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Hampshire Minerals Plan
Omission Site 12 Hucklesbridge, Ibsley
Agricultural Land Classification
ALC Map and Report
November 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

HAMPSHIRE MINERALS PLAN
OMISSION SITE 12 HUCKLESBRIDGE, 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 omission sites relating to the Hampshire Minerals and Waste Disposal Plan The work forms part of MAFF s statutory input to the above plan

1 2 Site 12 comprises 9 5 hectares of land to the east of the A338 near the village of South Gorley in the Avon Valley Hampshire An Agricultural Land Classification (ALC) survey was carried out during November 1994 The survey was undertaken at a detailed level of approximately one boring per hectare A total of 10 borings and one soil inspection pit were described 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 a long term limitation 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 in permanent pasture used for grazing by dairy cattle Land mapped as woodland comprises a wooded embankment fringing a stream

1 5 The distribution of grades and subgrades is shown on the attached ALC map and the areas and extent 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

Table 1 Distribution of Grades and Subgrades

Grade	Area (ha)	% of Site	% of Agricultural Land
3a	9 2	96 8	100 0 (9 2 ha)
Woodland	0 3	3 2	
Total area of site	9 5	100 0	

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 All of the agricultural land on the site has been classified as Subgrade 3a (good quality land) with soil droughtiness being the main limitation in terms of land quality This results from comparatively shallow soil depths over gravelly lower horizons Topsoils typically comprise medium clay loams which are slightly stony These overlie similarly textured or slightly heavier subsoils which in association with underlying gravel deposits become increasingly stony with depth

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 However climatic factors do interact with soil properties to influence soil wetness and droughtiness limitations At this locality the field capacity days are relatively high in a regional context High field capacity days increase the likelihood of soil wetness limitations

2 4 No local climatic factors such as exposure or frost risk are believed to affect the site

Table 2 Climatic Interpolation

Grid Reference	SU153106
Altitude (m)	26
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 and lies at approximately 26m AOD

4 Geology and Soil

4 1 British Geological Survey (1976) Sheet 314 Ringwood shows the site to be predominantly underlain by valley gravel with a very small area of alluvium shown in part of the site covered by woodland

4 2 The published Soil Survey map (SSEW 1983 1 250 000) shows soils of the Hucklesbrook association extending across the area underlain by valley gravel These soils are described as well drained coarse loamy and some sandy soils commonly over gravel Some similar permeable soils affected by groundwater Usually on flat land (SSEW 1983) Soils of the Frome association are shown in the area underlain by alluvium These soils are described as shallow calcareous and non calcareous loamy soils over flint gravel affected by groundwater (SSEW 1983)

4 3 Detailed field examination found soils to be broadly consistent with those of the Hucklesbrook association comprising well drained sandy and loamy soils over gravel and gravelly deposits at varying depths

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

Subgrade 3a

5 3 All of the agricultural land surveyed has been classified as Subgrade 3a good quality because of moderate soil droughtiness limitations Profiles typically comprise non calcareous medium sandy loam or medium clay loam topsoils over well drained (Wetness Class I) similarly textured or occasionally heavy clay loam upper subsoils Topsoils are slightly stony containing about 2-5% flints >2cm and 7 12% total flints by volume Upper subsoils tend to be moderately or very stony containing approximately 15 50% total flints by volume Due to underlying gravelly deposits the stony nature of these profiles resulted in many of the auger borings proving impenetrable to a soil auger between about 35 to 80 cm depth Consequently a soil inspection pit (Pit 1) was dug to assess soil properties at depth From Pit 1 it could be seen that lower subsoils comprise medium sandy loams which are very stony containing about 45 50% total flints by volume before passing into pure gravel at about 110 cm depth The presence of flints significantly reduces the available water capacity of the soils and makes them more drought prone The interaction between high soil profile stone contents soil textures and moderate subsoil structural conditions with the prevailing local climate gives a

moderate soil droughtiness limitation using soil moisture balance calculations This may reduce the level and consistency of crop yields meaning that this land can be classified as no higher than Subgrade 3a

ADAS Ref 1508/274/94
MAFF Ref EL15/107

Resource Planning Team
Guildford Statutory Group
ADAS Reading

SOURCES OF REFERENCE

British Geological Survey (1976) Sheet No 314 Ringwood 1 50 000 (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 religous buildings cemetries 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

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

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

APPENDIX III

SOIL PIT AND SOIL BORING DESCRIPTIONS

Contents

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	**WHT**	Wheat	**BAR**	Barley
CER	Cereals	**OAT**	Oats	**MZE**	Maize
OSR	Oilseed rape	**BEN**	Field Beans	**BRA**	Brassicae
POT	Potatoes	**SBT**	Sugar Beet	**FCD**	Fodder Crops
LIN	Linseed	**FRT**	Soft and Top Fruit	**FLW**	Fallow
PGR	Permanent Pasture	**LEY**	Ley Grass	**RGR**	Rough Grazing
SCR	Scrub	**CFW**	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 **GLEY/SPL** 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 dolimitic 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 appropiate 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

SOIL PIT DESCRIPTION

Site Name HANTS MINS OM SITE 12 Pit Number 1P

Grid Reference SU15401060

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	MSL	10YR42 43	5	12	HR		WKCSAB	FR		
28 50	MSL	10YR43 00	10	27	HR			FR	M	
50 70	MSL	10YR44 00	18	46	HR			FR	M	
70 110	MSL	10YR54 00	14	48	HR			FR	M	
110-120	GH	10YR46 00	0	0					P	

Wetness Grade 1

Wetness Class	I
Gleying	cm
SPL	No SPL

Drought Grade 3A

APW	104mm	MBW	-4 mm
APP	84 mm	MBP	-18 mm

FINAL ALC GRADE 3A
MAIN LIMITATION Droughtiness

SAMPLE NO	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	WETNESS CLASS	WETNESS GRADE	WHEAT AP	WHEAT MB	POTS AP	POTS MB	M REL DRT	EROSN FLOOD	FROST EXP	CHEM DIST	ALC LIMIT		COMMENTS
1	SU15401070	PGR					1	2	49	-59	49	-53	4				DR	3B	I30stony Q 3B
1P	SU15401060	PGR					1	1	104	-4	84	-18	3A				DR	3A	PSD=msl s
2	SU15301060	PGR					1	2	84	-24	87	-15	3B				DR	3A	I58stony Re 1P
3	SU15401060	PGR					1	1	83	-25	85	-17	3B				DR	3A	I55stony Re 1P
4	SU15301050	PGR					1	2	148	40	111	9	2				WD	2	Pots limit Ap
5	SU15401050	PGR					1	2	106	-2	108	6	3A				DR	2	I80stony Re 1P
6	SU15201040	PGR					1	2	46	62	46	-56	4				DR	3B	I30stony Q 3B
7	SU15301040	PGR					1	2	79	29	82	20	3B				DR	3A	I55stony Re 1P
8	SU15401039	PGR					1	2	76	-32	76	26	3B				DR	3A	I50stony Re 1P
9	SU15201020	PGR					1	2	76	-32	76	26	3B				DR	3A	I50stony Re 1P
10	SU15301020	PGR					1	2	56	-52	56	46	4				DR	3B	I35stony Q 3B

SAMPLE	DEPTH	TEXTURE	COLOUR	--- MOTTLES --- COL	ABUN	CONT	PED COL	GLEY	----STONES-- 2	6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
1	0-30	mcl	10YR43 00						3	0	HR	10							Imp 30 (x2) stony
1P	0-28	msl	10YR42 43						5	0	HR	12	WKCSAB	FR					field textd mcl
	28-50	msl	10YR43 00						10	0	HR	27		FR	M				field textd mcl
	50-70	msl	10YR44 00						18	0	HR	46		FR	M				field textd hcl
	70-110	msl	10YR54 00						14	0	HR	48		FR	M				field textd scl
	110-120	gh	10YR46 00						0	0		0			P				
2	0-30	mcl	10YR43 00						3	0	HR	10							
	30-50	hcl	10YR43 00						0	0	HR	8			M				
	50-58	mcl	10YR43 56						0	0	HR	35			M				Impen 58 stony
3	0 30	msl	10YR43 00						2	0	HR	8							
	30-55	msl	10YR43 00						0	0	HR	12			M				Impen 55 stony
4	0-30	mcl	10YR43 00						2	0	HR	8							
	30-50	hcl	10YR43 00						0	0	HR	8			M				
	50-120	hcl	10YR43 00						0	0	HR	2			M				
5	0-30	mcl	10YR43 00						2	0	HR	8							
	30 50	mcl	10YR43 00						0	0	HR	7			M				
	50 80	hcl	10YR43 00						0	0	HR	12			M				Impen 80 stony
6	0 25	mcl	10YR43 00						3	0	HR	10							
	25 30	mcl	10YR43 00						0	0	HR	35			M				Impen 35 stony
7	0-25	mcl	10YR43 00						2	0	HR	7							
	25-45	mcl	10YR43 00						0	0	HR	15			M				
	45 55	mcl	10YR43 00						0	0	HR	25			M				Impen 55 stony
8	0-25	mcl	10YR43 00						2	0	HR	8							
	25-50	mcl	10YR43 00						0	0	HR	15			M				Impen 50 stony
9	0-25	mcl	10YR43 00						2	0	HR	8							
	25-50	hcl	10YR43 00						0	0	HR	15			M				Impen 50 stony
10	0-30	mcl	10YR43 00						2	0	HR	8							
	30-35	mcl	10YR43 00						0	0	HR	30			M				Impen 35 stony