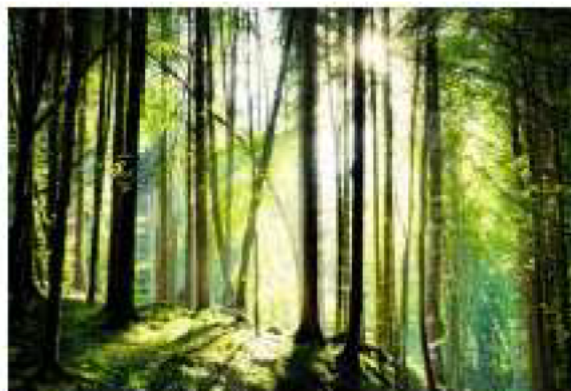


AGRICULTURAL LAND CLASSIFICATION REPORT



**WHITE HOUSE FARM
MOORLAND RD
HAVERFORDWEST
SA62 4LE**

AXIS

DOCUMENT CONTROL RECORD

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EXECUTIVE SUMMARY

Instruction	Oracle Environmental Experts Ltd (OEE) were commissioned by Axis to complete an Agricultural Land Classification (ALC) survey of a proposed solar farm at a site known as White House Farm.
Site Information	The site covers an area of 57 ha over 2 no. parcels of land (east and west parcels), of which 52 ha comprises agricultural land within separate 9 no. fields, located 1.0 km north-west of the village of Freystrop Cross. The western parcel of land is centred at Grid Reference SM945116 (194535E 211650N). The eastern parcel of land is centred at national grid reference SM953120 (195357E 212073N).
Agricultural Land Classification	The assessment has been carried out in accordance with the Defra and Welsh Government Joint Publication – 069 ‘Agricultural Land Classification of England and Wales – Guidelines for grading the quality of agricultural land’ (2025). The ALC survey has been completed using a combination of desktop assessment of the relevant published information, and a detailed site survey comprising 8 no. trial pits and 48 no. hand augers. From the available published information, together with the findings of the detailed soil survey, it has been determined that the quality of agricultural land at the site is limited by wetness and to a lesser extent gradient and stoniness. The approximate 52 ha of agricultural land within the survey site that has been assessed in this ALC survey has been classified with 2 no. areas of different Grades/Sub-grades. The largest area is Grade 5 covering 57.7 % of the site with Sub-grade 3b covering the remaining 42.3 %. The limiting factor across the majority of the site is wetness and whether a slowly permeable layer with mottling is present. Localised areas of the site are also limited by gradient and stoniness

This executive summary is intended to provide an outline of the site assessment and is not intended to provide a definitive analysis of the information obtained.

1.0 INTRODUCTION

1.1 Instruction

- 1.1.1 Oracle Environmental Experts Ltd (OEE) were commissioned by Axis to complete an Agricultural Land Classification (ALC) survey of a proposed solar farm at a site known as White House Farm.
- 1.1.2 The assessment has been made in accordance with the ALC system for England and Wales (see 'Methodology' below).

1.2 Limitations

- 1.2.1 Limitations to the scope of this report are presented in Appendix G.

2.0 METHODOLOGY

- 2.1 This assessment has been carried out in accordance with the Defra and Welsh Government Joint Publication – 069 'Agricultural Land Classification of England and Wales – Guidelines for grading the quality of agricultural land' (2025), referred to hereinafter as the 'ALC Guidelines'.
- 2.2 The ALC system provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use. The ALC system divides agricultural land into 5 no. grades (Grade 1 'Excellent' to Grade 5 'Very Poor'), with Grade 3 subdivided into Subgrade 3a 'Good' and Subgrade 3b 'Moderate'. Agricultural land classified as Grade 1, 2 and Subgrade 3a falls in the 'best and most versatile' category in accordance with Planning Policy Wales (PPW) Edition 12 (2024). Furthermore, reference should be made to the WAG 'Planning for Sustainable Rural Communities' Technical Advice Note (TAN) 6, Annex B for consultation arrangements with the Department of Rural Affairs (DRA).
- 2.3 The ALC survey has been completed using a combination of desktop assessment of the relevant published information and a detailed site survey.
- 2.4 The desktop study included the following information:
- Geological Information from British Geological Survey Internet Portal at https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.70761622.707236199.1708507952-901914965.1708507952
 - Soil information from LandIS published by Cranfield University and accessed at <https://www.landis.org.uk/soilscapes/>
 - Soil information from the UK Soil Observatory (UKSO) accessed at <https://mapapps2.bgs.ac.uk/ukso/home.html>

- The Met. Office Climatological data for Agricultural Land Classification, January 1989
- 2.5 An initial detailed soil survey was carried out on 06 February 2025 with an additional site visit completed on 12 December 2025. The soil survey involved examination of the soil's physical properties with trial pits and hand augers progressed at a sampling density of approximately 1 no. position per 1 ha. The locations of the trial pits and hand augers are shown on Figure 1, Appendix A.
- 2.6 Where feasible the location of the survey positions has been completed on a 100 m grid, however, due to the presence of 2 no. gas pipelines, field boundaries/hedgerows, and to ensure that at a sufficient number of positions were completed, locations have deviated from the grid where necessary.
- 2.7 The soil profile at each sample location was described in accordance with the 'Soil Survey Field Handbook: Describing and Sampling Soil Profiles' (Ed. J.M. Hodgson, Cranfield University, 2022). Each soil profile was ascribed an Agricultural Land Classification (ALC) grade following the ALC Guidelines.

3.0 LOCATION, LAND USE, TOPOGRAPHY, CLIMATE AND FLOODING

3.1 Site Location and Land Use

- 3.1.1 The site covers an area of 57 ha over 2 no. parcels of land (east and west parcels), of which 52 ha comprises agricultural land within separate 9 no. fields, located 1.0 km north-west of the village of Freystrop Cross. The western parcel of land is centred at Grid Reference SM945116 (194535E 211650N). The eastern parcel of land is centred at national grid reference SM953120 (195357E 212073N).
- 3.1.2 The western site was accessed via field entrances off Moorland Road and comprised 5 no. interconnected fields which, at the time of the survey were surfaced with grass. The internal field boundaries comprised either hedgerows or drainage channels.
- 3.1.3 Areas of waterlogged ground were present in the northern low lying areas of this parcel and marshy ground with marsh grass was present in the south-west.
- 3.1.4 This area was bound by wooded areas to the west and south, and hedgerows to the north and east.



Photograph 1: Marshy ground in the south of the site.



Photograph 2: Waterlogged ground at the base of a slope in the south of the western site.

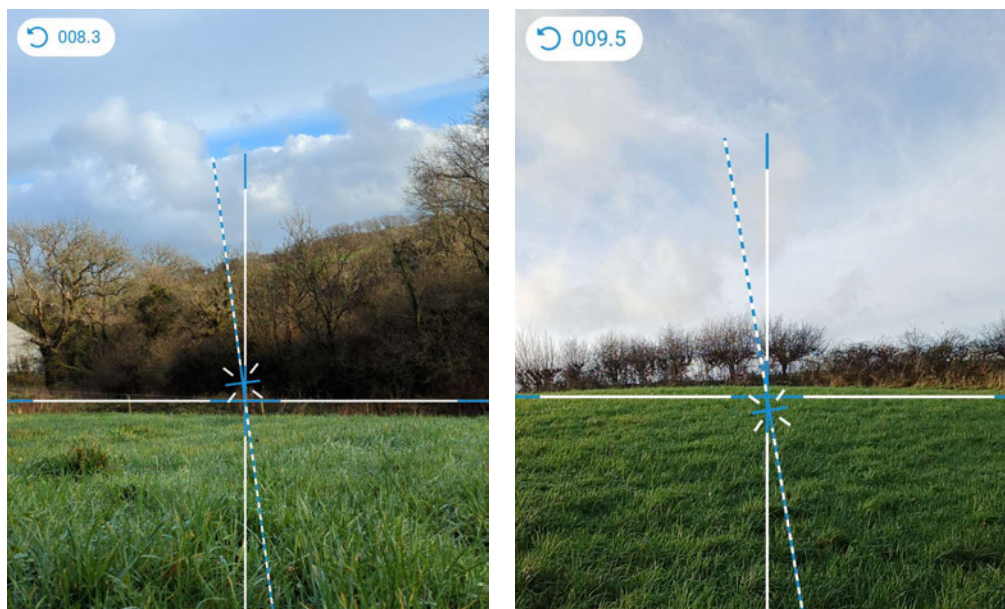
- 3.1.5 The eastern site was accessed via Middle Hill Farm in the east of the site, to the south of Lower Freystrop, and comprised 4 no. interconnected fields. These were also surfaced with grass with internal field boundaries consisting of hedgerows. The external boundaries comprised

hedgerows and mature trees with Red Water, a small watercourse, flowing along the northern boundary.

- 3.1.6 Marshy grasses were present in the south of this parcel although the majority of the site showed no sign of waterlogging.
- 3.1.7 A site location plan is presented as Figure 1 in Appendix A, and a photographic record is presented in Appendix B.

3.2 Topography

- 3.2.1 The topography of the site was generally undulating with steeper sections ($>7^\circ$) present in the eastern site. Field observations with a clinometer identified those slopes greater than 7° which result in these areas being limited to Sub-grade 3b. Photographic outputs of the clinometer readings are presented below as Figure 1.



Photograph 3 & 4: Slopes in the eastern site parcel with gradients $>7^\circ$.

- 3.2.2 In order to determine the extent of the steeper areas, LiDAR data has been used to map gradient with those areas of a slope greater than 7° highlighted in Figures 4 & 5 of Appendix A.
- 3.2.3 The western parcel had 2 no. small areas of steeper slopes in the north-east and west. These slopes were located towards to the field boundaries and were not representative of the fields overall gradient, however, they could present localised difficulties for farm machinery.
- 3.2.4 Whilst the majority of the eastern parcel was relatively level ($<7^\circ$), the northern and south-eastern boundaries comprised steep slopes down to the field boundaries. Sections of slopes

in these areas were in excess of 7° and as such are considered to be classified as ALC Grade 3b as outlined in Table 1 of the ALC guidelines.

- 3.2.5 Beyond the topographical restrictions outlined above, there were no micro-relief features identified that would restrict or hinder farming operations.

3.3 Flooding

- 3.3.1 The Natural Resources Wales 'Flood and Coastal Erosion Risk Maps' service shows that the majority of the land covered on both parcels proposed for the solar farm is not within a flood zone. This means in any year, land has less than a 0.1% chance of flooding from rivers or sea. There are 2 no. small areas of land in the eastern parcel of land that are mapped as being at medium-high risk of flooding from surface water and small watercourses. Both parcels of land are also bounded by watercourses which are mapped as being at medium-high risk of flooding from surface water and small watercourses.
- 3.3.2 Whilst it is acknowledged that the available flooding information is not compatible with the criteria of the 'Grade According to Flooding' in the ALC guidelines which relies largely on local and anecdotal observations, it is considered that the low flood rating for the majority of the site as described above, indicates that flooding is unlikely to be a limiting factor.

4.0 PUBLISHED GEOLOGICAL, SOIL AND ALC INFORMATION

4.1 Geology

- 4.1.1 According to the British Geological Survey (BGS) Geoindex resource, there are no superficial deposits mapped beneath either parcel of land.
- 4.1.2 The underlying bedrock geology beneath the western parcel of land comprises the South Wales Lower Coal Measures Formation and South Wales Middle Coal Measures Formation (undifferentiated) - (mudstone, siltstone and sandstone). The eastern parcel of land is also underlain by the same bedrock but the centre of the site is mapped as being underlain by South Wales Lower Coal Measures Formation and South Wales Middle Coal Measures Formation (undifferentiated) - (sandstone) trending in an east-west direction.

4.2 Soils

- 4.2.1 According to the LandIS information portal, soils on both parcels of land are mapped as freely draining slightly acid loamy soils and slowly permeable seasonally wet acid loamy and clayey soils
- 4.2.2 The UK Soil Observatory (UKSO) have mapped the parcels of land as being underlain by predominantly clayey loam to sandy loam. In the eastern parcel of land, locally above the

South Wales Lower Coal Measures Formation and South Wales Middle Coal Measures Formation (undifferentiated) - (sandstone), the soils are mapped as loam to sandy loam. The UKSO also shows that the site has a predicted calcium content of between 0.61 and 0.83 %.

- 4.2.3 In addition to the above resources a Soil Site Report (3 km x 3 km) was obtained from Cranfield University which details the Soil Associations mapping units present on site. The majority of the eastern parcel is mapped as NEATH (541h) with a thin strip of BRICKFIELD 3 (713g) along the southern boundary. The central and eastern areas of the western parcel comprise the NEATH unit with the northern, western and southern extents mapped as BRICKFIELD 3.
- 4.2.4 NEATH is described as 'well drained fine loamy soils often over rock'.
- 4.2.5 BRICKFIELD 3 is described as 'slowly permeable seasonally waterlogged fine loamy over clayey and clayey soils.
- 4.2.6 The full Soil Site Report is presented in Appendix F.

4.3 ALC Information

- 4.3.1 The published information available from the Data Map Wales resource indicates that the western parcel of land comprises Sub-grade 3a in the centre of the site and Sub-grade 3b in the north and south, in approximately equal proportions.
- 4.3.2 The majority of the eastern parcel is classified as Sub-grade 3a with approximately 3 ha of Sub-grade 3b along the site boundaries and eastern section.
- 4.3.3 It is noted that the area of Sub-grade 3a correlates with the areas of mapped loamy soils on the LandIS Soilscape Viewer and the areas of Sub-grade 3b are shown as loamy and clayey soils.

5.0 AGRICULTURAL LAND CLASSIFICATION

5.1 Background

- 5.1.1 This section of the report sets out the findings of the Agricultural Land Classification (ALC). It is based on a desktop study of relevant published information on climate, topography, geology, and soil, in conjunction with a soil survey of the site.
- 5.1.2 As described in the ALC Guidelines, the main physical factors influencing agricultural land quality are:
- climate;
 - site;
 - soil; and

- interactive limitations.

5.1.3 With regard to the ALC Guidelines, agricultural land quality can also be limited by 1 no. or more of 3 no. main site factors as follows:

- gradient;
- micro-relief (i.e., complex change in slope angle over short distances); and
- risk of flooding.

5.2 ALC Climate Data

5.2.1 Interpolated climate data have been calculated using the 2 no. closest grid points from the 5 km spacing data set provided in The Met. Office Climatological Data for ALC. The values for these data points are listed in Table 1 below. The site is located on the grid line between 2 no. grid points and as such, it is not considered necessary to use 4 no. points to interpolate site adjusted values.

Table 1: ALC Climate Data		
Location	Grid Point 1 SM950100	Grid Point 2 SN950150
Average altitude (m AOD)	67	27
Lapse rate of average annual rainfall (mm/m)	0.7	0.8
Average annual rainfall (AAR) (mm) (1941-70)	1113	1147
Accumulated temperature above 0°C – Median value (Jan to June 1961-80) (ATO)	1494	1538
Accumulated temperature above 0°C – Median value (April to Sept 1961-80) (ATS)	2351	2400
Moisture Deficit (MD), winter wheat (mm)	76	78
Moisture Deficit (MD), potatoes (mm)	61	65
Field Capacity Days (FCD)	226	234

5.2.2 The relevant interpolated values for the proposed development site, which have been adjusted for height and location, are presented in Table 2 below. The calculations for the interpolation process have been completed in line with the ALC guidelines.

Table 2: Interpolated Site Climatic Data	
Average altitude (m AOD)	80
Average annual rainfall (AAR) (mm) (1941-70)	1134
Accumulated temperature above 0°C – Median value (Jan to June 1961-80) (ATO)	1479
Moisture Deficit (MD), winter wheat (mm)	73
Moisture Deficit (MD), potatoes (mm)	58
Field Capacity Days (FCD)	230
Grade According to Climate	2

5.2.3 With reference to Figure 1 of the ALC guidelines 'Grade according to climate' in the ALC Guidelines, the site has been designated ALC Grade 2 based on climate.

- 5.2.4 Agricultural land at the site is predicted to be at field capacity (i.e. near saturation point) for 230 Field Capacity Days (FCD) per year, which will be mainly over the late autumn, winter, and early spring. The combination of topsoil texture, drainage status (Wetness Class) of the profile, and number of FCD affects the degree to which agricultural land is limited by soil wetness, assessed further below.

5.3 Interactive Limitations

5.3.1 Soil Texture, Structure and Wetness

- 5.3.1.1 A detailed soil survey was undertaken by OEE comprising 8 no. trial pits (TP01-TP08) to a maximum depth of 1.20 m and 48 no. hand augered soil bores (SB01-SB48) to a maximum depth of 1.23 m. The achievable depth of intrusive positions was limited in certain areas of the site due to the presence of increased stone content and potentially bedrock. It is noted that the majority of refusals (SB01-05) are located on the steeper sections in the eastern parcel where shallow rock is likely to be present.
- 5.3.1.2 Topsoil was typically encountered at depths ranging from 0.12 m to 0.44 m and generally comprised sandy clay (SC) in the eastern parcel of the site and clay (C) with silty clay (ZC) locally in the western parcel.
- 5.3.1.3 Topsoils were too wet to sieve on site to determine texture and as such 8 no. samples from the trial pits were submitted to a UKAS accredited laboratory for Particle Size Distribution (PSD) and Sedimentation analysis to confirm field observations. Test results were adjusted by removing the stone fraction to calculate the proportion of sand, silt and clay as a percentage. Full laboratory results are presented in Appendix E.
- 5.3.1.4 Based on field observations and confirmed by laboratory analysis, the majority of the topsoil in the western site comprised clay with a general structure of fine to coarse sub-angular blocky peds. The presence of waterlogged ground in certain areas prevented accurate field observations of structure and pores/voids.
- 5.3.1.5 As the fields do not appear to have been cultivated recently, it is considered that any voids or pores are likely to be a result of biological action such as grass roots or worm casts. Pore space was typically estimated to be between 0.5 - 2.0 % in the topsoil, made up of fine to medium macro bio-pores.



Photograph 5: Clay topsoil from the western site parcel with fine sub-angular blocky to granular peds and frequent grass rootlets creating bio-pores. Faint mottling can also be seen.

5.3.1.6 Those soils described as silty clay were located in the lower lying marshy areas of the western parcel, which have experienced deposition of fine material associated with the brook adjacent to the site boundary in these areas.

5.3.1.7 The eastern parcel typically comprised sandy clay topsoil with more positions refusing on suspected bedrock and cobbles, which is likely to be due to the conjectured underlying sandstone bedrock.



Photograph 6: Cobbles excavated from TP08 in the eastern site parcel.

5.3.1.8 Stone content for the 8 no. samples as determined by laboratory analysis is presented below in Table 3, and in reference to Table 5 of the ALC guidelines, the percentage of stones greater than 2 cm and 6 cm have been used to determine the ALC grade according to stoniness. It is considered that the variable stone content is possibly due to the undulating relief of the site which may have led to preferential transportation and deposition of the stones.

Table 3: Stone Content and Grading			
Position	Stoniness (%)		Grade according to stoniness
	>2 cm	>6 cm	
TP01	9	0	2
TP02	34	0	3b
TP03	2	0	1
TP04	0	0	1
TP05	0	0	1
TP06	0	0	1
TP07	31	0	3b
TP08	17	0	3b

5.3.1.9 Perched water was present at the base of the topsoil in several of the trial pits during the December 2025 visit as shown in Photograph 7 below. The restriction of movement of surface water through the soil profile is evidence of an underlying slowly permeable layer. The presence of mottling in the sub-soils shown in Photograph 7 further supports these soils qualifying as a slowly permeable layer, and this is discussed further below.



Photograph 7: Evidence of water in the topsoil perched on the underlying slowly permeable sub-soils with abundant diffuse mottling becoming clear and prominent towards the base.

5.3.1.10 The underlying sub-soil texture generally reflected the composition of overlying topsoil with sandy clay prevalent in the eastern site parcel with clay and locally silty clay in the western site parcel. The structure of the sub-soil was typically fine to coarse, sub-angular to angular blocky peds, with the structure being less developed and indistinguishable with depth. Pore/void space was generally negligible and considered to be below <0.5 % which is likely to be due to the absence of crops with deeper penetrating roots.

5.3.1.11 Sub-soils typically had a grey, dark grey and greyish brown matrix in the 7.5YR and 10YR colour range. The majority of positions showed mottling which ranged in abundance and contrast across the site and also with depth. The hue of mottles was generally either ochreous or brownish in the 7.5YR and 10YR range. Coarse sized prominent mottles were present in the deeper sub-soils of many of the trial pits, and an example of particularly clear mottling is shown below in Photograph 8.



Photograph 8: Evidence of clear prominent ochreous mottling in a greyish matrix within the sub-soils of TP05.

5.3.1.12 It is considered that those investigation locations exhibiting ochreous soils, represent soils that may have experienced chemical reduction of iron compounds due to waterlogging and anaerobic conditions creating the observed mottling

5.3.1.13 Beyond the perched groundwater there was little evidence of groundwater present in the sub-soils, with the exception of TP08, which encountered a seepage at 0.80 m bgl as shown in Photograph 9 below.



Photograph 9: Groundwater seepage pooling in the base of TP08. Soil profile also shows evidence of mottling within the greyish brown matrix.

5.3.1.14 Full details of the soil survey are available in Appendix C.

5.3.1.15 Observations from the on-site soil survey and derived wetness classes and soil grade based on criteria detailed in the ALC guidelines are outlined in Table 4 below. Those positions where it was not possible to achieve sufficient depth have been excluded from the assessment table below.

Position	Topsoil depth (m)	Texture of top 25cm	Depth to SPL (m)	Depth to gleying (m)	Figure used for class	Estimated wetness class*	Grade according to wetness[#]
TP01	0.32	SC	0.32	0.32	7	IV	5
TP02	0.31	C	-	-	6	I	3b
TP03	0.29	C	-	-	6	I	3b
TP04	0.26	C	0.26	0.26	7	IV	5
TP05	0.31	SC	0.31	0.31	7	IV	5
TP06	0.27	C	0.27	0.27	7	IV	5
TP07	0.32	C	0.32	0.32	7	IV	5
TP08	0.34	C	0.34	0.34	7	IV	5
SB05	0.32	C	0.32	0.32	7	IV	5
SB06	0.34	C	-	-	6	I	3b
SB07	0.44	SC	-	-	6	I	3b
SB08	0.38	SC	0.38	0.38	7	IV	5
SB10	0.44	SC	-	-	6	I	3b

Table 4: ALC Soil survey summary

Position	Topsoil depth (m)	Texture of top 25cm	Depth to SPL (m)	Depth to gleying (m)	Figure used for class	Estimated wetness class*	Grade according to wetness#
SB11	0.29	SC	0.29	0.29	7	IV	5
SB12	0.33	C	0.33	0.33	7	IV	5
SB14	0.42	SC	-	-	6	I	3b
SB15	0.37	SC	0.37	0.37	7	IV	5
SB17	0.30	ZC	0.30	0.30	7	IV	5
SB18	0.29	ZC	0.29	0.29	7	IV	5
SB19	0.22	C	0.22	0.22	7	V	5
SB20	0.28	C	0.28	0.28	7	IV	5
SB21	0.36	ZC	-	-	6	I	3b
SB22	0.26	ZC	0.26	0.26	7	IV	5
SB24	0.33	C	0.33	0.33	7	IV	5
SB25	0.27	C	0.27	0.27	7	IV	5
SB26	0.32	C	-	-	6	I	3b
SB27	0.36	C	0.36	0.36	7	IV	5
SB28	0.76	C	-	-	6	I	3b
SB29	0.27	C	-	-	6	I	3b
SB30	0.36	C	-	-	6	I	3b
SB31	0.32	C	0.32	0.32	7	IV	5
SB32	0.24	C	0.24	0.24	7	V	5
SB33	0.31	C	0.58	0.58	8	III	4
SB35	0.15	C	-	-	6	I	3b
SB36	0.22	C	0.22	0.22	7	V	5
SB37	0.32	C	0.32	0.32	7	IV	5
SB38	0.32	C	0.32	0.32	7	IV	5
SB40	0.34	C	0.34	0.34	7	IV	5
SB41	0.31	ZC	0.31	0.31	7	IV	5
SB42	0.26	ZC	0.26	0.26	7	IV	5
SB43	0.23	ZC	0.23	0.23	7	V	5
SB44	0.34	C	0.34	0.34	7	IV	5
SB45	0.24	ZC	-	-	6	I	3b
SB46	0.29	ZC	-	-	6	I	3b
SB47	0.40	ZC	0.40	0.40	7	IV	5
SB48	0.20	ZC	0.20	0.20	7	V	5

Notes:

SC = Sandy clay, C = Clay, ZC = Silty clay

* = Derived from Figures 6, 7 and 8 of the ALC guidelines based on an FCD of 230

= Derived from Table 6 (mineral soils) of the ALC guidelines.

5.3.2 Soil Droughtiness

5.3.2.1 From the ALC Guidelines, a soil droughtiness limitation exists 'in areas with relatively low rainfall or high evapotranspiration, or where the soil holds only small reserves of moisture available to plant roots.' The ALC grade according to soil droughtiness is shown in Table 5 below (based on Table 8 'Grade According to Droughtiness' in the ALC Guidelines). To be eligible for Grades 1 to 3b, the moisture balances (MBs) must be equal to, or exceed, the stated minimum values for both wheat and potatoes. If the MB for either crop is less (i.e. more negative) than that shown for Subgrade 3b, the soil is Grade 4 on droughtiness).

Table 5: ALC Grade According to Droughtiness		
Grade/Subgrade	Moisture Balance Limits	
	Wheat	Potatoes
1	+30	+10
2	+5	-10
3a	-20	-30
3b	-50	-55
4	<-50	<-55

5.3.2.2 Given that the soils have been classified as Grades 3b, 4 and 5 for wetness in Table 4 of this report, it is considered unlikely that droughtiness will be a limiting factor. However, the moisture balance (MB) values have been calculated for the trial pit soil profiles to confirm this and are listed with the corresponding ALC grade in Table 6 below. Full droughtiness calculations are available in Appendix D.

Table 6: ALC Grade According to Droughtiness			
Position	Moisture Balance Limits		Grade
	Wheat	Potatoes	
TP01	66.2	57.2	1
TP02	82.0	61.0	1
TP03	65.9	55.7	1
TP04	62.2	52.2	1
TP05	73.1	57.1	1
TP06	65.7	56.7	1
TP07	55.9	53.4	1
TP08	66.4	57.4	1

5.4 ALC Grading

5.4.1 From the published information above, together with the findings of the detailed soil survey, it has been determined that the quality of agricultural land at the site is limited by wetness and to a lesser extent gradient and stoniness.

5.4.2 Given the high Field Capacity Days for the site, the determining factor on the overall grading for wetness was whether a slowly permeable layer was present in the soil profile. Those areas of the site with a slowly permeable layer were designated as Grade 5 and those without were Sub-grade 3b. It is considered that the undulating gradient and sand content may have caused variations in the shallow groundwater conditions across the site that would influence the presence of gleying. Furthermore, it is noted that many of the positions had matrix and mottle colours in the 10YR range and as such determining the presence of ochreous mottling in this range is not as well defined as those soils towards the redder colour ranges (7.5YR and 5YR).

5.4.3 Slopes present in the north and south-east of the eastern parcel were sufficiently steep (>7°) to warrant classifying these areas as Sub-grade 3b.

- 5.4.4 Stoniness as determined by laboratory analysis due to the wet conditions on site, identified that several of the trial pits were limited to Sub-grade 3b by stoniness. It is considered likely that locations investigated by augers would be similarly graded by stoniness, however, due to the difficulty of estimating stone content on site, conservative estimates have been given.
- 5.4.5 The site has been zoned based on each positions limiting factor and is shown in Figure 4 Appendix A. The corresponding areas for each Grade/Sub-grade are listed below in Table 7.

Table 7: ALC Grade Area				
Grade/Sub-grade	Western Parcel (ha)	Eastern Parcel (ha)	Total Area (ha)	Percent of site Area (%)
3b	11	11	22	42.3
5	24	6	30	57.7

6.0 CONCLUSIONS

- 6.1 The approximate 52 ha of agricultural land within the survey site that has been assessed in this ALC survey has been classified with 2 no. areas of different Grades/Sub-grades. The largest area is Grade 5 covering 57.7 % of the site with Sub-grade 3b covering the remaining 42.3 %. The limiting factor across the majority of the site is wetness and whether a slowly permeable layer with mottling is present. Localised areas of the site are also limited by gradient and stoniness

7.0 REFERENCES

Hodgson, J.M. (ed.) (2022). Soil Survey Field Handbook. Technical Monograph No. 5. Soil Survey and Land Research Centre, Silsoe.

Department for Environment Food & Rural Affairs and Welsh Government (2025) 'Joint Publication 069 - Agricultural Land Classification of England and Wales – Guidelines for grading the quality of agricultural land'.

Natural England (December, 2012). 'Agricultural Land Classification: protecting the best and most versatile agricultural land (TIN049)'.

8.0 GLOSSARY

AAR: Average Annual Rainfall. AAR is a measure of the total amount of rainfall, falling in a calendar year (observation period 1941-1970). This is different to the duration of wetness throughout a calendar year – see FCD.

ALC: Agricultural Land Classification system. This is a robust, scientific system to assess agricultural land quality at a range of mapping scales. The ALC is the only approved system for grading land quality in England and Wales. (See also BMV)

ATO: Median Accumulated Temperature above 0°C (January to June). This measures the warmth of an area during a period critical for germination and plant growth. ATO is simply a sum of all temperatures above 0°C, summed daily from January to June. This is used in the assessment of overall climate. April to September values of ATO is used in some background calculations (this is known as ATS, see below).

ATS: Median Accumulated Temperature above 0°C (April to September). ATS is a sum of all temperatures above 0°C, summed daily from April to September.

FCD: Field Capacity Days. FCD is the number of days per year a soil is at Field Capacity. Field Capacity (FC) is maximum water soil content under gravity, i.e. the soil moisture deficit is 0 and the point at which drainage starts. At Field Capacity, soils are considered too wet for cultivation. FCD is a key criterion in ALC assessment of soil wetness and workability.

Interactive limitations: In ALC, these are physical limitations which result from interactions between climate, site and soil. The interactive limitations in ALC are soil wetness, droughtiness and erosion. Interactive limitations allow for similar soils to be assessed differently, in wetter or drier parts of England and Wales. See also Standalone limitations.

Mineral soils: Mineral soils are soils which are not organic-mineral soil or peaty and have less than 6-10% organic matter. Most lowland arable soils outside Fenland are mineral.

Moisture Balance (MB): Droughtiness limits for grades and subgrades are defined in terms of moisture balances (MB, in mm) for wheat and potatoes which are calculated using the following formulae:

- $MB \text{ (Wheat)} = AP \text{ (Wheat)} - MD \text{ (Wheat)}$
- $MB \text{ (Potatoes)} = AP \text{ (Potatoes)} - MD \text{ (Potatoes)}$

Moisture Deficit (MD): The moisture deficit term used in the ALC droughtiness assessment is a crop-related meteorological variable which represents the balance between rainfall and potential evapotranspiration calculated over a critical portion of the growing season.

Most limiting factor (ALC): If a combination of limiting factors exists, the most limiting one only is used to determine severity of limitation and hence ALC Grade. See Liebig's law of the minimum.

Organic-mineral or peaty soils: Organic mineral soils have between 6-25% organic matter, depending on clay content. Peaty soils have 20-100% organic matter, depending on clay content.

Predictive ALC: The Predictive ALC was introduced in Wales in 2017. It is a web-based model refining ALC grading at an all Wales level. It uses background climate and terrain models, linked to NATMAP soil property data. It then calibrates the data to the ALC system. Predictive ALC Grades (Including Subgrade 3a and 3b) can be viewed, along with all Post Revision field surveys. The Predictive ALC has

superseded the Provisional ALC maps in Wales and is available on the Welsh Government website. It is the primary source of strategic ALC information in Wales. (See Provisional ALC).

Soil structure: Soil structure is the aggregation of individual soil particles into discrete units, called peds or structural units. These can be classified into different shapes, sizes etc. Differences between soil structural type and condition can have a large effect on soil water movement. Soil structure is important for soil wetness/workability and droughtiness assessment.

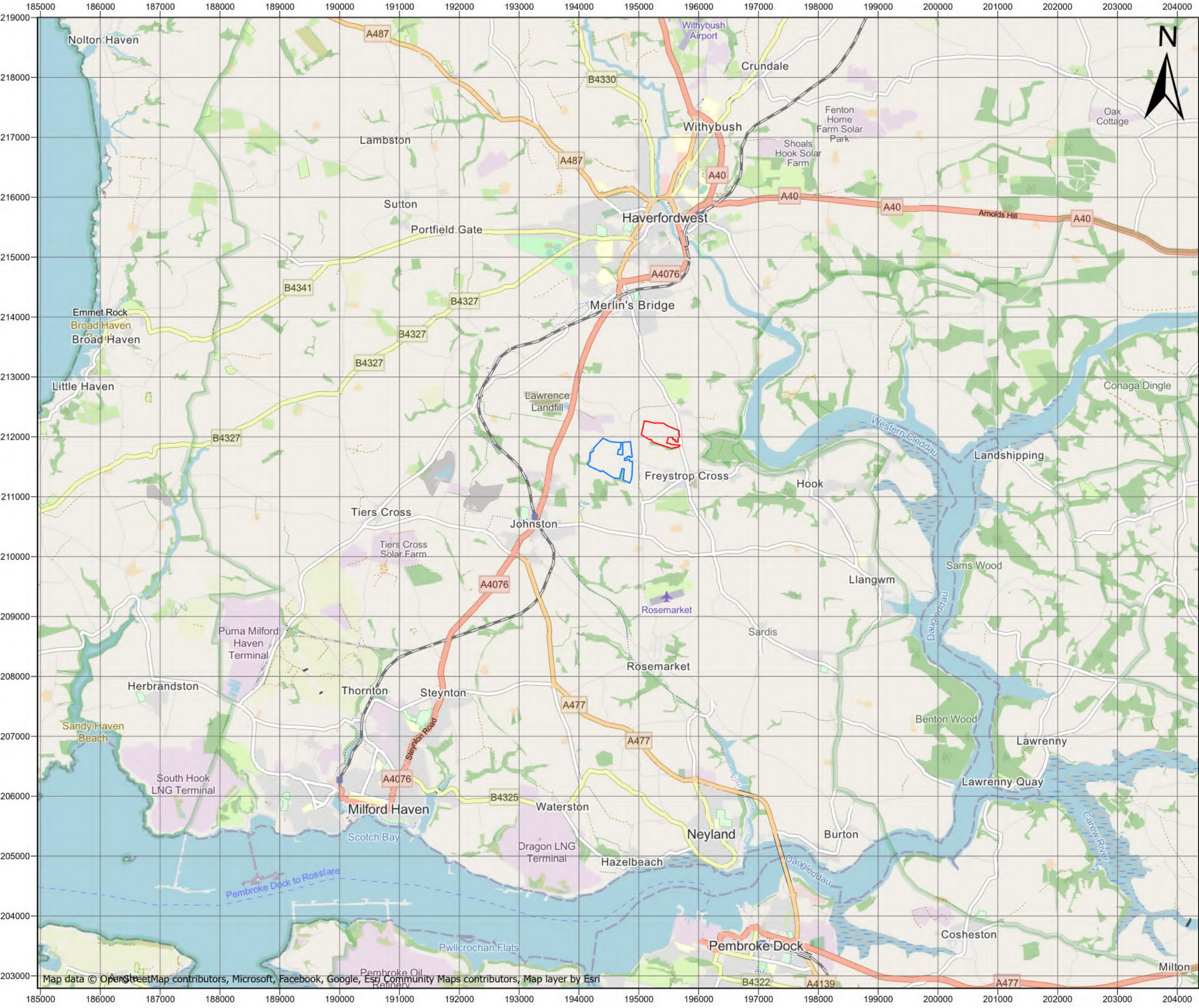
Soil texture: Soil texture is defined according to the relative proportions of sand, silt and clay fractions.

Standalone limitations: In ALC, these are limitations directly affecting grade independent of soil/climate interactions – e.g. flooding, gradient, topsoil stone content and overall climate.

Wetness Class: Wetness Class (WC) measures the amount of the year a soil is wet above certain depths on a scale of I – VI. WC I is driest, WC VI is wettest. WC I to IV are most encountered in ALC. For ALC, WC is assessed using (a) depth to gleyed horizon and depth to slowly permeable layer – measuring how quickly water can move through a soil profile – and (b) the number of Field Capacity Days (FCD) – measuring the duration of climatic wetness.

Wet: In soil wetness class assessment, ‘wet’ means water films are visible on the surfaces of grains or peds. Excavation below a wet horizon will cause water to flow down the exposed face, though flow may be very slow and confined to major pores and fissures. For a full definition see Soil Survey Field Handbook (Hodgson J.M. 1997 – definition as Hodgson J.M. 1976).

APPENDIX A - FIGURES



Legend

Middle Hill Farm Site

White House Farm Site



Title	
Figure 1: Site Location Plan	
Project Name	
White House Farm	
Project Number	
P252121	
Client	
Axis	
Date	Version
19/12/2025	1
Drawn By	Approved By
FS	AT
Scale	0 0.5 1 Kilometers
1:60,000 @ A3	



Legend

Middle Hill Farm Site

White House Farm Site

Trial Pit

Soil Auger



Title

Figure 2: Exploratory Hole Location Plan

Project Name

White House Farm

Project Number

P252121

Client

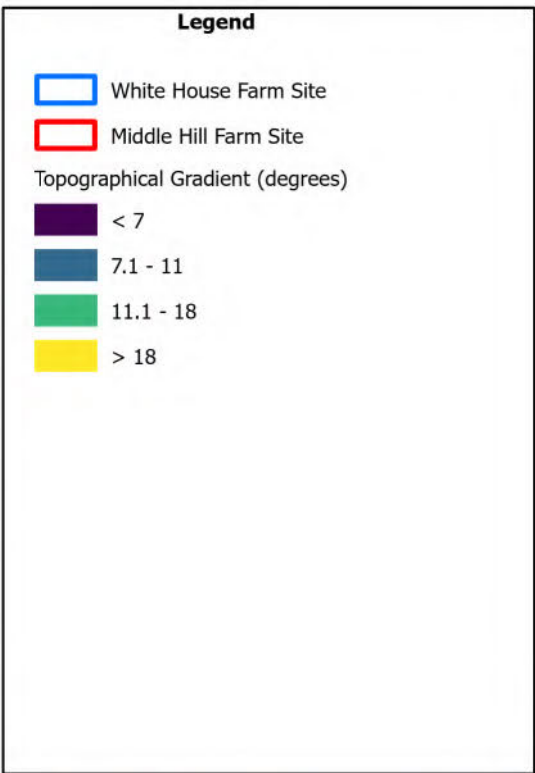
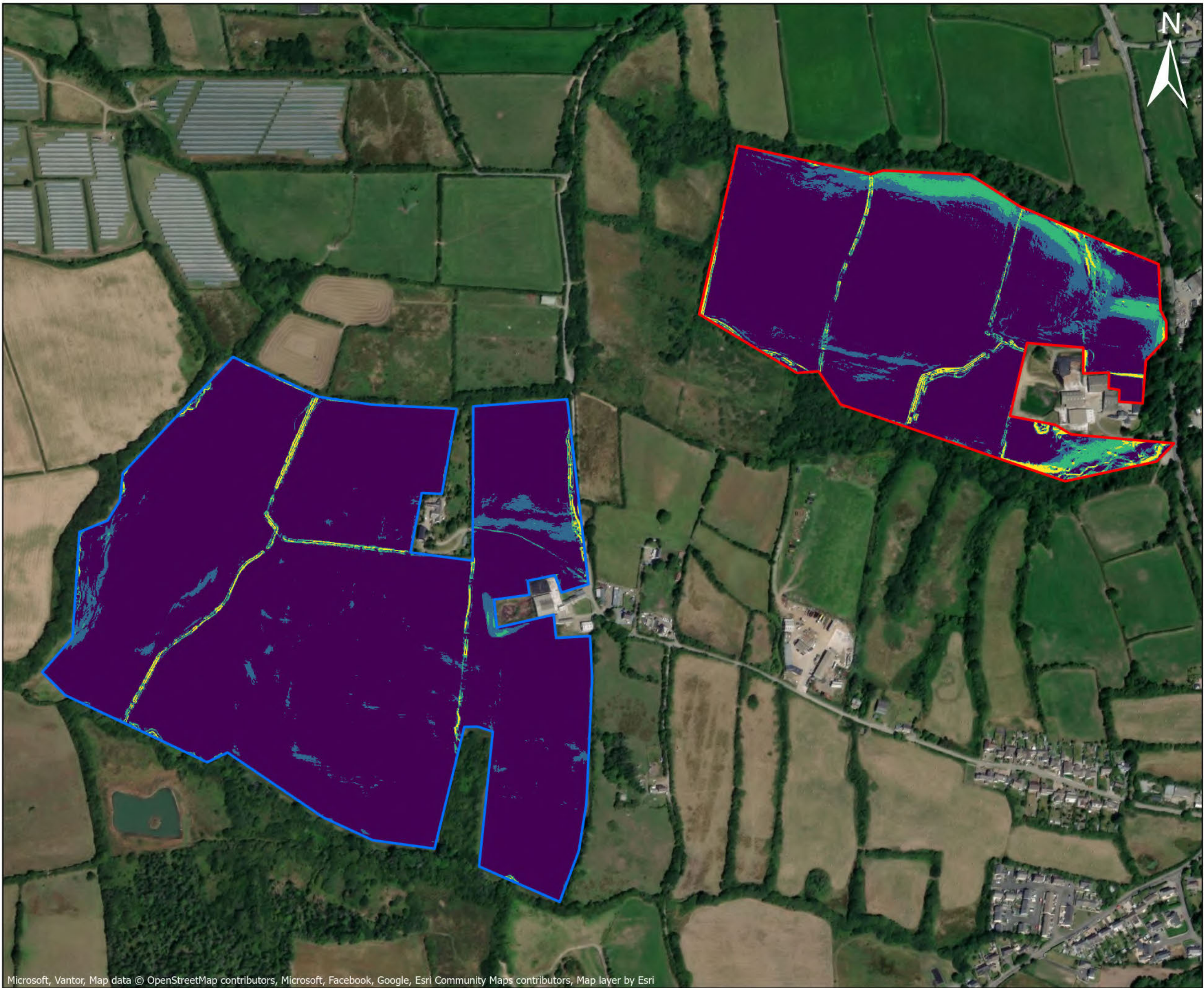
Axis

Date	Version
19/12/2025	1

Drawn By	Approved By
FS	AT

Scale	0 100
1:5,000 @ A3	 Meters





Title

Figure 3: Topographical Gradient Map

Project Name

White House Farm

Project Number

P252121

Client

Axis

Date

22/12/2025

Version

1

Drawn By

FS

Approved By

AT

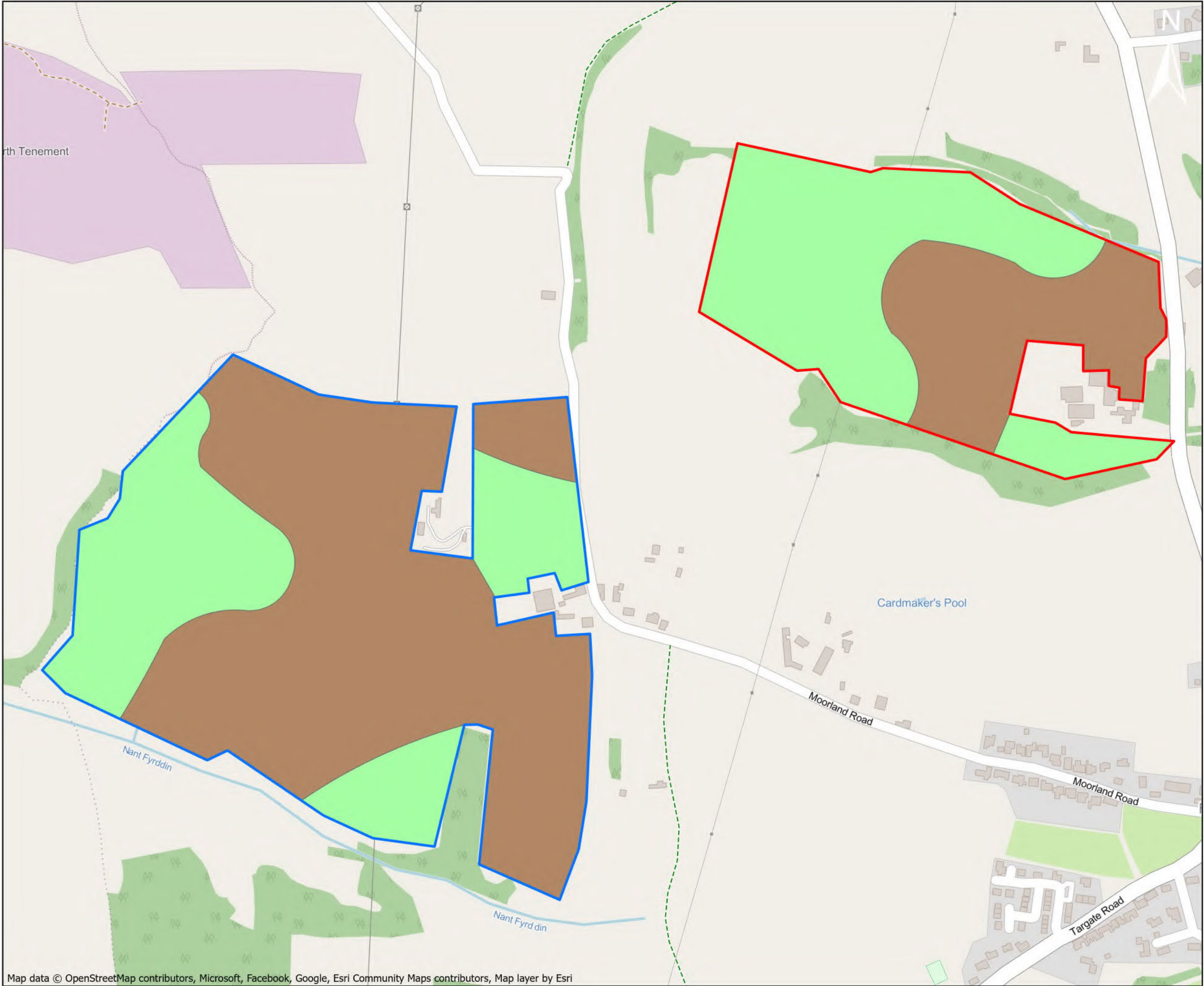
Scale

1:5,000 @ A3

0 100

Meters





Legend

Middle Hill Farm Site

White House Farm Site

ALC Grade:

3b

5



Title

Figure 4: Agricultural Land Classification Zone Map

Project Name

White House Farm

Project Number

P252121

Client

Axis

Date	Version
22/12/2025	1

Drawn By	Approved By
FS	AT

Scale	0 100
1:5,000 @ A3	 Meters



APPENDIX B – PHOTOGRAPHIC RECORD

PHOTOGRAPHIC RECORD



Photo 1: View north across north-east of western parcel.



Photo 2: View south-west across the centre of the western parcel.

PHOTOGRAPHIC RECORD



Photo 3: View west across southern section of western parcel.



Photo 4: View north across centre of western parcel.

PHOTOGRAPHIC RECORD



Photo 5: Marshy ground in the south-east of the western parcel.



Photo 6: Waterlogged ground in the south of the western parcel.



Photo 7: View south across eastern parcel.



Photo 8: Centre of eastern parcel.



Photo 9: Marshy grass in the south of the eastern parcel.



Photo 10: South-east corner towards slopes in the eastern parcel.



Photo 11: TP01 arisings



Photo 12: TP01 excavation



Photo 13: TP02 arisings



Photo 14: TP02 excavation



Photo 15: TP03 arisings



Photo 16: TP03 excavation



Photo 17: TP04 arisings



Photo 18: TP04 excavation



Photo 19: TP05 arisings



Photo 20: TP05 excavation



Photo 21: Mottling in the sub-soils of TP05



Photo 22: TP05 topsoil



Photo 23: TP06 arisings



Photo 24: TP06 excavation



Photo 25: Mottling in the base of TP06



Photo 26: Sub-soil arisings from TP06



Photo 27: TP07 arisings



Photo 28: TP07 Topsoil



Photo 29: TP07 excavation



Photo 30: TP07 topsoil



Photo 31: TP08 arisings



Photo 32: TP08 excavation



Photo 33: mottling of sub-soils in TP08.



Photo 34: TP08 topsoils



Photo 35: SB01



Photo 36: SB02



Photo 37: SB03



Photo 38: SB04



Photo 39: SB05



Photo 40: SB06



Photo 41: SB07



Photo 42: SB08



Photo 43: SB09



Photo 44: SB10



Photo 45: SB11



Photo 46: SB12



Photo 47: SB13



Photo 48: SB14



Photo 49: SB15



Photo 50: SB16



Photo 51: SB17



Photo 52: SB18



Photo 53: SB19



Photo 54: SB20



Photo 55: SB21



Photo 56: SB22



Photo 57: SB23



Photo 58: SB24



Photo 59: SB25



Photo 60: SB26



Photo 61: SB27



Photo 62: SB28



Photo 63 SB29



Photo 64: SB30



Photo 65: SB31



Photo 66: SB32



Photo 67: SB33



Photo 68: SB34



Photo 69: SB35



Photo 70: SB36



Photo 71: SB37



Photo 72: SB38



Photo 73: SB39



Photo 74: SB40



Photo 75: SB41



Photo 76: SB42



Photo 77: SB43



Photo 78: SB44



Photo 79: SB45



Photo 80: SB46



Photo 81: SB47



Photo 82: SB48

APPENDIX C – SURVEY DETAILS

Position	Depth (m)	Description	Munsell Colour		Depth to SPL (m)	Depth to Gleying (m)	Pores (%)	Texture	Stoniness (%)		Groundwater (m)	Slope (°)	Wetness Class	Grade					Limit	
			1st (Dominant)	2nd (Mottling)					>2cm	>6cm				Wetness	Droutiness	Stoniness	Gradient	Overall		
TP01	0.00-0.32	Soft dark brown stoney sandy clay with well developed medium to coarse sub-angular to angular blocky peds.	7.5YR3/2		0.32	0.32	0.5-2.0	SC	9	0	Dry	<7	IV	5	1	2	1	5	Wetness	
	0.32-1.00	Firm grey with very many coarse diffuse yellowish brown mottles slightly stoney clay with a massive structure. Large cobble at 0.60m	10YR5/1	10YR5/6			<0.5	C	5-10	0										
TP02	0.00-0.31	Soft dark brown very stoney clay with well developed medium to coarse sub-angular to angular blocky peds.	7.5YR3/3		-	-	2.0-5.0	C	34	0	Dry	<7	I	3b	1		3b	1	Wetness & Stoniness	
	0.31-0.76	Firm very dark brown and black stoney silty clay loam. Indistinguishable crumbly structure possibly granular.	7.5YR3/1 & 7.5YR2.5/1				0.5-2.0	ZCL	10-15	0										
TP03	0.00-0.29	Soft dark brown stoney clay with a massive clay dominated structure.	7.5YR3/2		-	-	0.5-2.0	C	2	0	Dry	<7	I	3b	1	1	1	3b	Wetness	
	0.29-0.58	Firm brown with few faint dark grey mottles stoney clay with weakly developed fine to coarse angular peds.	7.5YR4/4	7.5YR4/1			<0.5	C	10-15	0										
	0.58-0.84	Firm very dark grey and black stoney silty clay. Indistinguishable crumbly structure possibly granular.	7.5YR3/1 & 7.5YR2.5/1				<0.5	ZC	10-15	0										
TP04	0.00-0.26	Soft dark brown clay with well developed fine to coarse sub-angular to angular blocky peds.	7.5YR3/2		0.26	0.26	0.5-2.0	C	0	0	Dry	<7	IV	5	1	1	1	5	Wetness	
	0.26-0.48	Firm grey with many diffuse yellowish brown mottles sandy clay with weakly developed fine to coarse angular peds.	10YR5/1	10YR5/6			<0.5	SC	0	0										
	0.48-0.67	Firm dark grey mottled brown stoney silty clay with angular peds.	7.5YR4/1	7.5YR4/3			<0.5	ZC	10-15	0										
TP05	0.00-0.31	Very soft dark brown sandy clay with faint strong brown mottles. Fine sub-angular blocky to granular peds. Extent of pores difficult to determine due to water content.	7.5YR3/4	7.5YR5/6	0.31	0.31	-	SC	0	0	Perched water at base of topsoil.	<7	IV	5	1	1	1	5	Wetness	
	0.31-0.85	Firm grey and greyish brown with many prominent clear strong brown mottles stoney clay with sub-angular to angular blocky fine to coarse peds.	7.5YR6/1 & 10YR5/2	7.5YR5/8			<0.5	C	5-10	0										
	0.85-1.20	Stiff greyish brown stoney slightly sandy clay becoming lithified.	7.5YR5/2				<0.5	SC	5-10	0										
TP06	0.00-0.27	Very soft brown clay with fine sub-angular peds. Extent of pores difficult to determine due to water content.	7.5YR4/2		0.27	0.27	-	C	0	0	Perched in topsoil	<7	IV	5	1	1	1	5	Wetness	
	0.27-1.00	Firm grey and greyish brown mottled strong brown stoney clay with sub-angular to angular blocky fine to coarse peds.	7.5YR6/1 & 10YR5/2	7.5YR5/8			<0.5	C	10-15	0										
TP07	0.00-0.32	Soft dark brown stoney clay. Stones include brick and concrete. Made ground soils with indistinguishable/absent structure.	7.5YR3/2		0.32	0.32	0.5-2.0	C	31	0	Dry	<7	IV	5	1		3b	1	5	Wetness
	0.32-0.75	Firm greyish brown with very many coarse prominent strong brown mottles very stoney sandy clay with angular blocky fine to coarse peds.	10YR5/2	7.5YR5/8			<0.5	SC	15-20	0										
	0.75-0.90	Extremely weak grey with yellowish red mottles mudstone with clay infill.	10YR5/1	5YR5/8			<0.5	Mud.St	-	-										
	0.00-0.34	Very soft brown clay with fine sub-angular sub-angular blocky to granular peds. Pores considered to be limited to root and animal activity.	7.5YR4/3				0.5-2.0	C	17	0				Water seepage at 0.80m	<7	IV	5	1	3b	
0.34-1.10	Firm greyish brown with many coarse distinct strong brown mottles clay with fine to coarse angular peds. Frequent cobbles with depth.	10YR5/2	7.5YR5/8	<0.5	C	10-15	10-15													
SB01	0.00-0.18	Soft dark brown sandy clay. (Refused on potential bedrock)	7.5YR3/3		-	-	-	SC	0	0	Dry	<7	-	-	-	-	1	1	-	-
SB02	0.00-0.37	Soft dark brown sandy clay. (Refused on potential bedrock)	7.5YR3/3		-	-	-	SC	0	0	Dry	7-11	-	-	-	-	1	3b	3b	Gradient
SB03	0.00-0.28	Soft dark brown slightly sandy clay.	7.5YR3/2		-	-	-	SC	0	0	Dry	7-11	-	-	-	1	3b	3b	Gradient	
	0.28-0.35	Firm brown stoney sandy clay. (Refused on potential bedrock)	7.5YR4/3				-	SC	10-15	0										
SB04	0.00-0.42	Soft brown slightly sandy clay.	7.5YR4/3		-	-	-	SC	0	0	Dry	7-11	-	-	-	1	3b	3b	Gradient	
	0.42-0.53	Firm grey mottled yellowish brown stoney sandy clay. (Refused on potential bedrock)	10YR5/1	10YR5/4			-	SC	10-15	0										
SB05	0.00-0.32	Soft dark brown clay.	7.5YR3/2		0.32	0.32	-	C	0	0	Dry	7-11	IV	5	-	1	3b	5	Wetness	
	0.32-0.68	Firm grey mottled yellowish brown slightly stoney clay.	10YR5/1	10YR5/6			-	C	5-10	0										
SB06	0.00-0.34	Soft dark brown sandy clay.	7.5YR3/2		-	-	-	C	0	0	Dry	<7	I	3b	-	1	1	3b	Wetness	
	0.34-1.00	Firm grey mottled yellowish brown slightly stoney clay.	10YR5/1	10YR5/4			-	C	5-10	0										
SB07	0.00-0.44	Soft dark brown sandy clay.	7.5YR3/3		-	-	-	SC	0	0	Dry	<7	I	3b	-	1	1	3b	Wetness	
	0.44-1.00	Firm grey becoming mottled yellowish brown with depth slightly stoney sandy clay.	10YR5/1	10YR5/4			-	SC	5-10	0										
SB08	0.00-0.38	Soft dark brown, slightly sandy clay.	7.5YR3/2		-	-	-	SC	0	0	Dry	<7	IV	5	-	1	1	5	Wetness	
	0.38-1.00	Firm grey mottled brownish yellow sandy clay.	10YR5/1	10YR6/6			-	SC	5-10	0										
SB09	0.00-0.42	Soft dark brown slightly sandy clay. (Refused)	7.5YR3/3		-	-	-	SC	0	0	Dry	<7	-	-	-	-	1	1	-	-
SB10	0.00-0.44	Soft dark brown sandy clay.	7.5YR3/2		-	-	-	SC	0	0	Dry	<7	I	3b	-	1	1	3b	Wetness	
	0.44-0.52	Firm brown stoney sandy clay. (Refused)	7.5YR4/3				-	SC	10-15	0										
SB11	0.00-0.29	Soft dark brown sandy clay.	7.5YR3/4		0.29	0.29	-	SC	0	0	Dry	<7	IV	5	-	1	1	5	Wetness	
	0.29-0.75	Firm light grey mottled brownish yellow with depth, slightly sandy, slightly stoney clay. (Refused)	10YR5/1	10YR6/6			-	SC	5-10	0										
SB12	0.00-0.33	Soft dark brown clay.	7.5YR3/3		0.33	0.33	-	C	0	0	Dry	<7	IV	5	-	1	1	5	Wetness	
	0.33-0.85	Firm grey mottled yellowish brown slightly stoney sandy clay.	10YR5/1	10YR5/6			-	SC	5-10	0										
SB13	0.00-0.22	Soft, dark brown stoney sandy clayey loam. (Refused - Possible made ground with uneven moundy features in close proximity)	7.5YR3/4		-	-	-	SCL	10-15	0	Dry	<7			-	3a	1	-	-	
SB14	0.00-0.42	Soft dark brown sandy clay.	7.5YR3/3		-	-	-	SC	0	0	Dry	<7	I	3b	-	1	1	3b	Wetness	
	0.42-0.81	Firm light grey mottled yellowish brown clay.	10YR5/1	10YR5/4			-	C	0	0										
SB15	0.00-0.37	Dark brown slightly sandy clay.	7.5YR3/2		0.37	0.37	-	SC	0	0	Dry	<7	IV	5	-	1	1	5	Wetness	
	0.37-1.00	Firm grey mottled strong brown stoney sandy clay.	7.5YR5/1	7.5YR5/8			-	SC	0	0										
SB16	0.00-0.22	Soft dark brown sandy clay.	7.5YR3/3		-	-	-	SC	0	0	Dry	7-11	-	-	-	1	3b	3b	Gradient	
	0.22-0.30	Firm brown stoney sandy clay. (Refused)	7.5YR5/4				-	SC	10-15	0										
SB17	0.00-0.30	Soft dark brown silty clay.	7.5YR3/3		0.3	0.3	-	ZC	0	0	Dry	<7	IV	5	-	1	1	5	Wetness	
	0.30-0.91	Firm dark grey mottled brownish yellow.	7.5YR4/1	10YR6/8			-	C	0	0										
SB18	0.00-0.29	Soft dark brown silty clay.	7.5YR3/3		0.29	0.29	-	ZC	0	0	Dry	<7	IV	5	-	1	1	5	Wetness	
	0.29-1.15	Firm to stiff yellowish brown mottled grey and yellowish brown slightly sandy clay.	10YR5.4	10YR5/1 & 10YR5/6			-	SC	0	0										
SB19	0.00-0.22	Soft dark greyish brown clay.	10YR4/2		0.22	0.22	-	C	0	0	Dry	<7	V	5	-	1	1	5	Wetness	
	0.22-1.00	Firm grey becoming mottled yellowish brown with depth stoney sandy clay.	10YR5/1	10YR5/6			-	SC	10-15	0										
SB20	0.00-0.28	Soft dark brown clay.	7.5YR3/2		0.28	0.28	-	C	0	0	Dry	<7	IV	5	-	1	1	5	Wetness	
	0.28-0.87	Firm brown mottled strong brown sandy clay.	7.5YR4/3	7.5YR4/6			-	SC	0	0										
SB21	0.00-0.36	Soft dark brown silty clay.	7.5YR3/2		-	-	-	ZC	0	0	Dry	<7	I	3b	-	1	1	3b	Wetness	
	0.36-0.68	Soft to firm dark brown clay loam.	7.5YR3/3				-	CL	0	0										
	0.68-1.07	Firm dark grey mottled brown slightly stoney clay.	7.5YR4/1	7.5YR4/4			-	C	5-10	0										
SB22	0.00-0.26	Soft dark brown silty clay.	7.5YR3/3		0.26	0.26	-	ZC	0	0	Dry	<7	IV	5	-	1	1	5	Wetness	
	0.26-1.00	Firm grey mottled brownish yellow clay.	7.5YR5/1	10YR6/8			-	C	0	0										
SB23	0.00-0.12	Soft dark brown clay.	7.5YR3/3		-	-	-	C	0	0	Dry	<7	-	-	-	1	1	-	-	
	0.12-0.22	Firm brown slightly sandy stoney clay. (Refused on potential bedrock)	7.5YR4/2				-	SC	10-15	0										
SB24	0.00-0.33	Dark greyish brown clay.	10YR4/2		0.33	0.33	-	C	0	0	Dry	<7	IV	5	-	1	1	5	Wetness	
	0.33-1.00	Firm grey mottled yellowish brown slightly stoney sandy clay.	10YR5/1	10YR5/6			-	SC	5-10	0										
SB25	0.00-0.27	Soft dark brown clay.	7.5YR3/2		0.27	0.27	-	C	0	0	Dry	<7	IV	5	-	1	1	5	Wetness	
	0.27-1.23	Firm greyish brown mottled strong brown clay.	10YR5/2	7.5YR4/6			-	C	0	0										
SB26	0.00-0.32	Soft very dark brown clay.	7.5YR2.5/2		-	-	-	C	0	0	Dry	<7	I	3b	-	1	1	3b	Wetness	
	0.32-1.21	Firm becoming stiff dark grey mottled brown clay.	7.5YR4/1	7.5YR5/4			-	C	0	0										
SB27	0.00-0.36	Soft dark greyish brown clay.	10YR4/2		0.36	0.36	-	C	0	0	Dry	<7	IV	5	-	1	1	5	Wetness	
	0.36-1.00	Firm grey mottled yellowish brown stoney sandy clay.	10YR5/1	10YR5/6			-	SC	5-10	0										
SB28	0.00-0.76	Soft very dark grey stoney clay.	10YR3/1		-	-	-	C	0	0	Dry	<7	I	3b	-	1	1	3b	Wetness	
	0.76-1.00	Firm brown mottled dark grey stoney sandy clay.	7.5YR4/2	7.5YR4/1			-	SC	10-15	0										
SB29	0.00-0.27	Very soft dark brown clay.	7.5YR3/2		-	-	-	C	0	0	Dry	<7	I	3b	-	1	1	3b	Wetness	
	0.27-1.17	Firm dark yellowish brown mottled dark grey and brown slightly sandy clay becoming stoney with depth.	10YR4/4	10YR4/1 & 10YR5/3			-	SC	10-15	0										
SB30	0.00-0.36	Soft dark brown clay.	7.5YR3/2		-	-	-	C	0	0	Dry	<7	I	3b	-	1	1	3b	Wetness	
	0.36-0.94	Firm dark grey mottled brown slightly stoney clay.	7.5YR5/1	7.5YR4/2			-	C	5-10	0										
SB31	0.00-0.32	Soft very dark brown clay.	7.5YR2.5/2		0.32	0.32	-	C	0	0	Dry	<7	IV	5	-	1	1	5	Wetness	
	0.32-1.03	Firm becoming stiff yellowish brown mottled grey and strong brown silty clay becoming stoney with depth.	10YR5/4	7.5YR5/1 & 7.5YR4/6			-	ZC	10-15	0										
SB32	0.00-0.24	Soft dark brown clay.	7.5YR3/2		0.24	0.24	-	C	0	0	Dry	<7	V	5	-	1	1	5	Wetness	
	0.24-0.39	Firm dark brown mottled dark grey and strong brown clay.	7.5YR3/3	7.5YR4/1 & 7.5YR4/6			-	C	0	0										
	0.39-1.05	Firm brown mottled grey slightly stoney sandy clay.	7.5YR4/4	7.5YR5/1			-	SC	5-10	0										
SB33	0.00-0.31	Soft very dark brown slightly stoney clay.	7.5YR2.5/2		0.58	0.58	-	C	5-10	0	Dry	<7	III	4	-	2	1	4	Wetness	
	0.31-0.58	Firm dark brown clay.	7.5YR3/3				-	CL	0	0										
	0.58-0.93	Firm becoming stiff greyish brown mottled strong brown slightly sandy clay.	10YR5/2	7.5YR4/6			-	SC	0	0										
SB34	0.00-0.50	Soft very black and dark brown stoney organic sandy loam. (Refused-possible made ground)	7.5YR2.5/1 & 7.5YR2.5/2		-	-	-	SL	10-15	0	Dry	<7	-	-	-	3a	1	-	-	
SB35	0.00-0.15	Very soft dark brown clay.	7.5YR3/3		-	-	-	C	0	0	Dry	<7	I	3b	-	1	1	3b	Wetness	
	0.15-0.99	Soft to firm dark grey mottled yellowish brown silty clay.	10YR4/1	10YR5/4			-	ZC	0	0										
SB36	0.00-0.22	Soft dark greyish brown clay.	10YR4/2		0.22	0.22	-	C	0	0	Dry	<7	V	5	-	1	1	5	Wetness	
	0.22-1.10	Firm greyish brown mottled yellowish brown clay.	10YR5/2	10YR6/8			-	C	0	0										
	1.10-1.18	Stiff dark grey slightly stoney clay.	10YR4/1				-	C	5-10	0										
SB37	0.00-0.32	Soft very dark brown clay.	7.5YR2.5/2		0.32															

APPENDIX D – DROUGHTINESS CALCULATIONS

Droughtiness Calculation

Potato	
Moisture Deficit =	58

TP01				
	Thickness (cm)	Texture Class	Available Water (%)	Thickness x Avail Water
Topsoil (TA)	32	SC	17	544
Subsoil 1 (TA)	38	C	16	608
Available Water Capacity	115.2			
Moisture Balance	57.2			

TP02				
	Thickness (cm)	Texture Class	Available Water (%)	Thickness x Avail Water
Topsoil (TA)	31	C	17	527
Subsoil 1 (TA)	39	ZCL	17	663
Available Water Capacity	119			
Moisture Balance	61			

TP03				
	Thickness (cm)	Texture Class	Available Water (%)	Thickness x Avail Water
Topsoil (TA)	29	C	17	493
Subsoil 1 (TA)	29	C	16	464
Subsoil 2 (TA)	12	ZC	15	180
Available Water Capacity	113.7			
Moisture Balance	55.7			

TP04				
	Thickness (cm)	Texture Class	Available Water (%)	Thickness x Avail Water
Topsoil (TA)	26	C	17	442
Subsoil 1 (TA)	22	SC	15	330
Subsoil 1 (TA)	22	ZC	15	330
Available Water Capacity	110.2			
Moisture Balance	52.2			

TP05				
	Thickness (cm)	Texture Class	Available Water (%)	Thickness x Avail Water
Topsoil (TA)	31	SC	17	527
Subsoil 1 (TA)	39	C	16	624
Available Water Capacity	115.1			
Moisture Balance	57.1			

TP06				
	Thickness (cm)	Texture Class	Available Water (%)	Thickness x Avail Water
Topsoil (TA)	27	C	17	459
Subsoil 1 (TA)	43	C	16	688
Available Water Capacity	114.7			
Moisture Balance	56.7			

TP07				
	Thickness (cm)	Texture Class	Available Water (%)	Thickness x Avail Water
Topsoil (TA)	32	C	17	544
Subsoil 1 (TA)	38	SC	15	570
Available Water Capacity	111.4			
Moisture Balance	53.4			

TP08				
	Thickness (cm)	Texture Class	Available Water (%)	Thickness x Avail Water
Topsoil (TA)	34	C	17	578
Subsoil 1 (TA)	36	C	16	576
Available Water Capacity	115.4			
Moisture Balance	57.4			

Winter Wheat	
Moisture Deficit =	73

TP01				
	Thickness (cm)	Texture Class	Available Water (%)	Thickness x Avail Water
Topsoil (TA)	32	SC	17	544
Subsoil 1 (TA)	18	C	16	288
Subsoil 1 (EA)	70	C	8	560
Available Water Capacity	139.2			
Moisture Balance	66.2			

TP02				
	Thickness (cm)	Texture Class	Available Water (%)	Thickness x Avail Water
Topsoil (TA)	31	C	17	527
Subsoil 1 (TA)	19	ZCL	17	323
Subsoil 1 (EA)	70	ZCL	10	700
Available Water Capacity	155			
Moisture Balance	82			

TP03				
	Thickness (cm)	Texture Class	Available Water (%)	Thickness x Avail Water
Topsoil (TA)	29	C	17	493
Subsoil 1 (TA)	21	C	16	336
Subsoil 1 (EA)	8	C	8	64
Subsoil 2 (EA)	62	ZC	8	496
Available Water Capacity	138.9			
Moisture Balance	65.9			

TP04				
	Thickness (cm)	Texture Class	Available Water (%)	Thickness x Avail Water
Topsoil (TA)	26	C	17	442
Subsoil 1 (TA)	22	SC	15	330
Subsoil 1 (EA)	2	SC	10	20
Subsoil 2 (EA)	70	ZC	8	560
Available Water Capacity	135.2			
Moisture Balance	62.2			

TP05				
	Thickness (cm)	Texture Class	Available Water (%)	Thickness x Avail Water
Topsoil (TA)	31	SC	17	527
Subsoil 1 (TA)	19	C	16	304
Subsoil 1 (EA)	35	C	8	280
Subsoil 2 (EA)	35	SC	10	350
Available Water Capacity	146.1			
Moisture Balance	73.1			

TP06				
	Thickness (cm)	Texture Class	Available Water (%)	Thickness x Avail Water
Topsoil (TA)	27	C	17	459
Subsoil 1 (TA)	23	C	16	368
Subsoil 1 (EA)	70	C	8	560
Available Water Capacity	138.7			
Moisture Balance	65.7			

TP07				
	Thickness (cm)	Texture Class	Available Water (%)	Thickness x Avail Water
Topsoil (TA)	32	C	17	544
Subsoil 1 (TA)	18	SC	15	270
Subsoil 1 (EA)	25	SC	10	250
Subsoil 2 (EA)	45	Mud.St	5	225
Available Water Capacity	128.9			
Moisture Balance	55.9			

TP08				
	Thickness (cm)	Texture Class	Available Water (%)	Thickness x Avail Water
Topsoil (TA)	34	C	17	578
Subsoil 1 (TA)	16	C	16	256
Subsoil 1 (EA)	70	C	8	560
Available Water Capacity	139.4			
Moisture Balance	66.4			

APPENDIX E – LAB RATORY RESULTS



Laboratory Report



Contract Number: 77224

Client Ref: **P25212**
Client PO: **PO-19714**

Date Received: **18-02-2025**
Date Completed: **23-02-2025**
Report Date: **23-02-2025**

Client: **Oracle Enviromental Experts LTD**

This report has been checked and approved by:

Contract Title: **White House Farm**
For the attention of: **Alan Taylor**



Brendan Evans
Office Administrator

Description	Qty
Particle Size Distribution BS EN ISO 17892-4 : 5.1 - * UKAS	4
Sedimentation by Pipette Method BS EN ISO 17892-4 : 5.4	4

Notes: Observations and Interpretations are outside the UKAS Accreditation
* - denotes test included in laboratory scope of accreditation
- denotes test carried out by approved contractor
@ - denotes non accredited tests

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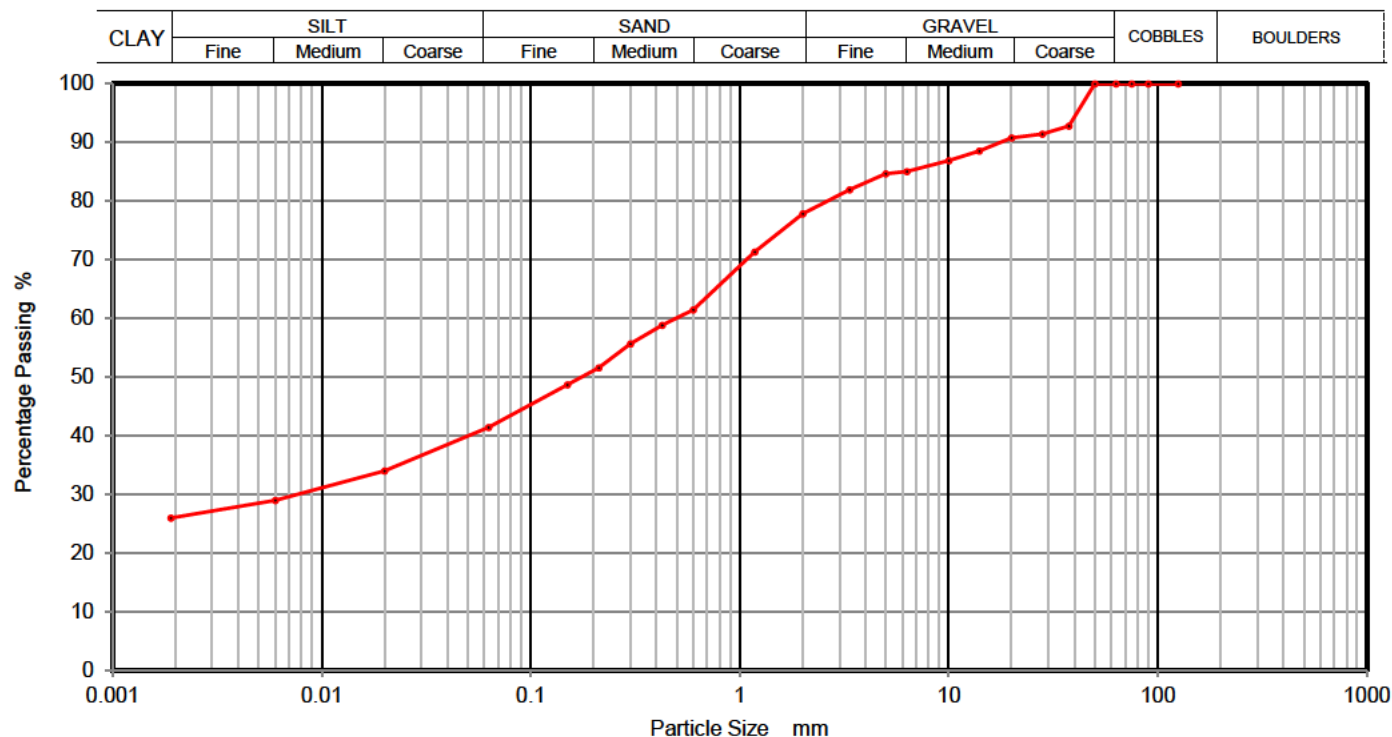
Approved Signatories:

Brendan Evans (Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (HR & HSE Manager)

PARTICLE SIZE DISTRIBUTION
BS EN ISO 17892-4:2016
Wet Sieve & Pipette Analysis, Clause 5.2 & 5.4

Contract Number	77224
Borehole/Pit No.	TP01
Sample No.	1
Depth Top	0.10
Depth Base	0.30
Sample Type	B

Project Name	White House Farm
Sample Description	Brown fine to coarse gravelly fine to coarse sandy silty CLAY
Date Tested	19/02/2025



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	34
90	100	0.0060	29
75	100	0.0020	26
63	100		
50	100		
37.5	93		
28	91		
20	91		
14	89		
10	87		
6.3	85		
5	85		
3.35	82		
2	78		
1.18	71		
0.63	61		
0.425	59		
0.30	56		
0.20	52		
0.15	49		
0.063	41		

Sample Proportions	% dry mass
Cobbles	0
Gravel	22
Sand	37
Silt	15
Clay	26

Remarks

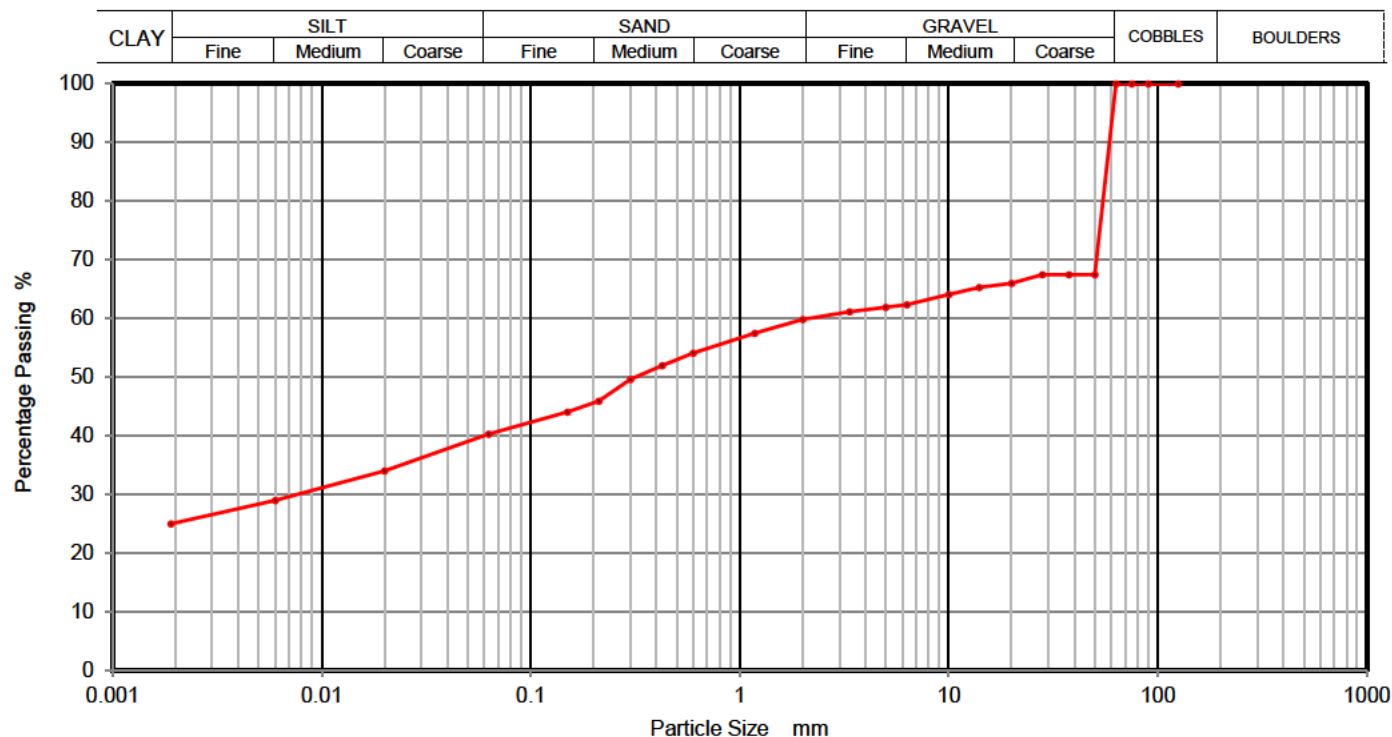
Preparation and testing in accordance with BS17892 unless noted below

Operator
Cameron T.

PARTICLE SIZE DISTRIBUTION
BS EN ISO 17892-4:2016
Wet Sieve & Pipette Analysis, Clause 5.2 & 5.4

Contract Number	77224
Borehole/Pit No.	TP02
Sample No.	1
Depth Top	0.10
Depth Base	0.30
Sample Type	B

Project Name	White House Farm
Sample Description	Brown fine to coarse sandy fine to coarse gravelly silty CLAY
Date Tested	19/02/2025



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	34
90	100	0.0060	29
75	100	0.0020	25
63	100		
50	67		
37.5	67		
28	67		
20	66		
14	65		
10	64		
6.3	62		
5	62		
3.35	61		
2	60		
1.18	58		
0.63	54		
0.425	52		
0.30	50		
0.20	46		
0.15	44		
0.063	40		

Sample Proportions	% dry mass
Cobbles	0
Gravel	40
Sand	20
Silt	15
Clay	25

Remarks

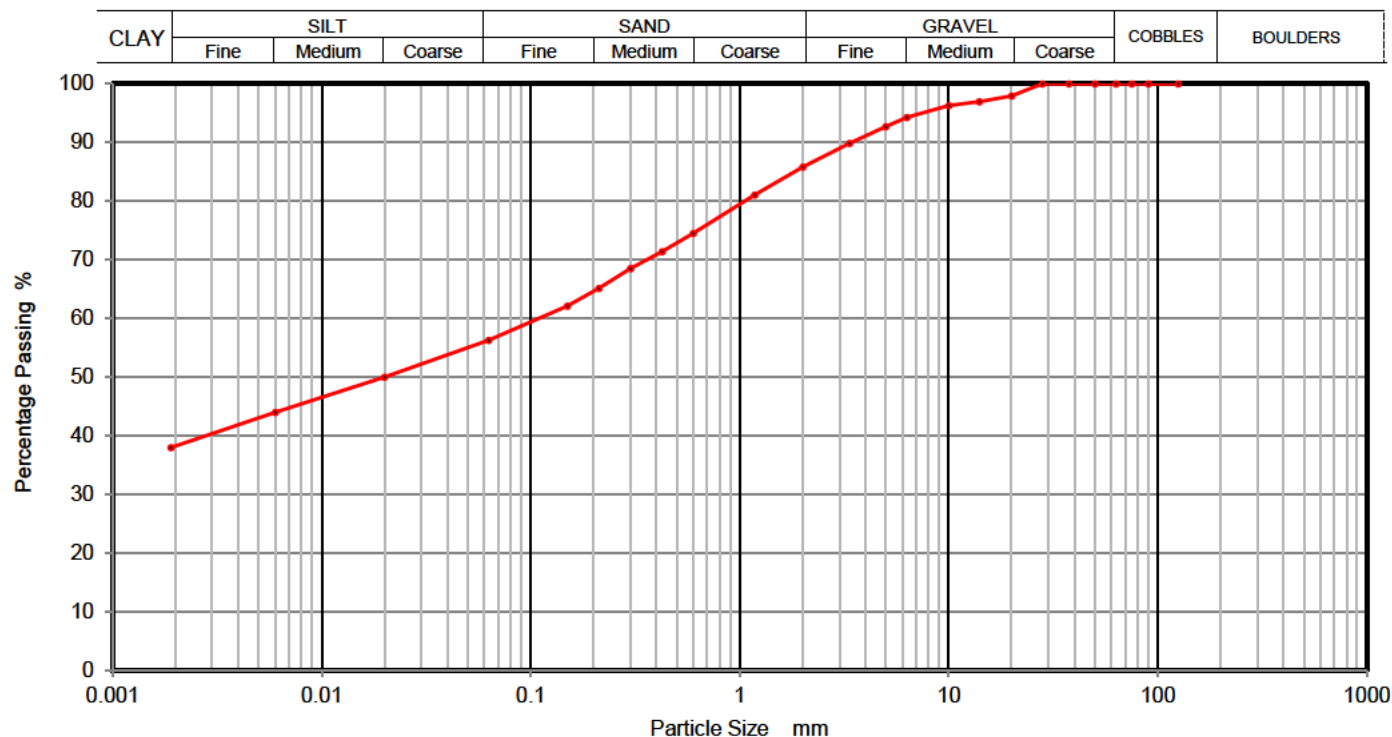
Preparation and testing in accordance with BS17892 unless noted below

Operator
Cameron T.

PARTICLE SIZE DISTRIBUTION
BS EN ISO 17892-4:2016
Wet Sieve & Pipette Analysis, Clause 5.2 & 5.4

Contract Number	77224
Borehole/Pit No.	TP03
Sample No.	1
Depth Top	0.10
Depth Base	0.30
Sample Type	B

Project Name	White House Farm
Sample Description	Brown fine to coarse gravelly fine to coarse sandy silty CLAY
Date Tested	19/02/2025



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	50
90	100	0.0060	44
75	100	0.0020	38
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	97		
10	96		
6.3	94		
5	93		
3.35	90		
2	86		
1.18	81		
0.63	75		
0.425	71		
0.30	68		
0.20	65		
0.15	62		
0.063	56		

Sample Proportions	% dry mass
Cobbles	0
Gravel	14
Sand	30
Silt	18
Clay	38

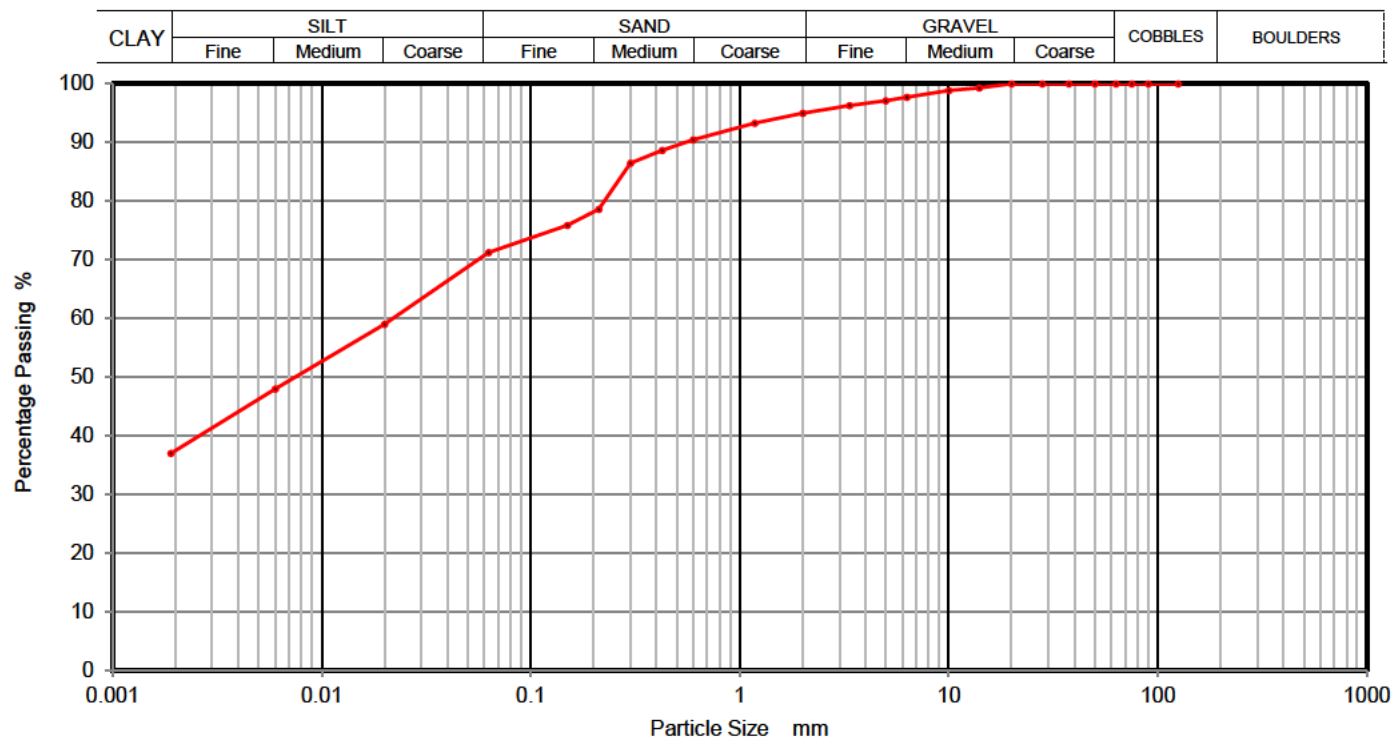
Remarks
Preparation and testing in accordance with BS17892 unless noted below

Operator
Cameron T.

PARTICLE SIZE DISTRIBUTION
BS EN ISO 17892-4:2016
Wet Sieve & Pipette Analysis, Clause 5.2 & 5.4

Contract Number	77224
Borehole/Pit No.	TP04
Sample No.	1
Depth Top	0.10
Depth Base	0.30
Sample Type	B

Project Name	White House Farm
Sample Description	Brown slightly fine to medium gravelly fine to coarse sandy silty CLAY
Date Tested	19/02/2025



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	59
90	100	0.0060	48
75	100	0.0020	37
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	99		
6.3	98		
5	97		
3.35	96		
2	95		
1.18	93		
0.63	90		
0.425	89		
0.30	86		
0.20	79		
0.15	76		
0.063	71		

Sample Proportions	% dry mass
Cobbles	0
Gravel	5
Sand	24
Silt	34
Clay	37

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator

Cameron T.



Laboratory Report



Contract Number: 83313

Client Ref: **P252121**

Client PO: **PO-21879**

Date Received: **15-12-2025**

Date Completed: **18-12-2025**

Report Date: **18-12-2025**

Client: **Oracle Enviromental Experts LTD**

This report has been checked and approved by:

Contract Title: **White House Farm**

For the attention of: **Alan Taylor**



Shaun Jones
Laboratory manager

Description	Qty
Particle Size Distribution BS EN ISO 17892-4 : 5.1 - * UKAS	4
Sedimentation by Pipette Method BS EN ISO 17892-4 : 5.4 - @ Non Accredited Test	4

Notes: Observations and Interpretations are outside the UKAS Accreditation

* - denotes test included in laboratory scope of accreditation

- denotes test carried out by approved contractor

@ - denotes non accredited tests

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Approved Signatories:

Brendan Evans (Business Support Co-ordinator) - Darren Bourne (Quality Senior Technician) - Jason Jenkins (Business Development Manager)
Luke Williams (Senior Laboratory Technician) - Paul Evans (Director) - Richard John (Quality/Technical Manager)
Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager) - Vince Williams (Site Technician)
Wayne Honey (HR & HSE Manager)

PARTICLE SIZE DISTRIBUTION
BS 1377-2:2022 Clause 10 &
BS EN ISO 17892-4:2016
Wet Sieve & Pipette Analysis, Clause 5.2 & 5.4

Contract Number **83313**

Borehole/Pit No. **TP05**

Project Name **White House Farm**

Sample No.

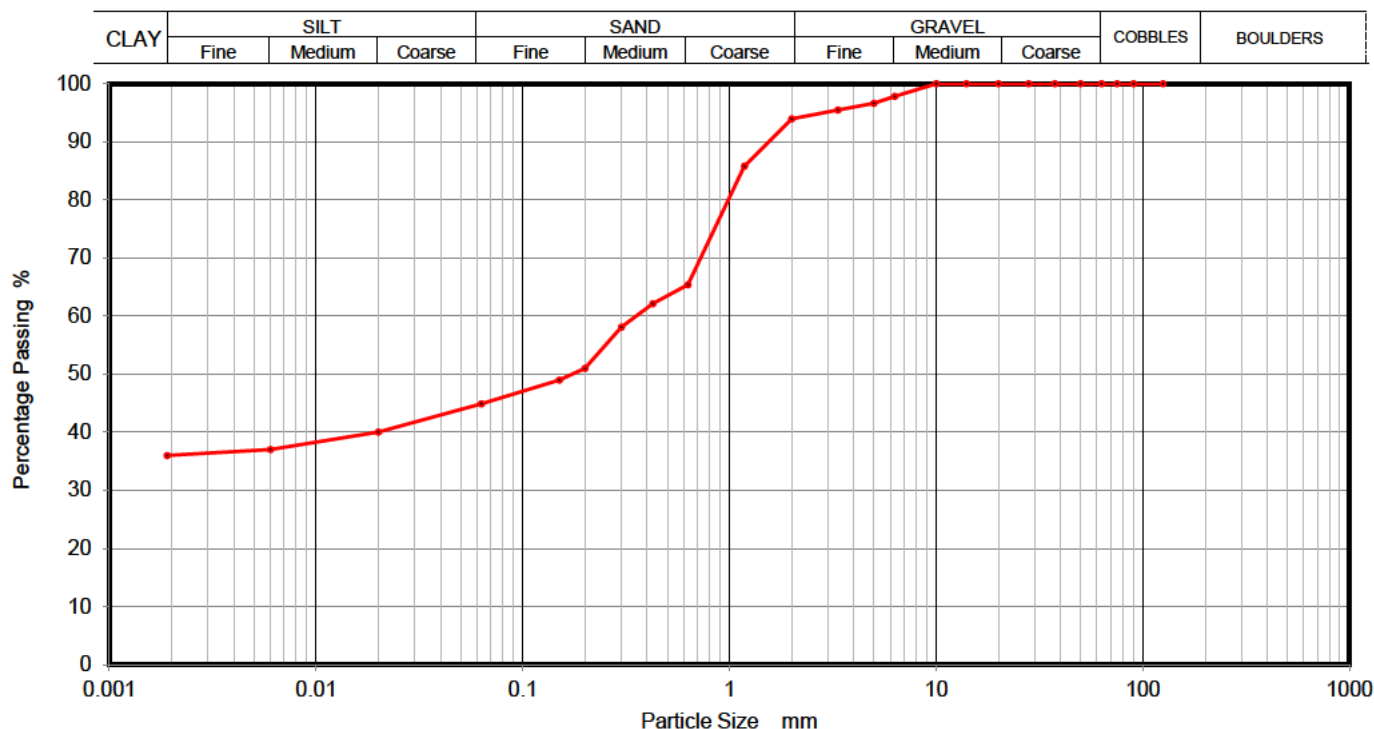
Sample Description **Brown gravelly fine to coarse sandy silty CLAY**

Depth Top **0.05**

Depth Base **0.20**

Date Tested **17/12/2025**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	40
90	100	0.0060	37
75	100	0.0020	36
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	98		
5	97		
3.35	95		
2	94		
1.18	86		
0.63	65		
0.425	62		
0.30	58		
0.20	51		
0.15	49		
0.063	45		

Sample Proportions	% dry mass
Cobbles	0
Gravel	6
Sand	49
Silt	9
Clay	36

Grading Analysis	
Uniformity Coefficient	N/A

Remarks
Preparation and testing in accordance with BS17892 unless noted below

Operator

Emyr. A

PARTICLE SIZE DISTRIBUTION
BS 1377-2:2022 Clause 10 &
BS EN ISO 17892-4:2016
Wet Sieve & Pipette Analysis, Clause 5.2 & 5.4

Contract Number **83313**

Borehole/Pit No. **TP06**

Project Name **White House Farm**

Sample No.

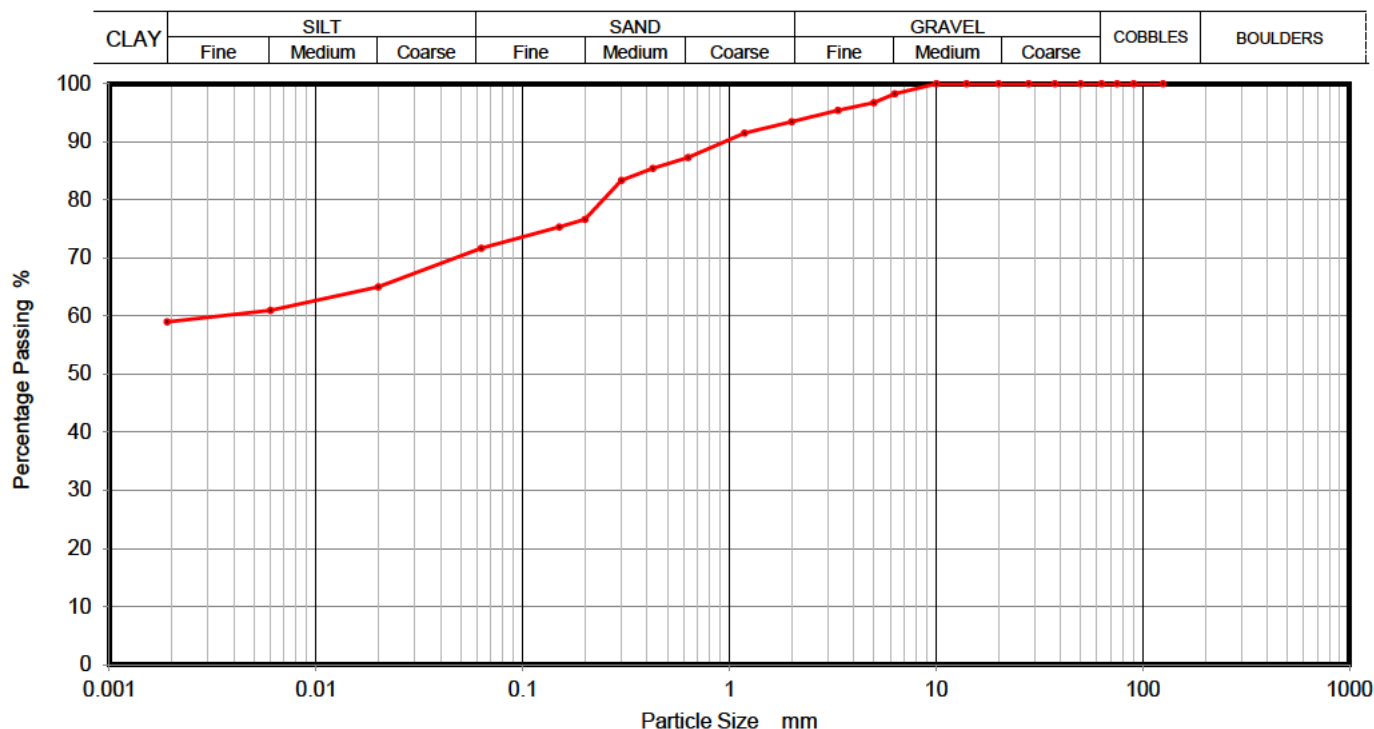
Sample Description **Brown gravelly fine to coarse sandy silty CLAY**

Depth Top **0.40**

Depth Base **0.50**

Date Tested **17/12/2025**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	65
90	100	0.0060	61
75	100	0.0020	59
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	98		
5	97		
3.35	95		
2	93		
1.18	92		
0.63	87		
0.425	85		
0.30	83		
0.20	77		
0.15	75		
0.063	72		

Sample Proportions	% dry mass
Cobbles	0
Gravel	7
Sand	21
Silt	13
Clay	59

Grading Analysis	
Uniformity Coefficient	N/A

Remarks

Preparation and testing in accordance with BS17892 unless noted below

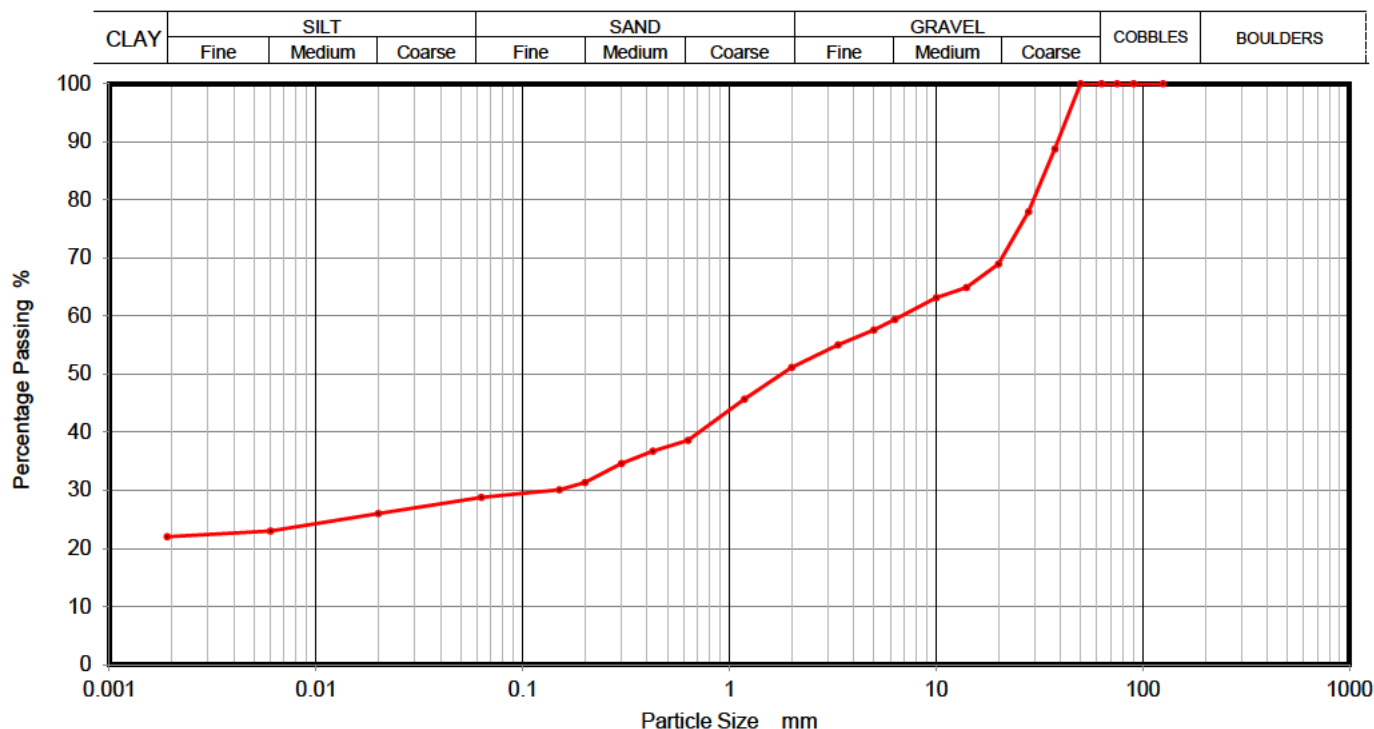
Operator

Emyr. A

PARTICLE SIZE DISTRIBUTION
BS 1377-2:2022 Clause 10 &
BS EN ISO 17892-4:2016
Wet Sieve & Pipette Analysis, Clause 5.2 & 5.4

Contract Number	83313
Borehole/Pit No.	TP07

Project Name	White House Farm	Sample No.	
Sample Description	Brown silty clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	0.05
		Depth Base	0.20
Date Tested	17/12/2025	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	26
90	100	0.0060	23
75	100	0.0020	22
63	100		
50	100		
37.5	89		
28	78		
20	69		
14	65		
10	63		
6.3	59		
5	58		
3.35	55		
2	51		
1.18	46		
0.63	39		
0.425	37		
0.30	35		
0.20	31		
0.15	30		
0.063	29		

Sample Proportions	% dry mass
Cobbles	0
Gravel	49
Sand	22
Silt	7
Clay	22

Grading Analysis	
Uniformity Coefficient	N/A

Remarks
Preparation and testing in accordance with BS17892 unless noted below

Operator
Emyr. A

PARTICLE SIZE DISTRIBUTION
BS 1377-2:2022 Clause 10 &
BS EN ISO 17892-4:2016
Wet Sieve & Pipette Analysis, Clause 5.2 & 5.4

Contract Number **83313**

Borehole/Pit No. **TP08**

Project Name **White House Farm**

Sample No.

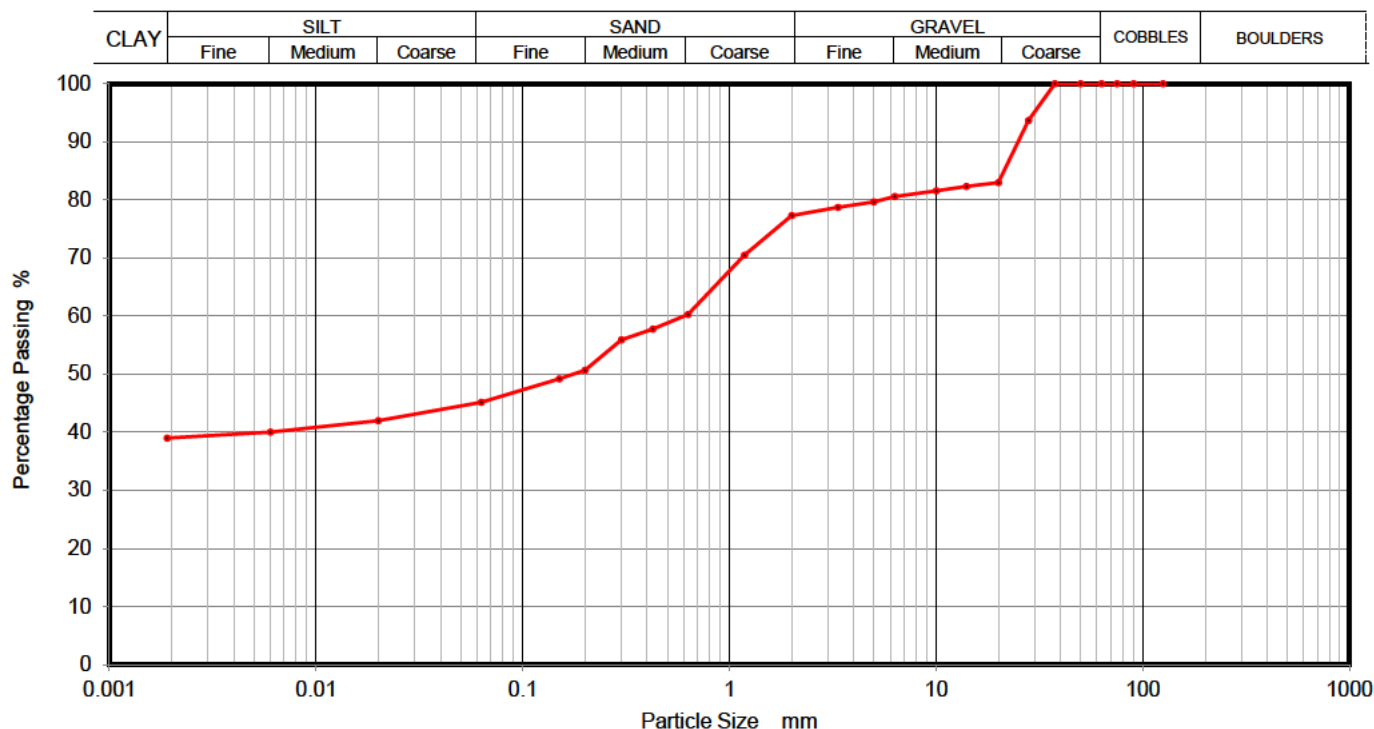
Sample Description **Brown gravelly fine to coarse sandy silty CLAY**

Depth Top **0.10**

Depth Base **0.20**

Date Tested **17/12/2025**

Sample Type **B**



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	42
90	100	0.0060	40
75	100	0.0020	39
63	100		
50	100		
37.5	100		
28	94		
20	83		
14	82		
10	82		
6.3	81		
5	80		
3.35	79		
2	77		
1.18	70		
0.63	60		
0.425	58		
0.30	56		
0.20	51		
0.15	49		
0.063	45		

Sample Proportions	% dry mass
Cobbles	0
Gravel	23
Sand	32
Silt	6
Clay	39

Grading Analysis	
Uniformity Coefficient	N/A

Remarks

Preparation and testing in accordance with BS17892 unless noted below

Operator

Emyr. A

Soil Site Report

Soil Report



White House Farm

Easting: 195244

Northing: 211979

Site Area: 3km x 3km

Prepared for: Alan Taylor, Oracle Environmental Experts Ltd

Date: 05 Sep 2025



Citation

Citations to this report should be made as follows:

Cranfield University (2025) Soil site report, Soil Report for location 195244E, 211979N, 3km x 3km, Cranfield University.

Produced using [Soil Site Reporter](#)

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Full and part-time

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- Geographical Information Management (GIM)
- Global Environmental Change (GEC)
- Environmental Engineering (EE)
- Environmental Management for Business (EMB)

Agrifood MSc courses (<https://www.cranfield.ac.uk/themes/environment-and-agrifood/agrifood-courses>):

- Applied Bioinformatics (AB)
- Future Food Sustainability (FFS)
- Food Systems and Management (FSM)

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Contact

For further information and for application forms please contact:
Phone: +44 (0) 1234 758008 Email: enquiries@cranfield.ac.uk

About this Report

This Soils Site Report aims to support the teaching of soil science at undergraduate (BSc, NVQ etc.) or equivalent level. If you are a researcher, we suggest you contact us for access to more comprehensive Soils Site Reports and their underlying data.

This Soils Site Report identifies and describes the properties and capacities of the soil at your specified location as recorded in the National Soil Map for England and Wales. It has been produced by Cranfield University's [National Soil Resources Institute](#).

The National Soil Map represents the most accurate and comprehensive source of information about the soil at the national coverage in England and Wales. It maps the distribution of soil mapping units (termed soil associations) which are defined in terms of the main soil types (or soil series) that were recorded for each soil association during field soil survey. Each soil association is named after its principal soil series and these bear the location name from where they were first described (e.g. Windsor). Each of these soil associations have differing environmental characteristics (physical, chemical and biological) and it is by mapping these properties that the range of thematic maps in this report have been produced.

Soil types and properties vary locally, as well as at the landscape scale. It is not possible to identify precisely the soil conditions at a specific location without first making a site visit. We have therefore provided you with information about the range of soil types we have identified at and around your selected location. Schematic diagrams are also provided to aid accurate identification of the soil series at your site.

Whilst an eight-figure national grid reference should be accurate to within 100m, a single rural Postcode can cover a relatively large geographical area. Postcodes can therefore be a less precise basis for specifying a location. The maps indicate the bounded area the reports relate to.

Your Site Soil Report will enable you to:

- identify the soils most likely to be present at and immediately around your specified location;
- understand the patterns of soil variation around your location and how these correlate with changes in landscape;
- identify the nature and properties of each soil type present within the area;
- understand the relevant capacities and limitations of each of the soils and how these might impact on a range of factors such as surface water quality.

Provided that this Soils Site Report is not modified in any way and it is used in the context of your undergraduate course work, you may reproduce it for a third-party.

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1. Soil Thematic Maps

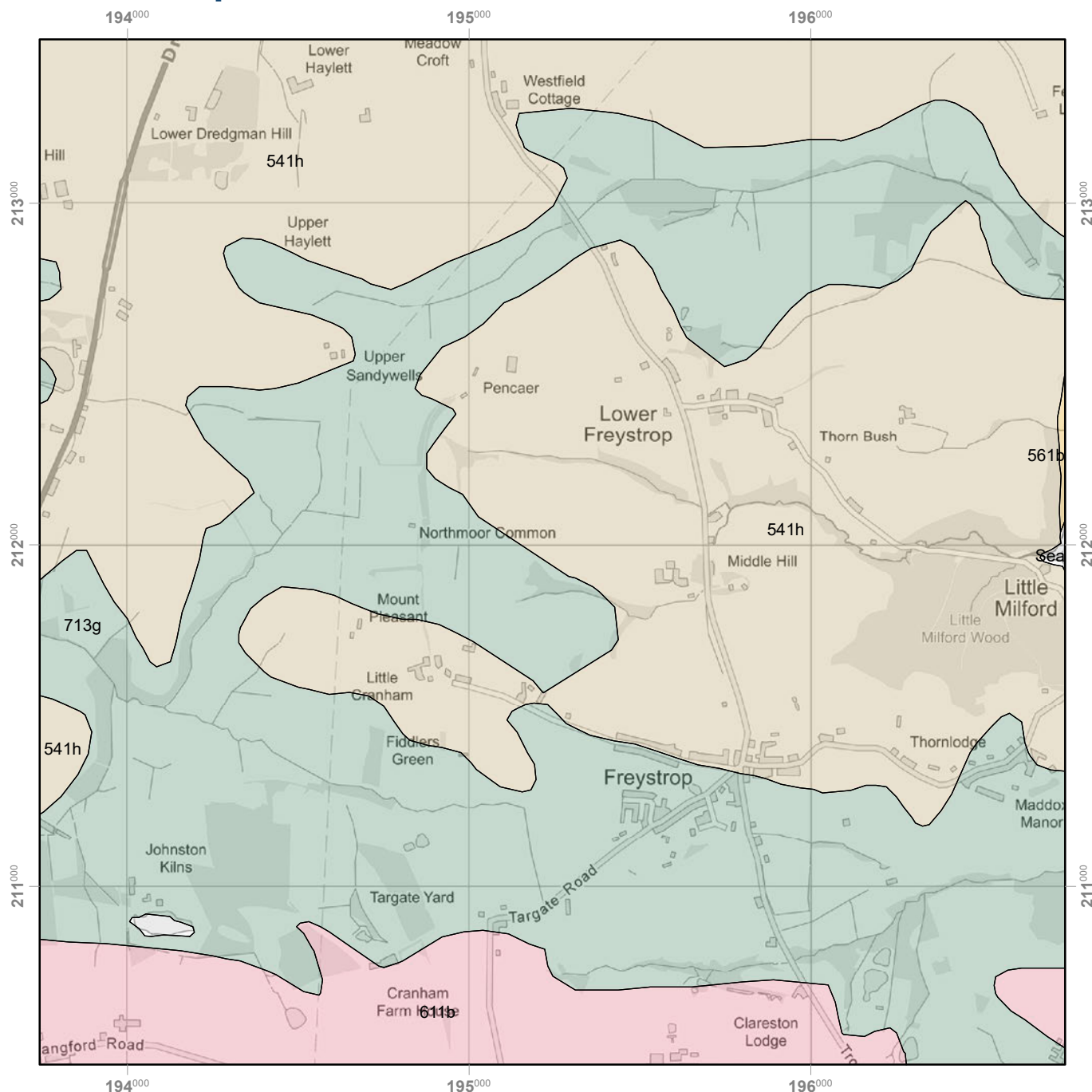
This section contains a series of maps of the area surrounding your selected location, presenting a number of themes relating to the characteristics of the soils. These provide an overview of the nature and condition of the local soil conditions. It is these conditions that may be used to infer the response of an area to certain events (with the soil as a receptor), such as pollution contamination from a chemical spill, or an inappropriate pesticide application and the likelihood of these materials passing through the soil to groundwater. Other assessments provide an insight into the way a location may impact, by corrosive attack or ground movement, upon structures or assets within the ground, for example building or engineering foundations or pipes and street furniture.

Soil is a dynamic environment with many intersecting processes, chemical, physical and biological at play. Even soils 'sealed' over by concrete and bitumen are not completely dormant. The way soils respond to events and actions can vary considerably according to the properties of the soil as well as other related factors such as land-use, vegetation, topography and climate. There are many threats facing our national soil resource today and importance should be given to identifying the best measures aimed towards soil protection and ensuring the usage of soils in the most sustainable way. This report is therefore a useful snapshot of the soil properties for your given area, providing a summary of a broad range of ground conditions



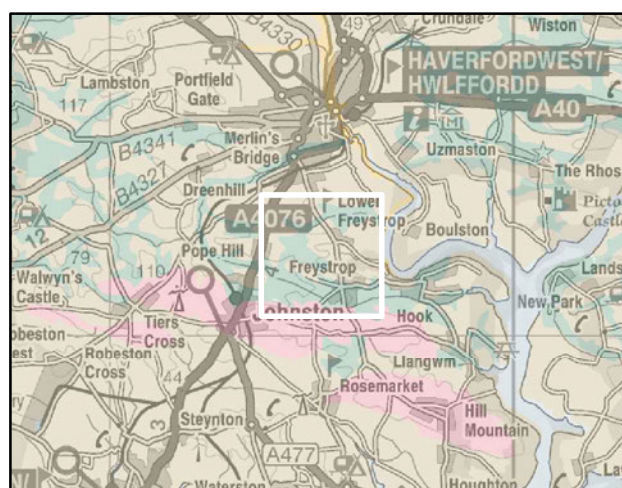
Figure 1: Location of study area

1a Soils - Spatial Distribution



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Soils - Spatial Distribution Key



541h NEATH

Well drained fine loamy soils often over rock.



561b TEME

Deep stoneless permeable silty soils.



611b MORETONHAMPSTEAD

Well drained gritty loamy soils with a humose surface horizon in places.



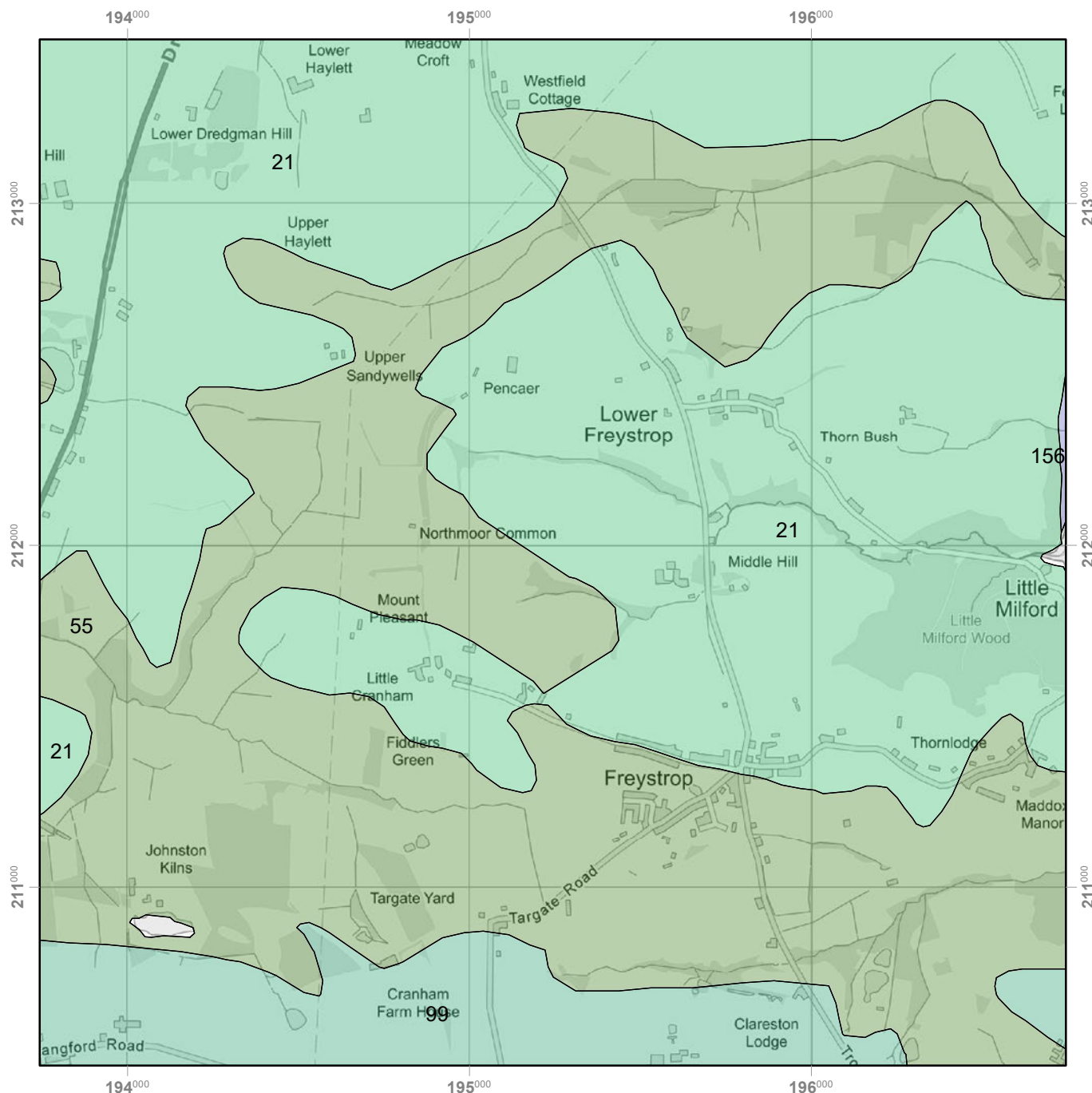
713g BRICKFIELD 3

Slowly permeable seasonally waterlogged fine loamy fine loamy over clayey and clayey soils.

SOIL ASSOCIATION DESCRIPTION

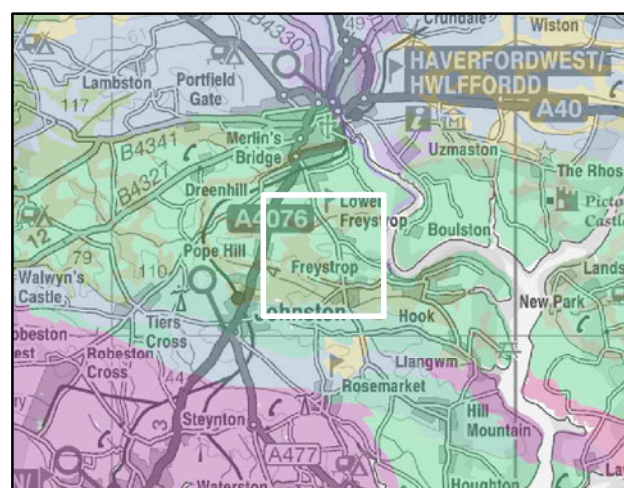
Soil associations represent a group of soil series (soil types) which are typically found occurring together, associated in the landscape (Avery, 1973; 1980; Clayden and Hollis, 1984). Soil associations may occur in many geographical locations around the country where the environmental conditions are comparable. For each of these soil associations, a collection of soil types (or soil series) are recorded together with their approximate proportions within the association. Soil associations have codes as well as textual names, thus code '554a' refers to the 'Frilford' association. Where a code is prefixed with 'U', the area is predominantly urbanised (e.g. 'U571v'). The soil associations for your location, as mapped above, are described in more detail in Section 2: Soil Association Descriptions.

1b Soil Parent Material



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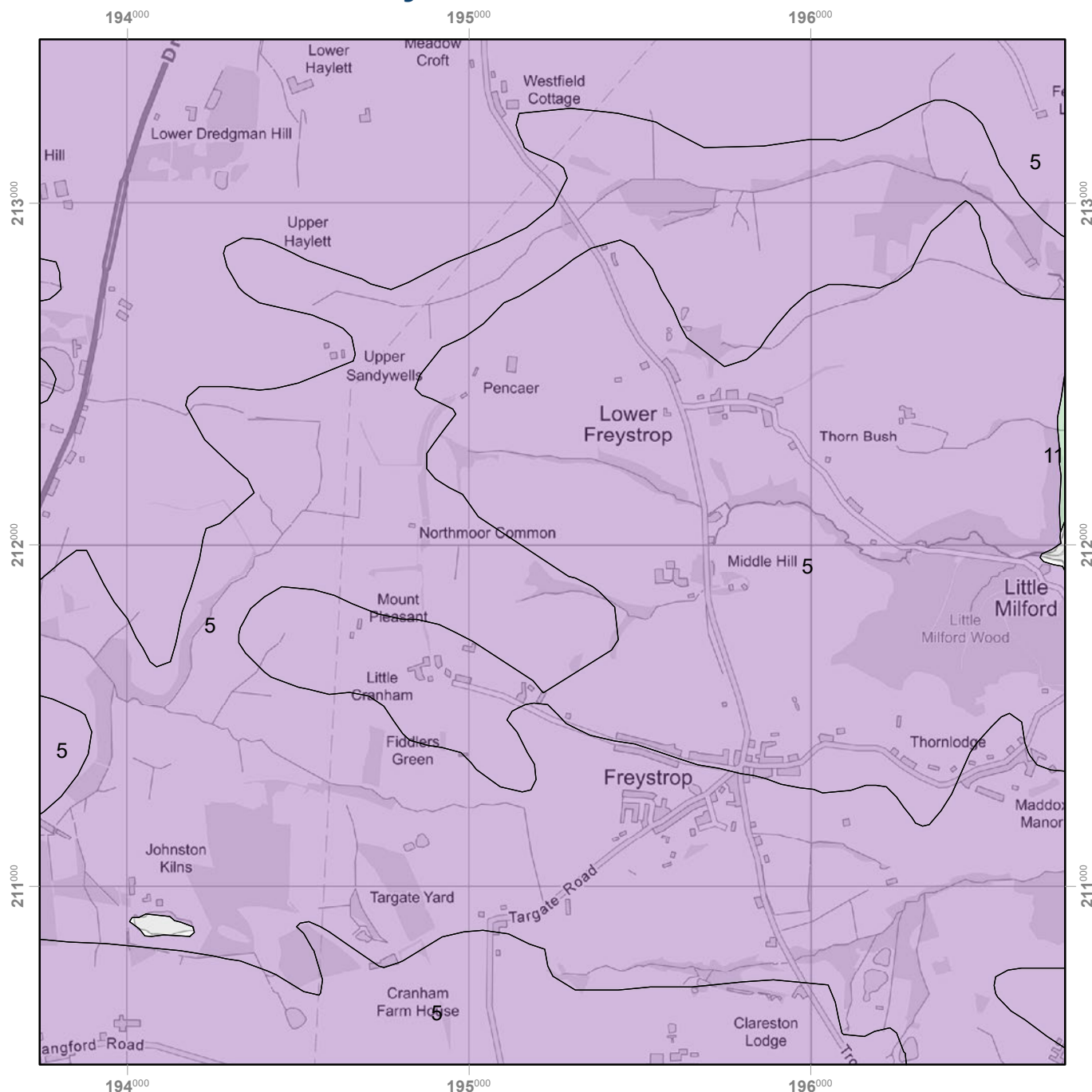
Soil Parent Material Key

-  21 Carboniferous sandstone and shale
-  55 Drift from Palaeozoic sandstone and shale
-  99 Granite and other acid igneous rock
-  156 River alluvium

SOIL PARENT MATERIAL DESCRIPTION

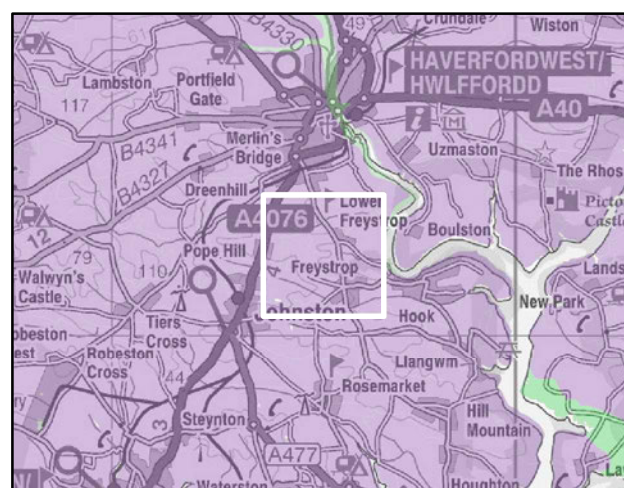
Along with the effects of climate, relief, organisms and time, the underlying geology or 'parent material' has a very strong influence on the development of the soils of England and Wales. Through weathering, rocks contribute inorganic mineral grains to the soils and thus exhibit control on the soil texture. During the course of the creation of the national soil map, soil surveyors noted the parent material underlying each soil in England and Wales. It is these general descriptions of the regional geology which is provided in this map.

1c Natural Soil Fertility



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Natural Soil Fertility Key



5 Low

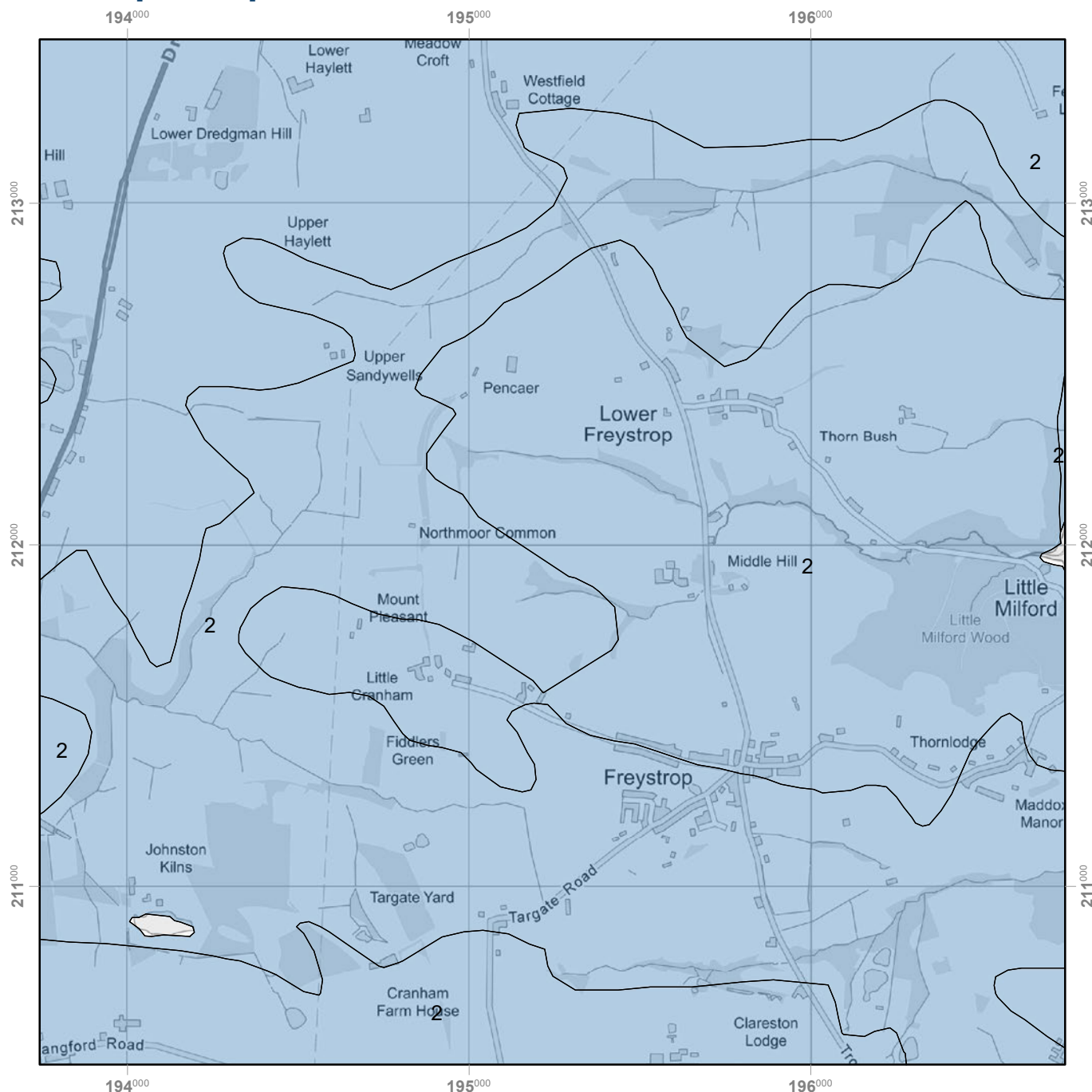


11 Moderate to high

NATURAL SOIL FERTILITY DESCRIPTION

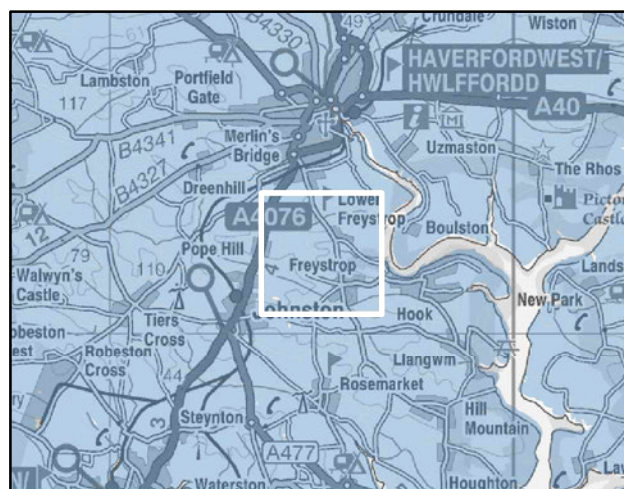
Soil fertility can be greatly altered by land management especially through the application of manures, lime and mineral fertilisers. What is shown in this map, however, is the likely natural fertility of each soil type. Soils that are very acid have low numbers of soil-living organisms and support heathland and acid woodland habitats. These are shown as of very low natural fertility. Soils identified as of low natural fertility are usually acid in reaction and are associated with a wide range of habitat types. The moderate class contains neutral to slightly acid soils, again with a wide range of potential habitats. Soil of high natural fertility are both naturally productive and able to support the base-rich pastures and woodlands that are now rarely encountered. Lime-rich soils contain chalk and limestone in excess, and are associated with downland, herb-rich pastures and chalk and limestone woodlands.

1d Simple Topsoil Texture



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Simple Topsoil Texture Key

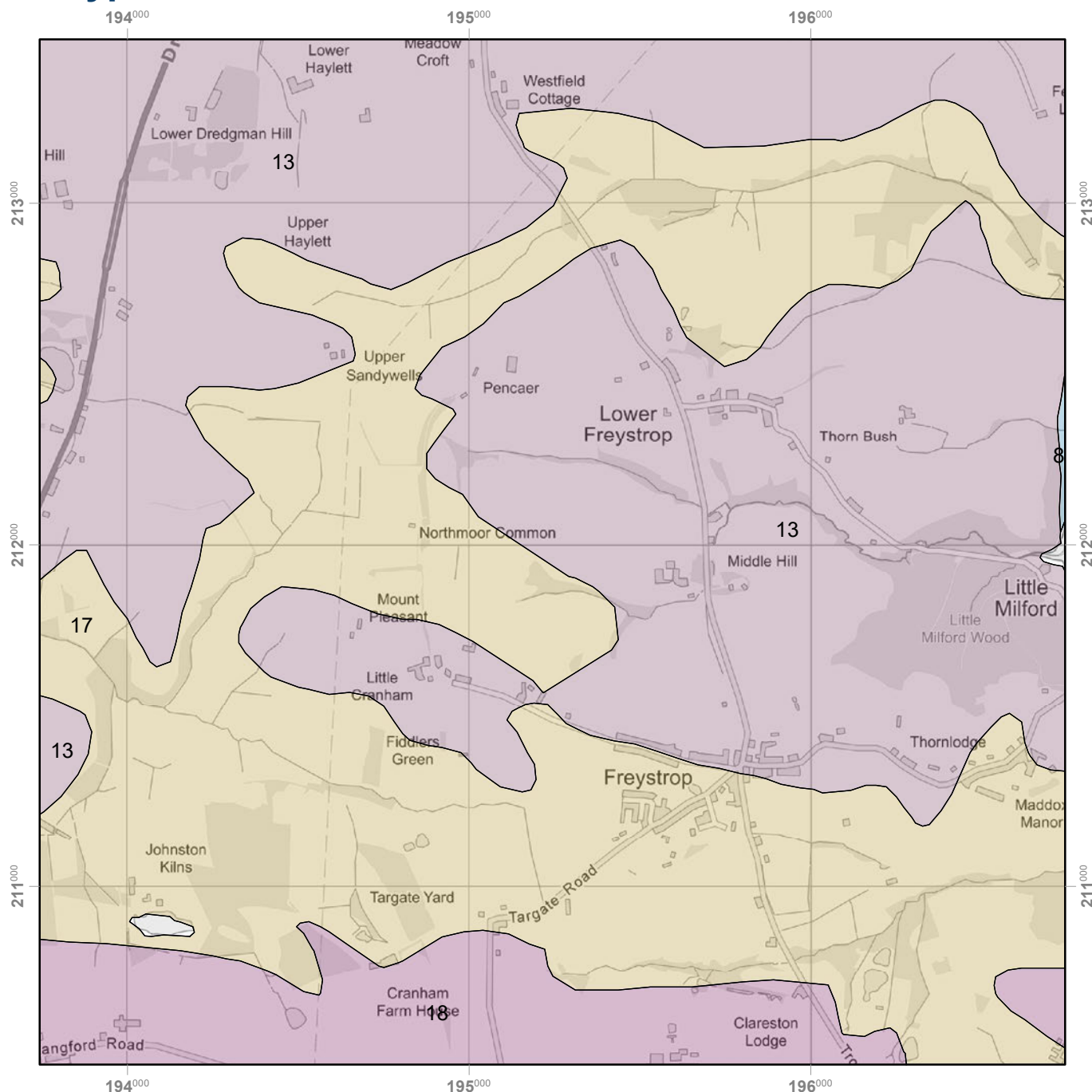


2 Loamy

SIMPLE TOPSOIL TEXTURE DESCRIPTION

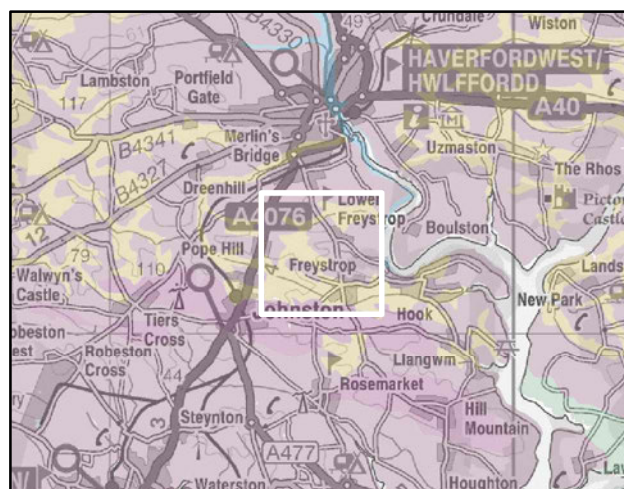
Soil texture is a term used in soil science to describe the physical composition of the soil in terms of the size of mineral particles in the soil. Specifically, we are concerned with the relative proportions of sand, silt and clay. Soil texture can vary between each soil layer or horizon as one moves down the profile. This map indicates the soil texture group of the upper 30 cm of the soil. Loamy soils have a mix of sand, silt and clay-sized particles and are intermediate in character. Soils with a surface layer that is dominantly organic are described as Peaty. A good understanding of soil texture can enable better land management.

1e Typical Habitats



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Typical Habitats Key



8 Grassland; wet carr woodlands in old river meanders



13 Neutral and acid pastures and deciduous woodlands; acid communities such as bracken and gorse in the uplands



17 Seasonally wet pastures and woodlands

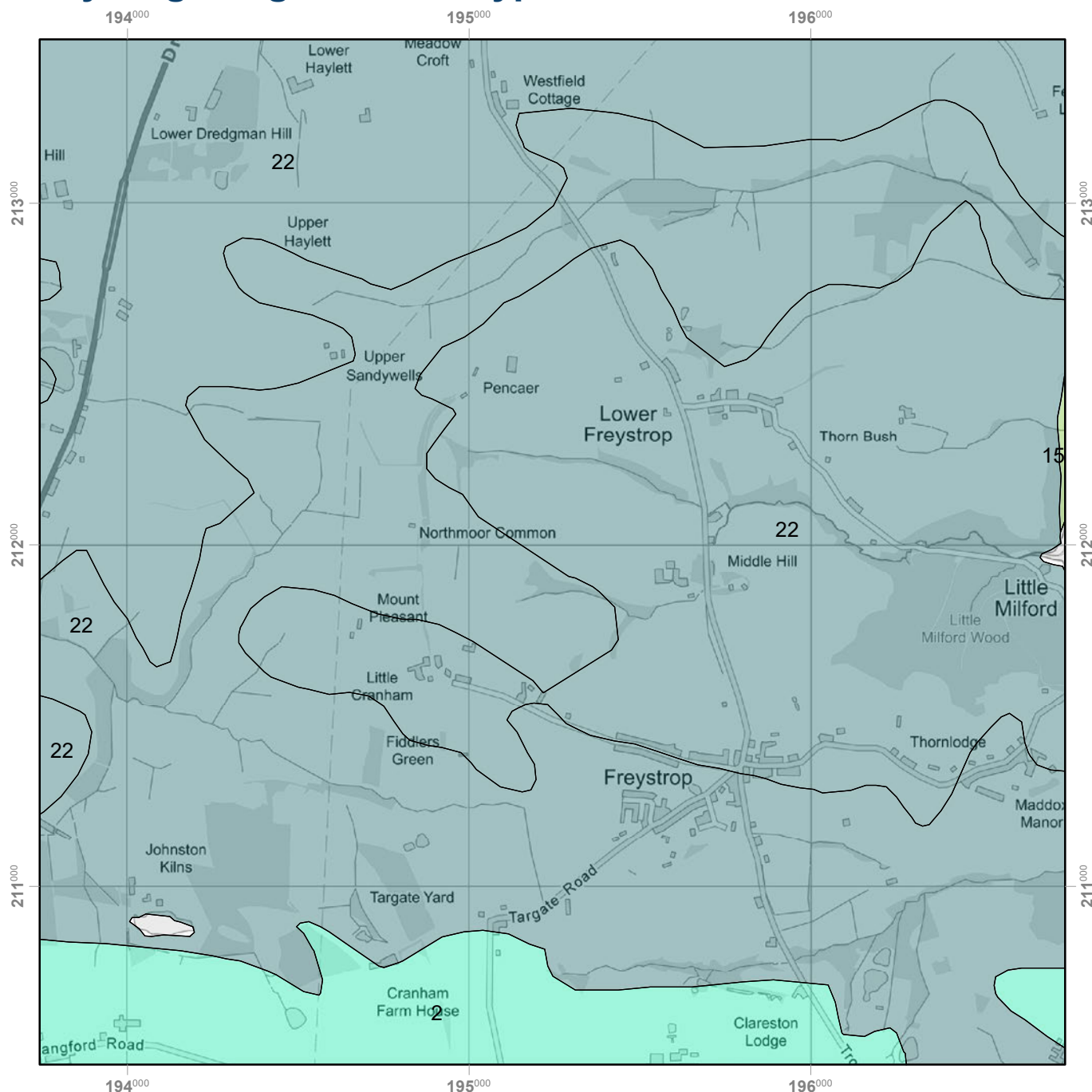


18 Steep acid upland pastures dry heath and moor; bracken gorse and oak woodlands

TYPICAL HABITATS DESCRIPTION

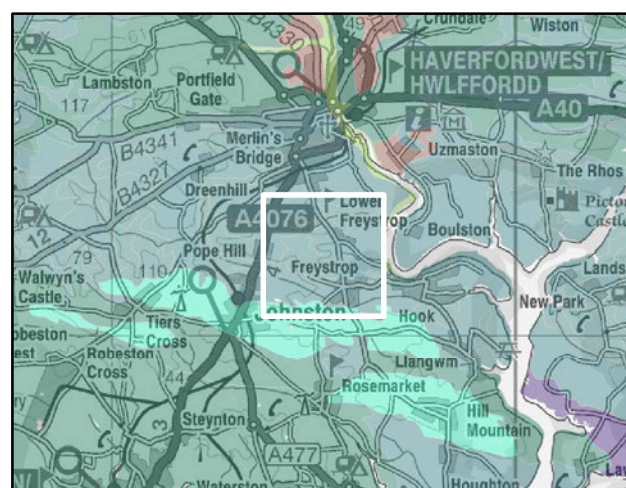
There is a close relationship between vegetation and the underlying soil. Information about the types of broad habitat associated with each soil type is provided in this map. Soil fertility, pH, drainage and texture are important factors in determining the types of habitats which can be established. Elevation above sea level and sometimes even the aspect, the orientation of a hillslope, can affect the species present. This map does not take into account the recent land management, but provides the likely natural habitats assuming good management has been carried out.

1f Hydrogeological Rock Type



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Hydrogeological Rock Type Key



2 weathered or deeply fissured intrusive or metamorphic rocks



15 river alluvium

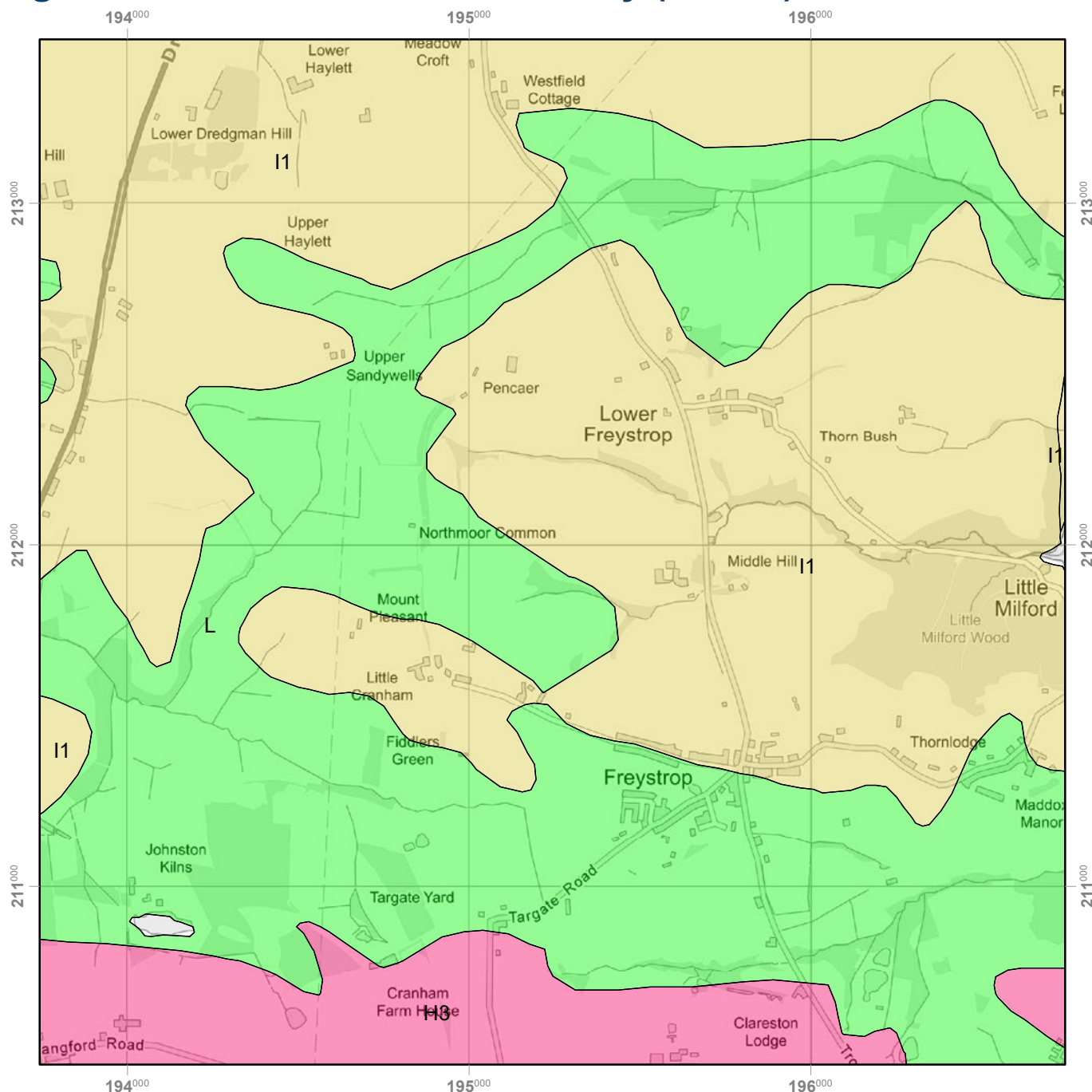


22 till and compact Head

HYDROGEOLOGICAL ROCK TYPE DESCRIPTION

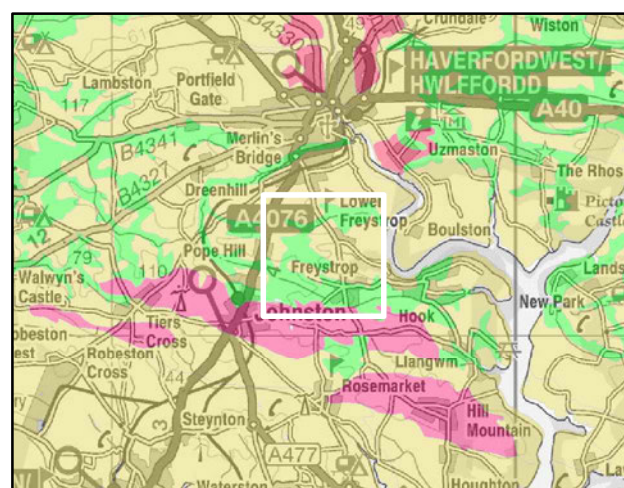
The hydrogeological classification of the soil parent materials provides a framework for distinguishing between soil substrates according to their general permeability and whether they are likely to overlie an aquifer. Every soil series has been assigned one of the 32 substrate classes and each of these is characterised according to its permeability (being characterised as permeable, slowly permeable or impermeable). For further information, see Boorman et al (1995).

1g Ground Water Protection Policy (GWPP)



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Ground Water Protection Policy (GWPP) Key

-  H3 Coarse textured or moderately shallow soils of high leaching potential, which readily transmit non-adsorbed pollutants and liquid discharges but which have some ability to attenuate adsorbed pollutants because of their relatively large organic matter or clay content
-  I1 Soils of intermediate leaching potential which have a moderate ability to attenuate a wide range of diffuse source pollutants but in which it is possible that some non-adsorbed diffuse source pollutants and liquid discharges could penetrate the soil layer
-  L Soils in which pollutants are unlikely to penetrate the soil layer either because water movement is largely horizontal or because they have a large ability to attenuate diffuse source pollutants

GWPP LEACHING CLASS DESCRIPTION

The Ground Water Protection Policy classes describe the leaching potential of pollutants through the soil (Hollis, 1991; Palmer et al, 1995). The likelihood of pollutants reaching ground water is described. Different classes of pollutants are described, including liquid discharges adsorbed and non-adsorbed pollutants.

2. Soil Association Descriptions

The following pages describe the following soil map units, (soil associations), in more detail.

-  NEATH 541h
Well drained fine loamy soils often over rock.
-  TEME 561b
Deep stoneless permeable silty soils.
-  MORETONHAMPSTEAD 611b
Well drained gritty loamy soils with a humose surface horizon in places.
-  BRICKFIELD 3 713g
Slowly permeable seasonally waterlogged fine loamy fine loamy over clayey and clayey soils.

The soil associations are described in terms of their texture and drainage properties and potential risks may be identified. The distribution of the soils across England and Wales are provided. Further to this, properties of each association's component soil series are described in relation to each other. Lastly, schematic diagrams of each component series are provided for greater understanding and in-field verification purposes. Further information on the soil associations and soil series can be found at [the LandIS Soils Guide](#)

NEATH (541h)

Well drained fine loamy soils often over rock.

a. General Description

Well drained fine loamy soils often over rock. Small patches of similar soils with slowly permeable subsoils and slight seasonal waterlogging.

The major landuse on this association is defined as Dairying and some cereals and stock rearing; some early potatoes in Dyfed.

b. Distribution (England and Wales)

The NEATH association covers 1607 km² of England and Wales which accounts for 1.06% of the landmass. The distribution of this association is shown in figure 2. Note that the yellow shading represents a buffer to highlight the location of very small areas of the association.

c. Comprising Soil Series

Multiple soil series comprise a soil association. The soil series of the NEATH association are outlined in Table 1 below. In some cases other minor soil series are present at a particular site, and these have been grouped together under the heading 'OTHER'. We have endeavoured to present the likelihood of a minor, unnamed soil series occurring in your site in Table 1.

Schematic diagrams of the vertical soil profile of the major constituent soil series are provided in Section D to allow easier identification of the particular soil series at your site.

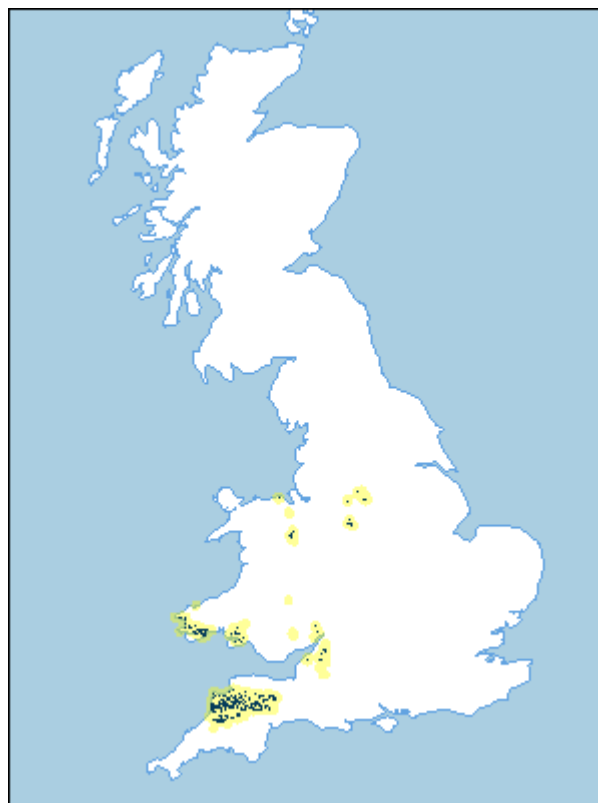


Figure 2: Association Distribution

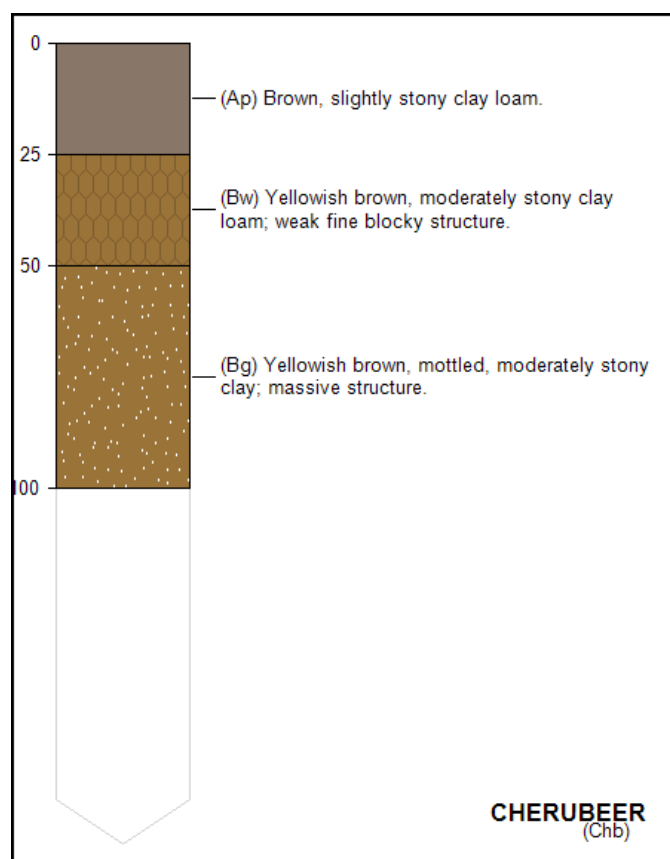
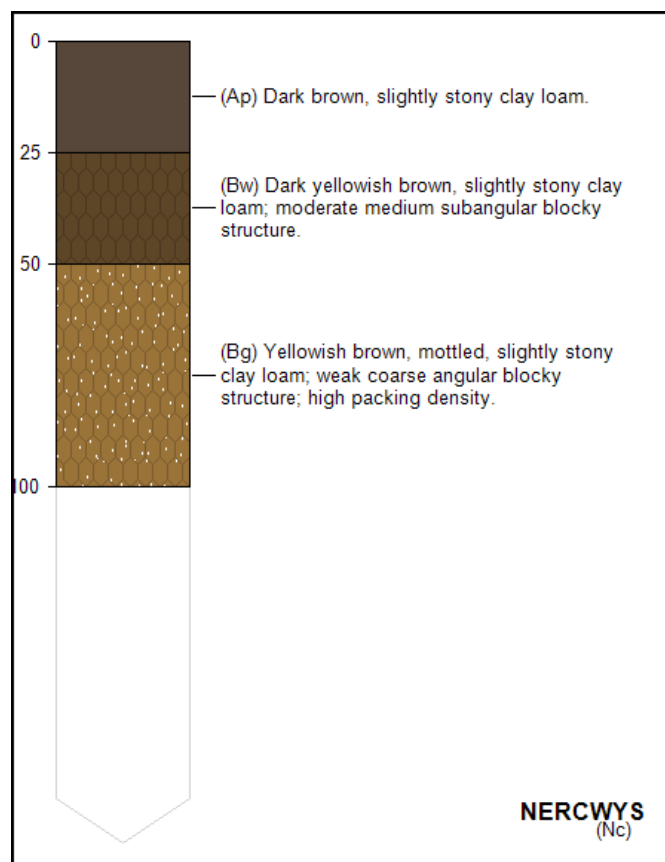
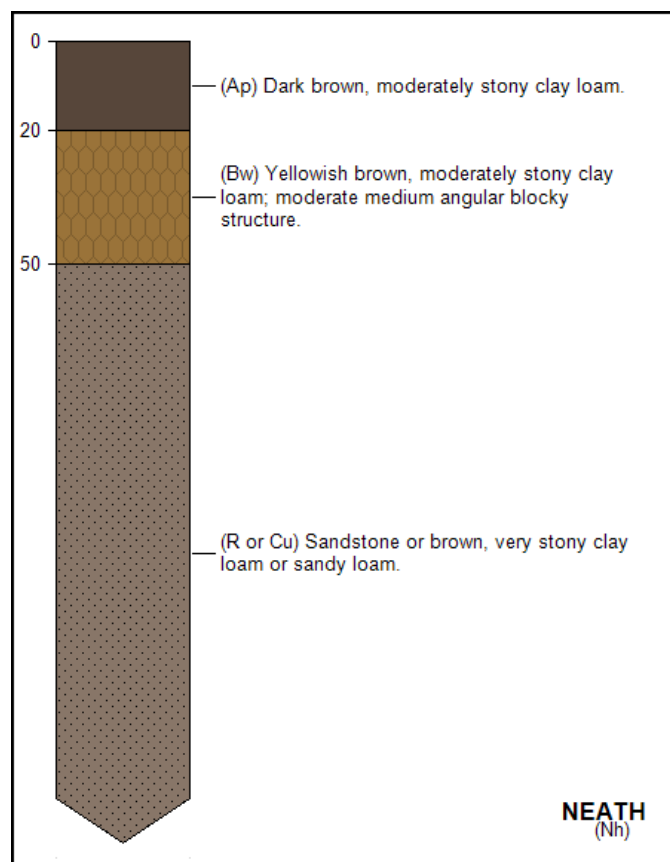
Table 1: The component soil series of the NEATH soil association. Because absolute proportions of the comprising series in this association vary from location to location, the national proportions are provided.

Soil Series	Description	Area %
NEATH (Nh)	medium loamy material over lithoskeletal sandstone	31%
NERCWYS (Nc)	medium loamy drift with siliceous stones	29%
CHERUBEER (Chb)	medium loamy over clayey drift with siliceous stones	10%
OTHER	other minor soils	30%

NEATH (541h)

Well drained fine loamy soils often over rock.

d. NEATH Component Series Profiles



TEME (561b)

Deep stoneless permeable silty soils.

a. General Description

Deep stoneless permeable silty soils. Some similar soils variably affected by groundwater. Gravelly subsoil in places.

The major landuse on this association is defined as Dairying and stock rearing on permanent and short term grassland; some cereals where flood risk low.

b. Distribution (England and Wales)

The TEME association covers 382 km² of England and Wales which accounts for 0.25% of the landmass. The distribution of this association is shown in figure 3. Note that the yellow shading represents a buffer to highlight the location of very small areas of the association.

c. Comprising Soil Series

Multiple soil series comprise a soil association. The soil series of the TEME association are outlined in Table 1 below. In some cases other minor soil series are present at a particular site, and these have been grouped together under the heading 'OTHER'. We have endeavoured to present the likelihood of a minor, unnamed soil series occurring in your site in Table 2.

Schematic diagrams of the vertical soil profile of the major constituent soil series are provided in Section D to allow easier identification of the particular soil series at your site.

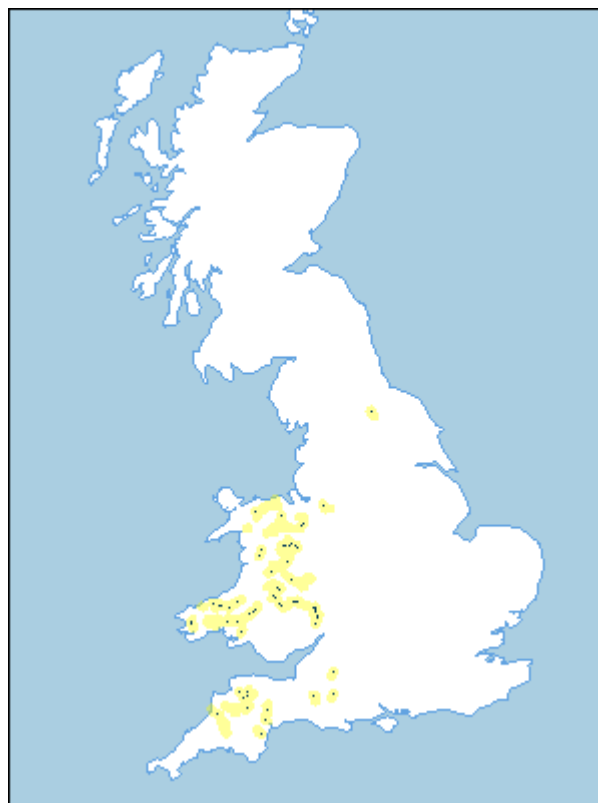


Figure 3: Association Distribution

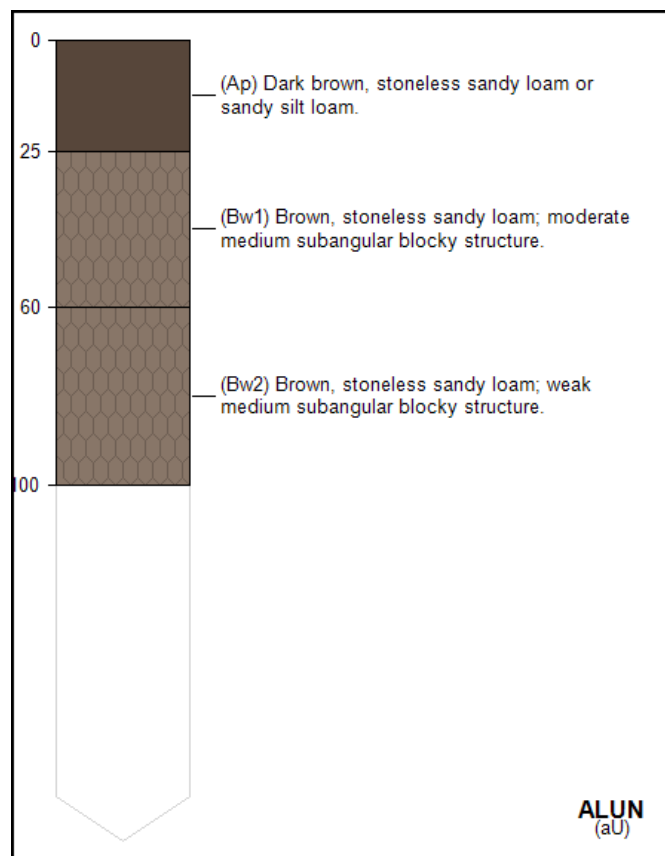
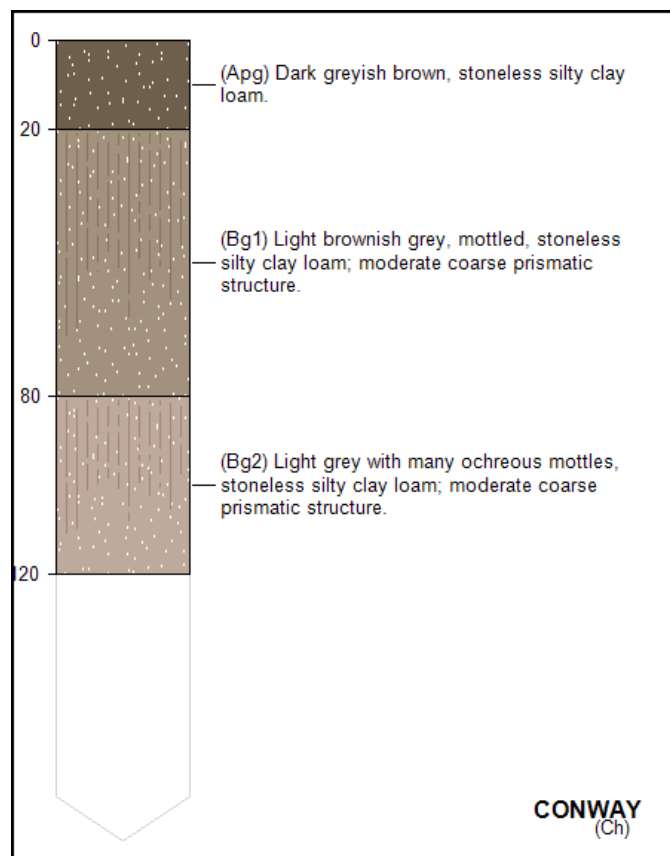
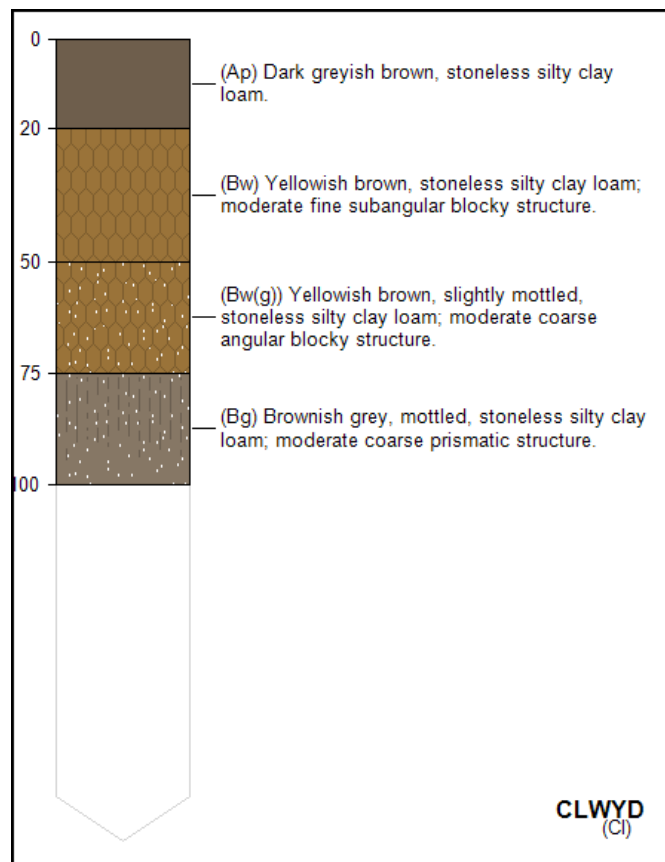
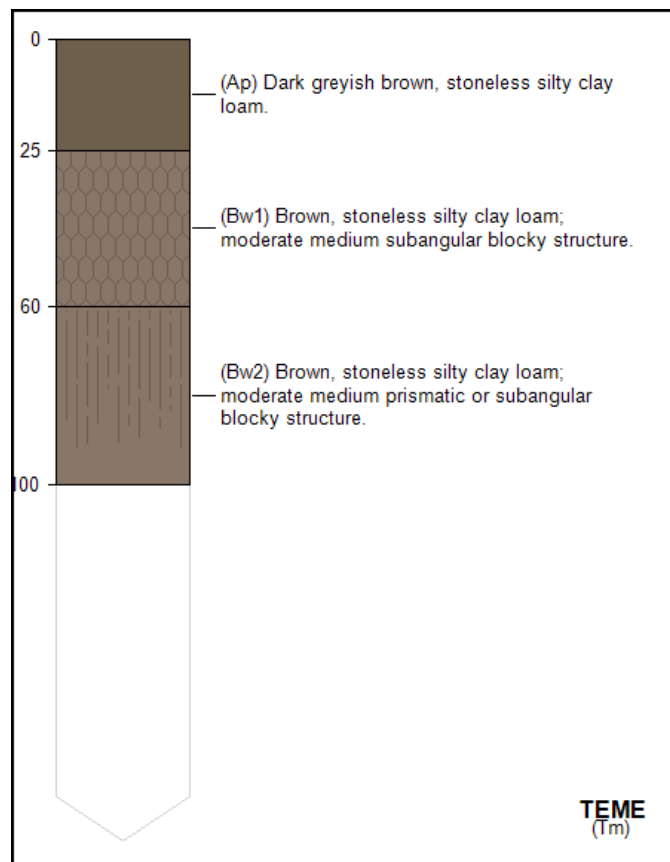
Table 2: The component soil series of the TEME soil association. Because absolute proportions of the comprising series in this association vary from location to location, the national proportions are provided.

Soil Series	Description	Area %
TEME (Tm)	medium silty river alluvium	45%
CLWYD (CI)	medium silty river alluvium	30%
CONWAY (Ch)	medium silty river alluvium	20%
ALUN (aU)	light loamy river alluvium	5%

TEME (561b)

Deep stoneless permeable silty soils.

d. TEME Component Series Profiles



MORETONHAMPSTEAD (611b)

Well drained gritty loamy soils with a humose surface horizon in places.

a. General Description

Well drained gritty loamy soils with a humose surface horizon in places.

The major landuse on this association is defined as Stock rearing in uplands on permanent grassland and some moorland of good grazing value; coniferous woodland; dairying some early potatoes and broccoli in West Cornwall.

b. Distribution (England and Wales)

The MORETONHAMPSTEAD association covers 588 km² of England and Wales which accounts for 0.39% of the landmass. The distribution of this association is shown in figure 4. Note that the yellow shading represents a buffer to highlight the location of very small areas of the association.

c. Comprising Soil Series

Multiple soil series comprise a soil association. The soil series of the MORETONHAMPSTEAD association are outlined in Table 1 below. In some cases other minor soil series are present at a particular site, and these have been grouped together under the heading 'OTHER'. We have endeavoured to present the likelihood of a minor, unnamed soil series occurring in your site in Table 3.



Figure 4: Association Distribution

Schematic diagrams of the vertical soil profile of the major constituent soil series are provided in Section D to allow easier identification of the particular soil series at your site.

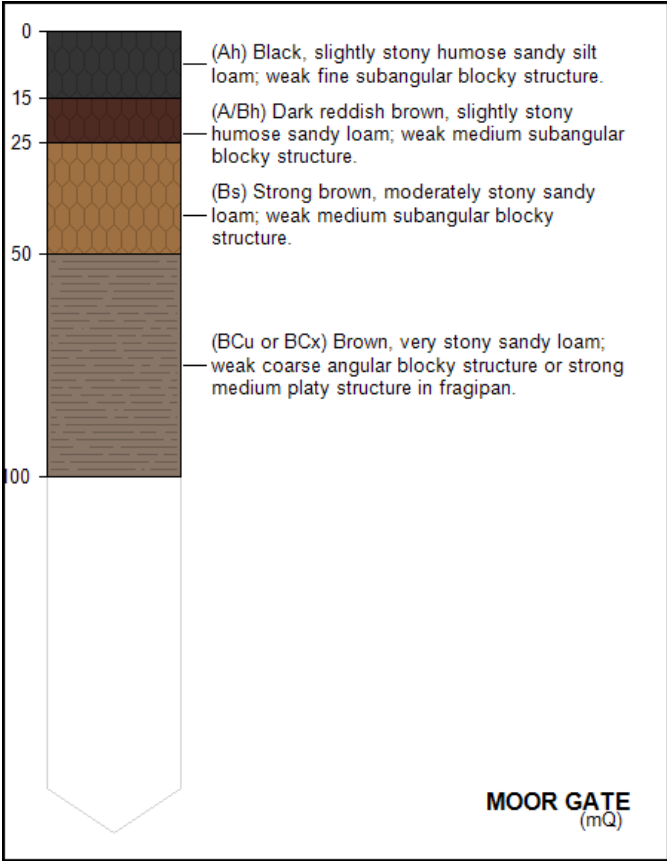
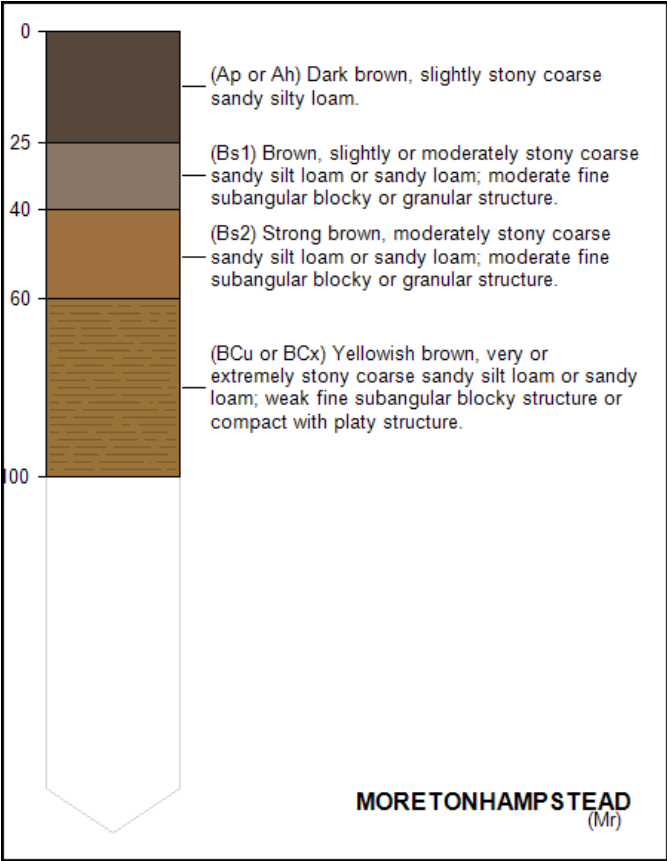
Table 3: The component soil series of the MORETONHAMPSTEAD soil association. Because absolute proportions of the comprising series in this association vary from location to location, the national proportions are provided.

Soil Series	Description	Area %
MORETONHAMPSTEAD (Mr)	light loamy material over lithoskeletal acid crystalline rock	85%
MOOR GATE (mQ)	light loamy material over lithoskeletal acid crystalline rock	10%
OTHER	other minor soils	5%

MORETONHAMPSTEAD (611b)

Well drained gritty loamy soils with a humose surface horizon in places.

d. MORETONHAMPSTEAD Component Series Profiles



BRICKFIELD 3 (713g)

Slowly permeable seasonally waterlogged fine loamy fine loamy over clayey and clayey soils.

a. General Description

Slowly permeable seasonally waterlogged fine loamy fine loamy over clayey and clayey soils. The major landuse on this association is defined as Stock rearing and some dairying on permanent grassland; grassland and winter cereals in drier lowlands.

b. Distribution (England and Wales)

The BRICKFIELD 3 association covers 4317 km² of England and Wales which accounts for 2.86% of the landmass. The distribution of this association is shown in figure 5. Note that the yellow shading represents a buffer to highlight the location of very small areas of the association.

c. Comprising Soil Series

Multiple soil series comprise a soil association. The soil series of the BRICKFIELD 3 association are outlined in Table 1 below. In some cases other minor soil series are present at a particular site, and these have been grouped together under the heading 'OTHER'. We have endeavoured to present the likelihood of a minor, unnamed soil series occurring in your site in Table 4.

Schematic diagrams of the vertical soil profile of the major constituent soil series are provided in Section D to allow easier identification of the particular soil series at your site.

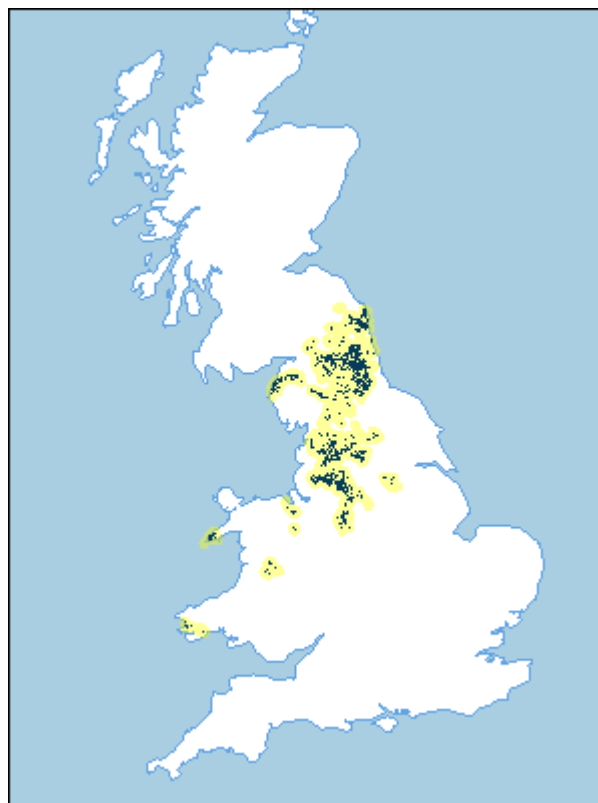


Figure 5: Association Distribution

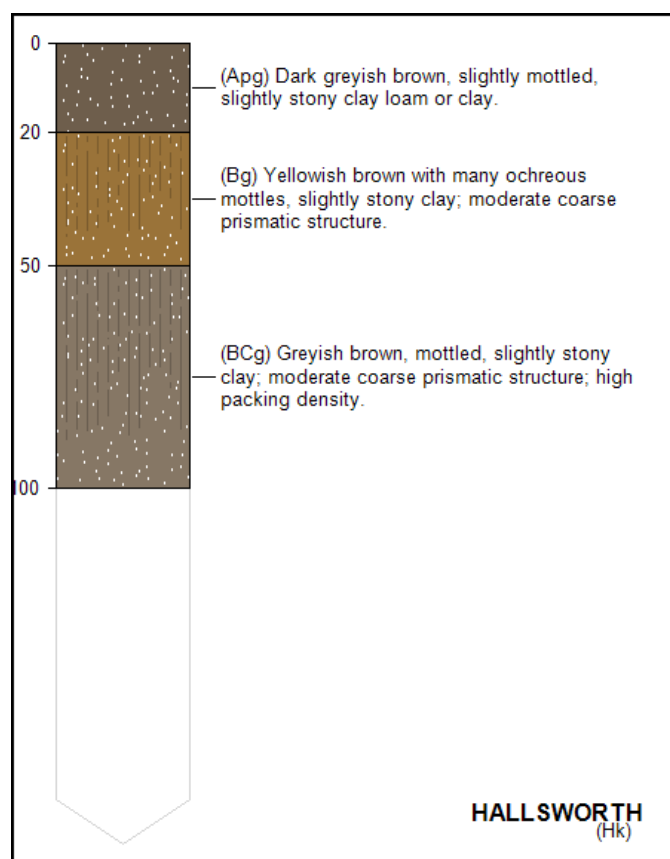
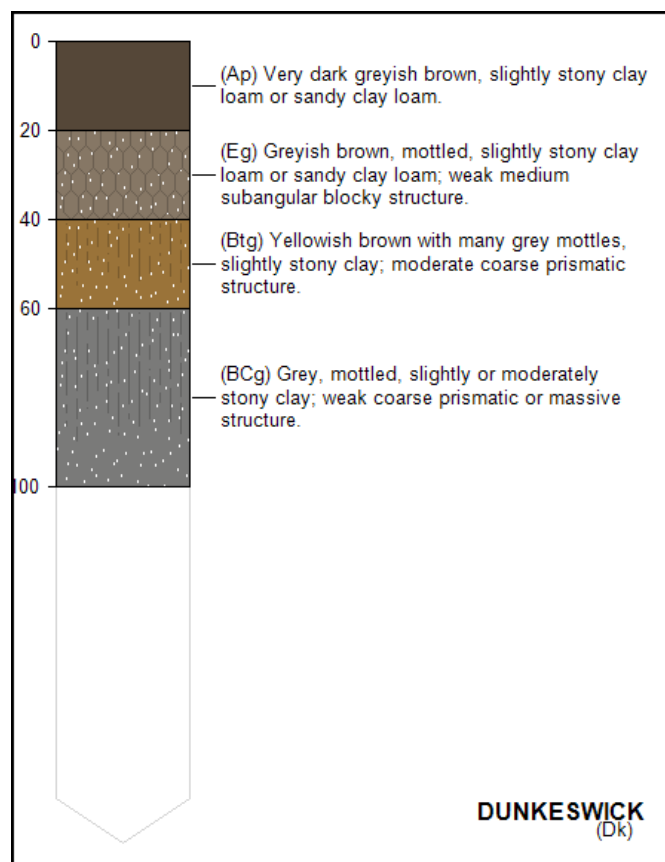
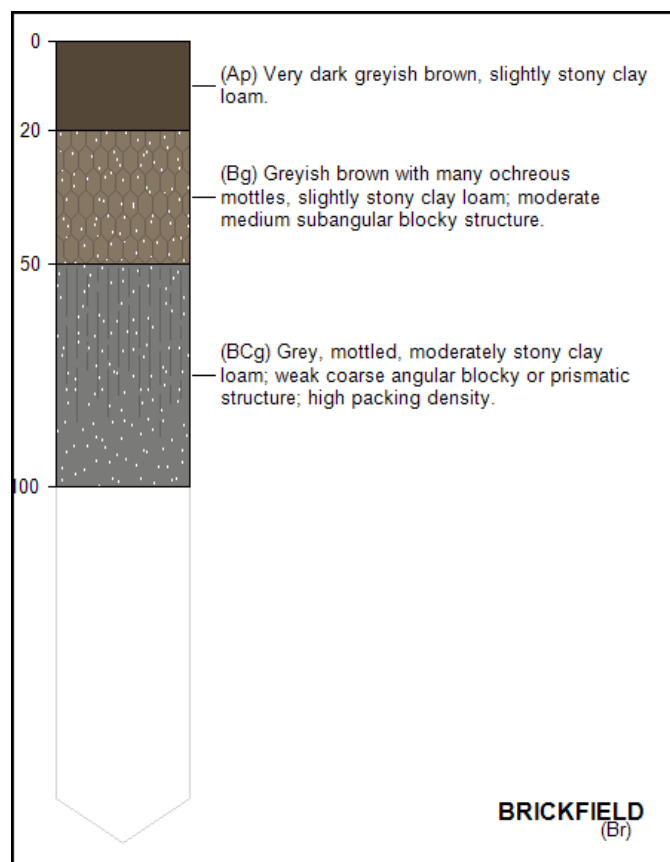
Table 4: The component soil series of the BRICKFIELD 3 soil association. Because absolute proportions of the comprising series in this association vary from location to location, the national proportions are provided.

Soil Series	Description	Area %
BRICKFIELD (Br)	medium loamy drift with siliceous stones	50%
DUNKESWICK (Dk)	medium loamy over clayey drift with siliceous stones	30%
HALLSWORTH (Hk)	clayey drift with siliceous stones	10%
OTHER	other minor soils	10%

BRICKFIELD 3 (713g)

Slowly permeable seasonally waterlogged fine loamy fine loamy over clayey and clayey soils.

d. BRICKFIELD 3 Component Series Profiles



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Subject to the specific instructions from the Client and the agreed scope of works, the intrusive site investigation works will have been carried out to provide sufficient information regarding the type, nature and extent of the contamination of the soil, groundwater and surface waters and air, to enable a reasonable assessment of risks to human health, the environment and building structures and services.

The investigation of the site will have been limited to those areas of the site that were accessible by exploratory equipment and were clear of buried services and ordinance (if present).

A more comprehensive investigation of the site may be required should the site be developed or used for a more sensitive land use than that indicated in this report.

The investigations of the exploratory holes undertaken can only provide an indication of the site conditions owing to the small volume of the ground represented by the exploratory holes in relation to the remainder of the site. The number and distribution of sampling locations and the methods of sampling and testing used does not preclude the presence of localised ‘hotspots’ of contamination where concentrations of contaminants may be higher than those encountered. Reasonable care must be taken in the interpretation of the findings of this investigation and in accordance with standard practice, no liability can be accepted by OEE for localised contamination ‘hot-spots’ not identified by the site investigation.

The soil, surface water, groundwater and air conditions reported herein are based on observations and testing completed at the time of the site investigation. The soil, surface water, groundwater and air conditions will change over time (e.g. owing to seasonal groundwater level fluctuations, weather related effects etc).

The risk assessment and associated opinions provided herein are based on currently available guidance relating to acceptable contaminant concentrations and the relevant land use scenarios associated with the proposed development of the site and the current land use of the adjacent sites.

OEE accepts no liability for the retrospective effects associated with any future changes or amendments to published assessment criteria, models or associated guidance. Should the proposed use of the site change from that detailed herein further investigation and/or assessment may be required.