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Wokingham District Local Plan
Site SW02 - Swallowfield, Berkshire
Agricultural Land Classification
January 1996

Resource Planning Team
Guildford Statutory Group
ADAS Reading

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AGRICULTURAL LAND CLASSIFICATION REPORT

WOKINGHAM DISTRICT LOCAL PLAN
SITE SW02 - SWALLOWFIELD, BERKSHIRE

Introduction

1. This report presents the findings of a detailed Agricultural Land Classification (ALC) survey of 5.4 hectares of land to the west of Swallowfield near Wokingham in Berkshire. The survey was carried out during January 1996.

2. The survey was commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF) from its Land Use Planning Unit in Reading in connection with the Wokingham District Local Plan. The results of this survey supersede any previous ALC information for this land.

3. The work was conducted by members of the Resource Planning Team in the Guildford Statutory Group of 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 all of the agricultural land was under ley grassland. The areas shown as 'Other Land' include a small copse in the south west corner and a number of warehouses to the north east.

Summary

5. The findings of the survey are shown on the enclosed ALC map. The map has been drawn at a scale of 1:10,000. It is accurate at this scale, but any enlargement would be misleading.

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

Table 1: Area of grades and other land

Grade/Other land	Area (hectares)	% Surveyed area	% Agricultural Land
2	5.0	92.6	100
Other Land	0.4	7.4	N/A
Total Site area	5.4	100.0	100.0

7. The fieldwork was conducted at an average density of approximately 1 boring per hectare. A total of 7 borings and two soil pits were described.

8. All of the agricultural land at this site has been classified as Grade 2 (very good quality) on the basis of both minor soil wetness and soil droughtiness limitations. To the south of the site a small area of land is affected by soil droughtiness. These profiles are relatively light in texture comprising a medium sandy silt loam topsoil over clay loam upper subsoils and loamy medium sand at depth. The stone content is negligible in the topsoil but becomes more significant in the upper subsoil horizons (10-35% flints by volume). The lower subsoil becomes stone free from approximately 70cm depth. In this locally dry climatic regime a combination of the light soil textures and moderate stone content act to restrict the water holding capacity of the soil such that Grade 2 is appropriate in this area.

9. To the north of the site soil droughtiness and soil wetness are equally limiting. In general the profiles are very slightly stony and relatively light comprising medium sandy loam topsoils over clay loam upper subsoils. At 50-60cm depth a poorly structured clay horizon occurs which slightly impedes drainage through the profile. The resultant waterlogging restricts land use in this area to the extent that Wetness Class III is considered appropriate. However, the effects of soil wetness are partially offset by the light topsoil textures and locally dry climate and therefore this land has been classified as Grade 2.

Factors Influencing ALC Grade

Climate

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

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

Table 2: Climatic and altitude data

Factor	Units	Values
Grid reference	N/A	SU 724 649
Altitude	m, AOD	45
Accumulated Temperature	day°C	1475
Average Annual Rainfall	mm	667
Field Capacity Days	days	139
Moisture Deficit, Wheat	mm	113
Moisture Deficit, Potatoes	mm	107

12. 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.

13. 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.

14. The combination of rainfall and temperature at this site mean that there is no overall climatic limitation (Climate Grade 1). However, climatic factors do interact with soil properties to influence soil wetness and droughtiness limitations. At this locality the slightly high crop adjusted soil moisture deficits may increase the likelihood of soil droughtiness while the correspondingly low average annual rainfall may reduce the likelihood of soil wetness.

15. Local climatic factors such as exposure or frost risk are not believed to affect the site.

Site

16. The majority of the site is relatively flat and is situated between 45-49m AOD. Nowhere on this site do either altitude or gradient adversely affect agricultural land use.

Geology and soils

17. The relevant geological sheet (BGS, 1971) maps the majority of the site as London Clay. A small area to the east is mapped as valley gravel.

18. The most recently published soil information for the site (SSEW, 1983) shows the Wickham 4 soil association to be mapped across much of the site with the Hurst association corresponding to the valley gravel in the east. The former are described as 'slowly permeable seasonally waterlogged fine loamy over clayey and fine silty over clayey soils associated with similar clayey soils, often with brown subsoils.' (SSEW, 1983). The latter are said to be 'coarse and fine loamy permeable soils mainly over gravels variably affected by groundwater.' (SSEW, 1983).

19. Detailed field survey broadly confirms the existence of such soils though those similar to the Hurst association tend to occur to the south of the site rather than the east.

AGRICULTURAL LAND CLASSIFICATION

20. 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.

21. 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.

Grade 2

22. Grade 2, very good quality land, has been mapped across the entire site. The soil profiles across the northern part of the site generally comprise stoneless or very slightly stony (1-3% flints of which 1-2% are > 2cm in diameter) medium sandy loam topsoils over a combination of medium clay loam, medium sandy silt loam or sandy clay loam upper subsoils. These contain a similar amount of flint. At between 45 and 60 cm depth a poorly structured,

slowly permeable clay occurs thus restricting drainage through the profile. Below this the profile becomes lighter and slightly more stony with 1-6% flint in either a medium sandy loam or loamy medium sand matrix.

23. To the south of the site the soil profiles comprise very slightly flinty (1% > 2cm & 5% total stone v/v) medium sandy silt loam topsoils over slightly flinty (10% by volume) medium clay loam upper subsoils. At 50cm depth the stone content increases to between 20% and 35% flint (v/v) in a medium clay loam matrix. Below 65cm depth the profile became impenetrable to the soil auger. However, soil inspection pit 2 revealed a stoneless loamy medium sand which commences at 70cm and continues to depth.

24. In both soil types the combination of light soil textures, slight to moderate stone content, occasional poor structures and the locally dry climatic regime act to slightly reduce the amount of profile available water for crops. As a result the level of crop growth and yields will be slightly affected thus restricting this land to Grade 2 on the basis of a minor soil droughtiness limitation.

25. A number of borings to the north of the site are also limited by soil wetness where slowly permeable clay occurs at a moderate depth. Soil wetness in this area is consistent with Wetness Class III, Grade 2, as light topsoil textures are less susceptible to workability restrictions. Occasional borings of slightly poorer quality are also present. However, these were not mapped separately due to their limited number and extent.

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SOURCES OF REFERENCE

British Geological Survey (1971) *Sheet No. 268*, Reading. 1:63,360 scale (Drift Edition). 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 Scale. SSEW: Harpenden.

Soil Survey of England and Wales (1983) *Soils and their Use in South East England.*. Bulletin 15. SSEW: Harpenden.

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.

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[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.

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).

[1] The number of days is not necessarily a continuous period.
[2] 'In most years' is defined as more than 10 out of 20 years.

APPENDIX III

SOIL DATA

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 **ST**: strongly developed	**MD**: moderately developed
ped size	**F**: fine **C**: coarse	**M**: medium **VC**: very coarse
ped shape	**S** : single grain **GR**: granular **SAB**: sub-angular blocky **PL**: platy	**M**: massive **AB**: angular blocky **PR**: prismatic

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 : WOK DLP,PSW02, SWALLOWFD Pit Number : 1P

Grid Reference: SU72306510 Average Annual Rainfall : 667 mm
Accumulated Temperature : 1475 degree days
Field Capacity Level : 139 days
Land Use : Ley
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 30	MSL	10YR42 00	0	1	HR					
30- 45	MCL	75YR43 00	0	1	HR		MDCSAB	FR	M	
45- 60	HCL	10YR52 00	0	1	HR	C	MDCSAB	FR	M	
60- 80	C	10YR52 00	0	1	HR	C	WKCSAB	FM	P	
80-120	LMS	10YR56 00	0	0		C	MDCAB	FR	G	

Wetness Grade : 1 Wetness Class : II
Gleying :045 cm
SPL :060 cm

Drought Grade : 2 APW : 135mm MBW : 22 mm
APP : 111mm MBP : 4 mm

FINAL ALC GRADE : 2
MAIN LIMITATION : Droughtiness

SOIL PIT DESCRIPTION

Site Name : WOK DLP,PSW02, SWALLOWFD Pit Number : 2P

Grid Reference: SU72206480 Average Annual Rainfall : 667 mm
Accumulated Temperature : 1475 degree days
Field Capacity Level : 139 days
Land Use : Ley
Slope and Aspect : degrees

HORIZON	TEXTURE	COLOUR	STONES >2	TOT.STONE	LITH	MOTTLES	STRUCTURE	CONSIST	SUBSTRUCTURE	CALC
0- 30	MSZL	10YR32 00	1	2	HR					
30- 50	MCL	10YR62 00	0	10	HR	C	MDCSAB	FR	M	
50- 70	HCL	10YR62 00	0	35	HR	C			M	
70-120	LMS	25 Y63 62	0	0					M	

Wetness Grade : 1 Wetness Class : II
Gleying : 030 cm
SPL : No SPL

Drought Grade : 2 APW : 122mm MBW : 9 mm
APP : 106mm MBP : -1 mm

FINAL ALC GRADE : 2
MAIN LIMITATION : Droughtiness

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
1	SU72306510	LEY		035	045	3	2	145	32	106	-1	2				WD	2		
1P	SU72306510	LEY		045	060	2	1	135	22	111	4	2				DR	2		WT at 80cm
2	SU72306500	LEY		028	060	3	2	150	37	109	2	2				WD	2		
2P	SU72206480	LEY		030		2	1	122	9	106	-1	2				DR	2		WT at 40cm
3	SU72376500	LEY		035	035	4	3A	86	-27	88	-19	3B				WE	3A		I55 Flints
4	SU72306490	LEY		030		2	1	86	-27	92	-15	3B				DR	2		I60 See 1P
5	SU72406490	LEY		035		2	1	149	36	111	4	2				DR	2		
6	SU72226480	LEY		030		2	1	95	-18	103	-4	3A				DR	2		I65 See 2P
7	SU72306480	LEY		035		2	1	97	-16	103	-4	3A				DR	2		I65 See 2P

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	0-25	msl	10YR42 00						1	0	HR	1							
	25-35	mszl	10YR54 00						0	0	HR	1		M					
	35-45	scl	10YR64 00	10YR68 00	C			Y	0	0	HR	1		M					
	45-80	c	10YR63 00	75YR68 00	M			Y	0	0	HR	1		P			Y		
	80-120	msl	10YR64 00	10YR68 00	C			Y	0	0	HR	1		M					
1P	0-30	msl	10YR42 00						0	0	HR	1							
	30-45	mcl	75YR43 00						0	0	HR	1	MDCSAB	FR	M				
	45-60	hcl	10YR52 00	75YR58 00	C			Y	0	0	HR	1	MDCSAB	FR	M				
	60-80	c	10YR52 00	75YR68 00	C			Y	0	0	HR	1	WKCSAB	FM	P		Y		
	80-120	lms	10YR56 00	75YR56 00	C			Y	0	0		0	MDCAB	FR	G				
2	0-28	msl	10YR42 00						0	0		0							
	28-50	msl	10YR63 00	10YR68 00	C			Y	0	0		0		M					
	50-60	scl	10YR63 00	10YR68 00	C			Y	0	0		0		M					
	60-80	sc	10YR63 00	10YR68 00	M			Y	0	0		0		P			Y		
	80-90	scl	10YR63 00	10YR68 00	M			Y	0	0		0		M			Y		
	90-120	mszl	10YR56 00					Y	0	0		0		M					
2P	0-30	mszl	10YR32 00						1	0	HR	2							
	30-50	mcl	10YR62 00	75YR56 00	C			Y	0	0	HR	10	MDCSAB	FR	M				
	50-70	hcl	10YR62 00	75YR56 00	C			Y	0	0	HR	35		M					
	70-120	lms	25 Y63 62					Y	0	0		0		M					Wet at 40
3	0-35	mszl	10YR43 00						0	0	HR	2							
	35-55	hcl	10YR62 00	75YR56 00	C		00MN00 00	Y	0	0	HR	5		P			Y		Imp Flints
4	0-30	msl	10YR42 00						2	1	HR	3							
	30-40	scl	10YR62 00	10YR66 00	C			Y	0	0	HR	1		M					
	40-50	scl	10YR63 00	10YR68 00	C			Y	0	0	HR	1		M					
	50-60	c	10YR63 00	75YR58 00	C			Y	0	0	HR	6		P			Y		Imp Flints
5	0-35	msl	10YR42 00						0	0	HR	2							
	35-58	scl	10YR62 63	75YR56 00	C			Y	0	0	HR	2		M					
	58-120	mcl	10YR71 72	75YR56 00	C		00MN00 00	Y	0	0	HR	2		M					
6	0-30	mszl	10YR32 42						1	0	HR	5							
	30-50	mcl	10YR42 52	75YR56 00	C			Y	0	0	HR	10		M					
	50-65	mcl	10YR62 00					Y	0	0	HR	20		M					Imp Flints/WT 60
7	0-35	mszl	10YR42 00						1	0	HR	5							
	35-50	mcl	10YR52 00	75YR56 52	C			Y	0	0	HR	10		M					
	50-65	mcl	10YR52 00	75YR56 00	C			Y	0	0	HR	25		M					Imp Flints/WT 60