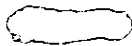


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NEA FARM, SOMERLEY, HAMPSHIRE
SOIL PHYSICAL CHARACTERISTICS
SOIL RESOURCE MAPS AND REPORT



NEA FARM, SOMERLEY, HAMPSHIRE : AGRICULTURAL LAND CLASSIFICATION

1. In March 1993 an Agricultural Land Classification (ALC) survey was conducted on 64 hectares of land on the Somerley Estate north of Ringwood in Hampshire. ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on the quality of agricultural land affected by an application to extract minerals.

The survey was carried out using MAFF's revised guidelines and criteria for classifying the quality of agricultural land. These guidelines allow land to be graded according to the extent to which its physical or chemical characteristics impose long term limitations on its use for agriculture. The details of the findings are given in the attached appendix and the distribution of the grades and sub-grades is shown on the attached ALC map. The map has been drawn at a scale of 1:10,000 and is accurate at this level but any enlargement may be misleading.

Agricultural Land Classification and soil handling recommendations were submitted as part of the planning application and ADAS's field work therefore took the form of a check of the soil types and their distribution as identified by the consultants. A total of 6 soil pits were examined in detail across the site with supplementary borings.

The majority of the site has been classified as high quality land, mostly grade 2, with soil droughtiness as the single most limiting factor.

Table 1: Distribution of Grades and Sub-grades

<u>Grade</u>	<u>Area (ha)</u>	<u>% of Agricultural Area</u>
2	56.1	90.5
3b	3.7	6.0
4	2.2	<u>3.5</u>
Non Agric	2.0	100% (62.0 ha)
Urban	<u>0.2</u>	
TOTAL	64.2 ha	

2. Climate : A detailed estimate of the prevailing climate was made by interpolation from a 5 km gridpoint dataset. 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 and soil conditions.

The main parameters used in the assessment of the climatic limitation are average annual rainfall, as a measure of overall wetness; and accumulated temperature, as a measure of the relative warmth of a locality.

The details of the interpolation are given in the table below and show that there is no overall climatic limitation affecting the site. However, the high local moisture deficits are an important factor in determining the amount of water available in the profile for extraction by crops.

No local climatic factors are felt to be significant on the site.

Table 2: Climatic Interpolation

Grid Reference	SU127088
Altitude (m)	47
Average Annual Rainfall (mm)	872
Accumulated Temperature (°days)	1512
Field Capacity (days)	180
Moisture Deficit, Wheat (mm)	108
Moisture Deficit, Potatoes (mm)	101
Overall Climatic Grade	1

3. The attached soil pit descriptions reveal the variation in soil that occurs across the site. Five of the six pits have been technically classified as Grade 1 with most profiles consistently exhibiting Medium Sandy Loam topsoil textures overlying light subsoils of Medium Sandy Loam which occasionally become heavier with depth, grading into Sandy Clay Loam lower subsoils. This textural assessment differs from that of the developer's consultant but the ADAS grading has been verified by laboratory analysis of the particle size distribution of two topsoil and two subsoil samples, taken from pits 4 and 6. The consultant's assessment relates to much lighter sandier soils throughout the profile which cause a much greater proportion of the site to be downgraded to Sub-grade 3B. The area has been conservatively classified by ADAS as Grade 2 due to possible variations in lower subsoil stone contents and variations in the sandiness of horizons. Soil droughtiness is the key limitation across the majority of the site; there is a slight restriction on the amount of available water present in the soil for extraction by roots.

An area of Sub-grade 3b land has been identified in the extreme west which picks out a sandy knoll where profiles are extremely sandy from the surface (Medium Sand), occasionally with stony horizons which combine to significantly restrict the amount of available water in the profile and cause a significant droughtiness limitation.

Two areas of Grade 4 land has been identified. The northern area, is an area where gradients are locally limiting (in excess of 11°). The eastern area of Grade 4 identifies an area of disturbed land which may have previously been used as a stone pit and which now has locally high levels of topsoil stone contents and areas where topsoil is missing. This area is no better than Grade 4.

NEA FARM, SOMERLEY, HAMPSHIRE
SOIL PHYSICAL CHARACTERISTICS

The attached Soil Resource maps describe the distribution of the main topsoils and subsoils across the site.

Two main soil types occur, each possessing topsoil, upper subsoil and lower subsoil layers.

'Topsoil' relates to the darker, more organic-rich surface horizons, generally extending to 25 cm depth, with lighter, organic-poor 'subsoil' layers beneath.

Map Unit A : Topsoils are typically Medium or Fine Sandy Loams and contain very low percentage stone contents (approximately 2%, greater than 2 cm). They exhibit dark greyish brown colours (10YR42) and show no evidence of surface wetness or compaction. Topsoil structures are Sub-angular Blocky in shape and may be coarse or medium in size and moderate or weak in terms of development.

This topsoil extends to 25 cm and covers 57.2 hectares, providing a total volume of 143,000m³.

The upper subsoil resource is typically a Medium Sandy Loam or Sandy Clay Loam, 45 cm thick, extending down to approximately 70 cm. Negligible stone contents occur in these brown and dark brown horizons (7.5YR42-54, 10YR54) which show no evidence of any soil wetness. Structures are typically moderately developed coarse Sub-angular blocky. A total volume of 252,450m³ is available.

The lower subsoil resource is heavier in nature than the horizon above and should be handled separately. Sandy Clay Loam and Sandy Clay textures predominate, with stone contents varying up to 40%. This soil resource extends to 120 cm; no gravel (+70% stone) layers occur on the site. Given the degree of stone present in some subsoils, the structures have been described as 'moderate' for the purposes of water holding capacity. A total lower subsoil resource of 280,550m³ is present in this map unit. The soils are placed in Wetness Class I (ie. the soil profile is not wet within 70 cm for more than 30 days in most years).

Map Unit B : This soil type is significantly sandier throughout than adjacent soils, and is located on a sandy knoll in the west of the site. Topsoil textures are Medium Sands, dark greyish brown in colour with weakly developed medium Sub-angular Blocky structures. This soil type extends over 3.7 hectares, providing a topsoil resource of 9,250m³.

A deep upper subsoil layer is present between 25-100 cm depth, which is a brown Medium Sand with a weakly developed fine Sub-angular Blocky structure, showing no evidence of compaction or wetness. This provides a resource of 27,750m³.

The lower subsoil of this soil type is a Sandy Clay Loam texture that extends to at least 120 cm and is brown in texture, free-draining with a moderately developed coarse Sub-angular Blocky structural condition. This represents a resource of 7,400m³.

The soils of this map unit are placed in Wetness Class I.

Nea Farm, Somerley, Hampshire

APPENDIX I

SOIL PIT DESCRIPTIONS

SOIL PIT DESCRIPTION

Site Name : NEA FM, SOMERLEY, HANTS Pit Number : 1P

Grid Reference: SU130 087 Average Annual Rainfall : 872 mm
 Accumulated Temperature : 1512 degree days
 Field Capacity Level : 180 days
 Land Use : Bare Soil
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 20	MSL	10YR42 00	0	2		WKMSAB
20- 50	SCL	10YR43 00	0	1		MDCSAB
50- 82	FSL	10YR43 00	0	2		MDCSAB
82-120	SC	10YR54 00	0	40		

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

Drought Grade : 1 APW : 142mm MBW : 34 mm
 APP : 113mm MBP : 12 mm

FINAL ALC GRADE : 1
 MAIN LIMITATION :

SOIL PIT DESCRIPTION

Site Name : NEA FM, SOMERLEY, HANTS Pit Number : 2P

Grid Reference: SU128 089 Average Annual Rainfall : 872 mm
 Accumulated Temperature : 1512 degree days
 Field Capacity Level : 180 days
 Land Use : Bare Soil
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 25	MSL	10YR42 00	0	2		WCSAB
25- 55	MSL	75YR42 00	0	1		MCSAB
55-100	FSL	10YR54 00	0	0		MCSAB
100-120	SCL	75YR54 00	0	0		MCSAB

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

Drought Grade : 1 APW : 163mm MBW : 55 mm
 APP : 113mm MBP : 12 mm

FINAL ALC GRADE : 1
 MAIN LIMITATION :

SOIL PIT DESCRIPTION

Site Name : NEA FM, SOMERLEY, HANTS Pit Number : 3P

Grid Reference: SU127 087 Average Annual Rainfall : 872 mm
 Accumulated Temperature : 1512 degree days
 Field Capacity Level : 180 days
 Land Use : Arable
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 25	F8L	10YR42 00	0	2		WKMSAB
25- 55	F8L	75YR42 00	0	0		MDCSAB
55-100	SC	75YR54 00	0	0		MDCSAB
100-120	SGL	10YR54 00	0	1		MDCSAB

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

Drought Grade : 1 APW : 160mm MBW : 52 mm
 APP : 121mm MBP : 20 mm

FINAL ALC GRADE : 1
 MAIN LIMITATION :

SOIL PIT DESCRIPTION

Site Name : NEA FM, SOMERLEY, HANTS Pit Number : 4P

Grid Reference: SU129 083 Average Annual Rainfall : 872 mm
 Accumulated Temperature : 1512 degree days
 Field Capacity Level : 180 days
 Land Use : Permanent Grass
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 23	MSL	10YR42 00	0	2		MCSAB
23- 55	MSL	75YR42 00	0	0		WCSAB
55- 70	MSL	75YR54 00	0	1		MCSAB
70-120	SC	75YR54 68	0	10		

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

Drought Grade : 1 APW : 152mm MBW : 44 mm
 APP : 115mm MBP : 14 mm

FINAL ALC GRADE : 1
 MAIN LIMITATION :

SOIL PIT DESCRIPTION

Site Name : NEA FM, SOMERLEY, HANTS Pit Number : 5P

Grid Reference: SU124 088 Average Annual Rainfall : 872 mm
 Accumulated Temperature : 1512 degree days
 Field Capacity Level : 180 days
 Land Use : Bare Soil
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 23	MSL	10YR42 00	0	1		WDMSAB
23- 60	MSL	75YR42 00	0	0		MDCSAB
60- 90	MSL	10YR54 00	0	2		MDCSAB
90-120	MSL	10YR53 00	0	40		

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

Drought Grade : 2 APW : 143mm MBW : 35 mm
 APP : 109mm MBP : 8 mm

FINAL ALC GRADE : 2
 MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : NEA FM, SOMERLEY, HANTS Pit Number : 6P

Grid Reference: SU124 086 Average Annual Rainfall : 872 mm
 Accumulated Temperature : 1512 degree days
 Field Capacity Level : 180 days
 Land Use :
 Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	MOTTLES	STRUCTURE
0- 27	MS	10YR42 00	0	0		WMSAB
27- 48	MS	10YR54 00	0	0		WFSAB
48-100	MS	10YR73 00	0	0		WFSAB
100-120	SCL	75YR54 00	0	0		MCSAB

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

Drought Grade : 3B APW : 085mm MBW : -23 mm
 APP : 056mm MBP : -45 mm

FINAL ALC GRADE : 3B
 MAIN LIMITATION : Droughtiness

Laboratory Results, Particle Size Distributions (%)

Particle Size	Pit 4 Topsoil	Pit 6 Topsoil	Pit 6 Upper Subsoil	Pit 6 Lower Subsoil
Coarse Sand	4	4	4	4
Medium Sand	28	48	56	50
Fine Sand	32	36	35	40
Silt	27	9	4	5
Clay	9	3	1	1
Organic Matter	2.8	2.0	0.3	0.5
TEXTURE	MSL	MS	MS	MS

program: ALC011

COMPLETE LIST OF PROFILES 04/28/93 NEA FM, SOMERLEY, HANTS

-----MOTTLES----- PED -----STONES----- STRUCT/ SUBS
 COL ABUN CONT COL. GLEY >2 >6 LITH TOT CONSIST STR POR IMP SPL CALC

SAMPLE	DEPTH	TEXTURE	COLOUR	COL	ABUN	CONT	COL.	GLEY	>2	>6	LITH	TOT	CONSIST	STR	POR	IMP	SPL	CALC
1P	0-20	ms1	10YR42 00						0	0	HR	2	WKMSAB	VF				
	20-50	sc1	10YR43 00						0	0	HR	1	MDCSAB	FR	M			
	50-82	fs1	10YR43 00						0	0	HR	2	MDCSAB	FR	M			
	82-120	sc	10YR54 00						0	0	HR	40				M		
2P	0-25	ms1	10YR42 00						0	0	HR	2	WCSAB	FR				
	25-55	ms1	75YR42 00						0	0	HR	1	MCSAB	FR	M	Y		
	55-100	fs1	10YR54 00						0	0		0	MCSAB	FR	M	Y		
	100-120	sc1	75YR54 00						0	0		0	MCSAB	FR	M	Y		
3P	0-25	fs1	10YR42 00						0	0	HR	2	WKMSAB	FR				
	25-55	fs1	75YR42 00						0	0		0	MDCSAB	FR	M			
	55-100	sc	75YR54 00						0	0		0	MDCSAB	FM	M			
	100-120	sc1	10YR54 00						0	0	HR	1	MDCSAB	FM	M			
4P	0-23	ms1	10YR42 00						0	0	HR	2	MCSAB	FR		Y		
	23-55	ms1	75YR42 00						0	0		0	WCSAB	VF	G	Y		
	55-70	ms1	75YR54 00						0	0	HR	1	MCSAB	FR	M	Y		
	70-120	sc	75YR54 66						0	0	HR	10				M		
5P	0-23	ms1	10YR42 00						0	0	HR	1	WDMSAB	VF		Y		
	23-60	ms1	75YR42 00						0	0		0	MDCSAB	VF	M	Y		
	60-90	ms1	10YR54 00						0	0	HR	2	MDCSAB	VF	M			
	90-120	ms1	10YR53 00						0	0	HR	40				M		
6P	0-27	ms	10YR42 00						0	0		0	WMSAB	VF				
	27-48	ms	10YR54 00						0	0		0	WFSAB	VF	M			
	48-100	ms	10YR73 00						0	0		0	WFSAB	VF	M			
	100-120	sc1	75YR54 00				00M00	00	0	0		0	MCSAB	FR	M	Y		

SAMPLE NO.	GRID REF	ASPECT USE	--WETNESS--		-WHEAT-		-POTS-		M.REL		EROSN EXP	FROST DIST	CHEM LIMIT	ALC COMMENTS	
			GRDNT	GLEY	SPL	CLASS	GRADE	AP	MB	AP					MB
1P	SU130 087	PLO	000		1	1	142	34	113	12	1			1	PIT 90CM
2P	SU128 089	PLO	000		1	1	163	55	113	12	1			1	PIT 100
3P	SU127 087	ARA	000		1	1	180	52	121	20	1			1	PIT 100
4P	SU129 083	PGR	000		1	1	152	44	115	14	1			1	
5P	SU124 088	PLO	000		1	1	143	35	109	8	2			DR	2
6P	SU124 086	TGR	000		1	1	085	-23	056	-45	3B			DR	3B