

# High Speed Rail (West Midlands - Crewe)

## Environmental Statement

### Volume 5: Technical appendices

CA2: Colwich to Yarlet

Agriculture, forestry and soils data (AG-001-002)



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Department  
for Transport

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# 1 Introduction

1.1.1 This document is the agriculture, forestry and soils assessment Appendix for the Colwich to Yarlet community area (CA2), and comprises:

- soils and agricultural land classification surveys (Section 2);
- forestry (Section 3); and
- farm holding impact assessment summaries (Section 4).

1.1.2 Maps referred to throughout this agriculture, forestry and soils Appendix are contained in the Volume 5, Agriculture, Forestry and Soils Map Book.

## 2 Soils and agricultural land classification surveys

### 2.1 Background

2.1.1 The soils and agricultural baseline conditions reported have been established from desktop studies and site surveys.

2.1.2 Information gathered by desktop studies has related primarily to the identification of soil resources in the study area, the associated physical characteristics of geology, topography and climate which underpin the assessment of agricultural land quality, and the disposition of land uses. The main sources of information have included:

- National Soil Map;<sup>1</sup>
- Soils and Their Use in Midland and Western England;<sup>2</sup>
- solid and superficial deposits from the Geology of Britain viewer;<sup>3</sup>
- Gridpoint meteorological data for Agricultural Land Classification of England and Wales;<sup>4</sup>
- Provisional Agricultural Land Classification of England and Wales (1:250,000);<sup>5</sup>
- Likelihood of Best and Most Versatile Agricultural Land (1:250,000);<sup>6</sup>
- agri-environment schemes;<sup>7</sup>
- aerial photography from Google Earth; and
- on-site soil and agricultural land classification surveys.

2.1.3 Information gathered by field survey has related to the enhancement of desk-based information on soils and agricultural land quality, and the engagement with landowners and tenants to establish the nature and extent of agricultural, forestry and related rural enterprises.

2.1.4 Where the collection of agricultural site and soil information has enabled a review/refinement of published information, this was undertaken in accordance the methodology prescribed by Ministry of Agriculture, Fisheries and Food (MAFF)<sup>8</sup>.

2.1.5 Information obtained from farm impact assessment interview surveys has been taken as a factual representation of local agricultural and forestry interests and has not been subject to further verification.

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<sup>1</sup> Cranfield University (2001), *The National Soil Map of England and Wales 1:250,000 scale*, Cranfield University: National Soil Resources Institute

<sup>2</sup> Soil Survey of England and Wales (1984), *Soils and Their Use in Midland and Western England*. Harpenden

<sup>3</sup> British Geological Survey (2017), [www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html](http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html)

<sup>4</sup> Meteorological Office (1989), *Gridpoint Meteorological data for Agricultural Land Classification of England and Wales and other Climatological Investigations*

<sup>5</sup> Ministry of Agriculture, Fisheries and Food (1983), *Agricultural Land Classification of England and Wales (1:250,000)*

<sup>6</sup> Department for Environment, Food and Rural Affairs (2005), *Likelihood of Best and Most Versatile Agricultural Land (1:250,000)*

<sup>7</sup> Multi-Agency Geographical Information for the Countryside (MAGIC), [www.magic.gov.uk](http://www.magic.gov.uk)

<sup>8</sup> Ministry of Agriculture, Fisheries and Food (1988), *Agricultural Land Classification of England and Wales – Revised guidelines and criteria for grading the quality of agricultural land*

## 2.2 Soils and land resources

- 2.2.1 This part of the technical appendix describes the findings of a desktop study and targeted soil and Agricultural Land Classification (ALC) surveys that identifies existing soil and agricultural land resources in the study area.
- 2.2.2 The location and extent of different soil types and agricultural land in the different ALC grades are influenced by topography and drainage, and by geology and soil parent materials, which are described in turn in the following sections. This section then provides a description and distribution of the main soil types encountered within the study area.

## 2.3 Topography and drainage

- 2.3.1 Topography in the area is dominated by the River Trent and its valley system. The valley floor is broad and the sides typically slope irregularly downward from series of ridges and terraces, with altitudes between 125m and 80m above Ordnance Datum (AOD).
- 2.3.2 In addition to the River Trent, drainage of the land is via two other significant water courses, the Trent and Mersey Canal and the Marston Brook. The Trent and Mersey Canal runs alongside the River Trent throughout the area. The Marston Brook drains southward between Marston and Stafford.

## 2.4 Geology and soil parent materials

- 2.4.1 The bedrock geology of the area is of Triassic age and is dominated by mudstones of the Mercia Mudstone Group. The mudstone is intersected by sandstones which run from the south-west of Great Haywood, west and then north to Hopton. Perpendicular to the sandstone and running from the north of Marston and westward to Yarlet is the Stafford Halite Member.
- 2.4.2 A list of geological strata occurring within the study area is provided in age order in Table 1 and shown on Map WR-02-202 (Volume 5, Water Resources and Flood Risk Map Book).

Table 1: Bedrock and soil forming materials

Formation	Composition/soil parent material
Kidderminster Formation	Pebble conglomerates and reddish brown sandstones
Bromsgrove Sandstone Formation	Sandstones, commonly pebbly
Mercia Mudstone	Mudstone and siltstone with thick halite bearing units
Stafford Halite Member	Halite-stone and mudstone

- 2.4.3 Superficial deposits differ according to the topography of the area. The Proposed Scheme passes through:
- alluvium, associated with the River Trent and, to a lesser extent, the Marston Brook;

- river terrace deposits across footslopes of the Trent Valley, comprising sand and gravel;
- glacial till deposits on the lower slopes and valley sides east of Great Haywood, east of Hopton, north-east of Stafford and between Marston and Yarlet. These deposits may include a range of unsorted material ranging in size from clay to boulders; and
- small mapped areas of glaciofluvial sheet deposits, to the north-east of Stafford and adjacent to the river terrace deposits in the north.

## 2.5 Description and distribution of soil types

2.5.1 The characteristics of the soils are described by the Soil Survey of England and Wales that accompanies the National Soil Map. The soils are grouped into soil associations of a range of soil types (soil series) and are summarised in Table 2, and their distribution is shown on Map AG-02-102 (Volume 5, Agriculture, Forestry and Soils Map Book).

Table 2: Soil associations

Soil association <sup>9</sup> : code shown on map AG-02-102	Soil association name	Description	Wetness class <sup>10</sup>
431	Worcester	Slowly permeable, non-calcareous and calcareous reddish clayey soils over mudstone with slight to moderate seasonal waterlogging; some similar non- calcareous clay loam over clayey soils.	II-III
541b	Bromsgrove	Reddish sandy loam profiles mainly over soft reddish brown sandstone. Naturally well drained.	I
541r	Wick 1	Deep well drained sandy loam and sandy soils, locally over gravel; some similar soils affected by groundwater.	I-II
572f	Whimple 3	Reddish clay loam and silty clay loam over clayey soils with slowly permeable subsoils and slight seasonal waterlogging; some similar clayey soils on brows; slowly permeable seasonally waterlogged clay loam over clayey soils on lower slopes.	II-III
572l	Flint	Reddish fine loamy over clayey soils with slight seasonal waterlogging.	III
711n	Clifton	Slowly permeable, seasonally waterlogged clay loam and sandy clay loam.	IV
813a	Midelney	Stoneless clayey soils mostly overlying peat and variably affected by groundwater.	IV or V

<sup>9</sup> Cranfield University (2017), <http://www.landis.org.uk/data/nsi.cfm>

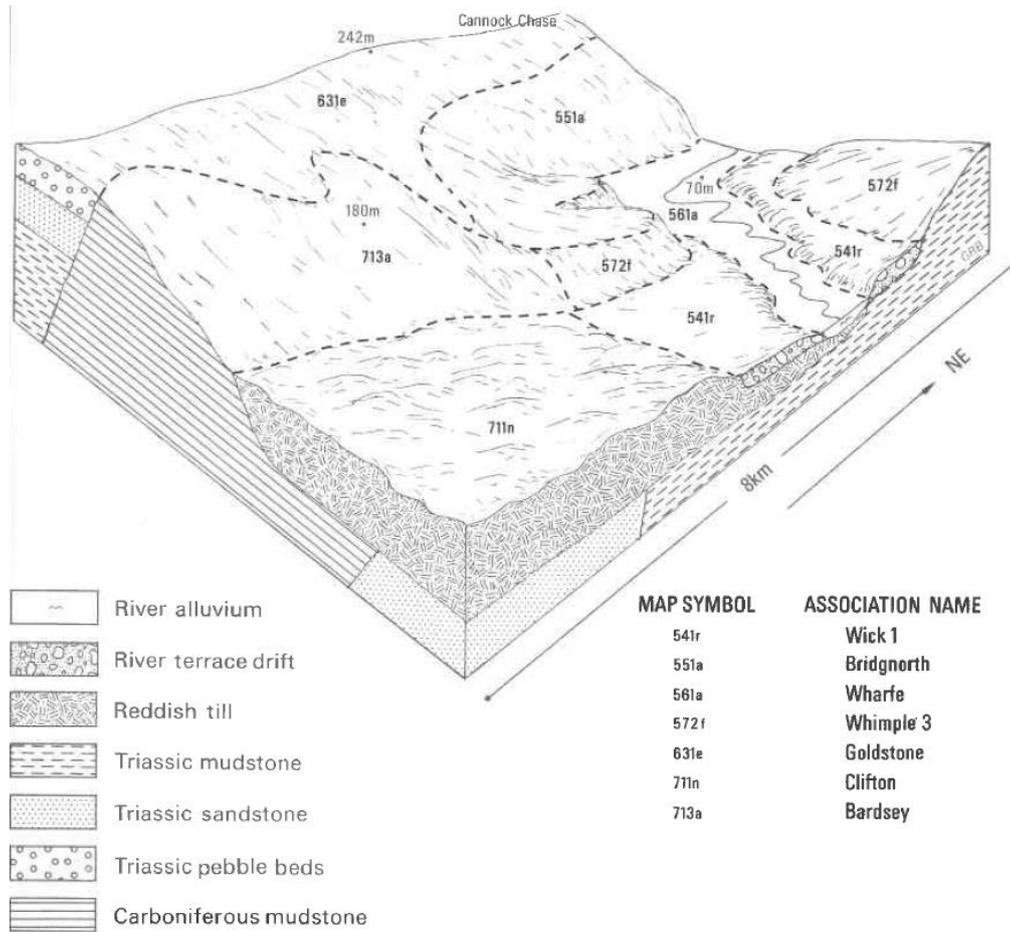
<sup>10</sup> The Wetness Class (WC) of a soil is classified according to the depth and duration of waterlogging in the soil profile and has six categories from WC I which is well drained to WC VI which is very poorly drained

2.5.2 The National Soil Map shows the following seven soil associations in the study area:

- the Flint association is mapped at the southern extremity of the area and comprises clay loam upper horizons over dense, slowly permeable clay subsoils;
- the Whimple 3 association covers four substantial areas located to the north and east of Great Haywood, at Ingestre, west of Hopton and between Marston and Yarlet. These soils are developed in thin drift over mudstone, typically on gently sloping land, and are characterised by clay loam or silty clay loam upper horizons over slowly permeable clay or silty clay lower subsoil;
- the Middelney association is mapped in conjunction with the River Trent and its floodplain and comprise stoneless clays. These soils develop in river alluvium over peat and are waterlogged for long periods;
- the Wick 1 association soils include sandy loams and sand and are found covering the footslopes of the Trent Valley between Great Haywood and Ingestre. These soils, locally over gravel, are mostly well drained;
- the Bromsgrove association soils are sandy loams and are found across a wide swathe of land between Tixall and Hopton over plateaux and gentle to moderate slopes. These soils are developed over permeable sandstone and are naturally well drained;
- the Clifton association is found to the north and east of Marston and is developed in till and glaciofluvial deposits. These soils are characterised by profiles of clay loam and sandy clay loam. The subsoils are slowly permeable and the profiles poorly drained; and
- the Worcester association soils have clayey profiles and are found across moderate slopes at the northern end of the area. These soils are seasonally waterlogged.

2.5.3 Soils of the Wick 1, Whimple 3 and Clifton associations are shown in a landscape context in Figure 1.

Figure 1: Wick 1, Whimble 3 and Clifton soil associations in a landscape context<sup>9</sup>



2.5.4 A detailed description for the predominant soil series of the Clifton association, which accounts for some 45% of the soils in the association, is given in Table 3.

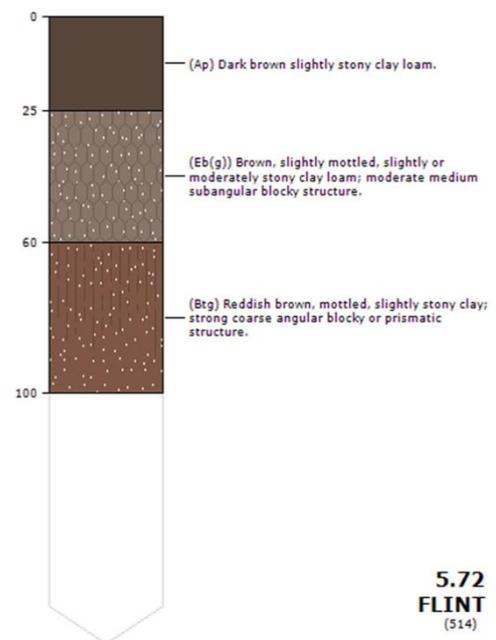
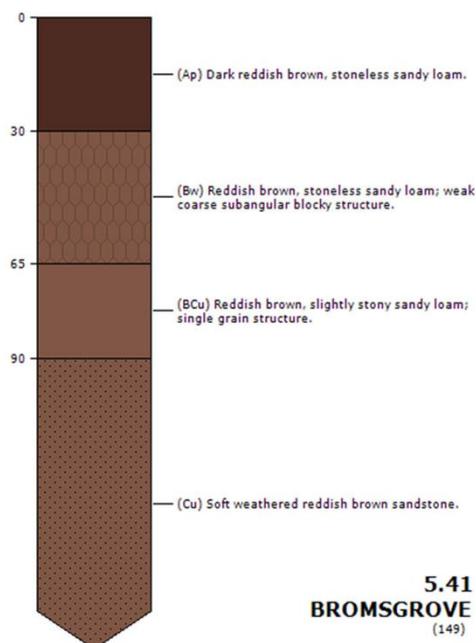
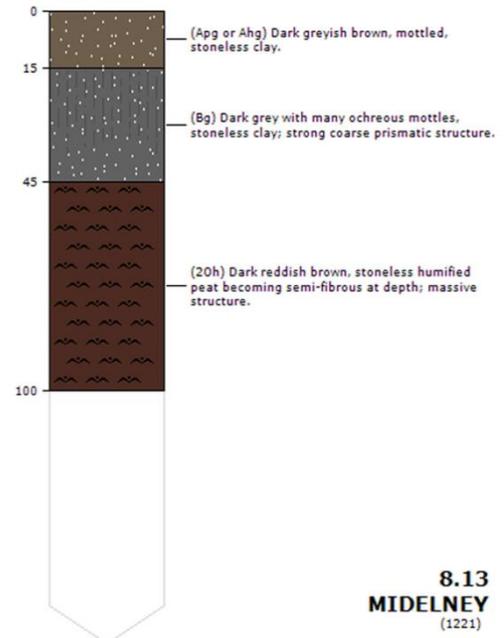
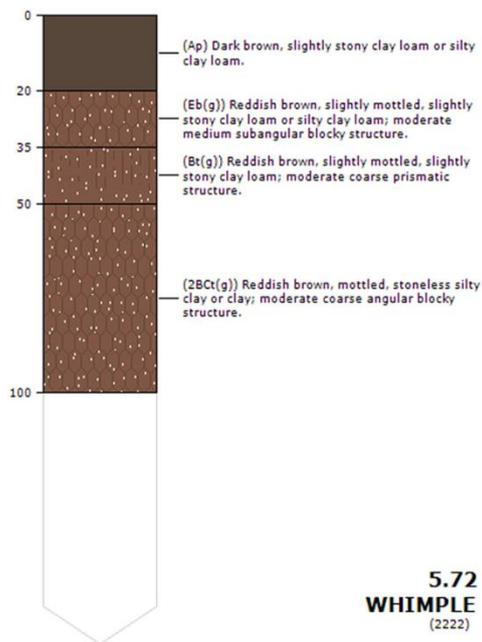
Table 3: Dominant soil series

Clifton series
0 – 23cm, Dark greyish brown (10YR4/2 <sup>21</sup> ) slightly stony sandy clay loam; large rounded quartzite; moist; strongly developed coarse subangular blocky; high packing density; moderately firm soil and ped strength; many very fine fibrous roots; non-calcareous; sharp wavy boundary.
23 - 37cm, Light grey to grey (10YR6/1) slightly stony sandy loam with many fine yellowish brown (10YR5/6) mottles; large rounded quartzite; moist; weakly developed, adherent medium subangular blocky; high packing density; moderately firm soil and ped strength; common very fine fibrous roots; non-calcareous; few irregular ferri-manganiferous nodules; abrupt wavy boundary.
37 - 86cm, Reddish brown (5YR4/4) slightly stony clay loam with common fine light grey to grey (10YR6/1) and strong brown (7.5YR5/6) mottles; large rounded quartzite; moist; strongly developed very coarse prismatic with greyish brown (10YR5/2) faces; high packing density; very firm soil strength; few very fine fibrous roots; non-calcareous; many clay coats; gradual smooth boundary.
86 - 107cm, Reddish brown (2.5YR4/4) slightly stony clay loam with common medium grey (N5/0) mottles; medium rounded quartzite; moist; massive; high packing density; moderately strong ped strength; common clay coats

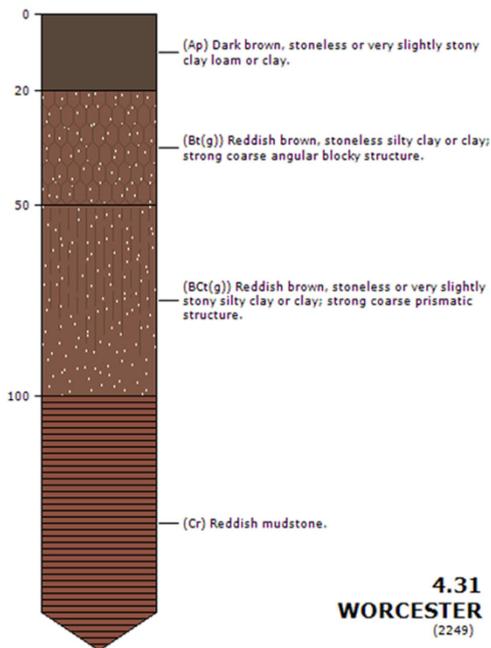
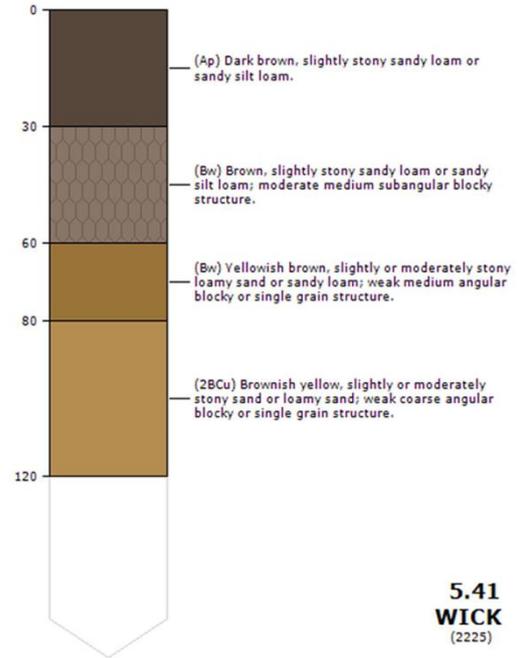
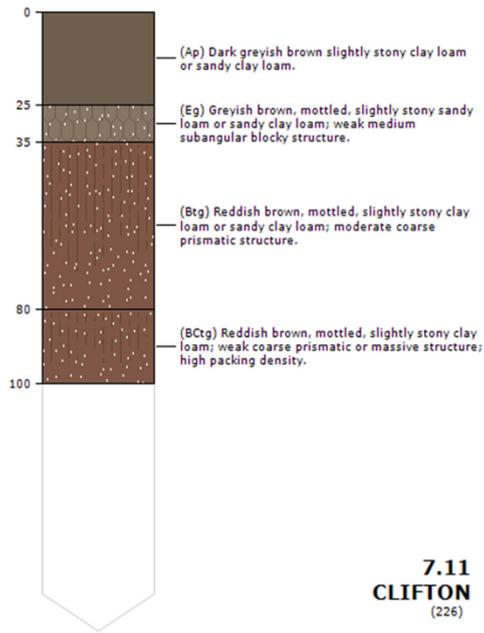
<sup>21</sup> Notations according to the Munsell Soil Color Book (2009). In this example, 10YR is the hue; 4/2 is the value/chroma

2.5.5 Typical soil profiles of the main series of each association<sup>9</sup> are depicted and described in Figure 2.

Figure 2: Predominant soil series profile descriptions



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## 2.6 Soil and land use interactions

### Agricultural land quality

- 2.6.1 A review of available ALC information has been undertaken to ascertain the agricultural land quality within the study area. The review sought to identify the extent of any existing, detailed post-1988 ALC information to ensure that surveys were not repeated unnecessarily. No existing detailed ALC data was found in this study area.
- 2.6.2 Agricultural land quality has thus been assessed from available information in the form of archived Soil Survey records obtained from the National Soil Resources Institute (NSRI) at Cranfield University and from detailed soil surveys undertaken in 2016 specifically for the purposes of this assessment.

### Detailed agricultural land classification

- 2.6.3 Archived auger bores from the NSRI were obtained and used for reference in this ALC assessment, as well as soil survey data obtained in the south of the area.
- 2.6.4 The principal physical factors influencing agricultural production and land quality in this study area are climate, site and soil and the interactions between them. Soil wetness and soil droughtiness are the most relevant limitations in this area.
- 2.6.5 During the detailed soil survey, soil profiles were examined using an Edelman (Dutch) auger and a spade. At each observation point the following characteristics were assessed for each soil horizon up to a maximum of 120cm where possible, or to any impenetrable layer:
- soil texture;
  - significant stoniness;
  - colour (including local gley and mottle colours);
  - consistency;
  - structural condition;
  - free carbonate; and
  - depth.
- 2.6.6 Soil Wetness Class ( $WC^{10}$ ) was inferred from the matrix colour, presence or absence of, and depth to, greyish and ochreous gley mottling and/or poorly permeable subsoil layers at least 15cm thick. Soil available water capacity, relevant to the assessment of drought risk, was estimated from texture, structure, organic matter content, stone content and profile depth.

### Agro-climatic limitations

- 2.6.7 The local agro-climatic factors have been interpolated from the Meteorological Office's standard 5km grid point dataset at four points within the study area, as set out in Table 4. There is only a small variation across the study area. Average annual rainfall is from 749 to 760mm. Median Field Capacity Days (FCD), i.e. when the soil moisture deficit is zero, are from 178 to 182 days. Moisture deficits are 87 to 91mm for

wheat and 72 to 77mm for potatoes, with the marginally larger values occurring on lower ground.

Table 4: Interpolated agro-climatic data

Agro-climatic parameter	SK014233 Great Haywood East	SJ960260 Hopton East	SJ965247 Stafford East	SJ926275 Marston
Altitude (AOD)	105m	126m	120m	104m
Average annual rainfall	760mm	759mm	754mm	749mm
Accumulated temperature >0°C <sup>12</sup>	1,354day°	1,330day°	1,337day°	1,355 day°
Field capacity days (FCD)	178days	182days	180days	182days
Average moisture deficit, wheat	91mm	87mm	88mm	90mm
Average moisture deficit, potatoes	77mm	72mm	74mm	77mm

- 2.6.8 Climate itself does not place any limitation upon the land in this area, but the interactions of climate with soil characteristics are important in determining the wetness and droughtiness limitations of the soil.
- 2.6.9 The influence of climate on soil wetness is assessed by reference to the number of FCDs, soil WC and topsoil texture. The ALC grade (according to any soil wetness limitation) is then determined following the methodology set out in the ALC Guidelines<sup>8</sup> and the data in Table 5.

<sup>12</sup> Accumulated temperature is the excess of daily air temperatures above a selected threshold temperature (0°C), summed over a specified period (January to June) which is the critical growth period for most crops

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Table 5: ALC grade according to soil wetness – mineral soils

Wetness class	Texture of the top 25cm	Field capacity days				
		<126	126-150	151-175	176-225	>225
I	Sand (S) Loamy Sand (LS) Sandy Loam (SL) Sandy Silt Loam (SZL)	1	1	1	1	2
	Silty Loam (ZL) Medium Silty Clay Loam (MZCL) Medium Clay Loam (MCL) Sandy Clay Loam (SCL)	1	1	1	2	3a
	Heavy Silty Clay Loam (HZCL) Heavy Clay Loam (HCL)	2	2	2	3a	3b
	Sandy Clay (SC) Silty Clay (ZC) Clay (C)	3a (2)	3a (2)	3a	3b	3b
II	S LS SL SZL	1	1	1	2	3a
	ZL MZCL MCL SCL	2	2	2	3a	3b
	HZCL HCL	3a (2)	3a (2)	3a	3a	3b
	SC ZC C	3a (2)	3b (3a)	3b	3b	3b
III	S LS SL SZL	2	2	2	3a	3b
	ZL MZCL MCL SCL	3a (2)	3a (2)	3a	3a	3b
	HZCL HCL	3b (3a)	3b (3a)	3b	3b	4
	SC ZC C	3b (3a)	3b (3a)	3b	4	4
IV	S LS SL SZL	3a	3a	3a	3b	3b
	ZL MZCL MCL SCL	3b	3b	3b	3b	3b
	HZCL HCL	3b	3b	3b	4	4
	SC ZC C	3b	3b	3b	4	5
V	S LS SL SZL	4	4	4	4	4
	ZL MZCL MCL SCL	4	4	4	4	4
	HZCL HCL	4	4	4	4	4
	SC ZC C	4	4	4	5	5

Notes. From Table 6 of ALC Guidelines, October 1988<sup>8</sup>

For naturally calcareous soils with more than 1% calcium carbonate (CaCO<sub>3</sub>) and between 18% and 50% clay in the top 25cm, the grade, where different from that of other soils, is shown in brackets.

Sand topsoil is not eligible for Grades 1,2 or 3a.

Loamy sand topsoil is not eligible for Grade 1.

2.6.10 Soil droughtiness is determined by comparing crop-adjusted available water (AP), with the moisture deficit (MD) for the locality for wheat and potatoes (MAFF ALC Guidelines, Appendix 4). Grading of the land can be affected if the AP is insufficient to balance the MD and droughtiness occurs. The calculation used in the ALC Guidelines to determine the severity of this limitation is given below in Figure 3.

## Appendix AG-001-002

Figure 3: Methodology for calculating the severity of a droughtiness limitation to ALC grading

$$AP \text{ wheat (mm)} = \frac{TA_{vt} \times LT_t + \sum (TA_{vs} \times LT_{50}) + \sum (EA_{vs} \times LT_{50-120})}{10}$$

where  
 TA<sub>vt</sub> is Total available water (TA<sub>v</sub>) for the topsoil texture  
 TA<sub>vs</sub> is Total available water (TA<sub>v</sub>) for each subsoil layer  
 EA<sub>vs</sub> is Easily available water (EA<sub>v</sub>) for each subsoil layer  
 LT<sub>t</sub> is thickness (cm) of topsoil layer  
 LT<sub>50</sub> is thickness (cm) of each subsoil layer to 50 cm depth  
 LT<sub>50-120</sub> is thickness (cm) of each subsoil layer between 50 and 120 cm depth  
 Σ means 'sum of'.

$$AP \text{ potatoes (mm)} = \frac{TA_{vt} \times LT_t + \sum (TA_{vs} \times LT_{70})}{10}$$

where  
 LT<sub>70</sub> is thickness (cm) of each subsoil layer to 70 cm depth

**MB (Wheat) = AP (Wheat) - MD (Wheat)**  
**MB (Potatoes) = AP (Potatoes) - MD (Potatoes)**

Where  
 MB is the Moisture Balance  
 AP is the Crop-adjusted available water capacity  
 MD is the moisture deficit, as determined by the agro-climatic assessment.

<b>Grade according to droughtiness</b>			
Grade/ Subgrade	Moisture Balance limits (mm)		
	<i>wheat</i>		<i>potatoes</i>
1	+30	<i>and</i>	+10
2	+5	<i>and</i>	-10
3a	-20	<i>and</i>	-30
3b	-50	<i>and</i>	-55
4	<-50	<i>or</i>	<-55

Derived from MAFF, 1988<sup>8</sup>

## Site limitations

- 2.6.11 The assessment of site limitations is primarily concerned with the way in which topography influences the use of agricultural machinery and hence the cropping potential of land. Gradient and microrelief are not considered limiting in this study area.
- 2.6.12 Flood risk is limiting to agricultural land quality within the Trent Valley particularly to the west of Great Haywood where the River Sow and the River Trent converge. The land is classified as Flood zone 3 and the limitation is to Subgrade 3b or Grade 4. However, the exact incidence and severity of flooding is difficult to ascertain as flood risk is determined by the extent, duration, frequency and timing of flooding events which may not have been recorded.

## Soil limitations

- 2.6.13 The main soil properties which affect the cropping potential and management requirements of land are texture, structure, depth, stoniness and chemical fertility. Together they influence the functions of soil and affect the water availability for crops, drainage, workability and trafficability.
- 2.6.14 The main soil characteristics within the study area are:
- light loamy and sandy textures developed in glaciofluvial and river terrace drifts over sandstone;
  - loamy over clayey textures, commonly with poor subsoil structure and slow permeability, over Mercia Mudstone and till; and
  - clayey textures in some shallow soils on mudstone and in alluvial soils in the valley bottoms with fluctuating groundwater.
- 2.6.15 One profile which is limited by soil depth was identified in the study area but chemical limitations are not encountered.

## Interactive limitations

- 2.6.16 The physical limitations which result from interactions between climate, the site and soil are soil wetness, droughtiness and erosion. Each soil can be allocated a WC based on soil structure, evidence of waterlogging and the number of FCDs; the topsoil texture then determines its ALC Grade in accordance with Table 6 of the MAFF ALC guidelines (as detailed in Table 5).
- 2.6.17 Land with soils typical of the Flint, Whimple 3, Clifton and Worcester associations is affected mostly by soil wetness and has been identified throughout the area in NSRI profiles. Topsoil textures are of sandy silt loam, silty clay loam or clay loam of 25cm average depth. The topsoils are slightly stony or stoneless and mostly reddish in colour. Upper subsoils are of clay loam or silty clay loam and overlie lower subsoils of clay loam or silty clay. The subsoils are gleyed and slowly permeable at varying depth, but all are of WC III. Soils of WC III are limited by wetness and workability to Subgrade 3a where the topsoil texture is sandy silt loam, medium clay loam or silty clay loam. Where the topsoil texture is of heavy clay loam or heavy silty clay loam the limitation is more severe, to Subgrade 3b.

- 2.6.18 The light loamy and sandy soils of the Wick 1 and Bromsgrove associations are well drained (WC I) and are most commonly affected by a slight droughtiness limitation, with topsoil stone and depth also representing occasional limitations. The limitation ranges from minor (Grade 2) to moderately severe (Subgrade 3b).
- 2.6.19 The presence of this soil type has been confirmed throughout the area in both the detailed surveys undertaken for the purpose of this assessment and in the archived NSRI profile data. Much of the NSRI data is drawn from locations in the vicinity of the Proposed Scheme but outside the study area. However, it provides a useful indication of likely soil properties where the soil associations are compatible.
- 2.6.20 To the east of Hopton, in an area mapped as the Bromsgrove association, is a profile comprising medium sandy loam to a restricted depth of 37cm in total. Restricted depth and soil droughtiness exert an equal limitation on the profile, to Subgrade 3a.
- 2.6.21 Bordering the Bromsgrove soils to the south-east of Stafford is another profile comprising sandy loam throughout, reaching a moderate total depth of 85cm. Although affected by droughtiness, the major limitation in this area is topsoil stone content which limits the profile to Subgrade 3b.
- 2.6.22 The 2016 survey undertaken in the south of the study area, east of Little Haywood, identified moderately stony sandy clay loam topsoil of 30cm depth, overlying coarse sandy loam subsoil containing many stones. Increasing subsoil stone content prevented observation of the soil at depths beyond 40cm. As to the south-east of Stafford, the main limitation is due to topsoil stone content but is less severe, and limits the profile to Subgrade 3a.
- 2.6.23 One profile, comprising sandy clay loam, possesses characteristics spanning those typical of the Wick 1 and Clifton associations and was identified in the south of the area in the detailed soil survey. Similar to the Wick 1 soils, an increasingly gravelly subsoil layer prevented observation beyond 55cm depth. Gleying in the subsoil, more characteristic of Clifton soils, reduces the profile to WC II resulting in a wetness and workability limitation to Subgrade 3a, although this may be overridden by a flood risk limitation to Subgrade 3b.
- 2.6.24 Soils characteristic of the Middelney association are present within a floodplain to the south of the area. The soil profile includes black medium clay loam topsoil of 30cm depth overlying malodorous, greenish grey clay upper subsoil to 70cm depth, below which is sandy clay loam. Inundation of the profile with water combined with the malodour suggests chronic waterlogging. Such soils can be classified as Grade 4.

## 3 Forestry

- 3.1.1 Assessment of forestry resources has primarily had regard to the National Forestry Inventory<sup>13</sup> and its predecessor, the National Inventory of Woodland and Trees<sup>14</sup>, and to data collected from landowners and tenants in the farm impact assessments.
- 3.1.2 The area of woodland within a 4km wide corridor (2km either side of the route centre line of the Proposed Scheme) has been determined using GIS, and is shown in Table 6.
- 3.1.3 Woodland is found predominantly around Ingestre, although there are some blocks to the south of the A51 Lichfield Road at Tithebarn Farm and to the north of the area, at Yarlet.
- 3.1.4 The larger blocks of woodland in the area include Ingestre Wood, Lionlodge Covert, Lambert's Coppice, Pool Covert and Hopton Pools Covert near Hopton, and The Grove and New Plantation at Yarlet.
- 3.1.5 The woodland around Ingestre and at Lionlodge Covert appears to be managed, although not as a commercial forestry activity.

Table 6: Area of woodland within the study area and construction boundary

	Area of woodland within 2km either side of centreline		Woodland permanently required	
	ha	%	ha	%
Ancient woodland	14.1	4	1.6	19
Broadleaved	257.0	69	5.3	62
Coniferous	78.2	21	0.0	0
Other	21.8	6	1.6	19
Total woodland	371.1	100	8.5	100
Woodland as % of total land within 2km either side of centreline		6.2		

<sup>13</sup> Forestry Commission, National Forest Inventory, <https://www.forestry.gov.uk/inventory>

<sup>14</sup> Forestry Commission, National Inventory of Woodland and Trees, <https://www.forestry.gov.uk/fr/infid-86xc6c>

## 4 Assessment of effects on holdings

- 4.1.1 The effects on farm holdings have been assessed according to the methodology set out in the Phase 2a Scope and Methodology Report (SMR) and the SMR Addendum which are set out in Volume 5: Appendix CT-001-001 and Appendix CT-001-002. A summary of the assessment is provided in Table 7.
- 4.1.2 The nature of impacts considered comprises the temporary and permanent land required from the holding, the temporary and permanent severance of land, the permanent loss of key farm infrastructure and the imposition of disruptive effects (particularly noise and dust) on land uses and the holding's operations. These impacts occur primarily during the construction phase of the Proposed Scheme.

Table 7: Summary of assessment of effect on holdings

Holding reference, name and description	Temporary effects	Permanent effects
<p>CA2/1</p> <p>Upper Moreton Farm</p> <p>Owner-occupied</p> <p>24ha cattle and sheep holding with small bale hay sales. Well-established care farm for disadvantaged adults and children.</p> <p>All land entered into Higher Level Stewardship (HLS) for species rich grassland and ridge-and-furrow grassland; other land in the Entry Level Stewardship (ELS) scheme.</p>	<p>Land required: Medium</p> <p>3.1ha; 13% of holding required for construction.</p> <p>Land required primarily for construction of balancing pond.</p> <p>Severance: Negligible</p> <p>Disruptive effects: Low</p> <p>Potential issues concerning disruption of the access during construction.</p>	<p>Land required: Medium</p> <p>2.9ha; 12% of holding required.</p> <p>Agricultural land required for balancing pond.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>
<p>CA2/2</p> <p>Moreton Farm</p> <p>Owner-occupied</p> <p>107ha arable farm with permanent pasture let to third-parties for grazing.</p> <p>1-2ha of woodland on farm, not managed commercially.</p> <p>All land entered into Entry Level Stewardship (ELS) scheme.</p>	<p>Land required: High</p> <p>21.6ha; 20% of holding required for construction.</p> <p>Agricultural land required for the construction of the Moreton cutting, the access to and for the accommodation overbridge and access ways for the Proposed Scheme.</p> <p>Severance: Low</p> <p>Shared-use private accommodation structure provided.</p> <p>Disruptive effects: Negligible</p>	<p>Land required: Negligible</p> <p>2.8ha; 3% of holding required.</p> <p>Severance: Low</p> <p>Shared-use private accommodation structure provided.</p> <p>Infrastructure: Negligible</p>
<p>CA2/3</p> <p>Woodruff Barn</p> <p>Owner-occupied</p> <p>2ha residential unit with ancillary equestrian use.</p>	<p>Land required: High</p> <p>0.6ha; 30% of holding required for construction.</p> <p>Severance: Negligible</p> <p>Disruptive effects: Negligible</p> <p>Access to the property and land will be maintained at all times.</p>	<p>Land required: Low</p> <p>0.1ha; 5% of holding required.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>

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Holding reference, name and description	Temporary effects	Permanent effects
<p>CA2/4*</p> <p>Land at Moreton Grange</p> <p>Owner-occupied</p> <p>1ha non-commercial equestrian unit.</p>	<p>Land required: High</p> <p>0.9ha, 94% of holding required for construction.</p> <p>Agricultural land required for the construction of the Moreton cutting, and the access to and for the accommodation overbridge.</p> <p>Severance: Low. Shared-use private accommodation structure provided.</p> <p>Disruptive effects: Low. Access during construction of the accommodation overbridge to the property and land will be maintained at all times.</p>	<p>Land required: High</p> <p>0.9ha, 94% of holding required.</p> <p>Agricultural land required for the construction of the Moreton cutting, and the access to and for the accommodation overbridge.</p> <p>Severance: Low</p> <p>Shared-use private accommodation structure provided.</p> <p>Infrastructure: Negligible</p>
<p>CA2/5</p> <p>Bottom End Cottage</p> <p>Owner-occupied</p> <p>2ha residential unit with ancillary equestrian use.</p>	<p>Land required: High</p> <p>2.0ha; 98% of holding required for construction. Agricultural land required for the construction of the Moreton cutting and haul routes.</p> <p>Severance: Negligible</p> <p>Disruptive effects: Negligible</p>	<p>Land required: High</p> <p>1.7ha; 86% of holding required.</p> <p>Agricultural land required for the construction of the Moreton cutting and mitigation planting.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>
<p>CA2/6</p> <p>Moreton House Farm</p> <p>Owner-occupied</p> <p>136ha arable and beef holding with 50-60 suckler cows and all progeny sold finished. Large agricultural contracting business also operated.</p> <p>Woodland – 4.5ha woodland just planted under the Woodland Grant Scheme and actively managed.</p> <p>Part of the farm entered into Higher Level Stewardship (HLS) with the remainder in the Entry Level Stewardship (ELS) scheme. Diversified activity includes renting out fishing lake to a local angling club.</p>	<p>Land required: Low</p> <p>12.4ha; 9% of holding required for construction.</p> <p>Agricultural land required for the construction of the Moreton cutting, and haul routes and stockpiles.</p> <p>Severance: Low</p> <p>Shared-use private accommodation structure provided.</p> <p>Disruptive effects: Medium</p> <p>Access to severed land will be provided but new internal access tracks may be required.</p>	<p>Land required: Low</p> <p>6.9ha; 5% of holding required.</p> <p>Severance: Low</p> <p>Shared-use private accommodation structure provided.</p> <p>Infrastructure: Medium</p> <p>Demolition of wind turbine.</p>
<p>CA2/7</p> <p>Tithebarn Farm</p> <p>Owner-occupied</p> <p>162ha arable and store cattle rearing farm; farmed in conjunction with a 234ha tenanted farm (AHA) some 16km distant.</p> <p>Beef breeding herd kept at tenanted farm, progeny and purchased store cattle taken to Tithebarn Farm for rearing and finishing in sheds. On-farm shoot.</p>	<p>Land required: High</p> <p>48.0ha; 30% of holding required for construction</p> <p>Agricultural land required for the general construction of the Proposed Scheme, accommodation crossings and stockpiles.</p> <p>Severance: Low. Private accommodation structure provided (with footpath and bridleway users).</p> <p>Disruptive effects: High. General issues arising with extent of construction area, requirement for two crossings, demolition of farmstead and re-construction subject to planning permission.</p>	<p>Land required: Medium</p> <p>23.7ha; 15% of holding required.</p> <p>Agricultural land required for the general construction of the Proposed Scheme, accommodation crossings and mitigation planting.</p> <p>Severance: Low</p> <p>Private accommodation structure provided (with footpath and bridleway users).</p> <p>Infrastructure: High</p> <p>Demolition of farmstead.</p>

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Holding reference, name and description	Temporary effects	Permanent effects
<p>CA2/8</p> <p>Far Coley Farm</p> <p>61ha permanent grassland farm grazed by a herd of some 30 suckler cows; Shorthorn beef cattle also reared on contract.</p> <p>Extensive diversified activities, including bed and breakfast and holiday cottages, caravan storage, rent of fishing lake to a local angling club, rent of hobby-use facilities and buildings.</p>	<p>Land required: Negligible</p> <p>0.1ha; &lt;1% of holding required for construction.</p> <p>Severance: Negligible</p> <p>Disruptive effects: Negligible</p>	<p>Land required: Negligible</p> <p>&lt;0.1ha; &lt;1% of holding required.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>
<p>CA2/9</p> <p>Farley Farm</p> <p>Owner-occupied</p> <p>57ha permanent grassland used for grazing Welsh Black cattle (30 cows), sheep (200 ewes) and Welsh Mountain ponies (12 mares plus stallion).</p> <p>Farmhouse rented out, 4ha grassland rented out (including to CA2/12).</p> <p>Diversified activities include DIY and Full livery.</p>	<p>Land required: Medium</p> <p>10.6ha; 19% of holding required for construction.</p> <p>Agricultural land required for the construction of the embankment prior to the Great Haywood viaduct, the Tolldish Lane temporary diversion and a transfer node.</p> <p>Severance: Negligible</p> <p>Disruptive effects: Negligible</p>	<p>Land required: Negligible</p> <p>2.3ha; 4% of holding required.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>
<p>CA2/10</p> <p>Land at Tolldish Lane</p> <p>2ha grassland, let to others.</p>	<p>Land required: High</p> <p>1.1ha; 56% of holding required for construction.</p> <p>Agricultural land required for the construction of the embankment prior to the Great Haywood viaduct and fuel pipeline realignment.</p> <p>Severance: Negligible</p> <p>Disruptive effects: Negligible</p>	<p>Land required: High</p> <p>0.7ha; 33% of holding required.</p> <p>Agricultural land required for the embankment prior to the Great Haywood viaduct and mitigation planting.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>
<p>CA2/11</p> <p>Avondale</p> <p>Owner-occupied</p> <p>3ha grassland used for hay making. Non-commercial breeding of rabbits.</p>	<p>Land required: High</p> <p>3.4ha; 100% of holding required for construction.</p> <p>Agricultural land required for the construction of the embankment prior to the Great Haywood viaduct, the Tolldish Lane temporary diversion and a transfer node.</p> <p>Severance: Negligible</p> <p>Disruptive effects: Negligible</p>	<p>Land required: High</p> <p>2.7ha; 79% of holding required.</p> <p>Agricultural land required for the embankment prior to the Great Haywood viaduct, and the permanent realignment of Tolldish Lane.</p> <p>Severance: Negligible</p> <p>Infrastructure: High</p> <p>Demolition of farmstead required</p>

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Holding reference, name and description	Temporary effects	Permanent effects
<p>CA2/12</p> <p>The Green Barn</p> <p>Owner-occupied</p> <p>15ha grassland managed, of which 2.4ha owned beside the A51 Lichfield Road. Rented land 7.3ha from CA2/9, plus 2.4ha from another.</p> <p>Sheep (50 Lleyrn ewes) and Welsh Cob ponies (11 mares plus stallion and foals).</p> <p>Breeding ponies for 33 years.</p> <p>Son runs a farriery business from the site.</p>	<p>Land required: High</p> <p>10.3ha; 69% of holding required for construction.</p> <p>Agricultural land required for the construction of the embankment prior to the Great Haywood viaduct, the temporary batching plant, stockpiles, transfer node and launch yard for the viaduct.</p> <p>Severance: Negligible</p> <p>Disruptive effects: High</p> <p>Disruption during construction and managing the business with the loss of land and buildings.</p>	<p>Land required: High</p> <p>7.0ha; 47% of holding required</p> <p>Agricultural land required for the embankment prior to the Great Haywood viaduct, and mitigation planting.</p> <p>Severance: Negligible</p> <p>Infrastructure: High</p> <p>Demolition of farmstead (barns)</p>
<p>CA2/13</p> <p>Tixall Lodge Estate</p> <p>Tenanted holding</p> <p>300ha holding farmed by a tenant with dairy and beef cattle, and sheep.</p> <p>Extensive shooting rights owned across some 1,800ha in the area. Full-time gamekeeper employed and syndicated shooting days let during the season.</p>	<p>Land required: Negligible</p> <p>4.7ha; 2% of holding required for construction.</p> <p>Severance: Negligible</p> <p>Disruptive effects: Negligible</p>	<p>Land required: Negligible</p> <p>1.9ha; &lt;1% of holding required.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>
<p>CA2/14*</p> <p>Land west of A51 Lichfield Road, Lichfield</p> <p>2.4ha permanent pasture.</p>	<p>Land required: High</p> <p>2.4ha; 100% of holding required for construction.</p> <p>Agricultural land required for construction compounds and improvements to local road network.</p> <p>Severance: Negligible</p> <p>Disruptive effects: Negligible</p>	<p>Land required: Negligible</p> <p>&lt;0.1ha; &lt;1% of holding required.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>
<p>CA2/15*</p> <p>Land south of Hoo Mill Lane</p> <p>4ha permanent pasture.</p>	<p>Land required: High</p> <p>1.8ha; 44% of holding required for construction.</p> <p>Agricultural land required for improvement to local road network for access.</p> <p>Severance: Negligible</p> <p>Disruptive effects: Negligible</p>	<p>Land required: Medium</p> <p>0.6ha; 16% of holding required.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>

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Holding reference, name and description	Temporary effects	Permanent effects
<p>CA2/16</p> <p>Canalside Farm</p> <p>Owner-occupied</p> <p>10ha holding used for horticulture growing strawberries in Spanish polytunnels and supplying on-site farm shop and café.</p> <p>Owner of Great Haywood Marina – let to commercial operator.</p>	<p>Land required: High</p> <p>2.5ha; 25% of holding required for construction.</p> <p>Agricultural land required underneath Great Haywood viaduct and to accommodation haul route.</p> <p>Severance: Low</p> <p>Land severed to the north of the viaduct but access will be maintained as required.</p> <p>Disruptive effects: Medium</p> <p>General disruption during construction likely to affect customer visits to farm shop and on-site café.</p>	<p>Land required: Negligible</p> <p>0.2ha; 2% of holding required.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>
<p>CA2/17*</p> <p>Land north of River Trent</p> <p>27ha grassland.</p>	<p>Land required: Medium</p> <p>3.7ha; 14% of holding required for construction.</p> <p>Severance: Negligible</p> <p>Disruptive effects: Negligible</p>	<p>Land required: Medium</p> <p>3.7ha; 14% of holding required.</p> <p>Agricultural land required for wetland habitat creation.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>
<p>CA2/18</p> <p>Land north of Mill Lane</p> <p>6ha grassland let to others.</p>	<p>Land required: High</p> <p>1.7ha; 29% of holding required for construction.</p> <p>Agricultural land required for construction of haul route.</p> <p>Severance: Negligible</p> <p>Disruptive effects: Negligible</p>	<p>Land required: High</p> <p>1.6ha; 27% of holding required.</p> <p>Agricultural land required for mitigation planting.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>
<p>CA2/19</p> <p>Hoo Mill Lane Farm</p> <p>Part of a 113ha grassland farming business centred at Whitchurch (50 km distant). Land at Great Haywood (37ha) with a barn used for grazing beef suckler cows and followers.</p>	<p>Land required: Low</p> <p>6.1ha; 5% of holding required for construction.</p> <p>Agricultural land required during construction under and alongside the Great Haywood viaduct and for the high-pressure gas pipeline realignment.</p> <p>Severance: Medium</p> <p>Holding severed during the construction of the Great Haywood viaduct but access underneath should be possible; worst case requires use of public highway during construction.</p> <p>Disruptive effects: Low</p> <p>Potential disruption during construction limiting unfettered access.</p>	<p>Land required: Negligible</p> <p>0.5ha; &lt;1% of holding required.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>

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Holding reference, name and description	Temporary effects	Permanent effects
<p>CA2/20</p> <p>Ingestre Manor Farm</p> <p>Owner-occupied</p> <p>526ha extensive holding with 105ha at Ingestre. Other land rented and owned in the area. Land farmed with arable, sheep (400 ewes) and store cattle (200 finished per annum). New house and buildings erected in recent past.</p> <p>Part of the farm HLS with the remainder in the ELS. Aspiration to develop a DIY and full livery yard with indoor and outdoor schools and a cross-country course.</p>	<p>Land required: Negligible</p> <p>7.1ha; 1% of holding required for construction.</p> <p>Agricultural land required for the construction of the balancing pond and the Great Haywood viaduct satellite compound.</p> <p>Severance: Negligible</p> <p>Disruptive effects: Low</p> <p>Potential disruption during construction limiting unfettered access.</p>	<p>Land required: Negligible</p> <p>3.8ha; &lt;1% of holding required.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>
<p>CA2/21</p> <p>Land at Tixall Lane</p> <p>Owner-occupied</p> <p>3ha non-commercial equestrian unit.</p>	<p>Land required: Low</p> <p>0.3ha; 7% of holding required for construction.</p> <p>Agricultural land required for drainage from railway balancing pond to watercourse.</p> <p>Severance: Low</p> <p>Holding severed during construction of the drainage facility. Access will be maintained as required.</p> <p>Disruptive effects: Negligible</p>	<p>Land required: Negligible</p> <p>&lt;0.1ha; &lt;1% of holding required.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>
<p>CA2/22</p> <p>Land south of Lionlodge</p> <p>3ha non-commercial equestrian unit.</p>	<p>Land required: High</p> <p>3.0ha; 100% of holding required for construction.</p> <p>Agricultural land required for the embankment north of the Great Haywood viaduct and mitigation planting.</p> <p>Severance: Negligible</p> <p>Disruptive effects: Negligible</p>	<p>Land required: High</p> <p>2.7ha; 90% of holding required.</p> <p>Agricultural land required for the embankment north of the Great Haywood viaduct and mitigation planting.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>
<p>CA2/23</p> <p>Tixall Manor Farm</p> <p>Owner-occupied</p> <p>117ha arable and grassland farm managed with beef suckler cattle, selling approximately 100 store or finished cattle per annum. Includes 47ha rented on an AHA tenancy (Swansmoor Farm).</p>	<p>Land required: High</p> <p>23.8ha; 20% of holding required for construction.</p> <p>Agricultural land required for the embankment north of the Great Haywood viaduct, for the realignment of the BPA pipeline, stockpiles and mitigation planting and ponds.</p> <p>Severance: Low</p> <p>Land owned to the north-east of the Proposed Scheme will be accessed via Ingestre underbridge.</p> <p>Disruptive effects: Negligible</p>	<p>Land required: Medium</p> <p>16.2ha; 14% of holding required.</p> <p>Severance: Low</p> <p>Land owned to the north-east of the Proposed Scheme will be accessed via Ingestre underbridge.</p> <p>Infrastructure: Negligible</p>

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Holding reference, name and description	Temporary effects	Permanent effects
<p>CA2/24*</p> <p>Lionlodge Covert</p> <p>25ha woodland with grassland.</p>	<p>Land required: Medium</p> <p>2.9ha; 17% of holding required for construction.</p> <p>Agricultural and woodland required for the embankment north of the Great Haywood viaduct, for the realignment of the BPA pipeline, stockpiles and mitigation planting and ponds.</p> <p>Severance: Negligible</p> <p>Disruptive effects: Negligible</p>	<p>Land required: Medium</p> <p>2.0ha; 12% of holding required.</p> <p>Land required for the embankment north of the Great Haywood viaduct and mitigation planting and ponds.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>
<p>CA2/25</p> <p>Upper Hanyards Farm</p> <p>Owner-occupied</p> <p>360ha holding managed with dairy cattle (350 cows), beef cattle (20 suckler cows), sale of finished stock and sheep (350 ewes). 100ha of arable crops also grown. Managed woodland on 1ha plots planted 20 years ago. Three farms combined within a ring fence – Lower and Upper Hanyards, plus Deer Park Farm.</p> <p>2 wind turbines erected in 2016/17; farm shoot.</p>	<p>Land required: Medium</p> <p>42.5ha; 12% of holding required for construction.</p> <p>Land required for the construction of the Ingestre cutting, stockpiles and mitigation planting and ponds.</p> <p>Severance: Low</p> <p>Private accommodation structure provided (with footpath and bridleway 0.1628 users).</p> <p>Disruptive effects: High</p> <p>General issues arising with extent of construction area, requirement for a farm crossing, demolition of farmstead and re-construction subject to planning permission.</p>	<p>Land required: Low</p> <p>19.3ha; 5% of holding required.</p> <p>Agricultural land required for the Ingestre cutting, mitigation planting and ponds.</p> <p>Severance: Low</p> <p>Private accommodation structure provided (with combined footpath and bridleway use).</p> <p>Infrastructure: High</p> <p>Demolition of farmstead.</p>
<p>CA2/26</p> <p>Park Farm, Stafford</p> <p>Owner-occupied</p> <p>79ha holding (including arable land farmed on a share-farming agreement). Grassland used for silage/haylage in the summer and grazed with sheep in the winter. Dwelling on site plus four houses (barn conversions) rented out. Commercial users renting building/space on farm.</p> <p>Extensive diversified activities including 2x Three-day eventing per annum (March and July), space let for rail engineering firm, bed and breakfast and Certificated Location caravan site. Land rented to Stafford showground for car parking and show jumping.</p>	<p>Land required: Low</p> <p>5.3ha; 7% of holding required for construction.</p> <p>Agricultural land for the construction of the Proposed Scheme, farm access and balancing pond.</p> <p>Severance: Low/Medium</p> <p>Private accommodation structure (albeit with limited headroom) provided.</p> <p>Disruptive effects: High</p> <p>General issues arising with extent of construction area, requirement for a farm crossing, and demolition of residential properties.</p>	<p>Land required: Low</p> <p>4.4ha; 6% of holding required.</p> <p>Agricultural land for the Proposed Scheme, balancing pond and mitigation planting.</p> <p>Severance: Low/Medium</p> <p>Private accommodation structure (albeit with limited headroom) provided.</p> <p>Infrastructure: High</p> <p>Demolition of residential properties.</p>

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Holding reference, name and description	Temporary effects	Permanent effects
<p>CA2/27</p> <p>Brick House Farm</p> <p>Owner-occupied</p> <p>168ha holding (with a further 120ha farmed on a share-farming agreement). 100ha of arable crops plus 630 ewes.</p> <p>Land rented to Stafford showground for car parking.</p>	<p>Land required: High</p> <p>35.3ha; 21% of holding required for construction.</p> <p>Agricultural land required for the realignment of the A518 Weston Road, the construction of a balancing pond, the accommodation access structure, the Hopton South Cutting Satellite Compound, stockpiles and a transfer node.</p> <p>Severance: Low.</p> <p>Private accommodation structure provided.</p> <p>Disruptive effects: Negligible</p>	<p>Land required: Low</p> <p>14.1ha; 8% of holding required.</p> <p>Agricultural land required for the construction of the Proposed Scheme including a balancing pond, internal farm accommodation access structure and mitigation planting.</p> <p>Severance: Low.</p> <p>Private accommodation structure provided.</p> <p>Infrastructure: Negligible</p>
<p>CA2/28</p> <p>Land south of Hopton</p> <p>80ha owned by two separate owners and rented by a dairy farmer to the east of the scheme on short-term tenancy, or rolling annual agreements for grazing/mowing. (The dairy farm is otherwise unaffected).</p>	<p>Land required: Medium</p> <p>9.2ha; 12% of holding required for construction.</p> <p>Agricultural land required for construction and mitigation planting.</p> <p>Severance: Medium.</p> <p>Rented land severed with no means of internal access provided – recourse to public highway.</p> <p>Disruptive effects: Low</p> <p>Potential for disruption to intra-farm travel during construction phase.</p>	<p>Land required: Medium</p> <p>8.5ha; 11% of holding required.</p> <p>Agricultural land required for construction and mitigation planting.</p> <p>Severance: Medium.</p> <p>Rented land severed with no means of internal access provided – recourse to public highway.</p> <p>Infrastructure: Negligible</p>
<p>CA2/29*</p> <p>Lower Bridge Farm</p> <p>13ha equestrian unit.</p>	<p>Land required: High</p> <p>7.2ha; 55% of holding required for construction.</p> <p>Agricultural land required for the Proposed Scheme, a balancing pond and mitigation planting.</p> <p>Severance: Negligible</p> <p>Disruptive effects: High</p> <p>General issues arising with extent of construction area and demolition of farmstead.</p>	<p>Land required: High</p> <p>6.8ha; 52% of holding required.</p> <p>Agricultural land required for the Proposed Scheme, a balancing pond and mitigation planting.</p> <p>Severance: Negligible</p> <p>Infrastructure: High</p> <p>Demolition of farmstead.</p>
<p>CA2/30*</p> <p>Wadden Farm</p> <p>24ha grassland.</p>	<p>Land required: Low</p> <p>2.1ha; 9% of holding required for construction.</p> <p>Agricultural land required for the Proposed Scheme and the realignment of the B5066 Sandon Road.</p> <p>Severance: Negligible</p> <p>Disruptive effects: Negligible</p>	<p>Land required: Negligible</p> <p>1.0ha; 4% of holding required.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>

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Holding reference, name and description	Temporary effects	Permanent effects
<p>CA2/31</p> <p>Oaklands</p> <p>Owner-occupied and tenanted</p> <p>18ha managed in total. 3.5ha used as a 20-kennel boarding kennels with exercise/run-out areas. Rented land managed with 125 ewes.</p> <p>Diversified activities include agricultural contracting and trailer repair business.</p>	<p>Land required: Negligible</p> <p>0.1ha; 1% of holding required for construction.</p> <p>Severance: Negligible</p> <p>Disruptive effects: Negligible</p>	<p>Land required: Negligible</p> <p>&lt;0.1ha; &lt;1% of holding required.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>
<p>CA2/32</p> <p>New Buildings Farm</p> <p>Owner-occupied (or rented from family)</p> <p>228ha dairy farm – all grass, on a New Zealand farming system (extensive grazing). 450 Friesian x Jersey cows with heifers bred on site. Beef cattle sold.</p> <p>Land is in a Nitrate Vulnerable Zone which has implications for spreading slurry on land (currently apply for a derogation annually).</p> <p>Extensive dairy buildings at New Buildings Farm and also at rented Hopton Farm.</p>	<p>Land required: Medium</p> <p>42.2ha; 19% of holding required for construction.</p> <p>Agricultural land required for the realignment of the B5066 Sandon Road, the construction of the farm accommodation access structure, the Hopton North Cutting Satellite Compound, and soil storage.</p> <p>Severance: Low</p> <p>Private accommodation structure provided (with footpath and bridleway users).</p> <p>Disruptive effects: Medium</p> <p>Impacts during construction relate to limiting cows access to grazing land.</p>	<p>Land required: Low</p> <p>20.8ha; 9% of holding required.</p> <p>Agricultural land required for the realignment of the B5066 Sandon Road, the construction of the farm accommodation access structure and mitigation planting.</p> <p>Severance: Low</p> <p>Private accommodation structure provided (with footpath and bridleway users).</p> <p>Infrastructure: Medium</p> <p>Impact post construction relate to remove of internal farm access tracks and the need to re-instate access for dairy cows to paddocks.</p>
<p>CA2/33</p> <p>Kent's Barn Farm</p> <p>Owner-occupied</p> <p>32ha grassland holding managed with beef (10 suckler cows and followers) and sheep (400 ewes).</p> <p>Diversified activities include agricultural contracting.</p>	<p>Land required: Low</p> <p>2.6ha; 8% of holding required for construction.</p> <p>Agricultural land required for Hopton Bridleway 12 Diversion and internal farm access ways.</p> <p>Severance: Negligible</p> <p>Disruptive effects: Negligible</p>	<p>Land required: Low</p> <p>1.5ha; 5% of holding required.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>
<p>CA2/34</p> <p>Marston Farm</p> <p>Owner-occupied</p> <p>43ha all arable holding. All land entered into ELS. New farm buildings erected in 2010 after planning permission granted to convert traditional buildings to residential.</p> <p>Diversified activities include agricultural contracting; one residential unit let out.</p>	<p>Land required: Medium</p> <p>7.9ha; 18% of holding required for construction.</p> <p>Agricultural land required for the Marston South Embankment Satellite Compound, the Marston Lane realignment and a balancing pond.</p> <p>Severance: Medium</p> <p>Rented land severed to the north of the Proposed Scheme. Access available via the public highway or the shared Marston Bridleway 8 accommodation underbridge.</p> <p>Disruptive effects: Medium.</p> <p>Issues arising in maintaining access to land severed to the north of the Proposed Scheme during construction.</p>	<p>Land required: Low</p> <p>4.4ha; 10% of holding required.</p> <p>Agricultural land required for the Proposed Scheme, the Marston Lane realignment, a balancing pond and mitigation planting.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>

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Holding reference, name and description	Temporary effects	Permanent effects
<p>CA2/35</p> <p>Sunnyhill Farm</p> <p>Owner-occupied</p> <p>39ha all arable holding; all land entered into ELS.</p>	<p>Land required: High</p> <p>12.4ha; 32% of holding required for construction.</p> <p>Agricultural land required for the Proposed Scheme, balancing ponds, realignment of Marston Lane, stockpiles and an access and footpath realignment to the north.</p> <p>Severance: Medium</p> <p>Access to land severed available via realigned public highway (Marston Lane).</p> <p>Disruptive effects: Medium</p> <p>Issues surrounding managing the residual farmland with the loss of all farm buildings and construction traffic.</p>	<p>Land required: Medium</p> <p>7.4ha; 19% of holding required.</p> <p>Agricultural land required for the Proposed Scheme, balancing ponds, realignment of Marston Lane, and an access and footpath realignment to the north.</p> <p>Severance: Medium</p> <p>Access to land severed available via realigned public highway (Marston Lane).</p> <p>Infrastructure: High</p> <p>Demolition of agricultural buildings.</p>
<p>CA2/36</p> <p>The Barn, Marston</p> <p>Owner-occupied</p> <p>2.5ha residential with equestrian. Field used for horse grazing and cart-racing practice.</p>	<p>Land required: High</p> <p>2.1ha; 83% of holding required for construction.</p> <p>Agricultural land required for the Proposed Scheme and mitigation ponds and planting.</p> <p>Severance: Medium.</p> <p>Land severed accessible via public highway and access track for the Proposed Scheme.</p> <p>Disruptive effects: Negligible</p>	<p>Land required: High</p> <p>2.1ha; 83% of holding required.</p> <p>Agricultural land required for the Proposed Scheme and mitigation ponds and planting.</p> <p>Severance: Medium</p> <p>Land severed to the north of the trace only available via public highway and access track for the Proposed Scheme.</p> <p>Infrastructure: Negligible</p>
<p>CA2/37</p> <p>Park Farm, Marston</p> <p>Staffordshire County Council (SCC) tenanted farm</p> <p>118ha dairy unit. 50ha rented from SCC at Park Farm augmented with other rented land in the locality. 150 dairy cows with all replacements home-reared; plus 50 suckler cows. Male (dairy) calves sold.</p> <p>Occasional contracting undertaken.</p>	<p>Land required: High</p> <p>12.3ha (11%) plus 31ha severed and not accessible for dairy cows required for construction.</p> <p>Agricultural land required to build the Proposed Scheme with a balancing pond, haul routes, and stockpiles.</p> <p>Severance: High</p> <p>Land severed to the north of the Proposed Scheme can be accessed via the public highway and an access track for the Proposed Scheme – but is not feasible with dairy cows.</p> <p>Disruptive effects: High</p> <p>Loss of available grazing land will require the cessation of dairy farming at this holding and a change of management practice.</p>	<p>Land required: High</p> <p>7.2ha (6%) plus 31ha severed and not accessible for dairy cows required.</p> <p>Agricultural land required to build the Proposed Scheme with a balancing pond, mitigation planting and a false cutting to the south-west.</p> <p>Severance: High</p> <p>Land severed to the north of the Proposed Scheme can be accessed via the public highway and an access track for the Proposed Scheme – but is not feasible with dairy cows.</p> <p>Infrastructure: High</p> <p>Demolition of farm buildings.</p>

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Holding reference, name and description	Temporary effects	Permanent effects
<p>CA2/38 Yarlet Hall Farm SCC tenanted farm 47ha dairy farm augmented with approximately 70ha rented on an annual basis. Managed with dairy cows (140 cows) and beef cattle (30 store cattle reared from dairy calves).</p>	<p>Land required: High 14.8ha; 32% of holding required for construction. Agricultural land required for the Yarlet South Cutting Satellite Compound (South), and stockpiles. Severance: Medium. Land severed to the south of the Proposed Scheme accessed via the public highway (A34 and Yarlet Lane). Disruptive effects: Low. Issues arising in maintaining access to land severed to the south of the Proposed Scheme during construction, including making use of the A34.</p>	<p>Land required: High 10.4ha; 22% of holding required. Agricultural land required for the Yarlet South cutting and mitigation ponds and planting. Severance: Low Land severed to the south of the Proposed Scheme accessed via the public highway (A34 and Marston Lane). Infrastructure: Low Loss of internal farm access.</p>
<p>CA2/39 Grove Farm 2ha grassland let to others Metalwork fabrication in farm buildings.</p>	<p>Land required: High 0.7ha; 35% of holding required for construction. Agricultural land required for the Yarlet Cutting. Severance: Negligible Disruptive effects: Negligible</p>	<p>Land required: Medium 0.4ha; 19% of holding required. Agricultural land required for the Yarlet Cutting. Severance: Negligible Infrastructure: Negligible</p>
<p>CA2/40 Holding No.33 SCC tenanted farm 79ha holding comprising 42ha rented from SCC augmented with 4ha rented adjacent and 32ha rented near Crewe. Land managed with dairy cattle (50 cows); all heifers reared and sold as dairy replacements and sheep (80 ewes).</p>	<p>Land required: Medium 7.7ha; 10% of holding required for construction. Agricultural land required for the realignment of the A34 and a construction transfer node. Severance: Negligible Disruptive effects: Negligible</p>	<p>Land required: Negligible 0.7ha; 1% of holding required. Agricultural land required for the realignment of the A34. Severance: Negligible Infrastructure: Negligible</p>
<p>CA2/41 Hilltop Farm SCC tenanted farm 5ha grassland let to others. 0.5ha planted under Woodland Grant Scheme.</p>	<p>Land required: Negligible 0.4ha; 8% of holding required for construction. Agricultural land required for the realignment of the A34. Severance: Negligible Disruptive effects: Medium. Disruption during construction of A34 realignment, effectively in an island between the old and new roads.</p>	<p>Land required: Negligible &lt;0.1ha; &lt;1% of holding required. Severance: Negligible Infrastructure: Negligible</p>
<p>CA2/42 Yarlet Bank Farm 3ha grassland</p>	<p>Land required: Medium 0.5ha; 17% of holding required for construction. Severance: Negligible Disruptive effects: Negligible</p>	<p>Land required: Medium 0.3ha; 10% of holding required. Severance: Negligible Infrastructure: Negligible</p>

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Holding reference, name and description	Temporary effects	Permanent effects
<p>CA2/43</p> <p>Long Enson Farm</p> <p>SCC tenanted farm</p> <p>48ha holding comprising 36ha rented from SCC east of the A34 (unaffected) augmented with 12ha rented to the west of the A34 (affected).</p> <p>Land managed with dairy cattle (70 cows) with all surplus calves reared and sold as strong stores (2 years).</p>	<p>Land required: High</p> <p>9.6ha; 20% of holding required for construction.</p> <p>Agricultural land required for construction, stockpiles and mitigation ponds and planting.</p> <p>Severance: Medium</p> <p>Off-lying block of land severed, access available via A34.</p> <p>Disruptive effects: Negligible</p>	<p>Land required: Medium</p> <p>8.7ha; 18% of holding required.</p> <p>Agricultural land required for the Proposed Scheme and mitigation ponds and planting.</p> <p>Severance: Medium</p> <p>Off-lying block of land severed, access available via A34.</p> <p>Infrastructure: Negligible</p>
<p>CA2/44</p> <p>Greenwood Farm</p> <p>SCC tenanted farm</p> <p>89ha SCC tenanted farm augmented with 73ha owned at Cheddleton (28 km to the north).</p> <p>SCC farm is the centre of the dairy operation with 300 dairy cows. Replacement home-reared at owned farm; a few (6) beef cattle reared.</p>	<p>Land required: Negligible</p> <p>4.4ha; 3% of holding required for construction.</p> <p>Agricultural land required for construction, stockpiles and mitigation ponds and planting.</p> <p>Severance: Negligible</p> <p>Disruptive effects: Negligible</p>	<p>Land required: Negligible</p> <p>3.9ha; 2% of holding required.</p> <p>Severance: Negligible</p> <p>Infrastructure: Negligible</p>

\* No Farm Impact Assessment interview conducted; data estimated.

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