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Hampshire Minerals & Waste
Disposal Plan
Omission Site 16 Downton Manor Farm
Agricultural Land Classification
ALC Map and Report
June 1994

AGRICULTURAL LAND CLASSIFICATION REPORT

HAMPSHIRE MINERALS AND WASTE DISPOSAL PLAN
OMISSION SITE 16 DOWNTON MANOR FARM

1 Summary

1 1 ADAS was commissioned by MAFF's Land Use Planning Unit to provide information on land quality for a number of sites in Hampshire The work forms part of MAFF's statutory input to the Hampshire Minerals and Waste Disposal Plan

1 2 Approximately 42 hectares of land relating to omission site 16 at Downton Manor Farm in Downton Hampshire was surveyed in June 1994 An Agricultural Land Classification (ALC) survey was carried out at a detailed level of approximately one boring per hectare for the agricultural area A total of 45 soil auger 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 or chemical characteristics impose a long term limitation on its use for agriculture

1 3 Land to the immediate south-west of the site was surveyed during 1992 (ADAS Ref 1508/118/92) and information obtained during that survey has been used to assist the current classification of adjacent land However this report is concerned only with the most recent survey

1 4 The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of ADAS

1 5 At the time of the survey the agricultural land use on the site was ley grass for silage and permanent pasture Land mapped as non agricultural includes an overgrown disused track farm tracks and scrubland Urban areas include houses and a road leading to farm buildings at Downton Manor Farm In addition a number of areas of woodland have been mapped

1 6 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 (including previous survey area)

Grade	Area (ha)	% of Site	% of Agricultural Land
2	28 4	35 7	37 7
3a	28 8	36 2	38 2
3b	18 1	22 7	24 1
Total agricultural area	75 3	94 6	100%
Urban	0 4	0 5	
Non Agricultural	1 7	2 1	
Woodland	1 8	2 3	
Agricultural Buildings	0 4	0 5	
Total area of site	79 6	100%	

1 7 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 8 The land surveyed has been classified as very good quality Grade 2 to moderate quality Subgrade 3b The grading of the site is primarily influenced by soil wetness and soil droughtiness limitations Variable soils were encountered on the site and the grade is determined by the severity of the wetness or droughtiness limitation Soil wetness is overriding where imperfectly drained clayey soils occur whilst droughtiness may be a problem where soils are stony and shallow over gravel

2 Climate

2 1 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 Estimates of climatic variables relevant to the assessment of agricultural land quality were obtained by interpolation from a 5km grid point dataset (Met Office 1989) for representative locations in the survey area

Table 2 Climatic Interpolations

Grid Reference	SZ270933	SZ277932
Altitude (m)	25	15
Accumulated Temperature (degree days Jan-June)	1541	1551
Average Annual Rainfall (mm)	806	800
Field Capacity (days)	167	166
Moisture Deficit Wheat (mm)	112	114
Moisture Deficit Potatoes (mm)	108	110

2 3 The details given in the table above show that there is no overall climatic limitation affecting the site In addition no local climatic factors such as exposure or frost risk affect the site

2 4 Climatic factors do however interact with soil properties to influence soil wetness and droughtiness limitations

3 Relief

3 1 The site lies at an altitude of 15-25 m AOD falling gently towards a small valley running north to south through the centre of the site Most of the site lies on a plateau at the higher altitude Nowhere on the site do gradient or relief affect land quality

4 Geology and Soil

4 1 British Geological Survey (1975) Sheet 330 Lymington shows the majority of the site to be underlain by plateau gravel with Osborne and Headon Beds mapped in conjunction with the valley

4 2 Soil Survey of England and Wales (1983) Sheet 6 shows the site to comprise soils of the Efford 1 association These are described as well drained fine loamy soils often over gravel associated with similar permeable soils variably affected by groundwater (SSEW 1983)

4 3 Detailed field examination of the soils on the site found them to comprise mainly well drained or moderately well drained clay loam profiles sometimes extending to about 1m before passing to gravelly horizons but more usually becoming very stony at shallower depths Occasional profiles were found to be less well drained, passing to poorly structured clay horizons at variable depths which impede drainage

5 Agricultural Land Classification

5 1 Table 1 provides the details of the area measurements for each grade and the distribution of each grade is shown on the attached ALC map

5 2 The location of the soil observation points are shown on the attached sample point map

Grade 2

5 3 Land of this quality has been identified in three mapping units across the area surveyed The land is principally limited by minor soil droughtiness restrictions although soil wetness may occasionally act in combination with droughtiness to influence land quality

Profiles typically comprise non calcareous medium clay loam topsoils which may be very slightly stony (ie 1 3% total flints by volume) These overlie similarly textured or slightly heavier (heavy clay loam) upper subsoils containing about 1-10% total flints Profiles may extend as such to depth but more usually pass to heavier clay horizons or more sandy horizons (sandy clay loam sandy loam or loamy sand textures) in the lower subsoil before becoming impenetrable (to soil auger) between 80 and 100 cm Lower subsoils may contain up to 45% total flints before becoming impenetrable over very stony horizons containing 50-60% flints Despite commonly being slightly gleyed below about 50 cm soils are generally well drained and are thus assigned to Wetness Class I (very occasionally Wetness Class II where gleying was evident within 40 cm of the surface) The land is principally limited by a very slight restriction on the amount of soil water available for crop growth caused by the interaction between climatic factors and soils which are slightly stony throughout and very stony and/or sandy at depth Occasional profiles are also limited by slight soil wetness resulting from a fluctuating groundwater table

Subgrade 3a

5 4 Land has been assigned to Subgrade 3a good quality land on the basis of both soil droughtiness and soil wetness limitations although land affected by droughtiness is more common

Profiles are non-calcareous throughout and comprise very slightly stony (ie 1 5% total flints by volume) medium clay loam topsoils These overlie similar or heavy clay loam upper subsoils Profiles may either continue as clay loams or pass to clay before becoming impenetrable to soil auger between 55 and 95 cm depth over gravelly horizons containing 30 50% flints or they may pass to more sandy textures such as sandy loams or loamy sands before becoming impenetrable over gravelly horizons (see 2p) Stone contents generally increase with depth to as much as 45% immediately above the impenetrable horizons Such profiles may show evidence of imperfect drainage in the form of slight gleying or gleying at

variable depths but as soils are permeable this is caused by fluctuating groundwater consequently soils are assigned to Wetness Class I or II The soils described above have limited reserves of profile available water due to their stony and gravelly horizons at relatively shallow depth which results in land affected by soil droughtiness This may affect the consistency and level of yield

Occasional profiles with similar topsoils and upper subsoils to those described above pass to poorly structured clay in the lower subsoil below about 45-50 cm The slow permeability of this horizon impedes drainage as indicated by shallow gleying from the topsoil such that Wetness Class III is appropriate Profiles may be impenetrable over gravelly horizons (see 3p) This land is affected by soil wetness limitations which may affect the timings of cultivations crop growth and development and may restrict the opportunities for land work

Subgrade 3b

5 5 Land assigned to this grade is again mainly affected by soil droughtiness limitations with occasional profiles being limited by soil wetness

Very slightly stony (1 5% total flints) medium clay loam topsoils overlie similar textures or heavy clay loam in the upper subsoil (containing 2-35% flints) Typically profiles become very stony (ie 36 60% flints by volume) below about 40 60 cm and impenetrable (to soil auger) from 45 65 cm These profiles have low reserves of available water for plant growth due to their shallow depth over gravelly horizons and total profile stone contents As a result plants may suffer severe drought stress and the level and consistency of yield will be affected Occasional profiles in the 3b mapping unit are affected by soil wetness Profiles are similar to those described above but rather than passing to gravelly horizons in the lower subsoil they pass to slowly permeable clay below 40 cm This impedes drainage causing periodic waterlogging as indicated by gleying from the topsoil which affects crop growth and development and enhances the risk of soil damage through untimely cultivations and poaching by livestock

SOURCES OF REFERENCE

British Geological Survey (1975) Sheet No 330 Lymington 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 scale

Soil Survey of England and Wales (1984) Bulletin No 15 Soils and their use in South East England

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 16 Pit Number 1P

Grid Reference SZ27559350 Average Annual Rainfall 806 mm
Accumulated Temperature 1544 degree days
Field Capacity Level 167 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- 23	MCL	10YR41 00	2	5	HR					
23- 40	MCL	10YR43 00	0	35	HR		MDCSAB	FR	M	
40- 45	HCL	10YR44 00	0	50	HR				M	
45-120	GH		0	0					P	

Wetness Grade 1 Wetness Class I
Gleying cm
SPL cm

Drought Grade 3B APW 070mm MBW 42 mm
APP 067mm MBP -41 mm

FINAL ALC GRADE 3B
MAIN LIMITATION Droughtiness

SOIL PIT DESCRIPTION

Site Name HANTS MINS OM SITE 16 Pit Number 2P

Grid Reference SZ28009320

Average Annual Rainfall	806 mm
Accumulated Temperature	1544 degree days
Field Capacity Level	167 days
Land Use	Permanent Grass
Slope and Aspect	01 degrees W

HORIZON	TEXTURE	COLOUR	STONES >2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 32	MCL	10YR43 00	1	3	HR					
32 55	HCL	10YR44 00	0	5	HR		MDCSAB	FM	M	
55 60	HCL	10YR54 00	0	43	HR				M	
60- 70	C	10YR54 00	0	50	HR				M	
70- 75	SCL	10YR54 00	0	50	HR				M	
75 80	LMS	75YR46 56	0	30	HR				M	
80-120	MS	75YR46 56	0	30	HR				M	

Wetness Grade 1 Wetness Class I

Gleying cm

SPL cm

Drought Grade 3A APW 111mm MBW -1 mm

APP 104mm MBP -4 mm

FINAL ALC GRADE 3A

MAIN LIMITATION Droughtiness

SOIL PIT DESCRIPTION

Site Name HANTS MINS OM SITE 16 Pit Number 3P

Grid Reference SZ28009360 Average Annual Rainfall 806 mm
Accumulated Temperature 1544 degree days
Field Capacity Level 167 days
Land Use Permanent Grass
Slope and Aspect 01 degrees E

HORIZON	TEXTURE	COLOUR	STONES	2	TOT STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 30	MCL	10YR51 00	2		3	HR	C				
30- 55	HCL	10YR53 00	0		2	HR	M	MDCSAB	FR	M	
55- 77	C	10YR52 00	0		2	HR	M	WKCSAB	FM	P	
77- 85	C	10YR61 00	0		60	HR	C			P	

Wetness Grade 3A Wetness Class III
Gleying 0 cm
SPL 055 cm

Drought Grade 3A APW 106mm MBW -6 mm
APP 111mm MBP 3 mm

FINAL ALC GRADE 3A
MAIN LIMITATION Soil Wetness/Droughtiness

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 33	mcl	10YR43 00						0	0	HR	2						
	33 50	hcl	10YR43 00						0	0	HR	5		M				
	50-63	mcl	10YR44 00						0	0	HR	5		M				
	63-85	msl	10YR54 00						0	0	HR	2		M				
	85-90	lms	10YR54 00						0	0	HR	35		M				IMP GRAVEL
1P	0-23	mcl	10YR41 00						2	0	HR	5						
	23 40	mcl	10YR43 00						0	0	HR	35	MDCSAB FR	M				
	40-45	hcl	10YR44 00						0	0	HR	50		M				
	45-120	gh							0	0		0		P				
2	0-30	mcl	10YR43 00						0	0		0						
	30-58	mcl	10YR44 00						0	0	HR	1		M				
	58-85	hcl	10YR54 00	10YR64 00	F				0	0		0		M				
	85-95	scl	10YR54 00	75YR58 00	C			S	0	0		0		M				
	95-100	hcl	10YR54 00	75YR58 00	C			S	0	0		0		M				
	100-120	c	10YR54 00	75YR58 00	C			S	0	0		0		M				
2P	0 32	mcl	10YR43 00						1	0	HR	3						
	32 55	hcl	10YR44 00						0	0	HR	5	MDCSAB FM	M				
	55 60	hcl	10YR54 00						0	0	HR	43		M				
	60 70	c	10YR54 00						0	0	HR	50		M				
	70 75	scl	10YR54 00						0	0	HR	50		M				
	75 80	lms	75YR46 56						0	0	HR	30		M				
	80 120	ms	75YR46 56						0	0	HR	30		M				
3	0 28	mcl	10YR52 61	75YR46 00	C			Y	0	0	HR	1						
	28 38	mcl	10YR42 00						0	0	HR	1		M				
	38-50	hcl	10YR44 00	75YR58 00	C			S	0	0	HR	1		M				
	50-57	c	10YR54 00	75YR58 00	C			S	0	0	HR	35		M				IMP GRAVEL
3P	0-30	mcl	10YR51 00	75YR56 00	C			Y	2	0	HR	3						
	30-55	hcl	10YR53 00	75YR58 00	M			Y	0	0	HR	2	MDCSAB FR	M	Y			
	55-77	c	10YR52 00	75YR58 00	M		10YR71 00	Y	0	0	HR	2	WKCSAB FM	P	Y		Y	
	77-85	c	10YR61 00	10YR58 00	C			Y	0	0	HR	60		P			Y	IMP GRAVEL
4	0-38	mcl	10YR42 00						0	0	HR	2						
	38-52	hcl	10YR52 00	75YR58 00	C			Y	0	0	HR	15		M				IMP GRAVEL
5	0-22	mcl	10YR42 00						0	0	HR	1						
	22-38	mcl	10YR52 00	10YR58 00	C		10YR61 00	Y	0	0	HR	1		M				
	38-48	hcl	10YR53 00	75YR58 00	M			Y	0	0	HR	2		M				
	48 80	c	10YR53 00	75YR58 00	M			Y	0	0	HR	2		P	Y		Y	
	80 120	msl	25Y 72 00	75YR58 00	M		25Y 70 00	Y	0	0		0		M				
6	0-25	mcl	10YR42 00						0	0		0						
	25-45	hcl	10YR52 00	75YR58 00	C			Y	0	0	HR	2		M				
	45 50	c	10YR61 00	75YR58 00	M			Y	0	0	HR	2		M				IMP GRAVEL

SAMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL	GLEY	STONES >2	STONES >6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC	
7	0-28	mcl	10YR52 00 75YR56 00 C					Y	0	0	HR	2							
	28 42	hcl	10YR62 00 75YR56 00 C					Y	0	0	HR	2		M					
	42-50	c	10YR53 63 75YR58 00 C				10YR71 00	Y	0	0	HR	10		P	Y		Y		
	50-65	c	10YR53 63 75YR58 00 C				10YR71 00	Y	0	0	HR	25		P	Y		Y		
	65-95	c	10YR53 63 75YR58 00 C				10YR71 00	Y	0	0	HR	10		P	Y		Y		IMP GRAVEL
8	0-35	mcl	10YR42 00						0	0	HR	2							
	35-48	mcl	10YR52 00						0	0	HR	2		M					
	48-65	hcl	10YR53 00 10YR71 58 C					Y	0	0		0		M					
	65-75	c	10YR53 00 10YR71 58 C					Y	0	0	HR	15		P	Y				
	75-80	scl	10YR53 00					Y	0	0	HR	50		M					IMP GRAVEL
9	0-25	mcl	10YR51 00 75YR46 00 M					Y	0	0		0							
	25-45	hcl	10YR51 52 75YR46 00 M					Y	0	0	HR	2		M					
	45 80	c	10YR53 00 75YR58 00 M				10YR71 00	Y	0	0		0		FM	P	Y		Y	
	80-105	c	25Y 72 00 75YR58 00 M				25Y 70 00	Y	0	0	HR	5		P	Y			Y	
	105-120	c	25Y 72 00 75YR58 00 M				25Y 70 00	Y	0	0	HR	20		P	Y			Y	
10	0-33	mcl	10YR52 00 75YR58 00 C					Y	0	0	HR	1							
	33-40	hcl	10YR53 00 75YR58 00 M				10YR63 00	Y	0	0		0		M					
	40-52	hcl	10YR53 00 75YR58 00 M				00MN00 00	Y	0	0	HR	5		M					
	52-75	c	10YR53 00 75YR58 00 M				00MN00 00	Y	0	0	HR	2		P	Y		Y		IMP GRAVEL
11	0-30	mcl	10YR42 00						0	0	HR	1							
	30-45	mcl	10YR43 00						0	0	HR	1		M					
	45-68	mcl	10YR53 00 10YR58 00 C				10YR72 00	Y	0	0		0		M					
	68-80	hcl	10YR72 00 75YR58 00 C					Y	0	0		0		M					
	80-99	msl	10YR62 00 75YR58 00 C				10YR72 00	Y	0	0		0		M					IMP GRAVEL
12	0-35	mcl	10YR42 00 10YR58 00 F						0	0	HR	2							
	35-45	mcl	10YR43 00						0	0	HR	2		M					
	45-50	mcl	10YR44 00						0	0	HR	1		M					
	50-55	mcl	10YR53 54						0	0	HR	15		M					IMP GRAVEL
13	0-28	mcl	10YR43 00						0	0	HR	5							
	28-52	hcl	10YR44 00						0	0	HR	5		M					IMP GRAVEL
14	0 38	mcl	10YR42 00						0	0	HR	4							
	38-45	mcl	25 Y62 00 10YR58 00 C					Y	0	0	HR	10		M					
	45-50	c	10YR53 00 75YR58 00 C					Y	0	0	HR	10		M					
	50 52	scl	10YR53 00 75YR58 00 C					Y	0	0	HR	45		M					IMP GRAVEL
15	0-30	mcl	10YR42 00 75YR58 00 C					Y	0	0	HR	1							
	30-70	hcl	10YR52 00 75YR58 00 C				10YR61 00	Y	0	0	HR	1		M					
	70-88	c	10YR53 00 75YR58 00 M					Y	0	0	HR	2		P			Y		
	88-110	hcl	10YR53 00 75YR58 00 M					Y	0	0	HR	2		M					
	110-120	c	10YR71 00 75YR58 00 M					Y	0	0	HR	10		P			Y		

AMPLE	DEPTH	TEXTURE	COLOUR	MOTTLES COL	MOTTLES ABUN	MOTTLES CONT	PED COL	PED GLEY	STONES >2	STONES 6	STONES LITH	STONES TOT	STRUCT/ CONSIST	SUBS STR	SUBS POR	SUBS IMP	SUBS SPL	SUBS CALC
15A	0-30	mcl	10YR51 00 75YR58 00 C					Y	0	0	HR	1						
	30-40	hcl	10YR51 00 75YR58 68 M					Y	0	0	HR	1		M				
	40-70	c	10YR51 00 75YR68 00 M					Y	0	0	HR	1		P		Y		
	70-82	c	10YR51 00 75YR68 00 M					Y	0	0	HR	15		P		Y		IMP GRAVEL
16	0-28	mcl	10YR42 00						0	0	HR	2						
	28 45	hcl	10YR42 52						0	0	HR	15		M				
	45-70	hcl	10YR42 41						0	0	HR	5		M				
	70-80	lms	10YR63 00						0	0	HR	10		M				
	80-95	lcs	10YR63 00						0	0	HR	10		M				IMP GRAVEL
17	0-25	mcl	25Y 42 00 75YR46 00 C					Y	0	0	HR	1						
	25-100	hcl	25Y 42 00 75YR46 00 M				00MN00 00	Y	0	0	HR	1		M				IMP GRAVEL
18	0 25	mcl	10YR43 00						0	0	HR	1						
	25-38	mcl	10YR42 00 75YR56 00 C					Y	0	0	HR	1		M				
	38 58	hcl	10YR44 00 75YR58 00 C					S	0	0	HR	1		M				
	58 65	hcl	10YR44 00 75YR58 00 C					S	0	0	HR	10		M				
	65 70	c	10YR44 00 75YR58 00 C					S	0	0	HR	25		M				IMP GRAVEL
19	0-38	mcl	10YR42 00						0	0	HR	1						
	38-58	hcl	10YR44 00						0	0		0		M				
	58 85	c	10YR44 00 75YR56 00 C					S	0	0		0		M				
	85 98	msl	10YR54 00 75YR56 00 C					S	0	0	HR	2		M				IMP GRAVEL
20	0 35	mcl	10YR43 00						0	0	HR	1						
	35 55	hcl	10YR44 00						0	0	HR	10		M				
	55 65	hcl	10YR44 54						0	0	HR	10		M				
	65-78	scl	10YR54 00						0	0	HR	15		M				
	78 85	lms	10YR54 00						0	0	HR	15		M				
	85-90	ms	25 Y54 00						0	0	HR	15		M				
	90-105	scl	10YR54 00						0	0	HR	15		M				
	105-120	hcl	10YR44 00						0	0	HR	15		M				
21	0 39	mcl	10YR43 00						0	0	HR	3						
	39 70	mcl	10YR44 00						0	0	HR	1		M				
	70 80	hcl	10YR44 54						0	0	HR	1		M				IMP GRAVEL
22	0 35	mcl	10YR43 00						0	0	HR	1						
	35 45	hcl	10YR44 00						0	0	HR	1		M				
	45-60	c	10YR54 00	10YR58 00 F			00MN00 00		0	0		0		M				
	60-90	c	10YR54 00	75YR58 00 C				S	0	0		0		M				
	90-120	c	10YR52 00	75YR58 68 M				Y	0	0	HR	2		P		Y		
23	0-35	mcl	10YR42 00						0	0	HR	1						
	35-58	hcl	10YR44 00						0	0	HR	1		M				
	58 82	c	10YR54 00	75YR58 00 C				S	0	0	HR	3		M				IMP GRAVEL

SAMPLE	DEPTH	TEXTURE	COLOUR	-- MOTTLES -- COL	ABUN	CONT	PED COL	GLEY	----STONES >2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC
24	0 38	mcl	10YR42 00						0	0	HR	1						
	38-48	hcl	10YR54 00						0	0	HR	1		M				
	48-68	c	10YR54 00	10YR58 00	C			S	0	0	HR	3		M				
	68-80	hcl	10YR53 00	75YR58 00	M			Y	0	0	HR	15		M				IMP GRAVEL
25	0-35	mcl	10YR43 00						0	0	HR	1						
	35-54	hcl	10YR44 00	75YR58 00	F				0	0	HR	1		M				
	54 80	c	10YR44 54	75YR58 00	C			S	0	0	HR	1		M				
	80-88	msl	10YR53 00					S	0	0	HR	5		M				IMP GRAVEL
26	0-38	mcl	10YR43 00	10YR58 00	F				0	0	HR	1						
	38-70	hcl	10YR44 00						0	0		0		M				
	70 80	c	10YR44 00	10YR58 00	F				0	0		0		M				
	80-105	msl	10YR54 00	10YR58 00	F				0	0		0		M				IMP GRAVEL
27	0 35	mcl	10YR43 00						0	0	HR	1						
	35-48	hcl	10YR44 00						0	0	HR	1		M				
	48-70	hcl	10YR54 00	75YR58 00	C			S	0	0	HR	1		M				
	70 85	hcl	10YR54 00	75YR58 00	C			S	0	0	HR	10		M				
	85-88	lms	10YR53 00					S	0	0	HR	45		M				IMP GRAVEL
27A	0 35	mcl	10YR42 00	75YR58 00	C		10YR72 00	Y	0	0	HR	5						
	35-78	mcl	10YR52 00	75YR58 00	C		10YR61 00	Y	0	0	HR	1		M				
	78-82	c	10YR53 00	75YR68 00	M			Y	0	0	HR	1		P				IMP GRAVEL
28	0 30	mcl	10YR43 00						0	0	HR	2						
	30-42	mcl	10YR43 53						0	0	HR	5		M				
	42-45	mcl	10YR43 53						0	0	HR	35		M				IMP GRAVEL
28A	0-30	mcl	10YR43 00						0	0	HR	1						
	30-48	hcl	10YR43 00						0	0	HR	15		M				
	48-60	hcl	10YR42 00	75YR56 00	F			S	0	0	HR	25		M				
	60-80	hcl	10YR42 00	75YR56 00	F			S	0	0	HR	5		M				
	80-98	mcl	10YR72 00	10YR58 00	C		10YR71 00	Y	0	0	HR	2		M				
	98-100	hcl	10YR72 00	10YR58 00	M		10YR71 00	Y	0	0	HR	5		M				IMP GRAVEL
29	0-33	mcl	10YR43 00						0	0	HR	1						
	33-60	hcl	10YR44 00						0	0	HR	1		M				
	60-78	mcl	10YR54 00						0	0	HR	1		M				
	78 80	hcl	10YR54 00						0	0	HR	35		M				IMP GRAVEL
30	0-35	mcl	10YR42 00						0	0	HR	1						
	35-48	hcl	10YR44 00						0	0		0		M				
	48 75	c	10YR54 00	10YR58 00	C			S	0	0	HR	1		M				
	75-82	hcl	10YR54 00	10YR58 00	C			S	0	0	HR	15		M				IMP GRAVEL
31	0-28	mcl	10YR42 00						0	0	HR	1						
	28-38	hcl	10YR42 00						0	0	HR	1		M				
	38-50	hcl	10YR54 00	10YR58 00	F				0	0	HR	1		M				
	50 55	c	10YR54 00	10YR58 00	C			S	0	0	HR	15		M				IMP GRAVEL

AMPLE	DEPTH	TEXTURE	COLOUR	-- MOTTLES----- COL	ABUN	CONT	PED COL	GLEY	--STONES- 2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC
32	0 32	mcl	10YR43 00						0	0	HR	1						
	32-45	hcl	10YR43 00						0	0	HR	1		M				
	45 65	hcl	10YR44 00						0	0	HR	5		M				
	65 68	hcl	10YR44 00						0	0	HR	45		M				IMP GRAVEL
33	0-35	mcl	10YR43 00	10YR58 00	C		10YR72 00	S	0	0	HR	1						
	35-85	mcl	10YR44 00					S	0	0	HR	1		M				
	85-90	msl	10YR53 00					S	0	0	HR	45		M				IMP GRAVEL
34	0-28	mcl	10YR43 00	75YR58 00	F				0	0	HR	1						
	28 38	mcl	10YR43 00						0	0	HR	3		M				
	38-60	mcl	10YR42 00						0	0	HR	35		M				
	60 68	mcl	10YR42 00						0	0	HR	50		M				IMP GRAVEL
35	0-28	mcl	10YR42 00						0	0	HR	5						
	28-58	mcl	10YR52 00						0	0	HR	30		M				
	58-60	lms	10YR52 00						0	0	HR	45		M				IMP GRAVEL
36	0-35	mcl	10YR43 00						0	0		0						
	35-50	hcl	10YR44 54						0	0	HR	1		M				
	50-62	hcl	10YR54 00						0	0	HR	25		M				IMP GRAVEL
37	0 35	mcl	10YR42 00						0	0	HR	1						
	35-55	hcl	10YR43 00						0	0	HR	1		M				
	55-80	c	10YR44 00	10YR58 00	F				0	0	HR	1		M				
	80-95	hcl	10YR54 00	75YR58 00	C			S	0	0	HR	1		M				
	95-98	c	10YR54 00	75YR58 00	M			S	0	0	HR	35		M				IMP GRAVEL
38	0 38	mcl	10YR42 00						0	0	HR	1						
	38 48	hcl	10YR42 00						0	0	HR	1		M				
	48 65	c	10YR44 00	10YR58 00	F				0	0	HR	1		M				
	65 82	c	10YR44 00	10YR58 00	C			S	0	0	HR	1		M				
	82-85	c	10YR54 00	10YR58 00	C			S	0	0	HR	35		M				IMP GRAVEL
39	0 28	mcl	10YR42 00						0	0	HR	1						
	28 45	hcl	10YR53 00	75YR58 00	C			Y	0	0	HR	1		M				
	45-65	mcl	25Y 52 51	75YR58 00	C			Y	0	0	HR	3		M				
	65 95	msl	10YR72 00	10YR58 71	C			Y	0	0	HR	3		M				
	95 100	lms	10YR72 00	10YR58 71	C			Y	0	0	HR	3		M				IMP GRAVEL
40	0 35	mcl	10YR43 00						0	0	HR	5						
	35 45	mcl	10YR43 00						0	0	HR	40		M				
	45-65	lms	10YR52 00						0	0	HR	30		M				
	65 80	msl	10YR52 00						0	0	HR	5		M				
	80 88	msl	10YR52 00						0	0	HR	20		M				IMP GRAVEL
41	0 35	mcl	10YR43 00						0	0	HR	1						
	35 70	hcl	10YR54 00						0	0		0		M				
	70 75	c	10YR54 00						0	0	HR	30		M				IMP GRAVEL

SAMPLE	DEPTH	TEXTURE	COLOUR	----MOTTLES----- COL	ABUN	CONT	PED COL	GLEY	- STONES- 2	>6	LITH	TOT	STRUCT/ CONSIST	SUBS STR	POR	IMP	SPL	CALC	
42	0-32	mcl	10YR43 00						0	0	HR	2							
	32-47	hcl	10YR44 00						0	0	HR	5		M					IMP GRAVEL

AMPLE NO	GRID REF	USE	ASPECT	GRONT	GLEY	SPL	--WETNESS-- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	DRT	M REL FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
1	SZ27709370	PGR	E	01			1	1	122	10	114	6	2				DR	2	IMP 90 GH
1P	SZ27559350	PGR	E	02			1	1	070	-42	067	-41	3B				DR	3B	
2	SZ27809370	PGR			085		1	1	152	40	118	10	2				DR	2	SL GLEY 85
2P	SZ28009320	PGR	W	01			1	1	111	-1	104	4	3A				DR	3A	
3	SZ27909370	PGR			0		2	2	089	-23	092	-16	3B				DR	3A	IMP 3A TO 120
3P	SZ28009360	PGR	E	01	0	055	3	3A	106	-6	111	3	3A				WD	3A	IMP 85
4	SZ27429360	PGR	N	02	038		2	2	085	27	086	-22	3B				DR	3A	IMP 3A TO 120
5	SZ27509360	PGR	N	01	022	048	3	3A	147	35	108	0	2				WE	3A	SPL 48
6	SZ27609360	PGR			025		2	2	083	-29	083	-25	3B				DR	3A	IMP 3A TO 120
7	SZ27709360	PGR	W	02	0	042	4	3B	108	-4	102	-6	3A				WE	3B	SPL 42
8	SZ27809360	PGR	W	01	048		1	1	113	0	115	6	3A				DR	3A	IMP 80
9	SZ27909360	LEY	SW	01	0	045	3	3A	000	0	000	0					WE	3A	SPL 45
10	SZ28009360	LEY	E	01	0	052	3	3A	103	-9	111	3	3A				WE	3A	SPL 52
11	SZ27309350	LEY			045		1	1	136	24	117	9	2				DR	2	IMP 99
12	SZ27409350	LEY					1	1	091	21	094	-14	3B				DR	3A	IMP 3A TO 120
13	SZ27529352	PGR	E	01			1	1	083	-29	085	23	3B				DR	3A	IMP 3A TO 120
14	SZ27609350	PGR	E	02	038		2	2	083	-29	084	-24	3B				DR	3A	IMP 3A TO 120
15	SZ27709350	PGR	E	01	0	070	3	3A	145	33	117	9	2				WE	3A	
15A	SZ27759348	PGR			0	040	4	3B	000	0	000	0					WE	3B	IMP 82
16	SZ27809350	LEY	SW	01			1	1	110	-2	111	3	3A				DR	3A	IMP 95
17	SZ27909350	LEY			0		2	2	134	22	116	8	2				WD	2	IMP 100
18	SZ28009350	LEY	E	01	025		2	2	102	-10	113	5	3A				DR	3A	
19	SZ27109340	LEY					1	1	131	19	119	11	2				DR	2	SL GLEY 58
20	SZ27209340	LEY					1	1	139	27	112	4	2				DR	2	
21	SZ27809340	LEY	W	01			1	1	115	3	117	9	3A				DR	2	IMP 2 TO 120
22	SZ27909340	LEY			090		1	1	142	30	118	10	2				DR	2	SL GLEY 60
23	SZ28009340	LEY	E	01			1	1	113	1	118	10	3A				DR	2	SL GLEY 58
24	SZ28109340	LEY	E	01	068		1	1	111	1	117	9	3A				DR	2	SL GLEY 48
25	SZ27009330	LEY					1	1	119	7	118	10	2				DR	2	SL GLEY 54
26	SZ27109330	LEY					1	1	142	30	119	11	1					1	
27	SZ27209330	LEY					1	1	120	8	118	10	2				DR	2	SL GLEY 48
27A	SZ27279332	LEY			0		2	2	114	2	116	8	3A				WD	2	WETPATCH
28	SZ27809330	LEY	S	01			1	1	075	-37	075	-33	3B				DR	3B	IMP 45
28A	SZ27759325	LEY	W	01	080		1	1	127	15	108	0	2				DR	2	SL GLEY 48
29	SZ27909330	LEY	SW	01			1	1	115	3	117	9	3A				DR	2	ALMOST 3A
30	SZ28009330	LEY					1	1	112	0	118	10	3A				DR	3A	SL GLEY 48
31	SZ28109330	LEY					1	1	088	24	092	-16	3B				DR	3A	SL GLEY 50
32	SZ28209330	LEY	NE	01			1	1	101	-11	111	3	3A				DR	3A	IMP 68
33	SZ27009320	LEY					1	1	124	12	118	10	2				DR	2	SL GLEY 0
34	SZ27809320	LEY	E	01			1	1	089	23	096	-12	3B				DR	3A	ALMOST 3B
35	SZ27909320	LEY	W	01			1	1	080	-32	083	-25	3B				DR	3B	IMP 60
36	SZ28009320	LEY	W	01			1	1	096	16	101	-7	3A				DR	3A	IMP 62

SAMPLE NO	GRID REF	USE	ASPECT	GRDNT	GLEY	SPL	-WETNESS- CLASS	GRADE	-WHEAT- AP	MB	-POTS- AP	MB	M REL DRT	FLOOD	EROSN EXP	FROST DIST	CHEM LIMIT	ALC	COMMENTS
37	SZ28109320	LEY					1	1	127	15	118	10	2				DR	2	SL GLEY 80
38	SZ28209320	LEY	E	01			1	1	114	2	118	10	3A				DR	2	SL GLEY 65
39	SZ28309320	LEY	E	01	028		2	2	134	22	115	7	2				WD	2	
40	SZ28009310	LEY	W	01			1	1	101	-11	088	-20	3A				DR	3A	IMP 88
41	SZ28109310	LEY	E				1	1	109	-3	118	10	3A				DR	2	IMP 75
42	SZ28059302	LEY	NW	01			1	1	079	-33	079	-29	3B				DR	3B	IMP 47