PHYSICAL CHARACTERISTICS REPORT FOR LAND AT WOLSTON FIELDS FARM

The site of approximately 133 hectares at Wolston Fields Farm was surveyed in February 1990 using the MAFF Revised Agricultural Land Classification system. The site was augered using a 5cm Dutch Auger at 100 metre grid intersections with additional borings and pits as necessary, to give a density of one boring per 0.88 hectares.

Most of the land is mapped as sub grades 3a and 3b with a smaller area of grade 2.

1. Land Use

Most of the site supports winter cereals or is fallow. The area between the sewage works and the cottage and the flood plain in the north support grass for cattle and horses.

2. Site Details and limitations

2.1 Climatic Limitations

The site receives an average annual rainfall of 668 mm and has a Accumulated Temperature (January to June) of 1403^{O}C. This combination of rainfall and temperature makes the site eligible for Grade 1.

2.2 Location and Site Limitations

The site lies adjacent to the River Avon between Wolston in the east and Ryton on Dunsmore in the west. The southern boundary is formed by Wolston Lane (B4029).

The land is surrounded by woods and a playing field in the east, by agricultural land and golf course in the north and west and by agricultural land in the south.

The land lies at an altitude of 67 m on the flood plain and rises to about 80 m on the higher ground in the south west and east. Most of the land is level to very gently sloping and only along the edge of the ridge in the south west does gradient limit the agricultural classification.

The level ground in the north lies within the River Avon flood plain. After the recent heavy rains the river had flooded the lowest ground at the base of the back slope, in most places by backing up the ditches. Local sources indicate that flooding is not a serious problem with floods being confined to winter months and generally lasting only one or two days. On parts of the flood plain an affective underdrainage system ensures that the flood water drains away rapidly once the level of the river falls. The risk of damaging floods is not sufficient to warrant downgrading the land below sub grade 3b.

2.3 Geology and Soils

Most of the area is covered by river terrace deposits on which deep stony sandy soils have formed. These soils are free draining on the highest terraces but close to the river they are affected by a fluctuating ground water table which causes wetness in winter and when the river is high. This area could be drained, but winter wetness would still be a problem at times when the outfalls were covered by high water levels in the rivers and ditches.

Most of the sandy soils are at least slightly stony with total stone content ranging from 5 to 20% in the topsoil and from 5 to 50% in the subsoil. The stones limit the available water capacity of the soil and cause wear and tear on machinery. In places they have limited the classification of the land.

Deposits of alluvium in the north and to the east of the western ridge have given deep clay soils which fall into Wetness Class

IV. In some areas the clay is underlain by peaty loam or organic clay, whilst adjacent to the terraces the clay lies over gravel.

Bands of marl occur close to the surface on either side of the western ridge and along the track to Wolston Field Farm. In these areas sandy loam overlies clay loam or clay at depths between 30 and 70cm and the soils fall into Wetness Class II to IV.

2.4 Interactive Limitations

Soil wetness and droughtiness are affected by the interactions between climate , site and soils.

Soil wetness is a limiting factor on the level ground around the sewage works and on the heavy flood plain soils near the river.

The wetness limitation is determined by the length the soils are at field capacity (152 days on this site), the depth to a slowly permeable layer, profile morphology and the texture of the topsoil. The heavy soils in the north, west and centre of the site falling to Wetness Class IV and having a clay loam or clay topsoil are classified as sub grade 3b. To the north of the sewage works deep sandy soils have no slowly permeable layer within auger depth but are affected by fluctuating ground water table. The installation of field drains would mainly overcome the wetness problem, but the land lies at very similar level to the river and outfalls may be blocked when the river is high, thus reducing the flexibility of the land in winter.

The sandy soils on gently sloping land in the east and west usually have no slowly permeable layer within 80cm and fall into Wetness Class I.

A drought limitation occurs on the sandy soils because of a high subsoil stone content. The susceptibility to drought is determined by the difference between the amount of water the soil can hold in the profile (AP), typically 90-120mm for wheat and 75-100mm for potatoes on this site, and the medium moisture deficit (MD) which has developed by the end of the critical part of the growing season. The MD on this site is 100mm for wheat and 90mm for potatoes. The moisture balance (MB), the difference between AP and MD indicates the susceptibility to drought of soils in a given area.

The land in the north has an adequate supply of irrigation water, available from the river, which largely offsets the droughty nature of the soils. The irrigation water is applied to potatoes on this site.

Erosion is not a serious problem on site and no further downgrading is warranted.

3. Agricultural Land Classification

Land quality ranges from Grade 2 to 3b with 86.2 hectares and 64.7% of the site being mapped as good or very good quality land.

3.1 Grade 2

Grade 2 accounts for 10.9 hectares and 8.2% of the site. It is mapped over very gently sloping ground where deep sandy loams overlie loamy sand and sand or occasionally clay marl. The soils are freely drained and usually fall into Wetness Class I. They are slightly stony and typically have topsoil stone contents of 5-7% of which about half are larger than 2cm. The stone content of the subsoils is more variable ranging from 5-20%. The soils are slightly droughty in dry years but yields of potatoes are improved by applying irrigation water. The variable stone content has limited the classification of this land.

3. Subgrade 3a

This subgrade is mapped extensively accounting for 75.3 hectares and 56.5% of the site. It includes deep slightly stony sandy soils which overlie loamy sand and sand or clay marl. The soils fall into Wetness Classes I to IV.

In areas where slowly permeable clay or clay loam occurs close to the surface the soils fall into Wetness Class IV and with sandy loam topsoils the land is eligible for subgrade 3a.

On the flat land north of the sewage works a high ground water table, which could be only partially controlled by drainage, coupled with very variable topsoil stone contents (typically 7 - 18%, of which most are larger than 2cm) limit the classification of the land to subgrade 3a. To the east of the track to Wolston Fields Farm and on the ridge in the west the soils are too stony and droughty for higher grades. Pockets of Grade 2 occur throughout the area mapped as subgrade 3a but they could not be mapped at this scale and could not be farmed separately.

3.3 Subgrade 3b

This subgrade accounts for 44.5 hectares and 33.4% of the site. It is mapped to include deep sandy clay loam to clay soils which fall into Wetness Class IV. Gravel occurs in some profiles below 60cm whilst peaty loam occurs below 50cm on parts of the flood plain.

In the extreme north east and along the edge of the ridge in the west Subgrade 3b is mapped over slopes of approximately 9%.

4. Soil Units

Eight separate units have been identified most of which will require separate handling if the site is worked for gravel.

4.1 Unit 1

This unit is mapped in the east and west to include deep, slightly stony sandy soils.

Typically 30cm of dark brown (10 YR4/3) sandy loam overlies dark brown (7.5YR3/4) sandy loam to 75cm. Below 75cm strong brown (7.5YR4/6) to yellowish red (5YR4/6) loamy sand or sand occurs, which in places contains pockets of sandy loam and sandy clay loam.

The soils are usually freely drained and fall into Wetness Class I. They often contain iron concretions and in places discontinuous iron cementing at depths below 30cm.

Soil structure is moderately porous, weakly formed, coarse subangular blocky in the topsoil and weakly formed, slightly porous, medium subangular blocky below 30cm. The lower subsoils vary from single grain to very weak coarse subangular blocky and are very porous.

The soils are stony, having between 5 and 20% of very small to medium sized rounded quartzite and angular flinty pebbles in the topsoil. The subsoil stone content ranges from few up to 50% of the volume of the profile. The stone content varies greatly over small distances. Plant roots and worms are common to at least 70cm and often to the base of the pits.

4.2 Unit 2

This unit is mapped over low lying sandy soils which have a high ground water table. These soils are very similar to those in Unit 1 but have a high water table which causes seasonal wetness.The presence of this water table has caused abundant rusty and grey mottles to form in the profile at depths below 30cm and ped faces are grey. If the site is worked for gravel these soils should only be disturbed when they are dry or they may become very compacted.

4.3 Unit 3

This unit is mapped over gently sloping land where the underlying marl occurs close to the surface.

Typically 30cm of dark brown (10YR4/3) sandy loam overlies strong brown (7.5YR4/5) sandy loam to 50 or 60cm. Reddish brown clay(5YR4/4) occurs below this depth, although the depth to clay varies from 30 to 70cm. Soil structure is moderately porous, weakly to moderately formed, coarse subangular blocky in the topsoil to weakly formed, coarse subangular blocky in the upper subsoils. The clay horizon has a coarse prismatic structure which breaks to moderately formed very slightly porous coarse angular blocky peds under pressure. A plough pan with a massive structure occurs at 25cm in some areas. The clay horizon forms a slowly permeable layer and the soils fall into Wetness Classes II to IV. Mottles and manganese concretions occur at variable depths below 30cm.

The soils are slightly stony in the sandy horizons (approximately 10% total) but only very slightly stony in the clay. Plant roots are common to the clay but mainly confined to ped faces within the clay. If the site is worked for gravel every care should be taken to strip and store the clay layers separately.

4.4 Unit 4

This unit is mapped to the south of the sewage works where sandy loam or sandy clay loam soils overlie similar subsoils.

Typically 23cm of dark brown (10YR3/3) sandy loam to sandy clay loam overlies dark brown (10YR3/3) sandy loam, with sandy clay loam, clay loam and loamy sand lenses occurring below 40cm.

The soils have a very porous weak coarse subangular blocky structure to 40cm and a moderately to very slightly porous, very coarse prismatic structure which breaks to very coarse angular or subangular blocky below 40cm. A slowly permeable layer occurs at 40cm and the soils fall into Wetness Class IV. Rusty and grey mottles are common below 25cm and abundant below 40cm.

Round quartzite and small angular flinty pebbles account for 5 to 10% of the volume of the topsoil but the soils generally become more stony with depth. Plant roots are abundant to 70cm in the vicinity of the pit with few below this depth.

4.5 Unit 5

This unit is mapped over heavy soils which overlie gravel.

Typically 23cm of dark greyish brown (10YR4/2) clay or heavy clay loam overlies yellowish brown (10YR5/6) to grey (10YR5/1) clay. An impenetrable gravel layer occurs at depths below 50cm.

The soils are waterlogged below 40cm and mottled below 20cm; they fall into Wetness Class IV. A slowly permeable layer occurs close to the surface and ped faces are very grey.

Soil structure is moderately formed, slightly porous, fine to coarse subangular blocky in the topsoil to strongly formed very coarse prismatic below this depth. Few pores occur below 25cm and plant roots are generally confined to ped faces.

Much of this area had a high ground water table at the time of survey.

4.6 Unit 6

This unit is very similar to unit 5, but generally has grey (7.5YR5/0) clay to at least 100cm.

4.7 Unit 7

This unit is very similar to unit 5, but has a massive peaty loam to organic clay horizon below 50cm. The peaty loam is black (10YR2/1) and structureless to very coarse prismatic. It appears to be waterlogged for long periods, having a distinct anaerobic smell and a peaty horizon. A water table was encountered within 40cm of the surface.

Because the upper horizon of units 5, 6 and 7 are very similar the topsoils from each can be stripped and stored together as can the subsoils. The lower subsoils from each unit should be stripped and stored separately.

4.8 Unit 8

This unit is mapped over areas which have little or no soil at the surface. It includes the site of buildings, a small disused rubbish tip and a farm track. This material should be buried during the restoration of the site. Several filled in marl pits occur on site and if imported waste has been used to fill these pits the waste should be discarded during the restoration of the site.

5. Summary

The site, which is underlain by river terrace deposits, is mapped mainly as grades 3a and 3b with a smaller area of grade 2.

Eight soil units have been identified which may require separate handling if the site is worked for gravel.

Summary of ALC

Grade	Area (ha)	% of site
2	10.96	8.2
3a	75.30	56.5
3b	44.53	33.4
Non-Ag	1.96	1.5
Ag Buildings	0.56	0.4
Total	133.31	100.0

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9 March 1990.

WALSTON FIELDS FARM SAND AND GRAVEL SITE. MRS R A PEEL JANUARY 1990

1. Almost level. Grass. Recently flooded. 0-23 cm dark brown clay loam. 23-40 cm brown clay (pale) grey mottles. 40-90 cm brown and very pale brown clay. Abundant mottles. 90-100 cm+ greenish grey clay (5 GY 4/1). No stones. 3b

2. Almost level. Grass. 0-23 cm dark greyish brown clay. 23-50 cm greyish brown and yellowish brown clay. 10 YR 5/2 and 5/6. Rusty and grey mottles abundant. 50-100 cm clay more 10 YR 5/2 with depth. Many iron concretions below 60 cm. 3b

3. Almost level. Grass. 0-23 cm dark greyish brown clay. 23-50 cm greyish brown and yellowish brown clay. 10 YR 5/2 and 5/6. Rusty and grey mottles abundant. 50-100 cm clay more 10 YR 5/2 with depth. Many iron concretions below 60 cm. 3b

4. Almost level. Grass. 0-23 cm dark brown clay. 23-40 cm pale brown clay. Abundant rusty mottles. 40-90 cm brown and pale brown clay. Abundant mottles. 90-100 cm+ very pale brown clay. No stones. 3b

5. Almost level. Grass. 0-25 cm heavy clay loam. Brown. Occasional stones. 25-35 cm brown clay loam (pale rusty and grey mottles common). Few stones. 35-50 cm pale brown sandy clay loam and very pale brown ped faces. Slightly stony. 50 cm+ impenetrable gravel layer. 3b

6. Almost level. Grass. 0-23 cm dark brown heavy clay loam. 23-40 cm brown heavy clay loam. Pale rusty and grey mottles many. 40-55 cm gravelly sandy clay loam grey and yellowish brown. 55 cm+ impenetrable gravel layer. 3b

7. Almost level, slight knoll. Grass. 0-28 cm dark brown sandy clay loam/sandy loam. 28-50 cm gravelly sandy clay loam, wet by 50 cm. Rusty and grey mottles common. 50 cm+ impenetrable gravel layer. Rusty and grey mottles abundant.

8. Almost level. Grass. 0-23 cm dark greyish brown clay/clay loam. 23-50 cm greyish brown (10 YR 5/2 and yellowish brown 5/6 clay). Rusty and grey mottles abundant. 50-100 cm+ clay becoming more grey brown with depth. 3b

9. Almost level. Winter cereals. (Recently flooded after heavy rain). 0-25 cm of dark brown clay loam/clay. 25-45 cm greyish brown clay. Rusty mottles common. 45-60 cm brownish yellow and grey sandy clay loam. 60-80 cm loamy sand with pockets of clay. Abundant rusty and grey mottles. 80-100 cm+ clay with pockets of loamy sand. Abundant mottles. 3b.

10. Almost level. Winter cereals. 0-25 cm dark brown clay loam/clay. 25-40 cm greyish brown clay. (10 YR 5/2). 40-60 cm grey and brownish yellow sandy clay loam. (10 YR

6/1 and 6/6). Abundant rusty and grey mottles. Slightly stony below 50 cm. Impenetrable stony layer 60 cm+. 3b

11. Almost level. Winter cereals. 0-28 cm dark brown sandy loam. 10 YR 4/3. Occasional small sub-angular and rounded quartzite pebbles. 28-70 cm brown sandy loam (10 YR 5/3). Prominent rusty and grey mottles. Occasional stones. 70-120 cm+ loamy sandy with gravel. Brown and dark yellowish brown. Waterlogged. More than 50% stones. 3a

12. Almost level. Winter cereals. 3% stones greater than 2 cm total stones 7% in topsoil. 0-35 cm dark brown sandy clay loam. 35-65 cm brown sandy clay loam (7.5 YR 5/4 and yellowish red 5 YR 4/6). Stony. Rusty and grey mottles. 65 cm+ impenetrable gravel layer. 3a

13. Almost level with the foot of the backslope. Permanent pasture. Waterlogged areas close by. 0-28 cm dark brown sandy clay loam/clay loam. Faint rusty mottles. 28-45 cm brown sandy clay loam, rusty and grey mottles common. 45-70 cm loamy sandy with pockets of sandy loam. Reddish yellow and very pale brown. Rusty and grey mottles abundant. 70-90 cm clay with occasional pockets of sand. Gravelly. 90 cm+ impenetrable gravel layer. 3a/2 profile 3b area due to flood risk and waterlogging.

14. At the foot of a 9^{o} slope. Permanent pasture. 0-35 cm dark brown sandy loam. Rusty mottles common. 35-70 cm brown sandy loam. No mottles. Approximately 10% stones. 70-100 cm+ pale brown loamy sand with rusty mottles. Wet. Grade 2 soil. 3b site.

15. Woodland. Foundations and brick walls from old buildings. 0-25 cm dark brown clay loam. 25-35 cm brown clay loam. 35-50 cm reddish brown clay loam/clay. Coal and brick fragments. 50-100 cm+ brown medium clay loam. Rusty and grey mottles many. Non-agricultural.

16. Almost level. Grass. (Recently flooded). 0-25 cm dark greyish brown clay. 10 YR 4/2. 25-55 cm very pale brown clay and reddish yellow clay. Rusty and grey mottles abundant. 55-100 cm dark grey organic clay becoming more pale grey with depth. Wet. No stones. 3b

17. Almost level. Winter cereals. 0-28 cm dark brown heavy clay loam. Occasional brown mottles. 28-35 cm dark brown clay loam. Rusty mottles common. 35-45 cm pale brown sandy clay loam, rusty and grey mottles common. Quite a coarse sand fraction. Stony. 45-65 cm loamy sand and gravel. Very pale brown and reddish grey. Rusty and grey mottles abundant. Stony. 65-90 cm sandy clay loam, very pale brown and reddish yellow. Abundant mottles. Stony. 90 cm+ impenetrable. 3b

18. Almost level. Winter cereals. (Higher than previous profile). 0-28 cm heavy clay loam/sandy clay loam. Dark brown. Approximately 5% stones. 28-35 cm sandy clay loam/clay loam. Brown. Occasional rusty mottles. 35-50 cm

brown and pale brown sandy clay loam. Rusty and grey mottles. Stones approximately 10%. 50-85 cm very pale brown sandy clay loam. Grey pockets and ped faces. Rusty and grey mottles abundant. 85 cm+ impenetrable stony layer. The profile becomes more stony with depth ranging from approximately 5% to 35 cm 10% to 85 cm and at least 80% below 85 cm. 3b

19. Almost level. Winter cereals. Approximately 5% surface stones greater than 2 cm and 12% to total. 0-33 cm dark brown sandy loam. 33-53 cm pale brown sandy loam. Rusty and grey mottles many. Stony. Moist by 45 cm. 50-65 cm loamy sand, wet. Very pale brown and yellow brown. Rusty and grey mottles many. Stony. 65 cm+ impenetrable stony layer. 3a

20. Very gentle slope. Winter cereals. Approximately 7% surface stone. 0-33 cm of dark brown sandy loam. 33-65 cm brown sandy loam. Approximately 7% stones. 65-85 cm wet loamy sand. 85-95 cm loamy sand/sand. Wet and gravelly. Approximately 25% stones. 95 cm+ impenetrable stony layer. 3a

21. Very gentle slope. Winter cereals. Approximately 7% total stones with 5% greater than 2 cm. 0-30 cm dark brown sandy loam. 30-50 cm brown sandy loam. 50 cm+ impenetrable stony layer. Two attempts. 3a.

22. Very gentle slope. Grass. (Slight ridge and furrow). 0-30 cm dark brown sandy loam. 30-60 cm strong brown sandy loam. 60-70 cm pockets of loamy sand, sandy clay loam and sandy loam. 70-85 cm reddish brown clay loam. Gritty. Rusty and grey mottles and manganese concretions. 85 cm impenetrable layer. Slight stony throughout.

23. Very gentle slope. Grass. 0-23 cm brown sandy loam, slightly stony. 30-40 cm loamy sand and gravel. Strong brown. 40 cm+ impenetrable layer. 3b?

24. Almost level. Winter cereal. On floodplain close to recently flooded area. 0-23 cm slightly organic dark brown clay. 23-39 cm greyish brown clay. Many rusty and grey mottles . 38-100 cm+ peaty loam. Becoming more organic clay with depth. 3b.

24a. On a slight ridge. Winter cereal. Above recent floodline. 0-30 cm dark brown sandy loam/sandy clay loam, occasional stone. 30-40 cm brown sandy loam, occasional rusty mottles below 35 cm. 40-60 cm gravelly loamy sand. 60 cm+ impenetrable gravel layer.

25. Almost level within an area of recent flooding. Winter cereal. 0-20 cm dark brown clay loam. 20-33 cm dark grey brown clay. Rusty mottles many. 33-60 cm peaty loam, very dark brown. 60-100 cm organic clay. Dark grey. Pockets of peaty loam and gravelly clay incorporated below 80 cm. 3b.

26. Almost level. Winter cereals. Approximately 10% surface stones. 0-28 cm dark brown sandy loam. 28-50 cm pale greyish brown sandy loam. Rusty and grey mottles many. 50-60 cm wet sand. Pale greyish brown. 60-85 cm pockets of sandy loam and loamy sand. Stony. Wet. Rusty and grey mottles abundant. 85 cm+ impenetrable stony layer. 3a

27. Almost level. Winter cereals. 10-12% surface stone. 0-28 cm dark brown sandy loam. Occasional brown mottles. 28-40 cm dark brown sandy loam, rusty mottles common. 40-55 cm pale brown sandy loam, rusty mottles common. Moist. 55-80 cm stony sand becoming more stony with depth. Mainly angular flinty pebbles. Rusty and grey mottles abundant. Wet. 80 cm+ impenetrable sandy and gravel. 3a

28. Almost level. Winter cereals. Surface stones approximately 10% with 5% greater than 2 cm. 0-35 cm dark brown sandy loam. 35-42 cm strong brown sandy loam. 42-90 cm strong brown sand, moist below 60 cm. 90 cm+ impenetrable stony layer. Slightly stony throughout with approximately 10% stones to 60 cm and at least 15% stones below this depth.

29. Almost level. Winter cereals. 7% total surface stone. 0-25 cm dark brown sandy loam. 25-40 cm strong brown sandy loam. 40-65 cm strong brown loamy sand. Slightly stony throughout approximately 10%. Impenetrable stony layer below 65 cm. Two attempts at this hole. 3a

30. Gentle slope. Ploughed. Slightly stony approximately 15% of mainly small rounded quartzite and sub angular flinty pebbles. 10% greater than 2 cm. 0-35 cm dark brown sandy loam. 35-45 cm strong brown sandy loam. 45-60 cm yellowish brown loamy sand. 60-100 cm+ yellowish brown sand. Stone percent appears constant throughout.

31. Almost level. Ploughed. 0-35 cm dark brown sandy loam. Approximate stone content 10%. 35-80 cm slightly stony sandy loam. Strong brown. 80 cm+ impenetrable gravel layer.

31a. Hill top. Ploughed. 0-30 cm dark brown sandy loam. 10% stones greater than 2 cm. 30-50 cm weak bodied sandy loam. 15% stone. 50-60 cm stony loamy sand. 60 cm+ too gravelly to auger.

32. Almost level. Ploughed. Sieve analysis of the top soil indicates 7% stones greater than 2 cm with 12% total stone content. Subsoil stones between 35 and 80 cm equal 23% greater than 2 cm and approximately 25% total. 0-30cm dark brown sandy loam. Slightly stony. 30-80 cm strong brown sandy loam. 80-100 cm slightly stony sand.

33. Almost level. Permanent pasture. Floodplain. Recently flooded, hollows still wet. 0-27 cm dull dark brown slightly organic heavy clay loam. Rusty mottles common. 27-50 cm grey clay. Rusty and grey mottles many. 50-75 cm very dark brown peaty loam. 75-100 cm organic clay/peaty loam. Dark brown. Anaerobic layer.

33a. Almost level, slightly higher than number 33. Permanent pasture. Above floodline. 0-27 cm dull brown clay. Rusty mottles common. 27-100 cm strong brown clay. Grey ped faces becoming more grey with depth. Wet by 50 cm. Prominent rusty and grey mottles. 3b.

34. Almost level. Grass. Two attempts at this hole. 0-28 cm dark brown sandy loam. Slightly stony. 28-40 cm pale brown sandy loam. Rusty and grey mottles common. Stony. 40- cm+ impenetrable layer.

34a. On a slight knoll on the edge of the floodplain. 0-30 cm dark brown sandy clay loam, slightly stony. 30-35 cm dark brown stony sandy clay loam. 35 cm+ impenetrable layer. Iron staining and concretions on the tip of the auger.

35. Almost level. Permanent pasture. Two attempts at this hole. 0-35 cm dark brown sandy loam. 35-45 cm strong brown sandy loam, very pale brown ped faces. Rusty and grey mottles common. Stony. 45 cm+ impenetrable stony layer.

36. Almost level. Winter cereals, very wet at the surface. 0-30 cm dark brown waterlogged sandy loam. Drier below 25 cm. 30-40 cm dark brown sandy loam, occasional rusty mottles. 40-50 cm strong brown sandy loam, stony. 50-100 cm+ loamy sand, too wet to assess accurately. Stony.

37. Almost level. Winter cereal. 8% surface stones, no worse with depth. 0-30cm dark brown sandy loam. 30-60cm strong brown sandy loam. Pale ped faces and rusty mottles at 50cm+. 60-80cm strong brown loamy sand, slightly stony.80-100cm sand.

38. Very gentle slope. Ploughed. 0-30 cm dark brown sandy loam, approximately 7% surface stone. 30-70 cm brown sandy loam becoming more strong brown with depth. 70-100 cm strong brown loamy sand. Moist. Stones no worse with depth.

39. Very gentle slope. Ploughed. 0-30 cm dark brown sandy loam, approximately 7% total stone. 30-45 cm strong brown sandy loam, slightly stony. 45-70 cm loamy sand, strong brown. Approximately 15% stone. 70-90 cm strong brown sand, occasional rusty mottles. 90-100 cm+ red brown clay. Rusty and grey mottles abundant.

40. Very gentle slope. Ploughed. 0-30 cm dark brown sandy loam approximately 12% stones greater than 2 cm and 15-18% total. 30-40 cm strong brown sandy loam, slightly stony. 40-50 cm gritty loamy sand with gravel estimated at 40%. 50 cm+ impenetrable layer. Gravel mainly small and very small.

41. Two attempts. Almost level. Ploughed. 0-28 cm dark brown sandy loam, slightly stony. 12-15% greater than 2 cm. 28-40 cm strong brown sandy loam. 40 cm+ impenetrable stony layer.

42. Almost level. Permanent pasture. Recently flooded. 0-25 cm very dark greyish brown slightly organic clay. 25-70 cm strong brown clay with grey ped faces. Rusty and grey mottles many. 70-85 cm very dark brown peaty loam. Anaerobic. 85-100 cm+ dark grey brown organic clay.

43. Almost level. Winter cereal. 0-30 cm dark brown sandy loam. 30-35 cm brown sandy loam. 35-45 cm brown sandy loam, (pale colours) iron and manganese concretions abundant. 45 cm+ too stony to auger.

44. Almost level. Winter cereals. 0-30 cm dark brown sandy loam, slightly stony. 30-40 cm brown sandy loam, slightly stony. 40-60 cm loamy sand, stony layer approximately 25% stone. 60-70 cm loamy sand, strong brown. Slightly stony approximately 10%. 70 cm+ impenetrable stony layer.

45. Almost level. Wheat. Approximately 10% stones greater than 2 cm with 15% total stones. 0-30 cm dark brown sandy loam, slightly stony. 30-60 cm strong brown sandy loam, rusty mottles by 50 cm. 60-70 cm strong brown loamy sand. Stony. 70 cm+ impenetrable stony layer.

46. Two attempts at this hole. Almost level. Winter cereals. 0-28 cm dark brown sandy loam. 28-40 cm brown sandy loam, rusty mottles common. 40-60 cm yellowish brown sandy loam with grey ped faces. Rusty and grey mottles many. 60 cm+ impenetrable gravel layer.

47. Almost level below a gentle slope. Ploughed. 0-30 cm dark brown sandy loam. 30-60 cm yellow brown sandy loam, 10YR5/4 occasional rusty mottles by 45 cm. Wet by 50 cm with prominent rusty mottles by 60 cm. 60-70 cm yellow brown loamy sand, abundant prominent rusty mottles. Wet. 70 cm+ impenetrable gravel layer.

48. Gentle slope. Ploughed. 0-28 cm dark brown sandy loam. 5% surface stone. 28-50 cm brown sandy loam, slightly stony approximately 5%. 50-80 cm loamy sand, strong brown. Slightly stony. 80-100 cm+ strong brown loamy sand. Stony.

49. Very gentle slope. Ploughed. 0-30 cm dark brown sandy loam, 7% stones greater than 2 cm with 10% total stones. 30-48 cm yellowish brown sandy loam 10YR4/2, rusty mottles below 35 cm. 48-100 cm+ red brown clay marl.

50. Very gentle slope. Ploughed. 0-30 cm dark brown sandy loam, 12% surface stone. 30-50 cm strong brown sandy loam, slightly stony. 50-70 cm loamy sand and sandy loam. Occasional rusty mottles by 60 cm. 70-100 cm+ red brown clay marl. Rusty mottles many, iron concretions common. 3a.

51. Almost level. Winter cereal. Above a drop to the river. 0-30 cm dark brown sandy loam. 30-60 cm brown sandy loam, occasional rusty mottles below 50 cm. 60-70 cm moist loamy sand. Stony. Approximately 12% surface stone. Stone content equals 3a.

52. Almost level. Winter cereal. Surface stones 12-15%. 0-27 cm dark brown sandy loam. 27-35 cm brown sandy loam. 35-60 cm brown sandy loam, pale colours. Grey and rusty mottles many. Moist. 60-70 cm brown loamy sand. Pale and mottled. 70 cm+ impenetrable stony layer. Slightly stony throughout becoming impenetrable by 70 cm. 3a.

53. Almost level. Winter cereals. Approximately 15% surface stone. 0-30 cm dark brown sandy loam. 30-35 cm brown sandy loam, slightly stony. 35-55 cm strong brown loamy sand with pockets of sand. Moist with rusty mottles. 55-85 cm strong brown sand. Rusty mottles many. Moist. 85-100 cm+ sandy clay loam. Yellow, red and grey. Abundant mottles. Stones equal 3a/b.

53a. Almost level. Winter cereal. 0-28 cm dark brown sandy loam, slightly stony. 28-35 cm brown sandy loam, slightly stony. 35-45 cm brown sandy loam, rusty mottles common. 45-50 cm+ sandy loam and gravel. 50 cm+ impenetrable gravel layer. Close by gravel band at 50-60 cm but below this depth 60-70 cm sandy loam, yellowish brown and grey. Moist. 70-90 cm loamy sand with pockets of sandy loam. 90 cm+ impenetrable gravel layer.

54. Almost level. Winter cereal. 0-35 cm dark brown sandy loam. 35-40 cm brown loamy sand/sandy loam, brown mottles with occasional iron and manganese concretions. 40-100 cm yellowish red loamy sand. Wet. Becoming almost sand with depth. Small, medium and large rounded quartzite pebbles with occasional angular flinty pebbles to 40 cm few below this depth. Wet areas around.

54a. Almost level. Winter cereal. 10-12% surface stone. 0-35 cm dark brown sandy loam, slightly stony. 35-45 cm brown sandy loam. 45-55 cm strong brown sandy loam, pale brown ped faces. Rusty and grey mottles common becoming wet by 60 cm. 75-100 cm+ loamy sand with pockets of sand and sandy loam. Slightly stony throughout. 3a.

55. Almost level. Grass. 0-28 cm dark brown sandy loam, slightly stony approximately 7% total. 28-35 cm brown sandy loam, slightly stony. 35-40 cm sandy loam/loamy sand, pale brown. Mottled and moist. 40-70 cm strong brown loamy sand. Moist. Mottled. 70-100 cm strong brown wet sand. No stones. Close by below 70 cm pockets of clay and sandy loam occur with abundant mottles.

55a. Almost level. Winter cereals. 0-33 cm dark brown sandy loam, slightly stony. 33-40 cm pale brown sandy loam, rusty mottles common. 40-90 cm reddish yellow and grey loamy sand. Rusty and grey mottles abundant. 90-100 cm sandy clay loam with pockets of sand. Surface stones approximately 10% becoming more stony below 33 cm. 3a.

56. On a slight slope. Ploughed. Surface stones approximately 7% total. Small and medium quartzite with occasional sub angular flinty. 0-30 cm dark brown sandy loam. 30-50 cm strong brown sandy loam. 50-75 cm loamy sand, brown. Iron

concretions with slight iron cementing. Stony layer. 75 cm+ too stony to auger.

57. At the top of a slight slope. Ploughed. Surface stones less than 5% and no worse throughout profile. 0-30 cm dark brown sandy loam. 30-55 cm strong brown sandy loam, 7.5YR4/6. Faint rusty mottles below 50 cm. 55-65 cm heavy clay loam/clay. 5YR4/4 reddish brown. Very large manganese concretions. Faint brown mottles. Water seeping in at the base of the sandy loam. 65-100 cm+ reddish brown clay. 5YR4/4 no stones below 55 cm.

58. Almost level. Ploughed. Total stones equal 12-15% but only 7% larger than 2 cm. 0-35 cm dark brown sandy loam, slightly stony. 35-50 cm brown sandy loam, slightly stony. 50-60 cm weak bodied sandy loam, occasional rusty mottles and iron concretions. Impenetrable in places. 60-80 cm moist loamy sand. Strong brown becoming more red brown with depth. 80-100 cm+ red brown clay. Rusty mottles and manganese concretions.

59. Almost level. Winter cereals. Surface stones approximately 10-12% small, medium and large rounded quartz and angular flint. 0-30 cm dark brown sandy loam. 30-40 cm dark brown sandy loam. 7.5YR4/4 with 5/4 ped faces. Rusty mottles common. 40-60 cm reddish yellow loamy sand. Rusty mottles common. Moist. 60-70 cm sandy loam and gravel. 70 cm+ impenetrable layer.

60. Almost level. Winter cereals. Approximately 12% surface stones greater than 2 cm. 0-35 cm dark brown sandy loam, slightly stony. 35-40 cm dark grey brown sandy loam, rusty and grey mottles. 40-60 cm reddish yellow loamy sand. Mottled. 60-100 cm+ sandy loam. Very gritty and stony. 3a.

61. Almost level. Winter cereal. 0-30 cm dark brown sandy loam. 30-40 cm dark grey brown sandy loam, 10YR4/2. Rusty mottles many. 40-60 cm dark grey loamy sand. 60-100 cm very pale brown and reddish yellow sandy loam. Wet.

62. Almost level. Winter cereal. 12% surface stones small, medium and large mainly rounded quartzite with occasional angular flint. 0-35 cm dark brown sandy loam. 35-55 cm yellowish brown sandy loam, rusty mottles common. 50-75 cm loamy sand, 10YR6/8 and 7/4 brownish yellow and very pale brown. Slightly stony. Rusty mottles. 75-100 cm+ yellowish red and very pale brown sandy clay loam. Rusty and grey mottles abundant. Moist. 3a.

63. Almost level. Winter cereal. 0-30 cm dark brown sandy loam, slightly stony. 30-50 cm sandy loam, 10YR4/3, brown. Rusty mottles many. Pale colours predominate. 50-60 cm brown loamy sand. Rusty mottles. Slightly stony throughout approximately 10-12% total. 60 cm+ impenetrable stony layer.

64. Very gentle slope. Ploughed. Surface stones 8-10% of mainly rounded quartzite pebbles. 0-30 cm dark brown sandy loam. 30-60 cm strong brown sandy loam, rusty mottles common. Becoming more yellow brown with depth. 60-80 cm yellow brown loamy sand. Moist. 80-100 cm wet sand. Slightly stony throughout.

65. Very gentle slope. Ploughed. 0-30 cm dark brown sandy loam, slightly stony approximately 7%. 30-50 cm strong brown sandy loam, slightly stony. 50-60 cm strong brown sandy loam with iron concretions abundant. Hard to auger. 60-85 cm slightly stony loamy sand. Yellow brown. 85-100 cm+ yellowish brown (10YR4/2) sand. Slightly stony.

66. Very gentle slope. Ploughed. 0-27 cm dark brown sandy loam. Slightly stony. 27-40 cm brown sandy loam (10YR4/3) prominent rusty mottles. 40-60 cm brown loamy sand, prominent rusty and grey mottles. Iron concretions. 60 cm+ too cemented to auger. Slight stony throughout, mainly small and medium rounded quartzite with occasional angular flinty pebbles. 3a.

67. Almost level. Ploughed. 10% surface stone. 0-35 cm dark brown sandy loam, rusty mottles common, 35-50 cm strong brown sandy loam, rusty and grey mottles many. Wet. 50-70 cm sandy loam and loamy sand, gravelly. 70 cm+ impenetrable gravel layer. Slightly stony throughout.

68. Almost level. Ploughed. 0-35 cm dark brown sandy loam. 35-45 cm brown (10YR5/3) sandy loam. Pale colours. Rusty and grey mottles common. 45-50 cm yellow brown loamy sand, rusty and grey mottles many. 50-80 cm yellow brown sand. 80-100 cm+ yellow brown sandy loam, rusty and grey mottles. Slightly stony throughout the profile approximately 10-15%.

69. Almost level. Ploughed. Surface stone approximately 9% small, medium rounded quartzite and angular flinty. Total stones approximately 12%. 0-33 cm dark brown sandy loam. slightly stony. 33-40 cm light yellow brown sandy loam, 10YR6/4. Rusty mottles. Pale colours. 40-50 cm reddish yellow sandy loam. Rusty and grey mottles. 50-70 cm reddish yellow loamy sand. Rusty and grey mottles. Moist. 70-100 cm+ gravelly sandy loam. Slightly stony throughout.

70. Very gentle slope. Ploughed. Approximately 5% surface stone and throughout. 0-40 cm dark brown sandy loam. Slightly stony. 40-60 cm strong brown sandy loam, slightly stony. 60-70 cm strong brown loamy sand. 70 cm+ impenetrable gravel layer. Close by loamy sand occurs between 70 and 100 cm and only slightly stony. Grade 2.

71. Gentle slope. Ploughed. 0-35cm sandy loam, strong brown. Small and medium angular flint and rounded quartz, approximately 25%, (10% > 2cm) 35-40cm gravel. 40cm + impenetrable layer.

72. Very gentle slope. Ploughed. 0-28 cm dark brown slightly stony sandy loam. 28-50 cm strong brown slightly stony

sandy loam. Occasional mottles below 45 cm. 50-93 cm sandy clay loam becoming clay loam by 60 cm. Rusty and grey mottles many. Yellow brown and very pale brown colours predominate. 93-100 cm moist loamy sand. Yellowish brown. 3a/2 (see pit No 3 for details).

73. Almost level. Permanent pasture. Some water filled hollows. 0-25 cm dark brown clayey loam/sandy clay loam. Common rusty mottles. Rusty and grey by 20 cm. 25-45 cm grey sandy clay loam. Prominent rusty mottles abundant. Heavier and more yellow brown with depth. 45-55 cm strong brown and grey clay loam. Pockets sandy clay loam. 55-70 cm sandy clayey loam. Light brownish grey and light yellowish brown. 70-100 cm dark grey loamy sand.

74. Almost level. Ploughed. Slightly stony surface stones 10-12%. 0-35 cm dark brown sandy loam. 35-50 cm brown (pale) sandy loam. Rusty mottles common. 50-70 cm slightly stony loamy sand. 70-80 cm stony sand. 80 cm+ impenetrable stony layer.

75. Almost level. Ploughed. 10-12% surface stones mainly small and medium rounded quartzite with occasional angular flinty. 0-33 cm dark brown sandy loam. 33-50 cm brown (pale) sandy loam occasional rusty mottles. 50-60 cm pale brown loamy sand. 60 cm+ impenetrable or iron cemented layer.

76. At the foot of a gentle slope. Ploughed. 0-28 cm dark brown sandy loam, slightly stony. 28-70 cm strong brown sandy loam, slightly stony. 70-100 cm brown loamy sand, wet with occasional rusty mottles. Pale colours below 70 cm. Surface stones approximately 7% and no worse with depth. Grade 2.

77. Gentle slope. Ploughed. Close to old field marl pit. 0-27 cm dark brown sandy loam. Slightly stony. 27-35 cm heavy clay loam, brown (7.5YR5/4) slightly stony. Iron concretions and cementing, pale ped faces. Occasional rusty mottles. 35-70 cm reddish brown clay. (5YR4/2) rusty mottles. No stones. 70-90 cm reddish brown coarse sandy loam and clay. Many small stones mainly angular flinty. 90 cm+ too stony to auger. 3a.

78. Almost level. Slightly higher and drier. Grain. 10% small medium and occasional large angular flint and rounded quartz at surface. 0-29 cm dark brown sandy loam. 29-65 cm strong brown sandy loam. Slightly stony. Lighter texture with depth. 65-90 cm loamy sand. Yellowish brown. Prominent rusty mottles. 90 cm+ too gravelly to auger.

78a. Level flood plain with water at surface. Grain. Very few stones. Occasional rounded quartz. 0-18 cm dark brown clay. 18 cm+ greyish brown clay. Rusty mottles abundant. Much more grey with depth. Occasional grit and gravel at 100 cm.

79. Level. Grain. Occasional water at surface. 10% total stones. 5% larger than 5 cm. Mainly rounded quartz and

angular flint. 0-40 cm dark brown sandy loam. 40-50 cm brown sandy loam. Large iron concretions. 50-65 cm brown loamy sand. Gravelly. Wet by 60 cm. 65 cm+ too gravelly to auger.

80. Almost level. Grass ley. Large area of surface water nearby. 0-30 cm dark brown sandy loam. Quite heavy. Abundant rusty mottles. More grey brown with depth. Slightly stony throughout. 30-45 cm clay loam (sandy) strong brown. Common rusty mottles. Grey streaks. 45-70 cm sandy clayey loam. Yellowish red. Pockets of clay loam. Almost clay by 70 cm. 70 cm+ too gravelly to auger.

81. Almost level. Grass ley. Waterlogged patches. 0-28 cm dark greyish brown sandy loam/sandy clay loam. Occasional rusty mottles. Slightly stony throughout. 28-45 cm pale grey heavy sandy loam. Large iron concretions. Rusty mottles common. 45-85 cm yellowish red clay loam with pockets of sandy loam. Gravelly below 70 cm. 85 cm+ too gravelly to auger.

82. Almost level with a faint ridge and furrow pattern. Permanent pasture. Water at surface. Disturbed? 0-25 cm dark greyish brown sandy loam. Common rusty mottles. 25-35 cm sandy clayey loam. Yellowish red and dark reddish grey. Pockets of clayey loam. 35-75 cm sandy loam brownish yellow. Slightly stony. Pockets of sandy clayey loam. Abundant grey mottles. 75-100 cm strong brown sandy clayey loam. Pockets of clay loam.

83. Permanent pasture. Level. 0-25 cm dark brown (10YR3/3) heavy sandy loam. 25-60 cm light yellowish brown sandy loam (10YR6/4 and 5/8) many rusty and grey mottles. Moist by 50 cm. 60-80 cm yellowish brown wet loamy sand. 80-100 cm strong brown sandy clay loam, heavier and more pale brown with depth. Rusty and grey mottles. Slightly stony throughout profile but nowhere greater than 7%. Grade 2.

84. Almost level. Permanent pasture. 0-25 cm dark brown sandy loam, slightly stony throughout. 25-40 cm dark brown sand loam (10YR4/3). Iron cementing. 40-75 cm brown loamy sand (10YR5/3) pale colour. Rusty and grey mottles. Stony layer at 75 cm prevent a deeper augering. Waterlogged at the base of the hole. 3a.

85. Almost level. Grass. (Recently flooded). 0-23 cm dark brown heavy clay loam. 23-45 cm brown heavy clay loam. More reddish brown with depth. Faint rusty mottles common. 45-100 cm+ reddish brown clay. Rusty and grey mottles common. More below 60 cm. 3b

86. Level. Cereal. 0-25 cm dark brown heavy clay loam. Occasional stones at surface. 25-100 cm+ clay. Yellowish brown matrix and light brownish grey areas. Abundant rusty and grey mottles. Water seeping into hole.

87. Level. Cereal. Occasional angular flint on the surface. 0-23 cm dark brown clay loam/clay. Water near surface.

23-30 cm yellowish brown and light brownish grey clay. Rusty and grey mottles. 30 cm+ gravel. Two auger borings tried.

88. On top of a slight ridge with a gentle slope. Drier than previous auger boring. Sub-rounded quartz pebbles and angular flint mainly less than 2 cm. Approximately 7% greater than 2 cm at surface. 0-27 cm dark brown sandy loam. 27-60 cm very gravelly strong brown sandy loam. 60-80 cm topsoil? Disturbed profile. Dark brown sandy loam. Occasional stones. 80-97 cm strong brown wet loamy sand with gravel. 97 cm+ too stony to auger.

89. Level. Grain. Water at surface in patches. 0-27 cm light clay loam. Dark brown. 27-65 cm strong brown clay loam. (Sandy). Rusty and grey mottles. 5% rounded quartz and angular flint at surface. Pockets of sandy clay loam with depth. 65-90 cm pale brown sandy clayey loam. Grey and rusty mottles abundant.

90. Almost level. Winter cereal. 0-25 cm dark brown clay loam (10 YR 4/3). Small and medium rounded angular flint approximately 5%. 25-80 cm strong brown clay loam (7.5 YR 5/6 and 5/8). 80-100 cm dark grey sandy loam. Slightly stony throughout.

91. Almost level. Water patches near surface. Medium sized rounded quartz and small angular flints at surface. 0-25 cm dark brown heavy sandy loam. 25-45 cm light brownish grey and brownish yellow sandy loam. Mottles occurring. 45-55 cm sand light brownish grey and brownish yellow. 55-70 cm clay with pockets of sand. Brownish yellow. More waterlogged. Gravelly. 70-100 cm sandy clayey loam grey and yellow brown. Rusty and grey mottles abundant.

92. Almost level. Permanent pasture. Wet hollows. 0-26 cm dark brown sandy clayey loam. Rusty and grey mottles common. Occasional stones. 26-37 cm strong brown heavy sandy loam. Many rusty and grey mottles. Stony below 30 cm. 37-75 cm light grey/grey and strong brown sandy clayey loam. Abundant rusty and grey mottles. 75-95 cm sandy loam. More strong brown and less grey with depth. 95-100 cm grey loamy sand.

93. Almost level. Permanent pasture. Drier than previous auger boring. 0-30 cm dark brown sandy loam. Occasional rusty mottles. Slightly stony. More greyish brown with depth. 30-50 cm very dark greyish brown sandy loam. Rusty mottles. More yellowish brown with depth. 50-70 cm yellowish brown sandy loam. Very grey ped faces. Pockets of sandy clayey loam. 70-80 cm brown/dark brown heavy sandy clayey loam. 80-100 cm reddish brown clay.

94. Almost level. Hilltop. Winter cereals. 0-33 cm of dark brown sandy loam. 33-60 cm brown sandy loam. Rusty mottles common below 35 cm. 60-80 cm strong brown loamy sand. Rusty mottles many. Moist. 80-90 cm+ reddish brown sandy loam. Wet. 90 cm+ impenetrable stony layer. Approximately

12% surface stones with 8-10% greater than 2 cm. Slightly stony throughout approximately 15% with many more forming an impenetrable layer at 90 cm.

95. Very gentle slope. Winter cereals. 0-25 cm of dark brown sandy loam (10 YR 4/3). 10% small rounded stones. 25-35 cm brown sandy loam (7.5 YR 4/4). Rusty and grey mottles abundant. 35-100 cm+ reddish brown clay 5 YR 4/4 and 7.5 YR 5/4. Wet by 70 cm. Abundant prominent rusty and grey mottles by 70 cm.

96. Almost level. Winter cereals. 0-23 cm dark brown clay. 10 YR 3/3. 23-60 cm grey and yellow red clay. 10 YR 5/1 and 5/6. Abundant rusty and grey mottles. 60-85 cm grey clay. 10 YR 5/1. 85-100 cm+ organic clay. Very dark brown. 10 YR 2/2. Fragments of decomposing organic matter visible. 3b

96a. Almost level. Winter cereals. 0-23 cm dark brown clay. 10 YR 3/3. 23-60 cm grey and yellow red clay. Only augered to 60 cm.

97. Level. Cereal. 5% approximately surface stones. Small to medium rounded quartz. 0-25 cm dark brown clayey loam. 25-50 cm strong brown heavy clay loam. Few faint rusty mottles. Gravelly by 40 cm. Hard to auger. 50-70 cm strong brown and pale brown sandy clayey loam/heavy clay loam. Many rusty and grey mottles. 65-70 cm gravelly reddish brown clay. 70 cm+ too gravelly to auger.

98. Almost level. Winter cereals. 0-30 cm reddish brown clay loam. 30-60 cm pale brown clay 10 YR 6/6 and 6/3. 60-100 cm pockets of sandy clay loam and sandy loam. Brownish yellow. Occasional stones but slightly stony below 60 cm.

99. Level. Grain. Water at surface. 0-25 cm dark brown heavy clay loam. 25-50 cm strong brown clay. Rusty and grey mottles common. 50-80 cm strong brown heavy clay loam. More sandy with depth. 80 cm+ strong brown sandy clayey loam. More grey with depth. More sandy with depth.

100. Level. Cereal. 0-25 cm dark brown heavy clay loam. Water seeping into pit. 25-50 cm yellowish brown and light brownish grey clay. 50-70 cm light grey clayey loam (sandy). 70-100 cm dark grey sandy clayey loam with pockets of clay and sandy loam.

101. Level. Grain. Water at surface. Less than 3% small angular flint and gravel at surface. 0-30 cm dark greyish brown heavy loam. Faint brown and grey mottles. 30-85 cm grey clay. Abundant rusty mottles. Pockets of sandy clayey loam and sandy clay. More orange red with depth. 85-95 cm dark grey sandy clay loam. Gravelly. 95 cm+ too gravelly to auger.

102. Level. Grain. Patches of water at surface. Less than 3% small angular flint and gravel at surface. 0-25 cm dark greyish brown clay. Faint rusty mottles by 20 cm.

Waterlogged. 25-30 cm dark grey brown clay. 30-85 cm light grey heavy clay loam (sandy). Lenses of sandy clayey loam. 85-100 cm dark grey sandy loam.

103. Level. Grain. 5% small angular flint and medium rounded hard stones. Waterlogged to surface. 0-30 cm dark greyish brown clayey loam (sandy). Faint grey mottles. 30-40 cm yellowish brown and grey sandy loam. Abundant rusty and grey mottles prominent. 40-85 cm reddish yellow sandy clayey loam and clayey loam. 85 cm+ too gravelly to auger.

104. Gentle slope 5^{o}. Winter cereals. 0-28 cm dark brown sandy loam. 28-70 cm brown sandy loam. 70-100 cm pockets of sandy loam, sandy clay loam and loamy sand. Moist. Rusty mottles common. Slightly stony throughout but no more than 10%. 3a/2.

104a Valley Bottom. Winter cereals. 0-23 cm dark greyish brown heavy clay loam. 23-30 cm heavy clay loam, greyish brown with rusty and grey mottles. 30-50 cm grey and reddish grey clay. Mottled. Only occasional stones. 3b

105. Gentle slope. Winter cereals. 0-23 cm of dark greyish brown clay loam (10 YR 4/3 rounded and sub-rounded hard stones and occasional flint. 23-80 cm yellowish red clay. 5 YR 5/6. 80-100 cm+ clay loam with weathering mudstone. Brighter coloured with depth. No stones below 23 cm.

105A Valley bottom. Winter cereals. 0-27 cm dark brown sandy loam. 27-60 cm brown sandy loam. Rusty and grey mottles. 60-90 cm heavy sandy loam, brown with rusty and grey mottles many. Wet. 90 cm+ impenetrable stony layer.

106. Almost level. Winter cereals. Approximately 12% surface stones. 0-30 cm dark brown sandy loam. 30-45 cm brown sandy loam. 45-60 cm brown sandy loam, approximately 20% stones. 60-80 cm sand with pockets of loamy sand. Gravelly and hard to auger. 80 cm+ impenetrable stony layer. 3a

107. Very gentle slope above a gentle slope. Winter cereal. 8% total topsoil stones with 4% greater than 2 cm. 0-30 cm dark brown sandy loam. 30-45 cm brown sandy loam. 45-60 cm brown sandy loam, stony. 40%? 60 cm+ impenetrable stony layer. 3a

108. Gentle slope above a moderate slope. Winter cereals. Approximately 12% surface stones with 10% greater than 2 cm. 0-30 cm dark brown sandy loam, slightly stony. 30-50 cm brown sandy loam, slightly stony. Occasional rusty mottles below 43 cm. 50-60 cm loamy sand/sandy loam. Very gravelly. Moist. 60-100 cm brown (7.5 YR 5/4 clay). Rusty mottles and manganese concretions. 3a

109. Two attempts on a slight knoll. Winter cereals. Approximately 10% total surface stones. 0-30 cm dark brown sandy loam. 30-40 cm brown sandy loam, slightly stony approximately 15%. 40 cm+ impenetrable stony layer. 3a?

110. Almost level, slightly above valley bottom. Winter cereals. 0-28 cm dark brown sandy loam. 28-33 cm dark brown sandy loam, rusty mottles. 33-63 cm sandy loam, very pale brown and reddish yellow. Abundant rusty and grey mottles. 63-100 cm clay with pockets of sandy clay loam. 10 YR 6/2 and 5?6. Light bluish grey. Yellow brown. Moist. Abundant mottles.

111. Almost level. Winter cereals. 0-20 cm of very dark greyish brown clay loam/clay. 20-70 cm grey clay orange and grey mottles abundant. 70-100 cm orange and grey sandy clay loam. Mottles abundant. Occasional small medium and large rounded stones throughout. 3b

112. Almost level. Winter cereals. 0-15 cm of dark grey brown clay. Wet. 15-40 cm grey clay. Rusty and grey mottles abundant. 40-60 cm yellowish grey clay. Wet. Rusty and grey mottles abundant. 60-100 cm sandy clay loam with pockets of sandy loam. Dark grey. Wet. 3b

113. Level. Grain. Small angular flinty gravel and small amount of medium quartz. Patches of water. 0-25 cm dark greyish brown clay. Reddy rusty mottles by 20 cm. 25-35 cm gravelly sandy loam. Pockets of sandy clayey loam. Abundant rusty and grey mottles. 35 cm+ sandy clayey loam reddish yellow and light grey/grey. Heavier with depth. Abundant rusty and grey mottles. Waterlogged.

114. Almost level. Winter cereals. 0-23 cm of dark brown clay loam, 10 YR 4/3. 23-40 cm clay loam (sandy) 10 YR 5/3 becoming more 5/2 with depth. Greyish brown. 40-60 cm sandy clay loam with pockets of sandy loam. 10 YR 6/4 and 6/6. Light yellow brown to brownish yellow. 60-70 cm clay and sandy clay loam pockets. 70 cm + too gravelly to auger. 3b

115. Almost level in valley bottom. Winter cereals. Wet. 0-25 cm of dark brown clay loam. 10 YR 3/3. 25-65 cm 10 YR 6/3, pale brown. Rusty and grey mottles abundant. 65 cm + too stony to auger. Waterlogged to the surface. Few stones throughout. 3b

116. Very gentle slope below gentle slope. Winter cereals. 0-28 cm heavy sandy loam. Dark brown. Approximately 10% stones. 28-40 cm sandy clay loam, 7.5 YR 4/4 and 5/2. Brown. (Grey colour). Rusty mottles common. 40-80 cm heavy sandy clay loam. Brown, 7.5 YR 5/2 and 4/4. Slightly stony throughout. Stony layer at 40 cm. 80 cm+ impenetrable.

117. Very gentle slope near Hill Top. Winter cereals. 0-28 cm dark brown sandy loam. Slightly stony. 28-50 cm strong brown sandy loam. Rusty mottles many. Iron concretions. 50-80 cm reddish yellow sand. Moist. Mottled. 80-100 cm+ reddish yellow sandy loam. 5 YR 5/6. Slightly stony to 80 cm few below 80 but very compact below 80.

118. Almost level. Hill Top. Winter cereals. 15% total stones 10% greater than 2 cm. 0-30 cm dark brown sandy loam.

30-50 cm brown sandy loam, faint sandy mottles common. 50-70 cm strong brown loamy sand. Rusty mottles and small iron concretions. 70-85 cm sandy clay loam and loamy sand. Sandy loam overall. Reddish yellow. 85-100 cm+ reddish yellow loamy sand.

119. Very gentle slope. Winter cereals. 0-30 cm dark brown sandy loam. 30-50 cm brown sandy loam. 50-100 cm yellowish brown loamy sand/sandy loam. Mottled. Slightly stony throughout. Approximately 12% to 50 cm with 10% below 50. 3a

120. Very gentle slope. Winter cereals. 0-30 cm dark brown sandy loam. 30-45 cm brown sandy loam, rusty mottles common by 35 cm. 45-90 cm heavy clay loam, becoming heavier with depth. Rusty and grey mottles abundant. 10 YR 5/3 brown. 5 YR 6/1 grey/light grey. 90-100 cm+ heavy clay loam with weathering fine sandstone. Topsoil stones 18% total with 14% greater than 2 cm. 3a

121. Gentle slope. Winter cereals. 12% total stones. 8% greater than 2 cm. 0-30 cm dark brown sandy loam. 30-80 cm brown sandy loam, slightly stony. 80-95 cm strong brown loamy sand. Slightly stony, less than previous. 95-105 cm+ strong brown sand. Approximately 10% stones. 3a

122. Gentle slope. Winter cereals. 0-30 cm dark brown sandy loam. 8% total stones. 5% greater than 2 cm. 30-50 cm brown sandy loam, rusty mottles below 42 cm. 50-80 cm strong brown sandy loam with very pale brown pockets. Rusty and grey mottles many. 80-100 cm+ gravelly sandy loam. Moist. 3a

123. Almost level. Valley bottom. Winter cereals. 0-28 cm medium clay loam. Dark brown. Only 3% total stones. 28-45 cm clay. Greyish brown and yellowish brown. 10 YR 5/2 and 5/8. Rusty and grey mottles abundant. 45-80 cm yellow brown and greyish brown sandy loam. Abundant mottles. Approximately 15% stones. 80 cm+ impenetrable stony layer. 3b

124. Gentle slope. Winter cereals. 0-27 cm clay loam (sandy) 5 YR 3/2 dark reddish brown. Slightly stony approximately 10%. 27-35 cm heavy clay loam, reddish brown. 5 YR 4/3. Rusty mottles common. 35-60 cm yellowish red clay (5 YR 4/3 and 5 GY 7/1) light greenish grey. 60-70 cm yellowish red gritty clay loam. Light greenish grey mudstone. 70 cm+ too compact to auger.

124a On the site of an old marl pit. Moderate slope. 0-30 cm dark brown sandy loam with 15% stones. 30-50 cm heavy clay loam, red brown. Mudstone. 3b

125. Very gentle slope. Winter cereals. Approximately 8% total stones. 0-27 cm dark brown sandy loam. 27-70 cm brown sandy loam with faint rusty mottles and many iron concretions. Becoming paler brown with depth. Rusty and grey mottles abundant below 60 cm. 70-100 cm+ clay with

pockets of sandy clay loam, reddish brown. Occasional angular flinty gravel. 3a

126. Almost level. Winter cereals. Approximately 15% total stones with 10% greater than 2 cm. 0-28 cm dark brown sandy loam. 28-55 cm brown sandy loam. 28-55 cm brown sandy loam. 55-65 cm strong brown loamy sand. 65-100 cm+ sand with pockets of loamy sand. Few stones in this horizon. 3a

127. Hill Top. Winter cereals. 0-30 cm dark brown sandy loam. 30-50 cm dark brown sandy loam. 50-70 cm gravelly loamy sand. Pale ped faces and rusty mottles below 60 cm. 70-100 cm+ sandy clay loam with pockets of clay loam. Red brown. Rusty mottles and manganese concretions common. Stone content approximately 10% to 50 cm 20% between 50 and 70 cm but few below 70 cm. Grade 2.

128. At the top of a gentle slope. Winter cereals. 0-27 cm dark brown sandy loam. 13% total stones with 10% greater than 2 cm. 27-50 cm sandy loam with 27% total stones. 50-80 cm loamy sand with 45% total stones. 80-100 cm sandy and gravel approximately 50% stones. 3a

129. Gentle slope. Winter cereals. Two attempts at this profile. 0-27 cm dark brown sandy loam. Slightly stony. 10% of small medium rounded quartzite pebbles and occasional angular flinty pebbles. 27-40 cm strong brown sandy loam. 10% stones. 40 cm+ impenetrable stony layer. 3a

130. Almost level on hill top. Winter cereals. 0-27 cm of dark brown sandy loam. 27-35 cm strong brown sandy loam. 35-65 strong brown loamy sand. 60-90 cm sand and gravel, hard to auger. 90 cm + impenetrable layer. 20% total stone, 10% greater than 2 cm, stones mainly small rounded quartz site and angular flinty.

131. Almost level. Hill top. Winter cereals. 0-30 cm of dark yellowish brown sandy loam. (10 YR 3/4). 30-40 cm loamy sand, strong brown. 7.5 YR 4/6. 40-65 cm sand/loamy sand, strong brown. 65-90 cm sandy loam and loamy sand pockets. Strong brown. 90 cm + stony layer.