Document 6.2

The West Midlands Rail Freight Interchange Order 201X

ES - Vol 1 - Chapter 6: Agriculture and Soils

Regulation 5(2)(a)

Askew Land & Soil - July 2018

West Midlands Interchange

Four Ashes Ltd

6 Agriculture and Soils

Introduction

6.1 This chapter of the ES assesses the likely significant environmental effects of the Proposed Development in respect of agricultural land quality, soil resources and local farming circumstances. In particular, this chapter describes the relevant legislation and policy context with regard to agriculture and soil; the methods used for assessment and details of the criteria used to determine significance; the baseline agricultural land and soil conditions at and surrounding the Site; the potential impacts and effects as a result of the Proposed Development; any mitigation or control measures required to reduce or eliminate adverse effects; and the subsequent residual effects and likely significant effects associated with the Proposed Development.

6.2 As described in more detail in Chapter 10: Ecology and Nature Conservation, an approximate 12 ha parcel of agricultural land to the east of Standeford (British National Grid (BNG) reference SJ917073) is proposed as off-site (within 1 km) mitigation land to off-set potential significant effects of the Proposed Development on farmland birds during the construction phase (15-year duration). The off-site mitigation measures are to be secured via a Section 106 agreement. The likely significant effects of this farmland bird mitigation scheme on agricultural land quality, soils and agricultural holdings is assessed separately from the main Site in this chapter.

6.3 This chapter is accompanied by Technical Appendix 6.1: Agricultural Land Classification (ALC), presented within ES Volume 2.

6.4 This chapter is written by Askew Land & Soil Ltd.

Legislation and Policy Context

European Union Thematic Strategy on Soil, 2006

6.5 In September 2006, the European Commission (EC) adopted a comprehensive '*Thematic Strategy*' specifically dedicated to soil protection. The Strategy includes a proposal for a Soil Framework Directive:

- European Commission (EC) *'Proposal for a Directive of the European Parliament and of the Council Establishing a Framework for the Protection of Soil and Amending Directive 2004/35/EC'.*

6.6 The aim of the Soil Framework Directive is to promote the sustainable use of soil and protect soil as a natural resource. This is to be achieved by controlling eight major threats, namely: erosion, organic matter decline, contamination, salinisation, compaction, soil biodiversity loss, sealing (i.e. built development covering soil) landslides and flooding.

6.7 The United Kingdom Government's Department for Environment, Food and Rural Affairs (DEFRA) reports that Environment Ministers have, as yet, been unable to reach political agreement on proposals for a European Union Soil Framework Directive, although the EU published a policy report on the implementation of the Strategy on 13th February 2012; therefore, the process is on-going. If and when agreed by EU members, it will be for each member state to devise and implement new national policy on soil protection.

6.8 The extent to which the above context will change as a result of the decision to exit from the EU is not yet known.

National Legislation and Policy

Relevant Legislation

6.9 The applicable legislative framework considered in this description of agriculture and soils is given in Table 6.1.

Table 6.1: Legislative Framework – Agriculture

Topic	Act / Regulation	Relevant Action
Agricultural Weeds	Weeds Act, 1959	Actions required to remove or control the spread of 'injurious weeds', primarily on agricultural land. Five weeds are classified under the Weeds Act 1959: common ragwort (*Senecio jacobaea*), spear thistle (*Cirsium vulgare*), creeping or field thistle (*Cirsium arvense*), broad-leaved dock (*Rumex obtusifolius*) and curled dock (*Rumex Crispus*). See Natural England 'Injurious weeds and invasive plants' online[1].
Agricultural Weeds	Ragwort Control Act, 2003 (amends Weed Act, 1959)	Action required to protect horses and other livestock from ragwort poisoning (c.f. The Code of Practice on how to prevent the spread of Ragwort, Defra 2004, amended 2007). See Code of Practice on How to Prevent the Spread of Ragwort (2003)[2].
Invasive Weeds	Wildlife and Countryside Act, 1981	It is a criminal offense to plant or cause the spread of Japanese Knotweed and/or Giant Hogweed in the wild (re Section 14(2) of the Act).
Plant Health	The Plant Health (Great Britain) Order, 1993 (as amended) Implements EC Directive 200/29/EC)	Prohibits the importation or certain plant pests, makes provision against the spread of pests, prohibits the keeping, sale, planting, movement or other disposal of certain plants, and requires the notification of certain plant pests.

[1] Natural England. Injurious weeds and invasive plants. Available online @ http://www.naturalengland.org.uk/ourwork/regulation/wildlife/enforcement/injuriousweeds.aspx

[2] Department for Environment, Food and Rural Affairs (2003). Code of Practice on How to Prevent the Spread of Ragwort. Available online @ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69264/pb9840-cop-ragwort.pdf

Table 6.1: Legislative Framework – Agriculture		
Topic	**Act/Regulation**	**Relevant Action**
Organic Farming	The Organic Farming (Aid) Regulations, 1994	Sets out the subsidy and conditions of entry for Organic Farming Scheme.
Organic Farming	The Organic Farming (England Rural Development Programme) Regulations, 2001	Sets out amendments to the Organic Farming Scheme of 1994.
Notifiable Disease Control	The Disease Control (Interim Measures) (England (No.2) Order, 2002	Sets out regulations for the movement of animals/livestock. See DEFRA Animal Diseases 'Notifiable Diseases' online[3].

National Policy Statement for National Networks, 2015

6.10 Of particular relevance to Agriculture and Soils, the National Policy Statement for National Networks (NPS) contains paragraphs 5.168, 5.176 and 5.179 as follows:

- Paragraph 5.168: "*Applicants should take into account the economic and other benefits of the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification). Where significant development of agricultural land is demonstrated to be necessary, applicants should seek to use areas of poorer quality land in preference to that of a higher quality. Applicants should also identify any effects, and seek to minimise impacts, on soil quality, taking into account any mitigation measures proposed. Where possible, developments should be on previously developed (brownfield) sites provided that it is not of high environmental value. For developments on previously developed land, applicants should ensure that they have considered the risk posed by land contamination and how it is proposed to address this (re Model Procedures for Management of Land Contamination (CLR11)*";
- Paragraph 5.176: "*The decision-maker should take into account the economic and other benefits of the best and most versatile agricultural land. The decision maker should give little weight to the loss of agricultural land in grades 3b, 4 and 5, except in areas (such as uplands) where particular agricultural practices may themselves contribute to the quality and character of the environment or the local economy*"; and
- Paragraph 5.179: "*Applicants can minimise the direct effects of a project on the existing use of the proposed site, or proposed uses near the site by the application of good design principles, including the layout of the project and the protection of soils during construction (re Defra, Construction Code of Practice for the Sustainable Use of Soils on Construction Sites, September 2009)*".

National Planning Policy Framework, 2012

6.11 Within section 11 of the National Planning Policy Framework (NPPF) (March 2012), which addresses policy guidance on '*Conserving and Enhancing the Natural Environment*', paragraphs 109 and 112 are of relevance to the assessment of soil and agricultural land quality. Specifically:

- Paragraph 109: "…The planning system should contribute to and enhance the natural and local environment by: …protecting and enhancing valued landscapes, geological conservation interests and soils…"; and
- Paragraph 112: "…Local planning authorities should take into account the economic and other benefits of the best and most versatile agricultural land[4]. Where significant development of agricultural land is demonstrated to be necessary, local planning authorities should seek to use areas of poorer quality land in preference to that of a higher quality…".

National Planning Practice Guidance, 2014

6.12 The following paragraphs set out in the Landscape section of the National Planning Practice Guidance (NPPG), 2014, are relevant to Agriculture and Soil, as follows:

- Paragraph 025: **"***The National Planning Policy Framework states that the planning system should protect and enhance valued soils and prevent the adverse effects of unacceptable levels of pollution. This is because soil is an essential finite resource that provides important 'ecosystem services', for example as a growing medium for food, timber and other crops, as a store for carbon and water, as a reservoir of biodiversity and as a buffer against pollution. As part of the Government's 'Safeguarding our Soils' strategy, Defra has published a code of practice on the sustainable use of soils on construction sites, which may be helpful in development design and setting planning conditions*" (see below); and
- Paragraph 026: *The National Planning Policy Framework expects local planning authorities to take into account the economic and other benefits of the best and most versatile agricultural land*" (see NPPF above).

National Code of Practice for the Sustainable Management of Soil on Construction Sites, 2009

6.13 As referenced in paragraph 5.179 of the NPS DEFRA has published 'Safeguarding our Soils – A Strategy for England' (24th September 2009). The Soil Strategy was published in tandem with a 'Construction Code of Practice for the Sustainable Use of Soils on Construction Sites'[5].

6.14 The Soil Strategy for England, which builds on DEFRA's 'Soil Action Plan for England' (2004-2006), sets out an ambitious vision to protect and improve soil to meet an increased global demand for food and to help combat the adverse effects of climate change.

Regional Policy

6.15 There are no relevant, adopted regional policies that direct the assessment of soils and agriculture away from the approach outlined in the national and local policies set out here.

Local Policy

South Staffordshire Core Strategy DPD, 2012

[3] Department for Environment, Food and Rural Affairs (2014). Notifiable Diseases. Available online @ http://www.defra.gov.uk/animal-diseases/notifiable/

[4] Agricultural land graded as Grade 1, Grade 2 and Subgrade 3a under the Agricultural Land Classification (ALC) system.

[5] Department for Environment, Food and Rural Affairs (2009). Construction Code of Practice for the Sustainable Management of Soil on Construction Sites. Available online @ https://www.gov.uk/government/publications/code-of-practice-for-the-sustainable-use-of-soils-on-construction-sites Last viewed December 2016.

6.16 The adopted South Staffordshire Core Strategy (SSCS) (2012) includes Core Policy 2: Protecting and Enhancing the Natural and Historic Environment. The natural and heritage assets in South Staffordshire includes '…the best and most versatile agricultural land'.

6.17 The adopted SSCS also includes Policy EV8 'Agriculture', which states that '…the Council will support proposals for agriculture and related development which is consistent with national policy for the protection of agricultural land and other local planning policies…'

Assessment Methodology

Method of Assessment

6.18 The collection of baseline information in this assessment of agriculture and soil resources was undertaken as follows (see Agricultural Land Classification (ALC) report given as Technical Appendix 6.1 for details):

- Desktop study of published information;
- Consultation with statutory organisations, relevant non-governmental organisations (NGOs);
- Field investigation: A detailed ALC / soil survey of the Site has been carried out in three parts over 2016 and 2017 as follows: (i) 24th and 25th August 2016, (ii) the 8th and 9th September 2016, and (iii) 24th and 25 April 2017. The detailed survey involved examination of the soil's physical properties at 182 locations, as shown on Figure 6.1 (see Figure 1 in Technical Appendix 6.1 also). The 182 auger borings are located on previously un-surveyed parts of the Site at a density of approximately one auger boring per hectare. The remainder of the study area is either non-agricultural land (i.e. railway, mineral extraction land, buildings, hard-standing, roads, farm tracks, woodland, canal and water bodies), or has been the subject of a previous, detailed ALC survey carried out by the former MAFF in connection with a mineral quarry in the south-east of the Site (see Technical Appendix 6.1 for details); and
- Desktop assessment of ALC, soils and agricultural holdings for an off-site farmland bird mitigation area (approximately 12 ha) to the east of Standeford (BGR SJ917073); see Chapter 10: Ecology and Nature Conservation for further details.

Desktop Study

6.19 Information regarding soil resources and the quality of agricultural land within the Site has been gathered during a desktop study of the following published information:

- Soil Survey of England and Wales (1984). Soil Map of Midland and Western England (Sheet 3, 1:250,00);
- Soil Survey of England and Wales (1984). '*Soils and their Use in Midland and Western England*', Bulletin No.12, Harpenden;
- Ministry of Agriculture, Fisheries and Food (1983). Agricultural Land Classification of the Midlands Region (1:250,000); and
- Ministry of Agriculture, Fisheries and Food (1994). Post 1988 Agricultural Land Classification of agricultural land at Four Ashes (Site 64), Staffordshire Aggregates Local Plan. Wolverhampton Job No. 079/94 (see copy given in Technical Appendix 6.1).

Consultation

6.20 Natural England (NE) maintains the national ALC database and provides ALC information on the Multi-Agency Geographic Information System for the Countryside (MAGIC)[6]. Relevant ALC information held on MAGIC was collated as part of EIA Scoping. As described above, NE provided an ALC report and map covering the mineral site in the east of the Site (i.e. Ministry of Agriculture, Fisheries and Food (1994). Post 1988 Agricultural Land Classification of agricultural land at Four Ashes (Site 64), Staffordshire Aggregates Local Plan. Wolverhampton Job No. 079/94), a copy of which is given in Technical Appendix 6.1.

6.21 In order to determine what environmental topics should be considered in the ES and how they should be assessed, a Scoping Report was prepared and submitted for a Scoping Opinion.

6.22 A Scoping Direction was received by the Secretary of State (SoS) in 2016 and the relevant issues for this chapter are identified in Table 6.2.

Table 6.2: Issues identified during EIA Scoping

Reference (i.e. para number or letter reference)	Significant Issue which needs consideration	Where this is covered in the ES
Para 3.32 Scoping Direction, and 'Soils and land quality' issues 1 and 2 (NE Letter dated 14th October 2016)	Set out detailed methodology for Agricultural Land Classification (ALC) survey.	Chapter 6. This is detailed in the Technical Appendix 6.1 (ALC report).
Para 3.32 Scoping Direction	Applicant should not rule out face-to-face contact with the stakeholders where possible and where appropriate.	Chapter 6. Information on agricultural holdings was provided by land agents on behalf of the land owner. Observations on farming at the site were made during visits to the Site.
Para 3.33 Scoping Direction	The Applicant should demonstrate how the results of the ALC survey have informed the layout of the Proposed Development, with an emphasis on retaining the BMV agricultural land.	The Parameters Plans have retained as much best and most versatile (BMV) agricultural land in 'soft use' (i.e. Primary Green Infrastructure) as practically possible.
Para 3.33 Scoping Direction	The specific area of agricultural land grade should be tabulated and compared with local / regional availability of each ALC grade.	Chapter 6. This is detailed in the ES Volume 2: Technical Appendix 6.1 (ALC report).
Para 3.33 Scoping Direction	Consultation with Natural England where loss of agricultural land exceeds 20 ha (re NE TIN 049).	Chapter 6. Natural England was consulted on ALC and soil issues as part of Scoping. See NE Scoping Response dated 1st October 2016.
Para 3.34 Scoping Direction and 'Soils and land quality' issue 3 (NE Letter dated 14th October 2016)	SoS welcomes use of DEFRA Construction Code of Practice for the Sustainable Use of Soil on Constructions Sites (2009). ES should provide details of how adverse effects on soil can be minimised and the Applicant	Chapter 6. This assessment of soil resources has identified DEFRA Construction Code of Practice for the Sustainable Use of Soil on Constructions Sites (2009) as

[6] Multi-Agency Geographic Information System for the Countryside (MAGIC). Available online @ www.magic.gov.uk

Table 6.2: Issues identified during EIA Scoping		
Reference (i.e. para number or letter reference)	**Significant Issue which needs consideration**	**Where this is covered in the ES**
	should submit a draft Soil Management Plan as part of the planning application.	mitigation. Given that specific development layouts are unknown a Soil Resource Plan (SRP) will be produced prior to construction in accordance with the principles described in Section 6.0 of the ODCEMP. This approach is considered to be consistent with DEFRA's Construction Code of Practice for the Sustainable Use of Soil on Constructions Sites (2009).

Significance Criteria

6.23 As described IEMA's EIA Guidelines (2004)[7], "…the assessment of significance is based on the characteristics (or magnitude) of the impact and the sensitivity of the receptor…"

6.24 The predicted effect may be beneficial (positive) or adverse (negative) on soil, agricultural land quality and agricultural holdings the significance of which can be assessed as either 'Major', 'Major/Moderate', 'Moderate', 'Minor' or 'Negligible' according to the magnitude of the effect and sensitivity of the receptor, as set out in the Impact Assessment Matrix (IAM) given as Table 6.3.

Table 6.3: Impact Assessment Matrix - Agriculture and Soil				
Magnitude of Effect	**Sensitivity of Receptor**			
	High	**Medium**	**Low**	**Negligible**
High	Major	Major/ Moderate	Moderate	Minor
Medium	Major/ Moderate	Moderate	Minor	Negligible
Low	Moderate	Minor – not significant	Negligible	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

6.25 The magnitude of impact on agricultural land and soil receptors is described as 'high', 'medium', 'low' or 'negligible' are shown in Table 6.4.

Table 6.4: Impact Magnitude for Agricultural Land and Soils	
Impact Magnitude	**Definition**
High	**Agricultural Land quality: 20 ha or more** of BMV agricultural land (*i.e.* agricultural land classified as Grades 1, 2 and 3a under the MAFF ALC system is affected by the Proposed Development, and/or change is likely to cause a direct adverse or permanent or long term (more than 10 years) impact on the integrity/value of the receptor (see **Note 1**)). **Soil Resources: 50,000 m^3 of soil or more.** Based on soil resources within 20.0 ha (200,000 m^2) of land area or more, affected by the development with an average 0.25m (25 cm) layer of soil (topsoil or subsoil) (see **Note 1**).
Medium	**Agricultural Land Quality: Between 10.0 ha to 19.9 ha** of BMV agricultural land (*i.e.* MAFF ALC grades 1, 2 and 3a), **and/or 50.0 ha** or more of lower quality agricultural land (*i.e.* agricultural land classified as ALC grade 3b, 4 and 5 under the MAFF ALC system) is affected by the Proposed Development. The latter specifically relates to the effect of the loss of land in grades 3b, 4 and 5 to national agricultural land resource, and does not take account of landscape character, or ecological qualities that low quality agricultural land may have, and/or that change is likely to impact adversely the integrity/value of the receptor but recovery is predicted in the medium term (>5 to 10 years) and there is predicted to be no permanent impact on its integrity. **Soil Resources: 25,000 m^3 to 49,999 m^3 of soil.** Based on soil resources within 10.0 ha to 19.9 ha (100,000 m^2 to 199,999 m^2) of land area, with an average 0.25m (25 cm) layer of soil (topsoil or subsoil).
Low	**Agricultural Land Quality: Between 5.0 ha to 9.9 ha** of BMV agricultural land (*i.e.* MAFF ALC grades 1, 2 and 3a), **and/or 10.0 ha to 49.9 ha** of lower quality agricultural land (*i.e.* MAFF ALC grades 3b, 4 and 5) is affected by the Proposed Development. The latter specifically relates to the effect of the loss of land in grades 3b, 4 and 5 to national agricultural land resource, and does not take account of landscape character, or ecological qualities that low quality agricultural land may have, and/or that change is likely to adversely impact the integrity/value of the receptor but recovery is expected in the short term (0 to ≤5 years = 'aftercare period'). See **Note 2**. **Soil Resources: 12,500 m^3 to 24,999 m^3 of soil.** Based on soil resources within 5.0 ha to 9.9 ha (50,000 m^2 to 99,999 m^2) of land area affected by the Proposed Development, with an average 0.25m (25 cm) layer of soil (topsoil or subsoil) (see **Note 2**).

[7] Institute of Environmental Management and Assessment (IEMA') (2004) 'Guidelines for Environmental Impact Assessment'

Table 6.4: Impact Magnitude for Agricultural Land and Soils	
Impact Magnitude	**Definition**
Negligible	**Agricultural Land Quality: 4.9 ha or Less** of best and most versatile agricultural land (*i.e.* MAFF ALC grades 1, 2 and 3a), **or less than 10.0 ha** of lower quality agricultural land (*i.e.* MAFF ALC grades 3b, 4 and 5), or non-agricultural/other land, is affected by the Proposed Development. The effect of the loss of land in grades 3b, 4 and 5 is in terms of the national agricultural land resource, and does not take account of landscape character, or ecological qualities that low quality agricultural land may have. Soil Resources: **12,499 m^3 or less.** Based on soil resources within 4.9 ha or less (49,999 m^2 or less) of land area affected by the Proposed Development, with an average 0.25m (25 cm) layer of soil (topsoil or subsoil).
Note 1	
A 20 ha threshold follows the approach of the Town and Country Planning (Development Management Procedure) (England) Order 2010 (as amended).As described in Natural England TIN049 (Second Edition, December 2012), for planning applications, specific consultations are required under Development Management Procedure Order where non-agricultural development proposals that are not consistent with an adopted local plan and involve the loss of twenty hectares or more of the BMV. *The '20 ha threshold' represents a measure of significance for the loss of such land which has been tried and tested in land use planning, and at public inquiries, over the last four decades, or more.*	
Note 2	
A threshold of 5.0 ha follows the applicable thresholds and criteria of the EIA Regulations 2011, Schedule 2 (10): *10. Infrastructure Projects:* *(a) Industrial estate, where area of development exceeds 5ha, or site area exceeds 20ha* *Urban development projects where (i) development includes more than 1 ha of urban development which is not dwelling house, (ii) more than 150 dwellings, (iii) overall development exceeds 5 ha.*	

6.26 The magnitude of impact on agricultural holdings is described as 'high', 'medium', 'low' or 'negligible' are shown in Table 6.5.

Table 6.5: Impact Magnitude Criteria for Agricultural Holdings				
Impact magnitude	**Definitions**			
	Land-take	**Severance**	**Infrastructure**	**Nuisance** (e.g. noise/dust)
High	>20% of all land farmed	No access available to severed land	Direct loss of farm dwelling, building or structure	Nuisance discontinues land use or enterprise
Medium	10% - 20% of all land farmed	Access available to severed land via the public highway	Loss of or damage to infrastructure affecting land use	Nuisance necessitates change to scale or nature of land use or enterprise
Low	5% - 10% of all land farmed	Access available to severed land via private way	Infrastructure loss/damage does not affect land use	Nuisance does not affect land use or enterprise
Negligible	<5% of all land farmed	No new severance	No impact on farm infrastructure	No nuisance on land use or enterprise

6.27 The sensitivity of the receptors (i.e. agricultural holding, agricultural land quality and soil type) is described as 'high', 'medium', 'low' or 'negligible' as shown in Table 6.6.

Table 6.6: Receptor Sensitivity	
Value	**Receptors**
High	ALC Grade 1, 2 and /or Subgrade 3a agricultural land (i.e. NPPF (2012) 'best and most versatile' (BMV) agricultural land). Soil types with low resilience to structural damage when being handled (heavy soils with >27% clay content: heavy silty clay loam, heavy clay loam, sandy clay, silty clay, clay). Farm types in which the operation of the enterprise is dependent on the spatial relationship of land to key infrastructure, and where there is a requirement for frequent and regular access between the two, or dependent on the existence of the infrastructure itself, e.g.: Dairying, in which milking cows must travel between fields and the parlour at least twice a day; or Irrigated arable cropping and field-scale horticulture, which are dependent on irrigation water supplies.

Table 6.6: Receptor Sensitivity

Value	Receptors
	Intensive livestock or horticultural production which is undertaken primarily within buildings, often in controlled environments Marginal agricultural holdings Horses Fruit crops Land in agri-environment schemes (Higher Level Stewardship) Land in agri-environment schemes (Organic Entry Level Stewardship) Land with organic/organic conversion status Land with Notifiable Weeds Land with Notifiable Scheduled Diseases Land in woodland/forestry grant schemes Statutory rural land designations, e.g. Nitrate Vulnerable Zones (re EU Nitrate Directive (91/676/EC)).
Medium	ALC Subgrade 3b agricultural land Soil types with moderate resilience to structural damage when being handled (medium textured soils with <27% clay content: silt loams, medium silty clay loam, medium clay loam, sandy clay loam) Farm types in which there is a degree of flexibility in the normal course of operations, e.g.: Combinable arable farms; and Grazing livestock farms (other than dairying) Unimproved pasture High value crops Land in agri-environment schemes (Entry Level Stewardship).
Low	ALC Grade 4 or 5 agricultural land and Non-agricultural / Other Land Soil types with high resilience to structural damage when being handled (light textured soils - loamy sand, sandy loam, sandy silt loam) Large agricultural holdings Tenancy or other short term arrangements, e.g. annual grass keep Farm types and land uses undertaken on a non-commercial basis.

Assumptions and Limitations

6.28 No assumptions have been made in the assessment of significance of environmental effects on agriculture and soil receptors in this chapter.

Baseline Conditions

Current Baseline

6.29 This section summarises the characteristics of the existing agriculture and soil conditions of the Site and the surrounding area from a desktop study of published information on climate, geology, soil and Ministry of Agriculture, Fisheries and Food (MAFF) Agricultural Land Classification (ALC). As described in 'Methodology' above, a detailed ALC / soil survey of the Site was completed on the 24th and 25th August 2016, and the 8th and 9th September 2016. An additional detailed ALC of approximately 45 ha in the south of the Site was carried out over the 24th and 25th April 2017. The detailed survey involved examination of the soil's physical properties at 182 locations, as shown on Figure 6.1 (see Figure 1 given in Technical Appendix 6.1). The 182 auger borings are located on previously un-surveyed agricultural land within the Site at a density of approximately one auger boring per hectare. The remainder of the study area is either non-agricultural land, or has be the subject of a previous, detailed ALC survey carried out by the former MAFF in connection with a mineral quarry in the south-east of the Site (see Technical Appendix 6.1 for details).

6.30 The approximately 297 ha Site is located directly to the north of Four Ashes, Staffordshire and 10 km north of Wolverhampton. The Site is bounded by the A5 trunk road to the north (from Junction 12 to the Gailey Roundabout); Calf Heath reservoir, the M6, Stable Lane and Woodlands Lane to the east; Station Drive, Vicarage Road and Straight Mile to the south; and the A449 trunk road (Stafford Road), from the Gailey Roundabout to Station Drive to the west. The south-eastern area of the Site is also bisected by Vicarage Road.. At the time of the ALC survey the Site was mainly under arable (including barley or barley stubble), with some areas of potatoes, rough grassland and set-aside land. The West Coast Main Line (WCML) section via Penkridge (also referred to as the Bushbury to Stafford Line) passes from north to south through the western half of the Site.

6.31 As described in the ALC Guidelines, the main physical factors influencing agricultural land quality are:

- Climate;
- Site;
- Soil; and
- Interactive Limitations.

Climate

6.32 Based on interpolated climatic data, the Site, and the farmland bird mitigation area, has an average annual rainfall of 700mm and is predicted to be at field capacity for 164 days per year. These values are comparable to the averages for lowland England of 700mm annual rainfall and 150 field capacity days. Therefore, climate alone does not limit the quality of agricultural land at the Site, but it may interact with other soil physical properties, such as soil texture, structure, stoniness, to cause so called 'interactive limitations' (i.e. soil wetness and/or soil droughtiness).

Geology

6.33 The bedrock underlying most of the Site, and the farmland bird mitigation area, is described by the British Geological Survey (BGS) (1:50,000) as sandstone of the Wildmoor Sandstone Formation. The bedrock underlying the north-western tip of the Site, to Croft Lane along the northern edge and to 300m south of Gravelly Way along the southern edge, is described as pebbly, gravelly sandstone of the Bromsgrove Sandstone Formation.

6.34 The BGS Superficial Deposit map (1:50,000) indicates that the bedrock underlying much of the Site is covered by sand and gravel from Devensian Glaciofluvial Deposits. Devensian Glacial Till covers areas of bedrock at the north-east and south of the Site. An area to the north-west of the Site is covered by clay, silt, sand and gravel from Alluvium and small areas

at the south-east and west of the Site are not covered by any recorded deposits. The bird mitigation area is mainly covered by glacial till, with some glacio-fluvial sands and gravels and alluvium in a narrow area flanking the Saredon Brook, along the northern boundary.

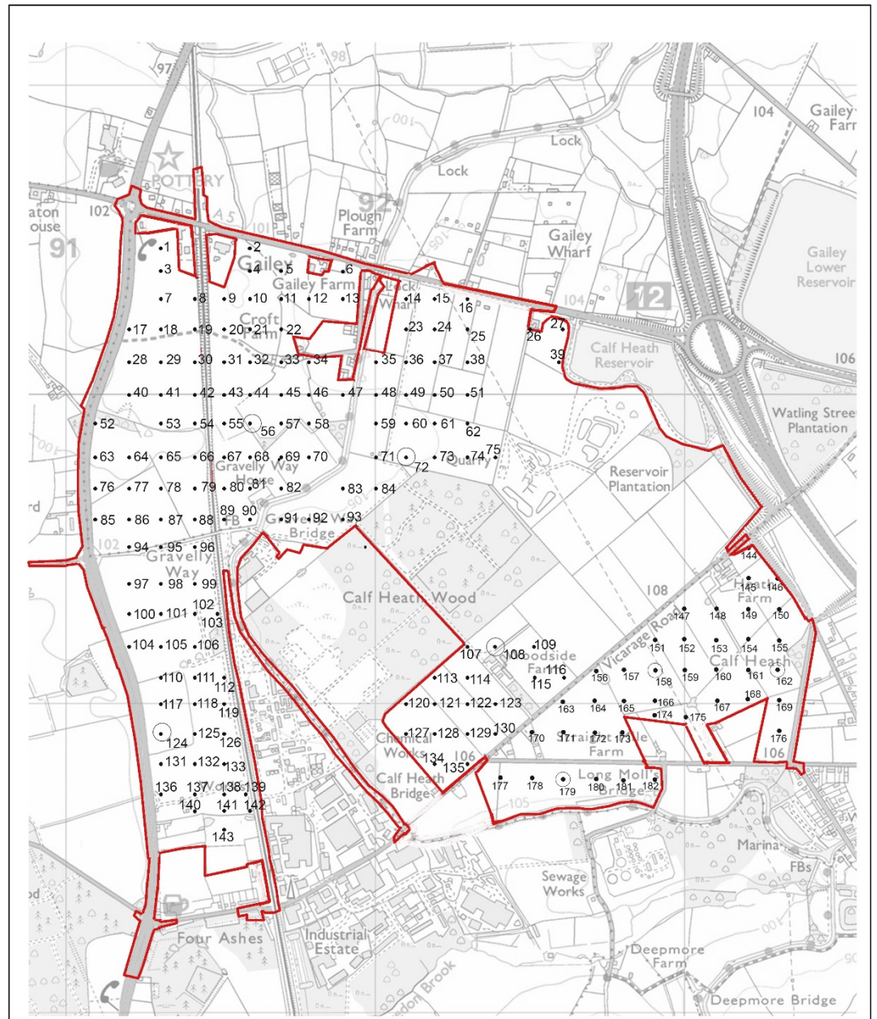
Published Information on Soil Resources

6.35 The 1:250,000 scale Soil Survey of England and Wales (SSEW) Provisional Soil Map for Midland and Western England (Sheet 3) indicates that most of the Site, including the bird mitigation area, is covered by soils grouped in the Clifton soil association. Part of the southern tip of the Site and land encompassing Gravelly Way from the bend in the Staffordshire and Worcestershire Canal to three-quarters of the way up the A449 is covered by deep, well drained, permeable, sandy loams or sandy silt loams of the Wick 1 soil association.

6.36 The Clifton association includes slowly permeable, seasonally waterlogged, reddish, fine and coarse (sandy) loamy soils, and similar soils with slight seasonal waterlogging, with some deep, coarse (sandy) loamy soils, seasonally affected by groundwater. The association is extensive south and west of the Pennines, from south Staffordshire and Clwyd to the Scottish border. The principal Clifton series are typical stagnogley soils consisting of reddish medium loamy drift with siliceous stones. A typical profile consists of dark greyish brown, slightly stony, clay loam or sandy clay loam topsoil; over greyish brown, mottled, slightly stony, sandy loam or sandy clay loam upper subsoil, with weakly developed, medium sub-angular blocky structure; over reddish brown, mottled, slightly stony, clay loam or sandy clay loam lower subsoil, with moderately developed, coarse prismatic structure; over reddish brown, mottled, slightly stony, clay loam, with weakly developed, coarse prismatic or massive structure. The main soils have slowly permeable subsoils and are seasonally waterlogged for long periods in winter (Wetness Class IV), though drainage measures significantly reduce the duration of waterlogging (Wetness Class III). These soils have small or moderate reserves of profile available water and, in the driest areas, potatoes may suffer slightly from drought and grassland tends to scorch in dry summers.

6.37 The Wick 1 association includes deep, well drained, coarse loamy and sandy soils, locally over gravel, with some similar soils affected by groundwater. These soils have a slight risk of water erosion. The association occurs widely throughout Northern England, the Midlands and Wales. The principal Wick series soils are deep, well drained, coarse loamy, typical brown earths. A typical profile consists of dark brown, slightly stony, sandy loam or sandy silty loam topsoil; over brown, slightly stony, sandy loam or sandy silty loam upper subsoil with moderately developed, medium subangular blocky structure; over yellowish brown, slightly or moderately stony, loamy sand or sandy loam lower subsoil with weakly developed, medium angular blocky or single grain structure; over brownish yellow, slightly or moderately stony, sand or loamy sand with weakly developed, coarse angular blocky or single grain structure. The main soils are well drained (Wetness Class I) and readily absorb winter rain. Droughtiness varies with climate.

Figure 6.1: Agriculture and Soil - Site and ALC Sample Locations



Published Information on Agricultural Land Quality

6.38 The Site consists of grassland and arable land, with some woodland. The former MAFF, which has been superseded by DEFRA, produced Agricultural Land Classification (ALC) maps for England and Wales during the 1960s and 1970s. These ALC maps were produced for strategic land-use planning purposes at a scale of 1:250,000. The MAFF Provisional (i.e. Pre 1988) ALC map for the Midlands Region indicates that agricultural land quality at the Site, including the farmland bird mitigation area, is Grade 3 (not differentiated between Subgrades 3a and 3b).

6.39 As provided in Technical Appendix 6.1, MAFF Post 1988 ALC survey information exists for the eastern end of the Site (i.e. Agricultural Land Classification: Four Ashes (Site 64), Staffordshire Aggregates Local Plan. Ref. 079/94, 1994), which is shown to be mainly Grade 2 and Subgrade 3a, with a small amount of Subgrade 3b on the eastern tip.

ALC and Soil Survey

6.40 As described in Technical Appendix 6.1, the findings of the detailed ALC soil survey determined that the soil across the Site is variable but can be broadly categorised under two types. Soil Type 1 (i.e. Low Sensitivity (light textured soils - loamy sand, sandy loam, sandy silt loam) to Medium Sensitivity (medium textured soil - sandy clay loam)). This is consistent with the SSEW description (1:250,000 scale information) of soils in the Clifton and Wick Association above.

6.41 Soil profiles over most of the Site consist of very dark greyish brown, very dark grey or dark brown (Munsell colours 10YR 3/2, 3/1 and 7.5YR 3/2), slightly to moderately stony (8-30% hard stones), non-calcareous, medium sandy loam, sandy clay loam or loamy medium sand topsoil. The upper subsoil consists of brown, yellowish brown or dark yellowish brown (Munsell colours 7.5YR 5/4, 4/4 or 10YR 5/3, 4/3, 5/4, 4/4), often ochreous mottled (Munsell colours 7.5YR 5/6, 5/8, 6/6, 6/8 or 10YR 5/6, 5/8), very slightly to very stony (2-60% hard stones), non-calcareous, medium sandy loam, loamy medium sand or sandy clay loam with moderate structural condition. The lower subsoil consists of variably coloured, light grey to light yellowish brown to strong brown to reddish brown (Munsell colours 10YR 7/2, 64, 7.5YR 4/6, 5YR 5/4), often ochreous and grey mottled, stoneless to very stony (0-60% hard stones), non-calcareous, loamy medium sand, medium sandy loam or medium sand, with moderate structural condition. Many of these profiles become impossible to auger at variable depth due to very stony or iron pan layers. Type 1 profiles are usually well drained and placed in Wetness Class I.

Soil Type 2 (i.e. High sensitivity (heavy textured soils with >27% clay content: heavy silty clay loam, heavy clay loam, sandy clay, silty clay, clay)

6.42 Some profiles across the Site include a slowly permeable layer within the upper or lower subsoil consisting of reddish brown (Munsell colours 5YR 4/4, 5/3, 5/4 or 2.5YR 44), grey mottled (Munsell colours 2.5Y 6/1, 6/2 and 10YR 6/1), stoneless to slightly stony (0-10% hard stone), non-calcareous, clay or sandy clay, with poor structural condition. These profiles often have similar, moderately structured, sandy clay loam or heavy clay loam layers immediately above or below the slowly permeable layer. Type 2 profiles range between well drained profiles placed in Wetness Class I and profiles which are waterlogged for long periods over the winter and placed in Wetness Class IV, depending on the depth to the slowly permeable clay layer.

Topsoil Texture

6.43 Table 10 of the ALC Guidelines (1988) distinguishes medium clay loam topsoil as having less than 27% clay content, whilst heavy clay loam topsoil has 27% clay or more (also see Natural England Technical Information Note 037, 'Soil Texture', First Edition, 21 February 2008). In order to substantiate the hand-texturing on-site, samples of topsoil were collected at seven selected locations which are representative of the main types of topsoil (i.e. Auger Locations 56, 72, 108, 124, 158, 162 and 179, as shown on Figure 6.1), as detailed in Technical Appendix 6.1 and Table 6.7 below. The topsoil samples were sent to an accredited laboratory (NRM Ltd) for analysis of texture/particle size distribution (PSD), based on the British Standard Institution particle size grades. The certificate of analysis is given in Technical Appendix 6.1. The findings of the PSD analysis are shown in Table 6.7 below.

Table 6.7: Topsoil Particle Size Analysis

Sample Location (re Figure 6.1)	% sand 0.063-2.0 mm	% silt 0.002-0.063 mm	% clay <0.002 mm	ALC Soil Texture Class
56	65	15	20	Sandy Clay Loam
72	79	13	8	Loamy Sand
108	80	11	9	Loamy Sand
124	63	21	16	Sandy Loam
158	70	18	12	Sandy Loam
162	79	12	9	Loamy Sand/Sandy Loam
179	78	12	10	Sandy Loam

Agricultural Land Classification (ALC) Grading at the Site

6.44 The ALC grades of agricultural land determined by detailed survey at the Site are shown on Figure 6.2 and are described below.

Grade 2 (i.e. high sensitivity)

6.45 Agricultural land at this Site is limited to Grade 2 due to several factors or combinations of them, as follows: (i) where the volumetric content of hard stones greater than 2cm size in the top 25cm of the profile is estimated to be between 6% and 10%, the profiles are limited by stone content to Grade 2 (re Table 5 of the ALC Guidelines) (ii) where profiles have Moisture Balance (MB) values for wheat greater than or equal to +5mm and MB values for potatoes greater than or equal to -10mm and either MB values for wheat less than +30mm and/or MB values for potatoes less than +10mm, the profiles are limited by soil droughtiness to Grade 2 (re Table 8 and Appendix 4 of the ALC Guidelines, October 1988), (iii) where profiles have sandy clay loam topsoil and slightly seasonally waterlogged subsoil (Wetness Class II) or sandy loam topsoil and seasonally waterlogged subsoil (Wetness Class III), the profiles are limited by soil wetness to Grade 2 in this climate area (151-175 field capacity days). Grade 2 land is the predominant map unit over the south-west of the Site, and areas are found throughout rest of the Site.

Subgrade 3a (High Sensitivity)

6.46 Agricultural land at this Site is limited to Subgrade 3a due to several factors or combinations of them, as follows: (i) where the volumetric content of hard stones greater than 2cm size in the top 25cm of the profile is estimated to be between 11% and 15%, the profiles are limited by stone content to Subgrade 3a (re Table 5 of the ALC Guidelines) (ii) where profiles have MB values for wheat greater than or equal to -20mm and MB values for potatoes greater than or equal to -30mm and either MB values for wheat less than +5mm and/or MB values for potatoes less than -10mm, the profiles are limited by soil droughtiness to Subgrade 3a (re Table 8 of the ALC Guidelines), (iii) where profiles have medium clay loam topsoil and seasonally waterlogged subsoil (Wetness Class III) or sandy loam topsoil and subsoil which is waterlogged for long periods in winter (Wetness Class IV), the profiles are limited by soil wetness to Subgrade 3a. Isolated profiles of Grade 2 and Subgrade 3b (i.e. auger points 28, 52, 85, 117 and 139 have been subsumed within contiguous areas of Subgrade 3a as it would

be unreasonable to manage them differentially to the surrounding land. Subgrade 3a land is the predominant map unit over the north of the Site and areas are found throughout the rest of the Site.

Subgrade 3b (Moderate Sensitivity)

6.47 Agricultural land at this Site is limited to Subgrade 3b due to several factors or combinations of them, as follows: (i) where the volumetric content of hard stones greater than 2cm size in the top 25cm of the profile is estimated to be between 16% and 35%, the profiles are limited by stone content to Subgrade 3b (re Table 5 of the ALC Guidelines) (ii) where profiles have MB values for wheat greater than or equal to -50mm and MB values for potatoes greater than or equal to -55mm and either MB values for wheat less than -20mm and/or MB values for potatoes less than -30mm, the profiles are limited by soil droughtiness to Subgrade 3b (re Table 8 of the ALC Guidelines), (iii) where profiles have sandy clay loam topsoil and subsoil which is waterlogged for long periods in winter (Wetness Class IV), the profiles are limited by soil wetness to Subgrade 3b. Areas of this land are found throughout the north of the Site.

Non-agricultural / Other Land (Low Sensitivity)

6.48 Specific land uses have been classified as non-agricultural/other land following the ALC Guidelines (1988) as follows: railway, mineral extraction land, buildings, hard-standing, roads, farm tracks, woodland, canal and water bodies (ponds).

6.49 The area and proportion of agricultural land in each ALC grade has been measured from an ALC map given as Figure 6.2 and Figure 2 in Technical Appendix 6.1. The findings are reported in Table 6.8.

Figure 6.2: Agriculture and Soil - Site and ALC Sample

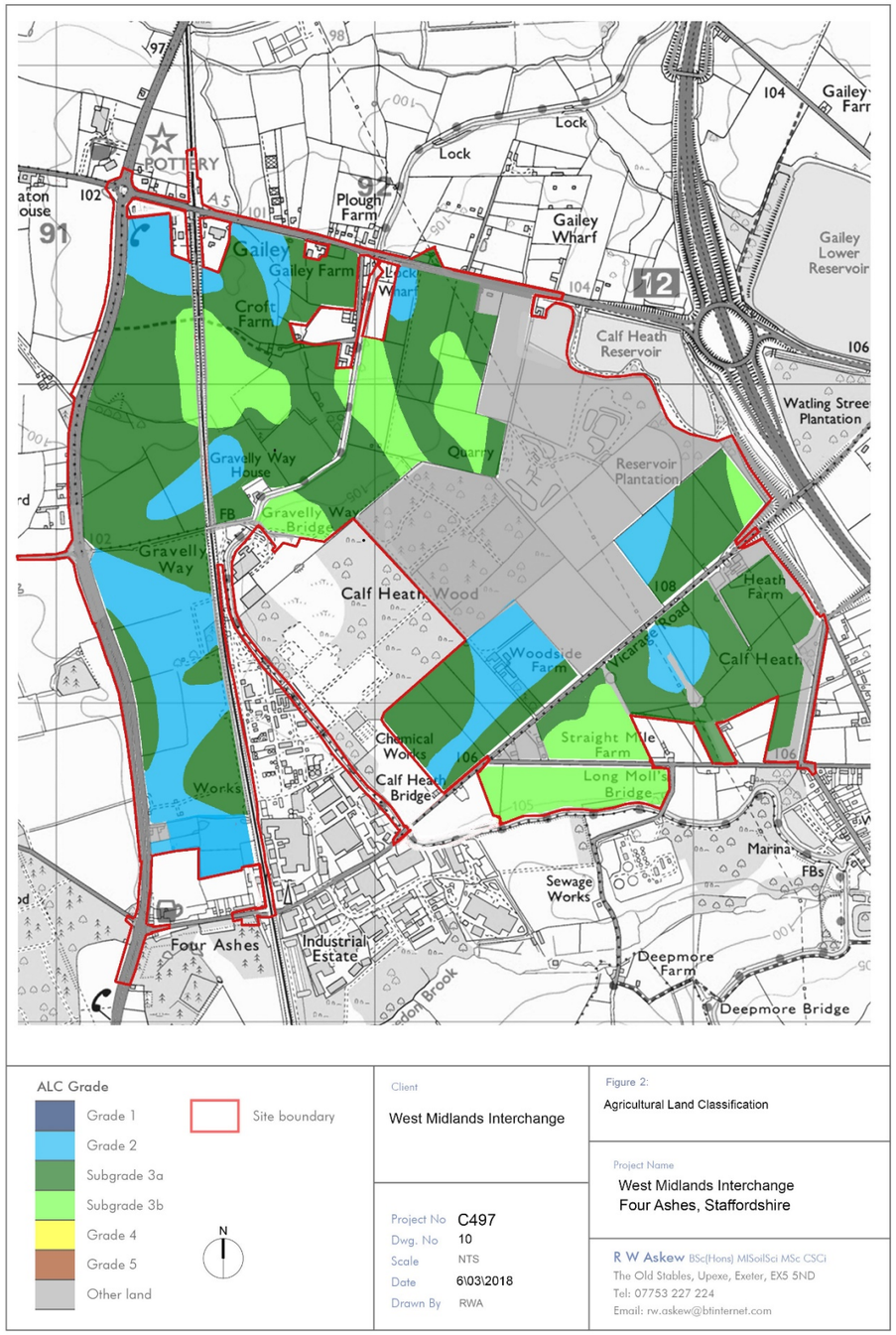


Table 6.8 Agricultural Land Classification		
ALC Grade	**Total (Ha)**	**Total (% of assessment area)**
Grade 1 (Excellent)	0	0
Grade 2 (Very Good)	51.1	17.2
Subgrade 3a (Good)	121.9	41.0
Best and Most Versatile (BMV) Agricultural Land (i.e. ALC Grades 1, 2 and Subgrade 3a)	*173.0*	*58.2*
Subgrade 3b (Moderate)	38.2	12.9
Grade 4 (Poor)	0	0
Grade 5 (Very Poor)	0	0
Other Land / Non-agricultural	85.7	28.9
Total	**296.9**	**100.0**

Agricultural Land Classification (ALC) Grading at the Farmland Bird Mitigation Area

6.50 As described above, the farmland bird mitigation area to the east of Standeford (BGR SJ917073) has a similar climate to the Site (i.e. approximately 700 mm Average Annual Rainfall and approximately 164 Field Capacity Days), and is underlain by sandstone (Wildmoor Sandstone Member), which is in turn covered by glacial till. The off-site farmland bird mitigation area has slowly permeable, seasonally waterlogged, reddish, fine and coarse (sandy) loamy soils grouped in the Clifton 1 Association. From desktop information, and from detailed ALC survey findings on similar agricultural land on the Site, it is predicted that the quality of agricultural land within the approximate 12 ha farmland bird mitigation area is limited by soil wetness and soil droughtiness to Subgrade 3a.

Agricultural Holdings at the Site

6.51 The agricultural holdings within the Site's boundary are identified in on Figure 6.3 and in Table 6.9. Where agricultural land has been entered in an agri-environmental scheme administered by Natural England, this has been derived from information on the MAGIC website (www.magic.gov.uk).

Figure 6.3: Agricultural Holdings

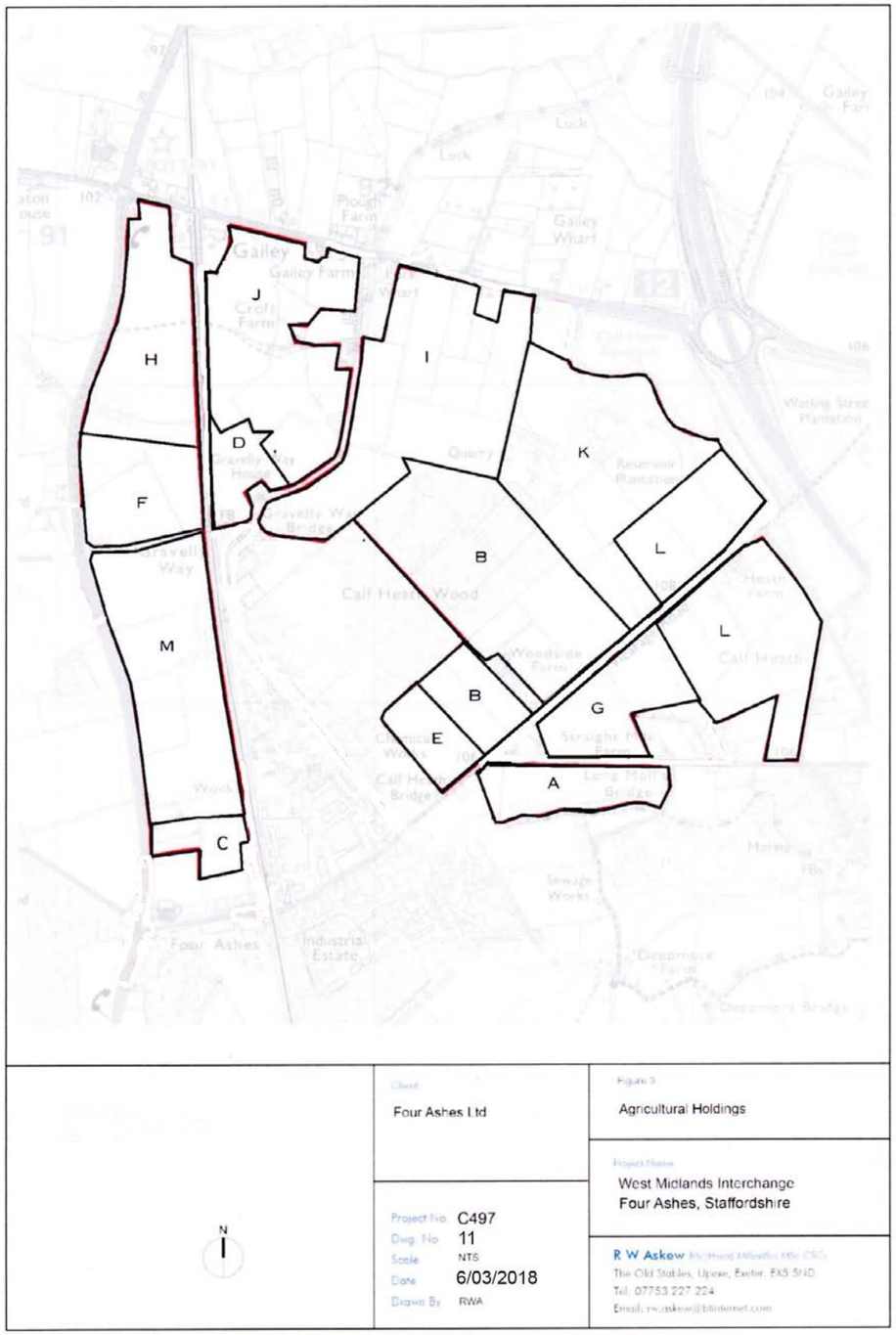


Table 6.9: Agricultural Holdings

Holding Reference	Holding Owner / Land Registry Title No.	Main Enterprise	Agri-environmental Scheme (HLS/ELS/OELS): Area (ha) entered in Scheme Scheme Holder	Sensitivity
A	A Monckton	Grassland. Annual Grazing Licence (AGL)	None	Low
B	A Monckton (Land Registry Ref. SF527181)	Arable and grass. Full Business Tenancy (FBT) until March 2017 – now ended	None	Low
C	A Monckton	Grassland. Tenancy	None	Low
D	A Monckton (Land Registry Ref. SF528668)	Arable. Tenancy	None	Low
E	A Monckton (Land Registry Ref. SF528704)	Grassland. Tenancy	None	Low
F	A Monckton (Land Registry Ref. SF527080)	Arable. Tenancy	None	Low
G	A Monckton (Land Registry Ref. SF528034)	Arable / Grassland. Tenancy	None	Low
H	A Monckton (Land Registry Ref. SF550586)	Arable. Tenancy	None	Low
I	A Monckton (Land Registry Ref. SF527224)	Arable. Tenancy	None	Low
J	A Monckton (Land Registry Ref. SF527265)	Arable. Tenancy	None	Low
K	A Monckton (Land Registry Ref. SF527218)	Arable. Tenancy	None	Low
L	Heath Farm, Gailey, Staffs, ST19 5PU	Approx. 33 ha Mixed Livestock and Arable: Tenant	None	Low
M	Somerford Home Farm, Stretton Hall, Stafford, ST19 9LQ	Approx. 682.11 ha Mixed Livestock and Arable: Contract Farmed	Entry Level Stewardship (ELS) 682.11 ha Somerford Home Farm	Medium

Agricultural Holdings at the off-site Farmland Bird Mitigation Area

6.52 The approximate 12 ha off-site farmland bird mitigation area is owned and farmed as part of Somerford Home Farm (Holding M in Table 6.9). The agricultural holding has entered 682.11 ha of farmland into the Entry Level Stewardship (ELS) scheme, including the land proposed as the farmland bird mitigation area. The agricultural holding, including land proposed as the farmland mitigation area, is considered to be of medium sensitivity.

Sensitive Receptors

Existing Sensitive Receptors

6.53 As determined under 'Baseline Conditions' above, it is considered that construction of the Proposed Development is likely to affect the following agricultural and soil receptors:

- Agricultural land quality: The construction of the Proposed Development is likely to have an effect on agricultural land in ALC Grade 2 (high sensitivity), Subgrade 3a (high sensitivity) and Subgrade 3b (medium sensitivity). Some land uses within the Site (e.g. woodland, buildings, roads) have been assessed as non-agricultural / other land (low sensitivity);
- Topsoil and Subsoil (low sensitivity – light textured soils; medium sensitivity – medium textured soils; high sensitivity – heavy textured soils): The construction of the Proposed Development has the potential to affect the quality of topsoil and subsoil; namely in terms of soil structure, through compaction, especially if clay / sandy clay soil (i.e. high sensitivity) is worked excessively in wet weather. Provided that it is stripped, stored and replaced appropriately in suitable weather conditions (see mitigation below), then permanent degradation to topsoil and subsoil structure can be avoided; and
- Local agricultural holdings, as identified in Table 6.9 above.

New Sensitive Receptors

6.54 For the purpose of this assessment, it is considered there will be no new sensitive receptors (i.e. agriculture and soil) resulting from the construction and / or operation of the Proposed Development.

Potential Effects

Demolition and Construction

6.55 As determined under 'Baseline Conditions' above, it is considered that construction of the Proposed Development is likely to affect the following agricultural and soil receptors:

- Agricultural land quality: The construction of the Proposed Development is likely to have a permanent, adverse effect on agricultural land in ALC Grade 2 (high sensitivity), Subgrade 3a (high sensitivity) and Subgrade 3b (medium sensitivity). This is because the construction of built development will effectively seal the agricultural land and permanently change the land use. The agricultural land on site is therefore taken out of agricultural production permanently. Some land uses within the Site (e.g. woodland, buildings, roads) have been assessed as non-agricultural / other land (low sensitivity);
- Topsoil and Subsoil (low sensitivity – light textured soils; medium sensitivity – medium textured soils; high sensitivity – heavy textured soils): As it takes approximately 500 years to form 1 cm of soil, it is regarded as a finite resource. The importance of the functions that soil performs for society is recognised in the DEFRA publication 'Safeguarding our Soils: As Strategy for England' (DEFRA, September 2009) and at an international level by ISRIC World Soil Information (available online at http://www.isric.org/about-soils/functions-soil). As well as (i) food and other biomass production, soils are also important for (ii) environmental interaction: storage, filtering, and transformation; (iii) functioning as a biological habitat and gene pool; (iv) being a source of raw materials; (v) being a store of physical and cultural heritage, and (vi) for being a platform for man-made structures: buildings, highways. The construction of the Proposed Development has the potential to adversely affect the quality of topsoil and subsoil; namely in terms of damaging soil structure, through compaction, especially if clay / sandy clay soil (i.e. high sensitivity) is worked excessively in wet weather. If the structure of the soil is damaged, and the spaces (pores) between soil peds (aggregates) is reduced, then drainage of water and transmission of gases (including oxygen and carbon dioxide) is impeded, which has a detrimental effect on plant, animal and microbial life in the soil. This reduces the suitability of the soil for reuse on site for landscaping and habitat creation, for example. Provided that it is stripped, stored and replaced appropriately in suitable weather conditions (see mitigation below), then permanent degradation to topsoil and subsoil structure can be avoided;
- Local agricultural holdings: The main likely significant impacts on local agriculture (medium sensitivity) are:
  - loss of agricultural land leading to extinguishment of holding / tenancy, or reduction in area of holding / tenancy;
  - affect the type of farm enterprises carried out in a particular growing season (due to the amount, duration and seasonal timing of land being taken out of agricultural production);
  - affect access arrangements, i.e. through severance or fragmentation of the farm holding;
  - lead to the spread of plant and animal diseases; and
  - affect the agreement of agri-environment schemes entered into.

Operational Development

6.56 Once the Proposed Development has been constructed, no other operational effects are anticipated.

Mitigation and Residual Effects

Construction Mitigation

Regulatory Regime

6.57 There is no regulatory regime with a bearing on the Proposed Development with regard to agriculture and soil. There are no known notifiable scheduled diseases or records of injurious weeds within the study area. Therefore, mitigation of adverse effects on agriculture and soil will be mainly through the adoption of appropriate best practice management techniques, as described below.

Management Controls

6.58 The predicted likely significant adverse effects of constructing the Proposed Development on agriculture and soil will be avoided, reduced or offset by employing best practice management techniques set out in the 'Construction *Code of Practice for the Sustainable Management and Use of Soil on Construction Sites*' (DEFRA, September 2009), as described below.

Agricultural Land Quality

6.59 As detailed in Section 3.0 of Technical Appendix 6.1, South Staffordshire District has no Grade 1 agricultural land. Approximately 18.4 % of the District comprises Grade 2, which is higher than the national average (14.2 %). The majority (i.e. 69.4 %) of agricultural land in the District is in Grade 3 (not differentiated between Subgrade 3a and 3b), which is also higher than the national average (48.2 %). Therefore, the presence of Grade 2 and Grade 3 agricultural land at the Site is to be expected, as these grades of agricultural land are widespread in the District.

6.60 There is no mitigation for the loss of agricultural land (i.e. the land use will be permanently changed) during the construction phase, but it is possible to mitigate for effects of the Proposed Development on soil, as described below.

6.61 Approximately 12 ha of off-site agricultural land in Subgrade 3a is proposed for use as a farmland bird mitigation area for 15 years via a Section 106 agreement. As no significant earthworks or tree planting is involved, and the land will be maintained in agricultural use. it is predicted that the quality and quantity of the approximately 12 ha of Subgrade 3a will not be diminished. Therefore, the significance of the effect of the farmland bird mitigation scheme on agricultural land quality is negligible.

Soil Resources

6.62 As described in 'potential effects' above, topsoil and subsoil resources on Site are identified as sensitive receptors. As described earlier in this chapter under 'legislation and policy context', European and UK Government is developing policy on soil protection. Possible mitigation with regard to the safeguarding and reuse of soil resources on site in a sustainable manner is described below.

6.63 The soil over the Proposed Development area is likely to be of 'multi-purpose' grade in terms of BS3882:2015 'Specification for Topsoil' (subject to appropriate laboratory certification). In such a case, it would be suitable for re-use in a landscaping scheme, for example, provided it is handled appropriately.

6.64 Therefore, the quality and quantity of soil within the Site should be maintained by implementing appropriate techniques for stripping, storing and re-use. This approach will be adopted in a Soil Resource Plan (SRP), as per Section 6.0 of the ODCEMP, to be secured as a DCO Requirement. This is consistent with the findings and recommendations of recent research carried out on behalf of Defra, including the development of a 'Construction Code of Practice for the Sustainable Management and Use of Soil on Construction Sites' (Defra, September 2009).

6.65 As the agricultural land proposed for use as an off-site farmland bird mitigation area will be kept in agricultural production, and because no significant earthworks or tree planting is involved, the significance of the effects of farmland bird mitigation on soil resources is negligible.

Agricultural Holdings

6.66 As shown in on Figure 6.3 and Table 6.9, most of the agricultural land at the Site is in the ownership of the Monckton family, with land being (i) let on various tenancies and annual grazing licences, or (ii) is being farmed as part of Somerford Home Farm, where the main centre of operation and farm buildings are located approximately 3 km to the north-west of the Site, at Stretton Hall, Stretton, Stafford, ST19 9LQ. From information provided by land agents on the project (Savills), in the future, the Monckton land will be farmed on a Contract Farming Agreement by a contractor, who also contract farms land at Somerford Home Farm. The land at Heath Farm (i.e. Agricultural Holding 'L' on Figure 6.3 and Table 6.9) is owned by The Inglewood Investment Company Limited, and is currently let to a tenant.

6.67 The Proposed Development will be carried out in phases, potentially as shown on the Illustrative DCO Phasing Plan (Figure 4.5, Volume 2 of this ES). It is intended that agricultural production on agricultural land in the later phases is progressed for as long possible, i.e. before construction in that phase commences.

6.68 In order to maintain agricultural production on agricultural land in the later phases of development (i.e. Phase 2 to 5) for as long as possible, it will be necessary to maintain access for agricultural machinery to the land. Therefore, as part of the phased development approach, agreed access routes will be established for construction personnel, machinery and equipment movements through on-going areas of agricultural land use, if required.

Phase 1

6.69 According to the Illustrative DCO Phasing Plan, several parcels of land belonging to the Monckton Family is developed in Phase 1 as follows: (i) all of Holdings D, F, H and J, (ii) most of Holdings I and K (see Figure 6.3). No access arrangements, or other mitigation is required. In addition, the northern and eastern edges of Holding M (Somerford Home Farm) is proposed for development in Phase 1. The remainder of Holding M could be accessed off the A449.

Phase 2

6.70 The Illustrative DCO Phasing Plan shows that all of the agricultural land in Holdings A and C (both Monckton) is proposed for development in Phase 2. The remainder of the agricultural land in Holding I (Monckton) is developed in Phase 2. No access arrangements, or other mitigation is required. Most of Holding B (Monckton), to the north of Calf Heath Wood, is proposed for development in Phase 2. The remainder of Holding B could be accessed off Vicarage Road. A narrow strip of agricultural land along the eastern edge of Holding M is also proposed for development in Phase 2.

Phase 3

6.71 The remainder of agricultural land in Holding M (Figure 6.3), i.e. land not developed in Phase 2 will be taken out of agricultural production in Phase 3. No access or any other agricultural mitigation is required in Phase 3.

Phases 4 and 5

6.72 Agricultural land at Heath Farm (Agricultural Holding 'L' on Figure 6.3) will not be directly affected by construction of the Proposed Development until Phase 4 (i.e. land within holding to the north of Vicarage Road), and Phase 5 (i.e. land in the holding to the south of Vicarage Road, north of the Straight Mile). Access to the agricultural land within Heath Farm will be maintained via existing access points to fields off Vicarage Road and Stable Lane (i.e. minor road between Vicarage Road and the Straight Mile, to the east of Heath Farm).

6.73 In addition, the whole of Holding E (Monckton) is proposed to be developed in Phase 4. No access or any other agricultural mitigation is required.

6.74 The remainder of agricultural land in Holding B is proposed to be development in Phase.

6.75 The whole of Holding G (Monckton), and the remainder of agricultural land at Heath Farm (Holding L) will be developed in Phase 5.

6.76 All agricultural production within the Site boundary will therefore cease at the end of Phase 4, prior to the commencement of construction in Phase 5.

Farmland Bird Mitigation Area

6.77 The land proposed for use in the off-site farmland bird mitigation area will be kept in agricultural use. Enhancement measures across the approximate 12 ha will include a buffer to Saredon Brook, wider headlands and margins, management including rotation and use of seed mixes intended to be of benefit for farmland birds, provision of skylark plots and planting of new hedgerows in place of or in addition to existing fences. A detailed enhancement, management and monitoring plan will be produced and appended to the first EMMP in accordance with the principles outlined in the FEMMP (see Chapter 10: Ecology and Nature Conservation). The land is part of Somerford Home Farm (Holding M in Table 6.9), and is currently entered in the ELS agri-environment scheme. Therefore, the significance of the effect of the farmland bird mitigation scheme on the agricultural holding is negligible.

Construction Residual Effects

6.78 As there is no mitigation for the permanent loss of agricultural, the significance of the residual effect of constructing the Proposed Development on approximately 51.1 ha of Grade 2 agricultural land is assessed as being **permanent, major adverse** at a national level.

6.79 The significance of the residual effect of constructing the Proposed Development on approximately 121.9 ha of Subgrade 3a agricultural land is assessed as being **permanent, major adverse** at a national level.

6.80 As described in more detail in Section 3.0 of Technical Appendix 6.1, South Staffordshire District has no Grade 1 agricultural land. Approximately 18.4 % of the District comprises Grade 2, which is higher than the national average (14.2 %). The majority (i.e. 69.4 %) of agricultural land in the District is in Grade 3 (not differentiated between Subgrade 3a and 3b), which is also higher than the national average (48.2 %). Therefore, the presence of Grade 2 and Grade 3 agricultural land at the Site is to be expected, as these grades of agricultural land are widespread in the District.

6.81 The significance of the residual effect of constructing the Proposed Development on approximately 38.2 ha of Subgrade 3b agricultural land is assessed as being **permanent, minor adverse** at a national level.

6.82 The significance of the residual effect of constructing the Proposed Development on approximately 85.7 ha of non-agricultural land / other land is assessed as being **negligible** at a national level, in agricultural land quality terms.

6.83 In line with current EU and UK Government guidance and Construction Code of Practice for the Sustainable Use of Soil on Construction Sites (2009), the quality and quantity of soil resources (topsoil and subsoil) available for reuse within the Site should be identified and safeguarded in a Soil Resource Plan (SRP), as per Section 6.0 of the Outline Demolition and Construction Environmental Management Plan (ODCEMP). By protecting soil resources in this way, the significance of the residual effect of the Proposed Development on soil resources would be **temporary, minor adverse**.

6.84 The significance of the residual effect of the loss, i.e. approximately 82 ha or 12% of the total 682 ha holding (medium impact magnitude) of a proportion of Somerford Home Farm (medium sensitivity) is assessed as being **permanent, moderate adverse** at a local level.

6.85 The significance of the residual effect of the extinguishment (high impact magnitude) of five agricultural holdings / agricultural land parcels, i.e. Heath Farm, SF527181, SF527224, SF527265, and SF527218 (low sensitivity) is assessed as being **permanent, minor adverse**.

6.86 The significance of the effect of the approximate 12 ha off-site farmland bird mitigation scheme on (i) agricultural land quality, (ii) soil resources, and (iii) agricultural holdings is **negligible**.

Operational Development

6.87 Once the Proposed Development has been constructed, no other operational effects are anticipated.

Summary of Mitigation Measures

Table 6.10: Summary of Proposed Mitigation and Enhancement Measures

Potential Effects Identified	Proposed Mitigation/Control & Enhancement Measures
Construction	
Soil Resources	The quality and quantity of soil within the Proposed Development should be maintained by implementing appropriate techniques for stripping, storing and re-use. This approach will be adopted in a Soil Resource Plan (SRP), as per Section 6.0 of the ODCEMP. This is consistent with the findings and recommendations of recent research carried out on behalf of Defra, including the development of a 'Construction *Code of Practice for the Sustainable Management and Use of Soil on Construction Sites*' (Defra, September 2009). This code of practice will be used in development of the SRP.
Agricultural Holdings	The Proposed Development will be carried out in phases, potentially as shown on the illustrative Phasing Plan (ref 'Illustrative DCO Phasing Plan', Figure 4.5). It is intended that agricultural production on agricultural land in the later phases will continue for as long possible. Therefore, as part of the phased development approach, agreed access routes will be established for construction personnel, machinery and equipment movements through on-going areas of agricultural land use, if required.
Completed Development: No operational effects. No mitigation necessary.	

Summary of Residual Effects

6.88 Table 6.11 provides a tabulated summary of the outcomes of the assessment of agriculture and soil resources.

Table 6.11: Summary of Residual Effects

Receptor	Description of Residual Effect	Nature of Residual Effect*					
		Significance **	+ -	D I	P T	R IR	St Mt Lt
Construction							
51.1 ha of Grade 2 Agricultural Land	Permanent sealing of agricultural land	Major	-	D	P	IR	Lt
121.9 ha of Subgrade 3a Agricultural Land	Permanent sealing of agricultural land	Major	-	D	P	IR	Lt
38.2 ha of Subgrade 3b Agricultural land	Permanent sealing of agricultural land	Minor	-	D	P	IR	Lt
85.7 ha of Non-Agricultural / Other Land	Permanent sealing of agricultural land	Negligible	-	D	P	IR	Lt
Soil Resources	Adverse effect of construction activities on quality and quantity of soil resources available on Site for reuse	Minor	-	D	T	R	Mt
Somerford Home Farm (Holding M on Figure 6.3 and Table 6.9)	Permanent reduction in area (ha) of agricultural land within holding.	Moderate	-	D	P	IR	Lg
Heath Farm (Holding L on Figure 6.3 and Table 6.9)	Extinguishment of agricultural holding in Phase 4 and Phase 5 (all low sensitivity)	Minor	-	D	P	IR	Lg
Holdings A, B, C, D, E, F, G, H, I, J, and K on Figure 6.3 and Table 6.9	Extinguishment of agricultural holding / land parcels (all low sensitivity)	Minor	-	D	P	IR	Lg
Completed Development							
Agricultural Land	No operational effects predicted						
Soil Resources	No operational effects predicted						
Agricultural Holdings	No operational effects predicted						

Notes:
* - = Adverse/ + = Beneficial; D = Direct/ I = Indirect; P = Permanent/ T = Temporary;
R=Reversible/ IR= Irreversible; St- Short term/ Mt –Medium term/ Lt –Long term.
**Negligible/Minor/Moderate/Major

Likely Significant Environmental Effects

6.89 The significance of the residual effect of constructing the Proposed Development on approximately 51.1 ha of Grade 2 agricultural land, and approximately 121.9ha of Subgrade 3a agricultural land is assessed as being significant at a national level.

6.90 The significance of the residual effect of the loss, i.e. approximately 82 ha or 12% of the total 682 ha holding (medium impact magnitude) of a proportion of Somerford Home Farm (medium sensitivity) is assessed as being significant at a local level.

Decommissioning

6.91 When decommissioning the scheme, soil resources on Site should be identified and safeguarded for re-use. The quality and quantity of soil within the decommissioning Site should be maintained by implementing appropriate techniques for stripping, storing and re-use. This approach should be adopted in a decommissioning Soil Resource Plan (SRP). This is consistent with the findings and recommendations of recent research carried out on behalf of Defra, including the development of a 'Construction Code of Practice for the Sustainable Management and Use of Soil on Construction Sites' (Defra, September 2009).

Cumulative Effects

6.92 In agricultural land quality terms there are no significant effects of the Proposed Development in combination with other developments during the construction or operational phase of the Proposed Development within 2 km of the Site.