	10					
	25-40	ms1	10YR42 00					0	0	HR	20		M			IMP FLINTS
5	0-26	mc1	10YR42 00					5	0	HR	8					
	26-55	mc1	10YR43 00					0	0	HR	10		M			
	55-65	ms1	10YR43 00					0	0	HR	20		M			IMP FLINTS
6	0-27	ms1	10YR42 00					0	0	HR	8					
	27-42	ms1	10YR42 00					0	0	HR	15		M			
	42-50	ms1	10YR43 00					0	0	HR	25		M			IMP FLINTS
8	0-29	ms1	10YR42 00					0	0	HR	8					
	29-60	mc1	10YR43 00					0	0	HR	10		M			
	60-70	ms1	10YR43 00					0	0	HR	20		M			IMP FLINTS
9	0-30	mc1	10YR42 43					0	0	HR	8					IMP FLINTS
10	0-27	ms1	10YR42 00					0	0	HR	8					
	27-45	hc1	10YR43 00					0	0	HR	20		M			IMP FLINTS
11	0-25	ms1	10YR42 00					0	0	HR	8					
	25-37	hc1	10YR43 00					0	0	HR	20		M			IMP FLINTS
12	0-30	ms1	10YR43 00					0	0	HR	8					
	30-50	mc1	75YR43 00					0	0	HR	20		M			IMP FLINTS
13	0-27	mc1	75YR42 00					0	0	HR	6					
	27-65	mc1	75YR52 00					0	0	HR	10		M			IMP FLINTS

SOIL PIT DESCRIPTION

Site Name HANTS MINS 11 IBSLEY Pit Number 1P

@ ASP 4

Grid Reference SU15301000 Average Annual Rainfall 866 mm
 Accumulated Temperature 1535 degree days
 Field Capacity Level 179 days
 Land Use Permanent Grass
 Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES	2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0 26	MSL	10YR42 00	5		10	HR		MDCSAB	FR		
26 43	MCL	10YR42 43	0		25	HR				M	
43 75	MSL	75YR42 00	0		35	HR				M	
75 120	MSL	75YR43 53	0		45	HR				M	

Wetness Grade 1 Wetness Class I
 Gleying 000 cm
 SPL No SPL

Drought Grade 3A APW 114mm MBW 6 mm
 APP 88 mm MBP -14 mm

FINAL ALC GRADE 3A
 MAIN LIMITATION Droughtiness

SOIL PIT DESCRIPTION

Site Name HANTS MINS 11 IBSLEY Pit Number 2P

Grid Reference SU15200980 Average Annual Rainfall 866 mm
 Accumulated Temperature 1535 degree days
 Field Capacity Level 179 days
 Land Use Permanent Grass
 Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 28	MCL	10YR42 00	8	11	HR					
28- 47	MCL	75YR42 00	0	25	HR				M	
47- 55	MSL	75YR42 00	0	35	HR				M	
55-120	MSL	75YR42 00	0	50	HR				M	

Wetness Grade 1 Wetness Class I
 Gleying 000 cm
 SPL No SPL

Drought Grade 3A APW 113mm MBW 5 mm
 APP 89 mm MBP -13 mm

FINAL ALC GRADE 3A
 MAIN LIMITATION Droughtiness