

**West Sussex Minerals Plan  
Objector Sites  
MLP 62 Land at Muddleswood,  
Albourne, West Sussex  
Agricultural Land Classification  
August 1995**

**Resource Planning Team  
Guildford Statutory Group  
ADAS Reading**

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**AGRICULTURAL LAND CLASSIFICATION REPORT**  
**WEST SUSSEX MINERALS PLAN - OBJECTOR SITES**  
**MLP 62 LAND AT MUDDLESWOOD**

**Introduction**

1 This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 6.6 ha of land to the south of Albourne near Hurstpierpoint West Sussex. The survey was carried out during August 1995.

2 The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) Land Use Planning Unit Reading in connection with the West Sussex Minerals Plan Objector Sites. The results of this survey supersede previous ALC information for this land.

3 The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group in ADAS. The land has been graded in accordance with the published MAFF ALC guidelines and criteria (MAFF 1988). A description of the ALC grades and subgrades is given in Appendix I.

4 At the time of survey the ground cover was permanent grass. The larger Non agricultural area to the south west of the site comprised a disused pit the floor of which was covered with recently cut scrub vegetation the walls were covered with deciduous scrub. Towards the north of the site a track is also shown as Non agricultural. The open water mapped towards the south of the site is a small artificial pond in an area of disturbed land. At the time of survey soil conditions were dry as little rain had fallen for an extended period.

**Summary**

5 The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10000 it is accurate at this scale but any enlargement would be misleading.

6 The fieldwork was conducted at an average density of 1 boring per hectare. A total of 3 borings and one soil pit were described.

7 The agricultural land at this site has been classified as Subgrade 3a and Subgrade 3b. Principal limitations include soil droughtiness and microrelief. The area of Subgrade 3a land comprises free draining very slightly stony light loamy topsoils and upper subsoils over sandy lower subsoils. In the local climate soils of this nature are moderately drought prone such that there is a likelihood of drought stress affecting plant growth and yield. The area to the extreme south of the site shown as Subgrade 3b has been disturbed possibly as a result of soil dumping from the pit located towards the south west of the site. The land form in this area was highly variable with complex changes of slope angle and direction over short distances this precludes the safe and efficient use of mechanised farm machinery. Therefore this area has limited agricultural potential and is best suited to grazing as such it has been classified as Subgrade 3b due to microrelief constraints which could not easily be rectified by the type of farm machinery that is normally available.

8 The area and proportions of the ALC grades and subgrades on the surveyed land are summarised in Table 1

**Table 1 Area of grades and other land**

Grade/Other land	Area (hectares)	% site area	% agricultural area
3a	4.1	62.1	83.7
3b	0.8	12.1	16.3
Non Agricultural	1.7	25.8	
Open Water	<0.1	<1.0	
<hr/>			
Total survey area	4.9		100.0
Total site area	6.6	100.0	

### Climate

9 Climate affects the grading of land through the assessment of an overall climatic limitation and also through interactions with soil characteristics

10 The key climatic variables used for grading this site are given in Table 2 and were obtained from the published 5km grid datasets using standard interpolation procedures (Met Office 1989)

**Table 2 Climatic and altitude data**

Factor	Units	Values
Grid reference	N/A	TQ 269 154
Altitude	m AOD	35
Accumulated Temperature	day°C	1496
Average Annual Rainfall	mm	856
Field Capacity Days	days	180
Moisture Deficit Wheat	mm	108
Moisture Deficit Potatoes	mm	101

11 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

12 The main parameters used in the assessment of an overall climatic limitation are average annual rainfall (AAR) as a measure of overall wetness and accumulated temperature (ATO January to June) as a measure of the relative warmth of a locality

13 The combination of rainfall and temperature at this site mean that there is no overall climatic limitation. Local climatic factors such as exposure and frost risk are not believed to significantly affect the site. The site is climatically Grade 1.

#### Site

14 The site lies at an altitude of approximately 35m AOD with the highest land to the north west. The land falls towards the east and south of the site. Nowhere on the site does gradient, microrelief or flooding affect the agricultural land quality.

#### Geology and soils

15 The published geological information for the site (BGS 1984) shows the majority to the west to be underlain by Folkestone Beds with a small area of Gault clay shown towards the south.

16 The published soils information for the site (SSEW 1983) shows the site to be underlain by soils of the Fyfield 4 Association. These are described as deep well drained often stoneless coarse loamy and sandy soils. Some fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging and some slowly permeable seasonally waterlogged fine loamy over clayey soils. Risk of water erosion (SSEW 1983). Soils of the coarse loamy and sandy type were found on the site.

#### Agricultural Land Classification

17 The details of the classification of the site are shown on the attached ALC map and the area statistics of each grade are given in Table 1 page 1.

18 The location of the auger borings and pits is shown on the attached sample location map and the details of the soils data are presented in Appendix III.

#### *Subgrade 3a*

19 Land of good quality has been mapped over the majority of the site. The principal limitation is soil droughtiness.

20 Soils in this area commonly comprise a very slightly stony (up to 5% total v/v hard sandstone) non calcareous medium sandy loam or medium sandy silt loam topsoil. This passes to a stoneless to very slightly stony (up to 3% total v/v sandstone) medium sandy loam or loamy medium sand upper subsoil horizon which was occasionally gleyed. Underlying this is a stoneless loamy medium sand or medium sand lower subsoil from between 45 and 55cm which may be gleyed on occasion. In the local climate soils of this nature when gleyed are placed in Wetness Class II (see Appendix II) but due to the light nature of the topsoil and its consequent easy workability status this places no limitation on land quality. The main limitation to land quality are the light soil textures encountered throughout the profile. These lead the soils to be moderately drought prone and subsequently Subgrade 3a has been applied on the basis of soil droughtiness which affects plant growth and consequent yield potential.

*Subgrade 3b*

21 Land of moderate quality has been mapped over the remainder of the site towards the south. In this area a microrelief limitation predominates.

22 The land in this part of the site has, it is believed, been subject to disturbance in the past. The land has complex changes of slope angle and direction over short distances in the form of deep ridges and furrows. This leads to restrictions in the versatility of the land, as it is unlikely that it would be possible for mechanised cultivation equipment to be safely or effectively used in this area. As such, this area of the site has a limited potential, being best suited to permanent grazing. This could be carried out for much of the year, given the generally free draining soil type encountered elsewhere on the site. Therefore, this area of the site has been classified as being of moderate quality, on the basis of a microrelief limitation which could not readily be removed using normally available farm machinery.

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## SOURCES OF REFERENCE

British Geological Survey (1984) *Sheet 318/333 Brighton and Worthing Solid and Drift Edition 1:50 000* BGS London

Ministry of Agriculture Fisheries and Food (1988) *Agricultural Land Classification of England and Wales Revised guidelines and criteria for grading the quality of agricultural land* MAFF London

Met Office (1989) *Climatological Data for Agricultural Land Classification*  
Met Office Bracknell

Soil Survey of England and Wales (1983) *Sheet 6 Soils of South East England 1:250 000*  
SSEW Harpenden

Soil Survey of England and Wales (1984) *Soils and their Use in South East England Bulletin No 15* SSEW Harpenden

## APPENDIX I

### DESCRIPTIONS 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 (e.g. 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 (e.g. 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 e.g. 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

### SOIL WETNESS CLASSIFICATION

#### Definitions of Soil Wetness Classes

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.

Wetness Class	Duration of waterlogging <sup>1</sup>
I	The soil profile is not wet within 70 cm depth for more than 30 days in most years <sup>2</sup>
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

#### Assessment of Wetness Class

Soils have been allocated to wetness classes by the interpretation of soil profile characteristics and climatic factors using the methodology described in *Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land* (MAFF 1988).

<sup>1</sup> The number of days is not necessarily a continuous period

<sup>2</sup> In most years is defined as more than 10 out of 20 years

**APPENDIX III**

**SOIL DATA**

**Contents**

**Sample location map**

**Soil abbreviations - Explanatory Note**

**Soil Pit Descriptions**

**Soil boring descriptions (boring and horizon levels)**

**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

<b>ARA</b>	Arable	<b>WHT</b>	Wheat	<b>BAR</b>	Barley
<b>CER</b>	Cereals	<b>OAT</b>	Oats	<b>MZE</b>	Maize
<b>OSR</b>	Oilseed rape	<b>BEN</b>	Field Beans	<b>BRA</b>	Brassicae
<b>POT</b>	Potatoes	<b>SBT</b>	Sugar Beet	<b>FCD</b>	Fodder Crops
<b>LIN</b>	Linseed	<b>FRT</b>	Soft and Top Fruit	<b>FLW</b>	Fallow
<b>PGR</b>	Permanent Pasture	<b>LEY</b>	Ley Grass	<b>RGR</b>	Rough Grazing
<b>SCR</b>	Scrub	<b>CFW</b>	Coniferous Woodland	<b>DCW</b>	Deciduous Wood
<b>HTH</b>	Heathland	<b>BOG</b>	Bog or Marsh	<b>FLW</b>	Fallow
<b>PLO</b>	Ploughed	<b>SAS</b>	Set aside	<b>OTH</b>	Other
<b>HRT</b>	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

<b>MREL</b>	Microrelief limitation	<b>FLOOD</b>	Flood risk	<b>EROSN</b>	Soil erosion risk
<b>EXP</b>	Exposure limitation	<b>FROST</b>	Frost prone	<b>DIST</b>	Disturbed land
<b>CHEM</b>	Chemical limitation				

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

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

## Soil Pits and Auger Borings

1 **TEXTURE** soil texture classes are denoted by the following abbreviations

<b>S</b>	Sand	<b>LS</b>	Loamy Sand	<b>SL</b>	Sandy Loam
<b>SZL</b>	Sandy Silt Loam	<b>CL</b>	Clay Loam	<b>ZCL</b>	Silty Clay Loam
<b>ZL</b>	Silt Loam	<b>SCL</b>	Sandy Clay Loam	<b>C</b>	Clay
<b>SC</b>	Sandy Clay	<b>ZC</b>	Silty Clay	<b>OL</b>	Organic Loam
<b>P</b>	Peat	<b>SP</b>	Sandy Peat	<b>LP</b>	Loamy Peat
<b>PL</b>	Peaty Loam	<b>PS</b>	Peaty Sand	<b>MZ</b>	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

<b>F</b>	Fine (more than 66% of the sand less than 0.2mm)
<b>M</b>	Medium (less than 66% fine sand and less than 33% coarse sand)
<b>C</b>	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 **GLEYS** 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

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

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



SOIL PIT DESCRIPTION

Site Name WSUSSEX MINS OBJ MLP62 Pit Number 1P

Grid Reference TQ26801540  
 Average Annual Rainfall 856 mm  
 Accumulated Temperature 1496 degree days  
 Field Capacity Level 180 days  
 Land Use Permanent Grass  
 Slope and Aspect 02 degrees E

HORIZON	TEXTURE	COLOUR	STONES	2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0 30	MSL	10YR42 00	0		3	HR					
30- 47	LMS	10YR54 00	0		3	HR		MDCAB	FM	M	
47 62	MS	10YR54 00	0		0			WKMSAB	VF	M	
62 120	MS	10YR62 00	0		0			SGLGRN	VF	M	

Wetness Grade 1  
 Wetness Class I  
 Gleying cm  
 SPL cm

Drought Grade 3A  
 APW 91 mm MBW -17 mm  
 APP 74 mm MBP 27 mm

FINAL ALC GRADE 3A  
 MAIN LIMITATION Droughtiness

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SAMPLE ID	GRID REF	ASPECT USE	GRDNT	SPL	- WETNESS -		-WHEAT-		-POTS-		M REL		EROSN	FROST	CHEM	ALC	COMMENTS
					CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	LIMIT		
1	TQ26801540	PGR E	02		1	1	90	-18	73	-28	3A				DR	3A	
1P	TQ26801540	PGR E	02		1	1	91	-17	74	-27	3A				DR	3A	PIT 80 AUG 120
2	TQ26901540	PGR E	02		1	1	84	-24	84	-17	3B				DR	3A	IMP STONE 50
5	TQ26961527	PGR S	02	30	2	1	115	7	97	4	2				DR	2	

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES -- - PED			---STONES---			STRUCT/ SUBS							
				COL	ABUN	CONT	COL	GLE	2	6	LITH	TOT	CONSIST	STR	POR	IMP	SPL
1	0-30	ms1	10YR42 00						0	0	HR	5					
	30-45	lms	10YR54 00						0	0	HR	3				M	
	45-75	ms	10YR66 00						0	0		0				M	
	75-120	ms	10YR71 00						0	0		0				M	
1P	0 30	ms1	10YR42 00						0	0	HR	3					
	30 47	lms	10YR54 00						0	0	HR	3	MDCAB	FM	M		
	47-62	ms	10YR54 00						0	0		0	WKMSAB	VF	M		
	62-120	ms	10YR62 00						0	0		0	SGLGRN	VF	M		
2	0-30	msz1	10YR42 00						0	0	HR	3					
	30-50	ms1	10YR44 54						0	0	HR	5				M	IMP STONE 50
5	0-30	ms1	10YR42 00						0	0	HR	5					
	30-55	ms1	10YR42 52	10YR56	00	C		Y	0	0		0				M	
	55-90	lms	10YR53 00	10YR56	00	C		Y	0	0		0				M	
	90-120	lms	10YR63 73	10YR58	00	M		Y	0	0		0				M	