

**A2**

**Mount Pleasant, Sway, Hampshire  
Statement of Physical Characteristics  
Soil Resource Maps and Report  
November 1993**

# STATEMENT OF PHYSICAL CHARACTERISTICS

## MOUNT PLEASANT, SWAY, HAMPSHIRE

### 1 INTRODUCTION

1 1 In September 1993 approximately 15 hectares of land at Mount Pleasant near Sway in Hampshire was surveyed in connection with proposals for gravel extraction and restoration under the 1981 Minerals Act ADAS was commissioned by MAFF's Land Use Planning Unit to determine the land quality and site physical characteristics of the land affected by the proposals

1 2 The survey was conducted by members of the Resource Planning Team in the Guildford Statutory Group at an observation density of approximately one boring per hectare A total of 14 borings and three soil inspection pits 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 and chemical characteristics impose long term limitations on its use for agriculture

At the time of survey the site was under grass grazed by horses cattle and sheep

1 3 The distribution of the grades and subgrades is shown on the attached ALC map and the area and extent are given in the table below The map has been drawn at a scale of 1 5000 It is accurate at this scale but any enlargement may be misleading This map supersedes any previous information for the site

Table 1 Distribution of Grades and Subgrades

<u>Grade</u>	<u>Area (ha)</u>	<u>% of Site</u>	<u>% of Agricultural Land</u>
2	8.1	53.3	57.4
3a	3.8	25.0	27.0
3b	2.2	14.5	15.6
			100% (14.1 ha)
Non Agricultural inc Open Water	1.1	7.2	
Total area of site	15.2 ha	100%	

1 4 A general description of the grades and land use categories identified in this survey is provided as an appendix The grades are described in terms of the type of limitation that can occur the typical cropping range and the expected level and consistency of yield

## 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 the overall climatic limitation are annual average rainfall as a measure of overall wetness and accumulated temperature 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 5 km 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 No local climatic factors such as exposure or frost risk affect the site

Table 2 Climatic Interpolations

Grid Reference	SZ298976
Altitude (m)	35
Accumulated Temperature (days)	1526
Average Annual Rainfall (mm)	831
Field Capacity (days)	173
Moisture Deficit Wheat (mm)	108
Moisture Deficit Potatoes (mm)	102
Overall Climatic Grade	1

## 3 RELIEF

- 3 1 The site lies at approximately 35 m AOD Its relief is divided into two sections In the north and west of the site is a natural dry valley feature with gentle slopes At no point within this section does gradient or microrelief affect land quality The remaining area to the south and east of the site is at a lower level (approx 2.5 m less) and is flat It is virtually surrounded by steeply sloping land Some areas of this were considered to be Non-agricultural being scrub covered and affected by erosion others were limited by slope gradient to being no higher than subgrade 3b This area at a lower level is thought to have been previously worked for minerals and restored

## 4 GEOLOGY AND SOIL

- 4 1 The relevant published geological sheet (B G S Sheet 330 Lymington) shows the site to be entirely underlain by Quaternary Plateau Gravel deposits described within the Mineral Assessment Report 122 (B G S 1982b) as a "flint rich gravel that often has a clayey superficial layer"
- 4 2 The Soil Survey of England and Wales, Soils of South East England Sheet 6 1 250 000 (1983) shows the site to be underlain by soils of the Efford 1 Association and describes them as well drained fine loamy soils often over gravel

associated with similar permeable soils. It also can be variably affected by groundwater. Soils at the site were found to be more clayey than the description above.

## 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 is shown on the attached sample point map.

### 5.3 Grade 2

Land of this quality is concentrated on the higher unworked land to the north west of the site. Soil samples from Pit 1 (see Appendix III) were found to typically comprise a very slightly stony (c. 2% flints by volume) medium or sandy clay loam topsoil texture over a similar or slightly stony (c. 10% flints by volume) medium or heavy clay loam upper subsoil passing to a similarly stony (c. 10% flints by volume) heavy sandy clay loam or clay lower subsoil which was found to be occasionally gleyed. This passes to a moderately stony (c. 35% flints by volume) clay horizon between 75 and 100 cm and extends to depth. This land is limited by a slight soil droughtiness risk arising from a combination of stone content and subsoil textures. Reserves of available water for crop growth are slightly reduced to the extent that Grade 2 is appropriate although this land is still capable of supporting a wide range of agricultural crops.

### 5.4 Subgrade 3a

Land of this quality is found towards the east of the site in a single block. The land on which it occurs is thought to have at some point been worked for minerals and restored to a lower level than the surrounding land. Soils here typically comprise a similar topsoil to that described above (para 5.3) but with a slightly higher stone content (c. 7% by volume) in a shallow layer within the topsoil. Subsoil horizons were found to comprise a very stony (c. 50% flints by volume) heavy sandy clay loam or sandy clay to approximately 60 cm where a gleyed and slowly permeable (from structural observation) stoneless clay layer is present to depth. Pit 3 (Appendix III) is representative of this area. This area of land was found to be primarily wetness limited due to drainage impedance within the profile caused by the slowly permeable clay lower subsoil. This in combination with the local climatic regime and soil workability leads to Wetness Class III being appropriate and Subgrade 3a being applied.

Wetness affected land can, depending on the severity of the problem, be subject to restrictions on the number of days when cultivation by machinery and/or grazing by livestock may occur without causing structural damage to the soil. Soil wetness can also affect seed germination and development by reducing temperature and causing anaerobism due to waterlogging. These restrictions limit the range of crops that can tolerate such conditions.

Due to the high stone contents in the upper subsoil and the heavy soil textures beneath this land is also limited by droughtiness such that available water reserves are limited within the profile. Subgrade 3a land is capable of consistently producing moderate to high yields of a narrow range of crops such as cereals, oilseed rape, potatoes and grass.

5.5 Subgrade 3b

Land of this quality occupies the central southern section of the land restored at a lower level and the slopes in agricultural use at the site boundary. The soils here were found to typically comprise a very slightly stony (c. 5% flints by volume) medium clay loam topsoil, either overlying a shallow moderately stony (c. 35% total flints by volume) sandy clay horizon which passes to an extremely stony (c. 60% total flints by volume) loamy medium sand lower subsoil, or on occasion the topsoil passes directly to the lower subsoil, also found to contain the water table at shallow depth (c. 40 cm). From these findings it was considered appropriate to place the land in Wetness Class IV (see Appendix III) and subsequent Subgrade 3b. This area of land was also found to be drought limited to this grade.

The area around the site boundary has been graded at this level due to the slope gradient caused by the previous mineral workings and subsequent restoration at a lower level. These are of a degree whereby certain types of agricultural machinery would be restricted on the basis of safety and efficient operation.

The main area of land restricted to this grade by wetness is affected by a soil water regime that adversely affects plant growth or imposes restrictions on cultivations or grazing by livestock. Plant growth is likely to be affected by poor seed germination and survival caused by lower soil temperatures and anaerobism. Soil wetness also influences soil sensitivity to structural damage such that there is a restriction on the number of days that the soil may be cultivated and/or grazed upon.

Due to the soil texture and subsoil stone contents the land is also limited by droughtiness such that reserves of soil water available for crop growth are moderately limited to a level such that Subgrade 3b is appropriate. This land is therefore capable of supporting moderate yields of a narrow range of crops, principally cereals and grass.

5.6 The areas marked as Non agricultural fall into two groups within the site: the first is between the unworked section and the restored area where a slope exists which has become seriously eroded and has reverted to scrub. The other larger block is currently an open gravel pit which was at the time of survey partially filled with water.

## 6 SOIL RESOURCES

### Soil Units Consideration for Restoration

6 1 The following section and the accompanying soil resource maps describe the pattern of topsoil and subsoil resources on the site. It should be emphasised that the maps are not soil stripping maps but merely an illustration of the soil resources available for restoration on the site. When considering these details it is important to remember that soils were sampled to a maximum depth of 120 cm during survey work. In some cases soil resources will extend below this depth.

### 6 2 Topsoils

Two top soil units were identified

Unit 1 This unit covers the majority of the site including the area previously unworked and the central southern section considered to have been worked and restored. The soils here comprise an average 30 cm of very dark greyish brown to dark greyish brown (10YR 3/2 or 10YR 4/2) medium clay loam occasionally sandy clay loam. These were found to be non calcareous and very slightly to slightly stony (c 2 to 8% flints by volume). These topsoils were found to be moderately structured having weakly developed coarse subangular blocky peds of very friable consistence. They are very porous and well rooted. The total resource in this unit is 31200 m<sup>3</sup>.

Unit 2 The remaining area towards the east of the site on the area considered to have previously been worked has a topsoil essentially similar in texture colour stoniness and structure to that above (Unit 1). The average depth is however only 15 cm and as such is mapped separately. The total resource in this unit is 5700 m<sup>3</sup>.

A total topsoil resource of 42000 m<sup>3</sup> exists

### 6 3 Subsoils

Three subsoil units were identified

Unit 1 This unit covers the area considered previously unworked. Pit 1 described as part of Appendix III is typical of this subsoil unit. It comprises an average 85 cm of soil split in to three horizons. The upper subsoil is a non calcareous medium heavy or sandy clay loam containing c 10% flints by volume and extending to approximately 65 cm depth. These are normally brown or dark yellowish brown to yellowish brown (10YR 4/3 5/3 or 10YR 4/4 5/4) in colour. The soil was found to be moderately structured comprising moderately developed coarse subangular blocky peds of friable consistence. They show no evidence of drainage imperfections and are well aerated and rooted.

The middle subsoil is a non calcareous moderately stony (c 20% total flints by volume) heavy clay loam or heavy sandy clay loam extending on average to 84 cm depth. These are commonly brown to yellowish brown in colour (10YR 5/3 5/4

5/6) There is slight drainage impedance and surface water gleying is often evident from around 65 cm depth. This is likely to result from the clay layer beneath. This horizon has moderately good structures comprising moderately developed coarse subangular blocky peds of friable consistence. The soil was poorly aerated and roots were common rather than abundant as above.

The lower subsoil unit extending to 120 cm depth (approximately 35 cm thick) comprises a stony (c 35% flints by volume) non calcareous clay of strong brown and yellowish red (75YR 5/6 and 05YR 6/2 7/2) to light brownish and light grey (25YR 6/2 7/2) colours. There is evidence of drainage impedance in the form of mottles caused by either ground water or surface water. The horizon was found to have moderate structures comprising moderately developed coarse subangular blocky peds of firm consistence but with a low porosity and roots were few within the horizon. The clay was not slowly permeable.

The total resource in this unit is 74800 m<sup>3</sup>

Unit 2 This unit covers the area restored at a lower level to the east of the site. It comprises a total of approximately 105 cm of soil in two occasionally three horizons. Pit 3 is typical of the subsoils in this unit.

The upper subsoil where present comprises a very dark greyish brown (10YR 3/2) very slightly stony (c 2% flints by volumes) non calcareous medium clay loam extending to approximately 45 cm depth. The ped structure was assessed as moderately developed coarse subangular blocky of friable consistence. It showed no evidence of drainage impedance and is well aerated and rooted.

The middle subsoil comprises a light brownish grey to dark greyish brown and dark yellowish brown (75Y 6/2 10YR 4/2 4/4) very stony (c 50% flints by volume) sandy clay or heavy sandy clay loam extending to approximately 54 cm. The structure could not be assessed due to the high stone content. There is drainage impedance and surface water gleying was evident likely to result from the slow permeability of the clay horizon beneath.

The lower subsoil comprises two similar horizons separated by colour alone. The upper extending to approximately 85 cm is a brown (75YR 5/3) stoneless clay showing evidence of gleying. The lower is a light grey (25Y 7/2) stoneless clay extending to 120 cm and also showing gleying evidence. The structure of the upper horizon was assessed as poor described as weakly developed coarse platy peds of a friable consistence. The lower horizon's structure was not assessed. Aeration in this horizon was poor as was the root content.

The total resource available in the unit is 39900 m<sup>3</sup>

Unit 3 This unit covers the remaining area restored to a lower level in the central southern section of the site. It comprises a minimum of 25 cm soil deposit in one occasionally two horizons. Pit 2 is typical of the unit.

The upper subsoil which is not always present is a very stony (c 35% flints by volume) yellowish brown (10YR 5/6) sandy clay extending to approximately 50 cm depth. Due to its high stone content the structural condition was not assessed.

The lower subsoil in this unit comprises an extremely stony (c 60% total flints by volume) yellowish brown (10YR 5/6) loamy medium sand. Due to its extreme stoniness and wetness the water table was encountered close to the horizon's upper boundary. It was not possible to assess the structural condition of this horizon which could not be penetrated beyond 60 cm and as such 4000 m<sup>3</sup> must be considered the minimum soil resource.

6.4 Table 3a Topsoil Resources

	Topsoil		Total Topsoil Resource
	1	2	
Average depth (cm)	30.0	15.0	
Area (ha)	10.4	3.8	
Volume (m <sup>3</sup> )	31200	5700	36900 m <sup>3</sup>

Table 3b Subsoil Resources

	Subsoil			Total Soil Resource
	1	2	3	
Average depth (cm)	85.0	105.0	25.0*	
Area (ha)	8.8	3.8	1.6	
Volume (m <sup>3</sup> )	74800	39900	4000	155600 m <sup>3</sup>

\*Shows the minimum soil resource available at the time of survey. Penetration beyond this depth was not possible due to wetness and stone content of the soil.

ADAS Ref 1508/193/93  
MAFF Ref 02/00563

Resource Planning Team  
Guildford Statutory Group  
ADAS Reading

## **SOURCES OF REFERENCE**

- \* British Geological Survey (1975) Sheet 330 Lymington 1 50000 Drift Edition
- \* British Geological Survey (1982a) British Regional Geology The Hampshire Basin and adjoining areas
- \* British Geological Survey (1982b) Mineral Assessment Report 122 SU20 SU30 Lymington and Beaulieu Hampshire (Sand and Gravel Resources)
- \* 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 No 6 Soils of South East England 1 250000
- \* Soil Survey of England and Wales (1984) Soils and their use in South East England Bulletin No 15

## APPENDIX 1 DESCRIPTION OF THE GRADES AND SUBGRADES

The ALC grades and subgrades are described below in terms of the types of limitation which can occur, typical cropping range and the expected level and consistency of yield. In practice, the grades are defined by reference to physical characteristics and the grading guidance and cut offs for limitation factors in Section 3 enable land to be ranked in accordance with these general descriptions. The most productive and flexible land falls into Grades 1 and 2 and Subgrade 3a and collectively comprises about one-third of the agricultural land in England and Wales. About half the land is of moderate quality in Subgrade 3b or poor quality in Grade 4. Although less significant on a national scale such land can be locally valuable to agriculture and the rural economy where poorer farmland predominates. The remainder is very poor quality land in Grade 5 which mostly occurs in the uplands.

Descriptions are also given of other land categories which may be used on ALC maps.

### **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 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 (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 very severe limitations which restrict use to permanent pasture or rough grazing except for occasional pioneer forage crops.

#### **Descriptions of other land categories used on ALC maps**

##### **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/airfields. Also active mineral working 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 land cover types eg buildings in large grounds and where map scale permits the cover types may be shown separately. Otherwise the most extensive cover type will usually be shown.

## APPENDIX II

### FIELD ASSESSMENT OF SOIL WETNESS CLASS

#### Definition of Soil Wetness Classes

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 <i>or</i> 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
III	The soil profile is wet within 70 cm depth for 91-180 days in most years <i>or</i> 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
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 <i>or</i> , 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
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

<sup>1</sup> The number of days specified 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 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 profile and pit information obtained during ALC surveys is held on a database. This has commonly used notations and abbreviations as set out below.

### BORING HEADERS

- 1 GRID REF National grid square followed by 8 figure grid reference
- 2 USE Land-use at the time of survey  
The following abbreviations are used

ARA - arable	PAS/PGR - permanent pasture
WHT - wheat	RGR - rough grazing
BAR - barley	LEY - ley grassland
CER - cereals	CFW - coniferous woodland
OAT - oats	DCW - deciduous woodland
MZE - maize	SCR - scrub
OSR - oilseed rape	HTH - heathland
BEN - field beans	BOG - bog or marsh
BRA - brassicae	FLW - fallow
POT - potatoes	PLO - ploughed
SBT - sugarbeet	SAS - set-aside
FDC - fodder crops	OTH - other
FRT - soft and top fruit	LIN - linseed

HOR/HRT horticultural crops
- 3 GRDNT Gradient as measured by optical reading clinometer
- 4 GLEY/SPL Depth in centimetres (cm) to gleyed and/or slowly permeable horizons
- 5 AP (WHEAT/POTS) Crop adjusted available water capacity. The amount of soil water (in millimetres) held in the soil profile that is available to a growing crop (wheat and potatoes are used as reference crops)
- 6 MB (WHEAT/POTS) The moisture balance for wheat and potatoes obtained by subtracting the soil moisture deficit from the crop adjusted available water capacity
- 7 DRT Grade according to soil droughtiness assessed against soil moisture balances
- 8 M REL Micro relief )  
FLOOD Flood risk ) If any of these factors are considered  
EROSN Soil erosion ) significant in terms of the assessment  
EXP Exposure ) of agricultural land quality a 'y' will  
FROST Frost prone ) be entered in the relevant column  
DIST Disturbed land )  
CHEM Chemical limitation)

- 9 LIMIT Principal limitation to agricultural land quality  
The following abbreviations are used

OC - overall climate	CH - chemical limitations
AE - aspect	WE - wetness
EX - exposure	WK - workability
FR - frost	DR - drought
GR - gradient	ER - erosion
MR - micro-relief	WD - combined soil wetness/soil droughtiness
FL - flooding	ST - topsoil stoniness
TX - soil texture	
DP - soil depth	

### PROFILES & PITS

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

S	- sand
LS	- loamy sand
SL	- sandy loam
SZL	- sandy silt loam
ZL	- silt loam
MZCL	- medium silty clay loam
MCL	- medium clay loam
SCL	- sandy clay loam
HZCL	- heavy silty clay loam
HCL	- heavy clay loam
SC	- sandy clay
ZC	- silty clay
C	- clay

For the sand loamy sand sandy loam and sandy silt loam classes the predominant size of sand fraction may be indicated by the use of prefixes

F	- fine (more than $\frac{2}{3}$ of the sand less than 0.2 mm)
C	- coarse (more than $\frac{1}{3}$ of sand greater than 0.6 mm)
M	- medium (less than $\frac{2}{3}$ fine sand and less than $\frac{1}{3}$ coarse sand)

The sub-divisions of clay loam and silty clay loam classes according to clay content are indicated as follows

M	- medium (less than 27% clay)
H	- heavy (27-35% clay)

Other possible texture classes include

- OL - organic loam
- P - peat
- SP - sandy peat
- LP - loamy peat
- PL - peaty loam
- PS - peaty sand
- MZ - marine light silts

2 MOTTLE COL Mottle colour

3 MOTTLE ABUN Mottle abundance

- F - few - less than 2% of matrix or surface described
- C - common - 2-20% of the matrix
- M - many - 20-40% of the matrix
- VM - very many - 40% + of the matrix

4 MOTTLE CONT Mottle continuity

- F - faint - indistinct mottles evident only on close examination
- 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

6 STONE LITH Stone lithology One of the following is used

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

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

7 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 well developed

- ped size                      F - fine  
    M - medium  
    C - coarse  
    VC - very coarse

- ped shape                      S     single grain  
    M - massive  
    GR - granular  
    SB/SAB - sub-angular blocky  
    AB - angular blocky  
    PR - prismatic  
    PL - platy

8    **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

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

G - good  
M - moderate  
P - poor

10   **POR**    Soil porosity    If a soil horizon has less than 0.5% biopores >0.5 mm a 'y' will appear in this column

11   **IMP**    If the profile is impenetrable a 'y' will appear in this column at the appropriate horizon

12   **SPL**    Slowly permeable layer    If the soil horizon is slowly permeable a 'y' will appear in this column

13   **CALC**    If the soil horizon is calcareous a 'y' will appear in this column

14   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 MT PLEASANT SWAY MINS Pit Number 1P

Grid Reference SZ29699757 Average Annual Rainfall 831 mm  
 Accumulated Temperature 1526 degree days  
 Field Capacity Level 173 days  
 Land Use Permanent Grass  
 Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	MOTTLES	STRUCTURE
0- 27	SCL	10YR32 00	0	2		WKCSAB
27- 45	MCL	10YR33 44	0	2		MDCSAB
45- 77	SCL	10YR46 54	0	5		MDCSAB
77-120	C	05YR58 00	0	34	C	MDCSAB

Wetness Grade 1 Wetness Class I  
 Gleying 077 cm  
 SPL No SPL

Drought Grade 2 APW 130mm MBW 22 mm  
 APP 109mm MBP 7 mm

FINAL ALC GRADE 2  
 MAIN LIMITATION Droughtiness

SOIL PIT DESCRIPTION

Site Name MT PLEASANT SWAY MINS Pit Number 2P

Grid Reference SZ29869753 Average Annual Rainfall 831 mm  
 Accumulated Temperature 1526 degree days  
 Field Capacity Level 173 days  
 Land Use Permanent Grass  
 Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	MOTTLES	STRUCTURE
0- 31	MCL	10YR32 00	0	5		WKCSAB
31- 60	LMS	10YR56 00	0	59		

Wetness Grade 3B Wetness Class IV  
 Gleying cm  
 SPL No SPL

Drought Grade APW mm MBW 0 mm  
 APP mm MBP 0 mm

FINAL ALC GRADE 3B  
 MAIN LIMITATION Wetness

SOIL PIT DESCRIPTION

Site Name MT PLEASANT SWAY MINS Pit Number 3P

Grid Reference SZ29989758 Average Annual Rainfall 831 mm  
 Accumulated Temperature 1526 degree days  
 Field Capacity Level 173 days  
 Land Use Permanent Grass  
 Slope and Aspect degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	MOTTLES	STRUCTURE
0- 10	MCL	10YR32 00	2	7		WKCSAB
10- 46	MCL	10YR32 00	0	2		MDCSAB
46- 60	SC	25Y 62 00	0	49	C	
60- 85	C	75YR53 00	0	0	M	WKC PL
85-120	C	25Y 72 00	0	0	C	

Wetness Grade 3A Wetness Class III  
 Gleying 046 cm  
 SPL 060 cm

Drought Grade 2 APW 124mm MBW 16 mm  
 APP 98 mm MBP -4 mm

FINAL ALC GRADE 3A  
 MAIN LIMITATION Wetness

SAMPLE NO	GRID REF	ASPECT USE	--WETNESS--		-WHEAT-		-POTS-		M REL		EROSN	FROST	CHEM	ALC	COMMENTS
			GRDNT	GLEYSPL	CLASS	GRADE	AP	MB	AP	MB	DRT	FLOOD	EXP	DIST	
1	SZ29709770	PGR S	02	085	1	1	113	5	110	8	2			DR 2	IMPST 90 1P
1P	SZ29699757	PGR		077	1	1	130	22	109	7	2			DR 2	PIT 120
2	SZ29509760	PGR		070	1	1	135	27	116	14	2			DR 2	SEE 1P
2P	SZ29869753	PGR			4	3B		0		0				WE 3B	PIT 60 WATBL40
3	SZ29609760	PGR		065	1	1	125	17	113	11	2			DR 2	IMPST 95 1P
3P	SZ29989758	PGR		046 060	3	3A	124	16	98	-4	2			WE 3A	PIT 75 AUG 120
4	SZ29709760	PGR			1	1	117	9	108	6	2			DR 2	IMPST 100 1P
5	SZ29809760	PGR N	02		1	1	100	-8	102	0	3A			DR 2	IMPST 80 1P
6	SZ29909760	PGR			1	1	59	-49	59	-43	3B			DR 3A	IMPST 45 3P
7	SZ30009760	PGR		020	2	2	37	-71	37	-65	4			DR 3A	IMPST 30 3P
8	SZ29609750	PGR		065	1	1	126	18	109	7	2			DR 2	SEE 1P
9	SZ29709757	PGR			1	1	106	-2	108	6	3A			DR 2	IMPST 80 1P
10	SZ29809750	PGR			4	3B		0		0				WE 3B	WATBL 45 2P
11	SZ29909750	PGR			1	1	107	-1	113	11	3A			DR 3A	IMPST 80 3P
12	SZ30009750	PGR			1	1	57	-51	57	-45	4			DR 3A	IMPST 40 3P
13	SZ29559740	PGR			1	1	124	16	115	13	2			DR 2	IMPST 100 1P
14	SZ29659740	PGR			1	1	118	10	115	13	2			DR 2	IMPST 85 1P

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES-----			PED COL	----STONES-----			STRUCT/ CONSIST	SUBS			SPL	CALC	
				COL	ABUN	CONT		GLE	>2	>6		LITH	TOT	STR			POR
1	0-38	mc1	10YR42 32					0	0	HR	8						
	38-70	hc1	10YR53 00					0	0	HR	10			M			
	70-85	sc1	10YR56 00					0	0	HR	20			M			
	85-90	c	75YR56 00 75YR58 00 C					Y	0	0	HR	35			M		
1P	0-27	sc1	10YR32 00					0	0	HR	2	WKCSAB	VF				
	27-45	mc1	10YR33 44					0	0	HR	2	MDCSAB	FR M				
	45-77	sc1	10YR46 54					0	0	HR	5	MDCSAB	FR M				
	77-120	c	05YR58 00 10YR52 00 C					05YR46 00 Y	0	0	HR	34	MDCSAB	FM M	Y		HR VOL ASESED
2	0-37	mc1	10YR42 00					0	0	HR	2						
	37-55	mc1	10YR43 00					0	0	HR	2			M			
	55-70	mc1	10YR44 00					0	0	HR	5			M			
	70-85	hc1	10YR52 00 10YR58 00 M					Y	0	0	HR	10			M		
	85-120	c	25Y 62 00 10YR58 00 M					Y	0	0	HR	35			M		
2P	0-31	mc1	10YR32 00					0	0	HR	5	WKCSAB	FR				
	31-60	lms	10YR56 00					0	0	HR	59			M		HR VOL ASESED	
3	0-35	mc1	10YR42 00					0	0	HR	3						
	35-50	mc1	10YR43 00					0	0	HR	3			M			
	50-65	mc1	10YR44 54					0	0	HR	10			M			
	65-75	sc1	10YR53 00 10YR56 00 C					Y	0	0	HR	10			M		
	75-95	hc1	10YR53 00 10YR56 00 C					Y	0	0	HR	10			M		
3P	0-10	mc1	10YR32 00					2	0	HR	7	WKCSAB	FR				
	10-46	mc1	10YR32 00					0	0	HR	2	MDCSAB	FR M				
	46-60	sc	25Y 62 00 75YR58 00 C					Y	0	0	HR	49			M		HR VOL ASESED
	60-85	c	75YR53 00 75YR56 58 M					Y	0	0	0	WKC PL	FR P	Y		Y	
	85-120	c	25Y 72 00 75YR68 00 C					Y	0	0	0		P	Y		Y	
4	0-38	sc1	10YR32 42					0	0	HR	3						
	38-65	sc1	10YR44 00					0	0	HR	5			M			
	65-75	sc1	10YR56 00					0	0	HR	10			M			
	75-100	c	75YR58 00					0	0	HR	35			M			
5	0-37	sc1	10YR42 32					0	0	HR	5						
	37-55	sc1	10YR44 00					0	0	HR	10			M			
	55-75	sc1	10YR56 00					0	0	HR	25			M			
	75-80	c	10YR54 00					0	0	HR	35			M			
6	0-10	mc1	10YR32 00					0	0	HR	3						
	10-35	sc	10YR44 00					0	0	HR	20			M			
	35-45	sc	10YR44 00 75YR58 00 C					0	0	HR	30			M			
7	0-20	sc1	10YR31 00					0	0	HR	20						
	20-30	sc1	10YR42 00 10YR56 00 C					Y	0	0	HR	40			M		

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----			PED COL	----STONES----			STRUCT/ CONSIST	SUBS					
				COL	ABUN	CONT		GLEY	>2	>6		LITH	TOT	STR	POR	IMP	SPL
8	0-35	sc1	10YR32 00					0	0	HR	2						
	35-55	sc1	10YR44 00					0	0	HR	2			M			
	55-65	sc1	10YR53 52 10YR56 00 F					0	0	HR	5			M			
	65-85	c	10YR53 00 10YR66 00 C					Y	0	0	HR	10			M		
	85-120	c	10YR52 00 05YR58 00 M					Y	0	0	HR	35			M		
9	0-35	sc1	10YR32 42					0	0	HR	2						
	35-75	sc1	10YR44 54					0	0	HR	5			M			
	75-80	c	10YR56 00					0	0	HR	35			M			
10	0-38	mc1	10YR32 42					0	0	HR	5						
	38-50	sc	10YR56 00					0	0	HR	35			M			
11	0-33	mc1	10YR42 00					0	0	HR	3						
	33-45	mc1	10YR44 00					0	0	HR	5			M			
	45-55	c	10YR56 00					0	0	HR	5			M			
	55-70	sc1	10YR33 00					0	0	HR	5			M			
	70-80	c	10YR56 00					0	0	HR	35			M			
12	0-15	mc1	10YR42 00					0	0	HR	5						
	15-25	mc1	10YR44 54					0	0	HR	5			M			
	25-40	mc1	10YR32 00					0	0	HR	35			M			
13	0-30	mc1	10YR32 42					0	0	HR	2						
	30-50	mc1	75YR32 00					0	0	HR	2			M			
	50-70	mc1	10YR54 00					0	0	HR	5			M			
	70-80	c	75YR44 00					0	0	HR	20			M			
	80-100	sc1	75YR58 00					0	0	HR	30			M			
14	0-35	mc1	10YR32 00					0	0	HR	2						
	35-60	mc1	10YR54 00					0	0	HR	2			M			
	60-75	sc1	10YR54 00					0	0	HR	5			M			
	75-85	mc1	10YR54 64					0	0	HR	20			M			