Environmental Statement

Volume 2i: Scheme-wide Assessment

Chapter 19: Agriculture

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19. AGRICULTURE

Summary of principal findings

This chapter presents the assessment of agricultural soils and the viability of affected agricultural holdings associated with the construction and operation of the Huddersfield to Westtown (Dewsbury) section of the Transpennine Route Upgrade (TRU) Programme. This chapter covers the assessment of the entirety of the Huddersfield to Westtown (Dewsbury) Route (herein referred to as the 'Scheme').

Agricultural land acquisition in the construction phase will be 21.77 hectares (ha) of which 5.17ha is of best and most versatile (BMV) quality in Agricultural Land Classification (ALC) Grades 2 and 3a. Temporarily acquired land, totalling 11.56ha will be restored to a condition equivalent to its original, unless the landowner and Network Rail agree an alternative position. The permanent land-take will be 10.21ha, of which 1.56ha is of BMV quality, and this is a significant adverse effect.

Three agricultural holdings will be affected during the construction phase. With appropriate mitigation of impacts during construction, there will be not be a significant effect on their viability. All three holdings will permanently lose small amounts of land to the engineering footprint of the Scheme, none of which is will be significant in terms of their future operation.

19.1 Introduction

19.1.1 This chapter presents the assessment of agricultural soils and the viability of affected agricultural holdings associated with the construction and operation of the Huddersfield to Westtown (Dewsbury) portion of the Transpennine Route Upgrade (TRU) Programme. This chapter covers the assessment of the entirety of the Huddersfield to Westtown (Dewsbury) Route (herein referred to as the 'Scheme').

19.1.2 This chapter is set out as follows:

- Legislative and policy context – relevant international, national and local policy requirements, legal requirements and guidance which have been used to define the assessment approach are outlined;
- Assessment methodology – the methodology the assessment follows is defined including the justification for the study area and the approach for determining significance of effects;
- Baseline – a summary of the agricultural baseline within the study area is provided;
- Potential effects – the potential impacts and effects (both beneficial and adverse) during construction and operation are characterised;
- Mitigation measures – agreed avoidance, mitigation, compensation and enhancement measures are described;
- Residual effects – the significance of residual effects (both beneficial and adverse) following the implementation of mitigation measures are assessed; and
- Cumulative effects – the potential likely significant cumulative effects of the Scheme are described.

19.1.3 A detailed description of the Scheme is provided in Chapter 2 (Scheme description) of this Environmental Statement (ES) and all appendices and figures referred to in this chapter are provided in Volumes 3 and 4 of this ES respectively.

19.1.4 For ease of the reader, the assessment reported in this chapter is broken down into the three Route Sections in which agricultural land is affected, namely:

- Route Section 4 – Colne Bridge and Battyeford;
- Route Section 5 – Mirfield and Lower Hopton; and
- Route Section 6 – Ravensthorpe and Westtown.

19.1.5 No agricultural land is present within the study area for Route Sections 1 to 3 and therefore no assessment of these areas is necessary.

19.1.6 No separate Route Section Assessments for agriculture are included within Volume 2ii of this ES.

19.2 Legislative and policy context

National

National Planning Policy Framework 2019

19.2.1 Paragraph 170 of the National Planning Policy Framework (NPPF) requires that local planning authorities should take into account the economic and other benefits of best and most Versatile (BMV) agricultural land, which is land in Agricultural Land Classification (ALC)

Grades 1, 2 and 3a[1]. 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.

Natural England Technical Information Note 049 - 2012

19.2.2 Technical Information Note 049 (TIN049)[2] Agricultural Land Classification: protecting the best and most versatile agricultural land states that, for planning applications, specific consultations with Natural England are required under the Town and Country Planning (Development Management Procedure) (England) Order 2015 in relation to BMV agricultural land. These are for non-agricultural development proposals that are not consistent with an adopted local plan and involve the loss of 20ha or more of BMV land.

Local

Kirklees Local Plan 2019

19.2.3 The Kirklees Local Plan[3], in Section 6 Delivering Growth and Sustainable Development, states that developments on BMV agricultural land should be avoided, where possible.

Technical guidance and standards

19.2.4 In May 2019, an Environmental Scoping Report (ESR) was submitted to the Transport and Works Act Order Unit (now Transport Infrastructure Planning Unit (TIPU)). This document set out the proposed approach to the assessments that would be undertaken as part of the Environmental Impact Assessment (EIA) on the Scheme. The section on agriculture land and soil followed the approach of the Design Manual for Roads and Bridges (DMRB) 2001 Volume 11, Section 3, Part 6 Land use[4] (the guidance at that time). No precise descriptions of environmental value (sensitivity) and magnitude of impact were provided in that edition and it was left to authors to provide their own bespoke descriptions on a project-by-project basis.

19.2.5 In October 2019 LA 109 (Geology and soils)[5] and LA 112 (Population and human health)[6] replaced DMRB Volume 11, Section 3, Part 11 & Part 6. These editions provide precise descriptions of environmental value (sensitivity) and magnitude of impact; these have been reviewed and a decision taken to utilise them within the assessment and therefore replace the bespoke definitions contained in the ESR.

19.2.6 The new guidance also identifies that any assessment of agricultural impacts from a development should be considered within the Geology and Soils and Population and Human Health chapters. However, to ensure that this topic is easily accessed and to ensure that the departure from the approved structure of the ESR is kept to a minimum, the ES to support the Transport and Works Act Order (TWAO) for this Scheme will retain agriculture as a standalone chapter. This does not affect the conclusions of this assessment.

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[1] Ministry of Agriculture, Fishers and Food (1988) Agricultural Land Classification of England and Wales. Revised guidelines and criteria for grading the quality of agricultural land
[2] Natural England (2012) Technical Information Note 049. 'Agricultural Land Classification: protecting the best and most versatile agricultural land. Accessed 01/11/2019 http://publications.naturalengland.org.uk/publication/35012
[3] Kirklees Council (2019) Kirklees Local Plan Strategies and Policies (accessed 01/11/2019) https://www.kirklees.gov.uk/beta/planning-policy/local-plan.aspx
[4] DMRB (2001) Volume II Environmental Assessment, Section 3, Environmental Assessment Techniques, Part 6 Land use-Amendment No. 1
[5] DMRB (2019) Sustainability & Environment Appraisal LA109 Geology and soils https://www.standardsforhighways.co.uk/prod/attachments/adca4c7d-4037-4907-b633-76eaed30b9c0?inline=true
[6] DMRB (2019) Sustainability & Environment Appraisal LA112 Population and human health https://www.standardsforhighways.co.uk/prod/attachments/1e13d6ac-755e-4d60-9735-f976bf64580a?inline=true

19.2.7 DMRB guidance states that land use effects shall be assessed during construction and for the first year of operation (future year scenario). After the first year of operation, effects on land use associated with routine maintenance are unlikely to be significant as landowners, will adapt to the new circumstances. In contrast, loss of BMV land is an unmitigable and permanent damaging loss to the nation's agricultural resource.

19.3 Assessment methodology

Study area

19.3.1 For agricultural soils, the study area is consistent with the Scheme boundary and includes land required for construction areas and construction compounds (permanent and temporary land take).

19.3.2 When assessing effects on farming operations, the study area incorporates farm entities whose land is to be affected by the Scheme on a permanent or temporary basis as a whole. This may extend beyond the Scheme boundary to include all land associated with an affected farm entity.

Data sources and limitations

19.3.3 Given the small area of agricultural land-take affected by the Scheme, the identification of potentially BMV land is based on professional judgement, drawing on published mapping rather than field investigations. This includes reference to soil and geological maps (Soil Survey of England Wales[7] and British Geological Survey[8]) and ALC maps obtainable from Natural England on their Access to Evidence website[9] and Defra's MAGIC website[10]. It is unlikely that field investigations would significantly refine this published data, given the established clear relationship between geology, soils and ALC. Therefore, no field investigations have been undertaken, in line with a proportionate level of assessment.

19.3.4 Information on cropping on affected farmland has been obtained from Google Earth imagery and interviews with landowners at Helm Farm and The Sands.

19.3.5 Land use data were obtained by interviews with landowners at Helm Farm and The Sands. Lack of specific data from the owner of Ouzelwell Hall Farm does not affect the robustness of the assessment as the land-take by the Scheme is peripheral and of small extent.

Assessment criteria

Sensitivity of receptors

19.3.6 The following sensitivity criteria in Table 19-1 are applied to the agricultural receptors affected by the Scheme.

[7] Soil Survey of England and Wales (1983). Soils of England and Wales, Sheet 1 Northern England. Rothamsted Experimental Station, Harpenden.
[8] British Geological Survey Geology http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html
[9] Natural England Access to Evidence. Maps and reports for detailed Post 1988 ALC surveys. http://publications.naturalengland.org.uk/category/5735244522061824
[10] https://magic.defra.gov.uk/

Table 19-1 Sensitivity criteria for agricultural land

Sensitivity	Criteria
Very high	BMV agricultural land in ALC Grades 1 and 2. Agricultural land holdings: 1) areas of land in which the enterprise is wholly reliant on the spatial relationship of land to key agricultural infrastructure; and 2) access between land and key agricultural infrastructure is required on a frequent basis (daily).
High	BMV agricultural land in ALC Grade 3a. Agricultural land holdings: 1) areas of land in which the enterprise is dependent on the spatial relationship of land to key agricultural infrastructure; and 2) access between land and key agricultural infrastructure is required on a frequent basis (weekly).
Medium	Agricultural land in ALC Grade 3b. Agricultural land holdings: 1) areas of land in which the enterprise is partially dependent on the spatial relationship of land to key agricultural infrastructure; and 2) access between land and key agricultural infrastructure is required on reasonably frequent basis (monthly).
Low	Agricultural land which has an ALC Grades 4 or 5. Agricultural land holdings: 1) areas of land which the enterprise is not dependent on the spatial relationship of land to key agricultural infrastructure; and 2) access between land and key agricultural infrastructure is required on an infrequent basis (monthly or less frequent).
Negligible	Previously developed land formerly in 'hard uses' with little potential to return to agriculture. Agricultural land holdings which are infrequently used on a non-commercial basis.

Source: DMRB LA109 and LA112

Magnitude of impact

19.3.7 Magnitude of impact (change) on agricultural holdings is assessed using the criteria in Table 19-2, and the magnitude of impact of the Scheme on agricultural soils is assessed using the criteria in Table 19-3. These use the latest DMRB definitions, with some bespoke explanatory text in italics.

Table 19-2 Assessment of magnitude of impact on agricultural holdings

Magnitude	Criteria
Major	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements. e.g. direct acquisition and demolition of buildings and direct development of land to accommodate highway (*or railway)* assets; and/or introduction (adverse) or removal (beneficial) of complete severance with no/full accessibility provision. ***Adverse*** *- The identified impacts are predicted to result in very significant damage to a farm business or rural land-based enterprise and may compromise its viability.* ***Beneficial -*** *Large scale or major improvement of land quality; extensive restoration or enhancement; previous severe impediments or severance of enterprise removed with full accessibility provided.*
Moderate	Partial loss of/damage to key characteristics, features or elements, e.g. partial removal or substantial amendment to access or acquisition of land compromising viability of property, businesses, community assets or

Magnitude	Criteria
	agricultural holdings; and/or introduction (adverse) or removal (beneficial) of severe severance with limited / moderate accessibility provision. ***Adverse -*** *The identified impacts are predicted to result in significant damage to a farm business or rural land-based enterprise, but with changes to management it should remain viable.* ***Beneficial*** *- Improvement of land quality; removal of previous severance with significantly improved accessibility provision.*
Minor	A discernible change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements, e.g. amendment to access or acquisition of land resulting in changes to operating conditions that do not compromise overall viability of property, businesses, community assets or agricultural holdings; and/or introduction (adverse) or removal (beneficial) of severance with adequate accessibility provision. ***Adverse -*** *The identified impacts are predicted to result in some damage to a farm business or rural land-based enterprise, but with minor changes to management it should continue as before.* ***Beneficial -*** *Some minor benefits may occur through improvements to access, drainage, field shapes etc.*
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements. e.g. acquisition of non-operational land or buildings not directly affecting the viability of property, businesses, community assets or agricultural holdings; and/or very minor introduction (adverse) or removal (beneficial) of severance with ample accessibility provision. *The identified impacts are predicted to result in little change (adverse or beneficial) to a farm business or rural land-based enterprise.*

Source: DMRB LA109 (non-italic text).

Table 19-3 Assessment of magnitude of impact on agricultural soils

Magnitude	Criteria
Major	Physical removal or permanent sealing of >20ha of agricultural land.
Moderate	Physical removal or permanent sealing of 1ha - 20ha of agricultural land; or permanent loss/reduction of one or more soil function(s) and restriction to current or approved future use (e.g. through degradation, compaction, erosion of soil resource).
Minor	Temporary loss/reduction of one or more soil function(s) and restriction to current or approved future use (e.g. through degradation, compaction, erosion of soil resource).
Negligible	No discernible loss/reduction of soil function(s) that restrict current or approved future use.

Source: DMRB LA109

Significance of effect

19.3.8 The significance of effect on the agricultural baseline is determined by consideration of a combination of the magnitude of the impact and the sensitivity of each receptor, with a level of professional judgement included in the determination. The matrix for determining the significance of effect, is demonstrated in Table 19-4.

19.3.9 Where two potential values of significance of effect are identified, professional judgement is used to assign the value, based on understanding of details of both the magnitude of impact and value of the asset. For example, where a Minor impact is identified in relation to a receptor of High sensitivity, professional judgement would be used to determine whether this results in a Slight or Moderate adverse effect.

Table 19-4 Determination of significance of effect

		Impact magnitude				
		Major	**Moderate**	**Minor**	**Negligible**	**No Change**
Sensitivity	**Very high**	Very Large	Large or Very Large	Moderate or Large	Slight	Neutral
	High	Large or Very Large	Moderate or Large	Slight or Moderate	Slight	Neutral
	Medium	Moderate or Large	Moderate	Slight	Neutral or Slight	Neutral
	Low	Slight or Moderate	Slight	Neutral or Slight	Neutral or Slight	Neutral
	Negligible	Slight	Neutral or Slight	Neutral or Slight	Neutral	Neutral

19.3.10 In general, Moderate to Very Large effects are considered to be "significant" in terms of this EIA. Where necessary professional judgement is used to conclude whether an effect is significant.

Scoping and consultation

19.3.11 A Scoping Opinion was received in July 2019. No comments were received with regards to the assessment approach or detail proposed for the agriculture assessment.

19.3.12 Natural England is the statutory consultee where there is to be loss of more than 20ha of BMV land. That threshold is not reached on the Scheme, so consultation is not required.

19.4 Baseline

Accessing baseline data

19.4.1 The western extent of the Scheme mainly consists of residential development and commercial/industrial premises, with agricultural land found to the eastern end of the route. Agricultural land and three agricultural holdings are directly affected in three of the route sections, as follows:

- Helm Farm, mixed arable and grass farm – Located within Route Section 4 Colne Bridge and Battyeford;
- Sands Grass Holding, small grass farm – Located within Route Section 5 Mirfield and Lower Hopton; and
- Ouzelwell Hall Farm, mixed arable and grass farm – Located within Route Section 6 Ravensthorpe and Westtown.

19.4.2 The affected agricultural land is at Helm Farm (between Colne Bridge and Battyeford), Sands Grass Holding (east of Mirfield Station) and Ouzelwell Hall Farm (south of the new Ravensthorpe Station). Data accessed relates to soils, ALC and agricultural land use.

19.4.3 The assessment is based on the whole farm enterprise, irrespective of the individual ownerships of land parcels within the farm boundary. It is common for ownership to be divided among family members or institutions who are not involved in the day-to-day running of the farm.

Soils and agricultural land quality

19.4.4 The British Geological Survey's (BGS) Geology of Britain Viewer[11] shows the affected farmland to be underlain by Pennine mudstone and siltstone, with outcrops of Clifton Rock Sandstone, and alluvium beside the River Calder.

19.4.5 There is no detailed published soil map of the study area. The only available map is the 1:250,000 soil map of Northern England published by the Soil Survey of England and Wales in 1983[12]. This shows the soils developed in Carboniferous mudstone and siltstone to be the Dale association of slowly permeable, seasonally waterlogged clayey soils. Well drained sandy loam soils of the Rivington association occur over the Clifton Rock Sandstone. Undifferentiated alluvial soils are mapped on the River Calder's floodplain.

19.4.6 BMV land is in the Ministry of Agriculture Fisheries and Food (MAFF) ALC Grades 1, 2 and Subgrade 3a[13], as defined in Annex 2 of the NPPF and in Natural England's Technical Information Note 049.

19.4.7 The published MAFF 1:250,000 Provisional ALC Map of Yorkshire and the Humber[14] provides only a broad indication of land quality and should not be used definitively on specific sites smaller than 80ha. Moreover, the published map does not subdivide Grade 3 into Subgrades 3a and 3b and so cannot be used definitively in areas that are marginal to BMV. The entire study area is shown as Grade 3 (good to moderate quality) within a wider area of Grades 3 and 4.

19.4.8 In 1988, MAFF published a revised system of ALC that subdivided Grade 3 Subgrades 3a and 3b[15]. In the study area, where the average annual rainfall is around 770mm and the number of field capacity days is 193, soil wetness in relation to topsoil texture is the main factor determining ALC grade. Drought can affect lighter, well drained soils and there is a risk of flooding beside the River Calder. Slowly permeable, clayey soils of the Dale association cannot be better than Subgrade 3b (moderate quality). Free draining loamy Rivington soils are in Grade 2 (very good quality), their only limitation being a slight tendency to drought. The alluvial soils at Sands are at risk of flooding which puts them in Subgrade 3a (good quality).

19.4.9 In terms of sensitivity, Grade 2 is very high, Subgrade 3a is high and 3b is Medium (see Table 19-1).

Route Section 4

19.4.10 The geology at Helm Farm consists of the Pennine Lower Coal Measures Formation of mudstone and siltstone forming the lower ground and Clifton Rock Sandstone forming the higher ground.

19.4.11 A detailed ALC map of the land at Helm Farm is published on the government's MAGIC

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[11] British Geological Survey. Geology of Britain Viewer. https://mapapps.bgs.ac.uk/geologyofbritain/home.html Accessed 01/11/19
[12] Soil Survey of England and Wales (1983) Soils of England and Wales, Sheet 1 Northern England. Rothamsted Experimental Station, Harpenden.
[13] MAFF (1988) Agricultural Land Classification of England and Wales. Revised Guidelines and Criteria for Grading the Quality of Agricultural Land http://webarchive.nationalarchives.gov.uk/20130402151656/http:/archive.defra.gov.uk/foodfarm/landmanage/land-use/documents/alc-guidelines-1988.pdf, Accessed on 01/11/2019
[14] Natural England (n.d) Regional Agricultural Land Classification Maps. Yorkshire and the Humber Region , Accessed on 01/11/2019 from http://publications.naturalengland.org.uk/publication/141047?category=5954148537204736
[15] MAFF 1988 Revised guidelines and criteria for grading the quality of agricultural land http://publications.naturalengland.org.uk/publication/6257050620264448

website[16] and can be seen in Figure 19-1. These confirm the well-drained, sandy loam soils of the Rivington association to be BMV land in Grade 2 and the clayey Dale association to be in Subgrade 3b (non-BMV). At Helm Farm around 50% of the affected land is therefore assessed as Grade 2 (BMV) and very high sensitivity.

Route Section 5

19.4.12 The affected agricultural land within Route Section 5 is part of a 12ha grass holding known as "The Sands".

19.4.13 The Geology of Britain Viewer shows the geology at The Sands as alluvium. The 1:250,000 scale Soils of Northern England map shows the presence of sand and gravel workings on adjacent floodplain across the railway which indicates that the overlying fine textured alluvial sediments are thin.

19.4.14 A detailed ALC map of the adjacent land north of the railway, prior to sand and gravel extraction[17], describes the soil as a well-drained silty clay loam over gravel and is classified as ALC Subgrade 3a (good quality) and high sensitivity.

Route Section 6

19.4.15 The Geology of Britain Viewer shows the whole of the affected land to be underlain by the Pennine Lower Coal Measures Formation, largely consisting of a unit described as 'interbedded grey mudstone, siltstone and pale grey sandstone, with mudstones and coal seams in the lower and upper parts respectively'.

19.4.16 The 1:250,000 scale Soils of Northern England map shows the soils to be the Dale association of slowly permeable, seasonally waterlogged clayey soils.

19.4.17 There is no published detailed ALC map of the affected land on the government's MAGIC website. However, an ALC map of the land at Helm Farm in Route Section 4 puts these soils in Subgrade 3b (moderate quality) and so it can be inferred that the affected soils in this section are also in Subgrade 3b, which is not BMV quality and is of medium sensitivity.

Agricultural holdings

Route Section 4 – Helm Farm

19.4.18 Helm Farm comprises 48 ha and is in two short term tenancies. Cropping is grass for beef and sheep and cutting of hay and silage.

19.4.19 This type of farmland is of medium sensitivity.

Route Section 5 – The Sands grass holding

19.4.20 Google Earth imagery of the affected land at Sands Grass Holding shows that this land has been under grass since at least 2002. It forms part of a 12ha grass holding belonging to Sands House. Discussions with the owners in November 2019 confirmed that the land has a grazing tenant who rents or owns other farmland in the district.

19.4.21 The farmland is of medium sensitivity.

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[16] www.magic.gov.uk
[17] Natural England. Sands Lane, Mirfield, Agricultural Land Classification. publications.naturalengland.org.uk/file/5648676328833024

Route Section 6 – Ouzelwell Hall Farm

19.4.22 Google Earth imagery of the affected land at Ouzelwell Hall Farm shows it to be in winter cereal based arable rotations with some temporary grass; a land use typically associated with moderate to large farms of 80ha or more and of medium sensitivity.

19.4.23 The farmland is of medium sensitivity.

Assumptions and limitations

19.4.24 High level information has been obtained through Network Rail's land and property team on the agricultural holdings affected by the Scheme. This, alongside freely available mapping data and knowledge of farm management practices, is sufficient to inform the baseline and agricultural impact assessment in this EIA. As part of the TWAO process, there will be a continued endeavour to engage with the affected parties to collate information on farm management operations. However, based on the impacts of the Scheme, it is considered that the mitigation outlined in this assessment is appropriate to mitigate for the level of effects anticipated.

19.5 Potential effects

19.5.1 There is a need for acquisition (temporary and permanent) of agricultural land to build and operate the Scheme. In most cases, the temporary and permanent land acquisition will occur simultaneously at the start of the construction period and it is the combined effect of both that will have an impact on the holdings and associated agricultural soils. During the construction period, the temporarily acquired agricultural land will be restored and so the impact on individual holdings and agricultural soils will be reversed.

19.5.2 Temporary construction effects will occur on the land required to construct the Scheme and will include: any temporary severance of land during the construction period and the effects of disruption, principally from construction noise and dust, on land uses.

19.5.3 Where land is required permanently, the effect would begin during the construction period and remain following the construction period into operation of the Scheme.

Construction

19.5.4 In total, approximately 21.77ha of agricultural land will be acquired during the construction phase, of which 11.56ha will be acquired temporarily for construction purposes. The remaining 10.21ha will be permanently acquired for the operation of the Scheme.

Agricultural soils

19.5.5 The magnitude of impact for the overall loss of 21.77ha of agricultural soils during construction is Major. Of this, 5.17ha is Grade 2 and Subgrade 3a (very high or high sensitivity) and so the overall effect of the Scheme in the construction phase on agricultural soils (taking into account the mix of Grade 2 and 3a) is **Large adverse**, which is significant. A more detailed breakdown of the impacts to agricultural soils within each Route Section is provided in the following paragraphs.

Route Section 4

19.5.6 The affected agricultural land in Route Section 4 is under arable and grass rotations. Land-take in the construction phase will be 7.83ha, of which 4.97ha (see Figure 19-2) will be restored to farming following construction of the Scheme. The land is in ALC Grade 2 (very high sensitivity) and Subgrade 3b (medium sensitivity) and circa 3.92ha is BMV.

19.5.7 The loss during construction of 7.83ha of agricultural soil including 3.92ha of Grade 2 land (very high sensitivity) is a Moderate impact magnitude having a **Large adverse** effect, which is significant.

Route Section 5

19.5.8 During construction, 1.25ha of Subgrade 3a BMV land (high sensitivity) will be acquired for a compound resulting in a Moderate impact magnitude. All, apart from 0.13 ha, will be returned to agriculture. The effect of the temporary loss of BMV land is **Moderate adverse**, which is significant.

Route Section 6

19.5.9 Land take in the construction phase will be 12.69ha of Subgrade 3b land (i.e. non-BMV quality), which will be used as a construction compound and for undergrounding of overhead power lines (see Figure 19-2).

19.5.10 Subgrade 3b land is of Medium sensitivity and the loss of 12.69ha is of Moderate impact magnitude resulting in a **Moderate adverse** effect**,** which is significant.

Summary of loss of agricultural soils during construction

19.5.11 In summary, temporary construction land-take will total 21.77ha, of which 11.56ha will be returned to agriculture use following construction:

- 7.83ha is located in Route Section 4 including 3.92ha of BMV Grade 2 land and 3.91ha of Grade 3b land;
- 1.25ha of BMV Subgrade 3a land is located in Route Section 5;
- 12.69ha is located in Route Section 6 which is Subgrade 3b land.

Agricultural holdings

19.5.12 Three agricultural holdings will be affected during the Scheme construction with the details set out as follows:

Route Section 4 – Helm Farm

19.5.13 Temporary adverse construction impacts at Helm Farm will include:

- Loss of use of 7.83ha for hay and silage making and grazing;
- Stripping and stockpiling of topsoil;
- Noise, but this is should not disturb grazing livestock that can move away from disturbance;
- Dust arising from construction;
- Risk of noxious weeds spreading from stockpiles; and
- Restoration of the topsoil.

19.5.14 These impacts are Minor as the land take does not involve severance of any part of the holding (which is of Medium sensitivity), so its farming operation will continue as before, but on a slightly reduced area. The effect, therefore, is only **Slight adverse**, which is not significant.

Route Section 5 - Sands Grass Holding

19.5.15 Temporary adverse construction impacts at Sands Grass Holding will include:

- Presence of a construction compound resulting in loss of use of 1.25ha of grazing land;
- Stripping and stockpiling of topsoil;

- Noise affecting livestock and dust which may affect the quality of surrounding crops during the construction process;
- Restoration of the topsoil; and
- Potential spread of noxious weeds onto surrounding farmland from stockpiles and by vehicle movements.

19.5.16 The compound is on the edge of the holding so there will be no severance. The impact magnitude is Minor as the holding (Medium sensitivity) will, with small changes to management, continue as before and loss of 1.25ha of BMV land will be only temporary. The effect, therefore, is **Slight adverse**, which is not significant.

Route Section 6 - Ouzelwell Hall Farm

19.5.17 The loss of use of 12.69ha of land at Ouzelwell Hall Farm is assessed as no more than a Minor impact, as with small changes to management it should continue as before.

19.5.18 Temporary adverse construction impacts at Ouzelwell Hall Farm will include:

- Loss of use of land due to presence of a construction compound, haul roads and overhead electricity cabling works;
- Stripping and stockpiling of topsoil;
- Noise affecting livestock and dust which may affect the quality of surrounding crops during the construction process;
- Restoration of the topsoil; and
- Potential spread of noxious weeds onto surrounding farmland from stockpiles and by vehicle movements.

19.5.19 A Minor beneficial permanent impact will result from the dismantling of pylons and overhead electricity power lines from nine fields, removing the obstruction to cultivation and spraying. There will however be a temporary loss of access to the affected fields during the works.

19.5.20 The magnitude of these impacts, adverse and beneficial, are Minor. The land take does not involve severance of any part of the holding (which is of Medium sensitivity), so its farming operation will continue as before, but on a slightly reduced area, compensated for to some extent by removal of pylons. The overall effect, therefore, is **Slight adverse**, which is not significant.

Operation

19.5.21 The main agricultural impact arising from the operation of the Scheme is the permanent loss of 10.21ha of farmland.

Agricultural soils

19.5.22 The permanent loss of 10.21ha of land will become an operational impact as it cannot be mitigated. The magnitude of this impact is Moderate. Of this land, 1.56ha is Grade 2 (very high sensitivity) and Subgrade 3a (high sensitivity) and so the overall effect of the Scheme in the operational phase is **Large adverse**, which is significant.

19.5.23 Without correct storage of soil resources during construction, a loss or reduction in soil function could occur for land which is to be ‘restored’. With mitigation outlined in Section 19.6, this impact will be avoided.

19.5.24 The impacts on each Route Section are described more particularly below.

Route Section 4

19.5.25 There are no operational impacts on agricultural soils apart from the permanent loss of 2.86ha, of which 1.43ha is Grade 2 (Very High sensitivity), which is Moderate impact having a **Large adverse** effect, and which is significant.

Route Section 5

19.5.26 There will be a permanent loss of 0.13 ha in Subgrade 3a (High sensitivity) which is of Negligible impact, having a **Slight adverse effect** which is not significant.

Route Section 6

19.5.27 Permanent loss of 7.22ha of Grade 3b (Medium sensitivity) is a Moderate impact magnitude and the significance of effect of this loss is **Moderate adverse**, which is significant.

Agricultural holdings

19.5.28 During operation, land-take will cease to be an adverse effect on farming operations beyond the first year or so as management systems will have adjusted to the status quo. Potential indirect operational effects are noise emanating from moving trains (specifically related to intensification of use of the route or realignment of the track i.e. a change from baseline) and the propensity of operational land to harbour noxious weeds. With regard to the latter, Network Rail has weed control procedures in place along all its tracks (see mitigation in Section 19.6 below).

Route Section 4 – Helm Farm

19.5.29 The new railway alignment within Helm Farm will result in a permanent loss of 2.86ha. The impact is Minor for this receptor of Medium sensitivity, resulting in a **Slight adverse** effect, as the land take does not involve severance of any part of the holding. Its operation will, with small changes to management, continue as before, but on a slightly reduced area.

19.5.30 Noise is not considered to be an operational impact here as grazing livestock are able to move freely away from the sound source and soon become habituated to passing trains. Noise would only be an issue for fixed livestock buildings or other enclosures close to the track, but there are none in this location.

19.5.31 Operational land, being outside the control of the neighbouring farmer, has the potential to harbour noxious weeds. Unmitigated, this would have a **Slight adverse** effect on Helm Farm, which is not significant, but the additional risk is considered extremely low.

Route Section 5 – Sands Grass Holding

19.5.32 Permanent loss of 0.13 ha will have a Negligible impact on land of Medium sensitivity and the effect **Neutral.** Other potential impacts arising from the operation of the Scheme at Sands Grass Holding are limited to indirect ones such as noise and noxious weeds. However, there should be no change, in this regard, from the existing operational impacts of the railway, which are already very low risk, and so the impact will be Negligible and the effect **Neutral**.

Route Section 6 - Ouzelwell Hall Farm

19.5.33 The permanent loss of 7.22ha to this farming operation of medium sensitivity is assessed as no more than a Minor impact, as with small changes to management it should continue as before. The effect is therefore **Slight adverse**, which is not significant.

19.5.34 Other potential impacts on agricultural land at Ouzelwell Hall Farm are limited to indirect

effects such as noise and noxious weeds. However, there should be no change, in this regard, from the existing operational impacts of the railway, which are already very low risk, and so the impact will be Negligible and the effect **Neutral**.

19.6 Mitigation measures

Agricultural soils

Construction

19.6.1 At the end of the construction phase, 11.56ha of the 21.77ha of land acquired is to be restored to a condition suitable for its existing land uses (agriculture), assuming this is the agreed end-use between the landowner and Network Rail.

19.6.2 A survey of the existing condition of this 11.56ha will be made before any works start. This will be detailed within the Code of Construction Practice (CoCP). Part A of the CoCP can be found at Appendix 2.1 in Volume 3 of this ES.

19.6.3 Part B of the CoCP, will be submitted to and agreed by the Local Authority pursuant to a condition to be attached to the deemed planning permission[18] before construction works commence.

19.6.4 Part B of the CoCP will include a soil management plan (SMP) which will include a pre-disturbance record of the 11.56ha of soil's physical characteristics and ALC grade of the land.

19.6.5 The quality and quantity of soil on-site will be maintained by implementing appropriate techniques for stripping, stockpiling and reinstatement, in accordance with Defra's 2009 Code of Practice for the Sustainable Use of Soils on Construction Sites[19]. This will include details of suppression of noxious weeds on stockpiles.

19.6.6 The construction site will be subject to an aftercare period, the duration of which will be defined in the SMP (Part B of the CoCP). During this after care period, problems with settlement, drainage and weed infestation will be rectified.

Agricultural holdings

Construction

19.6.7 There is no environmental mitigation for temporary loss of use of agricultural land. Acquisition by negotiation is the preferred option, however if necessary, land will be compulsorily purchased through the TWAO.

19.6.8 Impacts of construction on the affected agricultural holdings will be minimised through liaison between the contractor and landowner and tenant, as set out in the External Communications Programme to be produced and approved by the local authority under Part B of the CoCP. Discussions are already ongoing between the landowners and tenants and Network Rail's land and property team). Mitigation measures included within Part A of the CoCP include:

- Demarcation of the construction working corridor once defined, in order to prevent disturbance to adjacent land;

[18] On making an order under the Transport and Works Act 1992, the Secretary of State may direct that planning permission shall be deemed to be granted, subject to such conditions (if any) as may be specified in the direction.
[19] HMSO. DEFRA. CoP sustainable use of soils, 'Code of practice for the sustainable use of soils on construction sites'

- Provision of temporary access to land which is severed by construction works, if required by the farmer;
- Diversion or restoration of existing land drainage systems affected by the engineering works; and
- Suppression of dust and reduction of noise in the vicinity of livestock.

19.6.9 Any noise disturbance is expected to be slight, and not requiring mitigation, as livestock are soon habituated to construction noise and able to move freely away from the construction site if they are disturbed.

Operation

19.6.10 There is no environmental mitigation for permanent agricultural land-take

19.6.11 Noise reduction measures for livestock should not be required as no confined livestock are close to railway, even at Helm Farm where the railway is to be realigned onto farmland. Network Rail will continue to abide by its obligations to prevent the spread of noxious weeds from its land and the operational impacts of noise and weeds will be negligible.

19.7 Residual effects

19.7.1 The potential scale of effect is determined by combining the highest impacts on agricultural soils and farm holdings with their sensitivity.

Agricultural soils

19.7.2 For agricultural soils, where there is a mixture of BMV and non-BMV land, the assessment of residual effect is based on the permanent sealing or removal of the BMV soils.

Construction

19.7.3 Land acquisition for construction will total 21.77ha, but 11.56ha of this will only be acquired temporarily and will suffer no post-construction residual effect.

Route Section 4

19.7.4 During construction, the loss of 7.83ha of land, 3.92ha of which is BMV (very high sensitivity), cannot be mitigated. This will result in a temporary moderate impact and a **Large adverse** residual effect, which is significant.

Route Section 5

19.7.5 The loss of 1.25ha of Subgrade 3a BMV land (high sensitivity) during construction, is a Moderate magnitude impact, resulting in a **Moderate adverse** residual effect which is significant.

Route Section 6

19.7.6 The temporary loss of 12.69ha of Grade 3b (i.e. non-BMV quality) agricultural soil is a Moderate adverse impact magnitude. Grade 3b land is of Medium sensitivity and the significance of residual effect of a loss of 12.69ha is **Moderate adverse**, which is significant.

Operation

19.7.7 With mitigation in place, there should be no discernible loss/reduction in soil function that will restrict future agricultural uses of the land that has been restored. Therefore, the magnitude of the impact will be negligible and not significant for all restored agricultural soils.

Route Section 4

19.7.8 The permanent loss of agricultural land, following restoration of temporarily acquired land during construction, is 2.86ha. Grade 2 BMV land of Very High sensitivity accounts for 1.43ha of this permanent loss, with a Moderate impact resulting in a **Large adverse** residual effect which is significant.

Route Section 5

19.7.9 Of the 1.25ha of agricultural soils acquired for construction 1.12ha will be restored to farming, such that there should be no discernible loss/reduction in soil function that will restrict future agricultural uses. The magnitude of impact is assessed as Negligible and the residual effect of the permanent loss of 0.13ha of BMV land (Subgrade 3a land of High sensitivity) will be **Slight**.

Route Section 6

19.7.10 The effect of the Scheme on agricultural soils in Route Section 6 is a permanent loss of 7.22ha of Subgrade 3b land (Medium sensitivity). This is a Moderate impact and the residual effect is **Moderate adverse**, which is significant.

19.7.11 Table 19-5 summarises the total loss of agricultural land to the Scheme across all three affected Route Sections. The losses per holding and Route Sections are given elsewhere in this chapter, but here the summary is presented in terms of the significance of the loss in terms of utilised agricultural land in England, where agricultural land totals 9.1million ha, of which around 5.3million ha is of BMV quality[20].

Table 19-5 Summary of residual effect on Scheme-wide agricultural soils (operation)

Total area of affected soils	Sensitivity	Impact magnitude before mitigation	Mitigation	Impact magnitude after mitigation	Residual effect (significance)
Permanent loss of 1.56ha of BMV land which 1.43 ha is Grade 2	Very High to High	Moderate	N/A	Moderate	**Large adverse (Significant)**
Permanent loss of 8.65 ha of Grade 3b non-BMV land	Medium	Moderate	N/A	Moderate	**Moderate adverse (Significant)**
11.56 ha of BMV and non-BMV land temporarily acquired	Very High to Medium	Moderate	Restoration to equivalent of original condition	Negligible	**Slight adverse** or **Neutral. (Not significant)**

19.7.12 The total loss of BMV land will be a permanent loss to the nation's agricultural resource and overall, for the Scheme, the loss results in a **Large adverse** and significant effect.

[20] Defra (2018), Farming Statistics Final Land Use, Livestock Populations and Agricultural Workforce at June 2017 – England.

Agricultural holdings

Construction

19.7.13 A summary of residual effects during construction is presented for the holdings in each Route Section as follows.

Route Section 4

19.7.14 The holding is a receptor of Medium sensitivity and the Minor impact of a loss of 7.83ha means that the residual effect is **Slight adverse**.

19.7.15 Noise and dust will have a Negligible or Minor impact and the effects are no more than **Slight adverse.**

19.7.16 Therefore, the construction residual effects are not significant.

Route Section 5

19.7.17 The loss of use of 1.25 ha of grazing on a holding of Medium sensitivity will have a Minor impact, resulting in a **Slight adverse** effect on the farming operation, which is not significant.

Route Section 6

19.7.18 The holding is a receptor of Medium sensitivity and the Minor impact of loss of 12.69ha means that the residual effect is **Slight adverse**, which is not significant.

Operation

19.7.19 A summary of residual effects during operation is presented for the holdings in each Route Section as follows. DMRB guidance states that land use effects shall be assessed during construction and for the first year of operation (future year scenario). After the first year of operation, effects on land use associated with routine maintenance are unlikely to be significant as landowners will adapt to the new circumstances.

Route Section 4

19.7.20 The permanent loss of 2.86ha to an agricultural holding of Medium sensitivity is assessed as a Minor impact, and with small changes to management it should continue as before. The residual effect is therefore **Slight adverse** which is not significant.

19.7.21 The impact of noise will be negligible and **Neutral** in its effect. With continued measures from Network Rail to control noxious weeds on their land, there should be no change in terms of the impact on adjacent farmland.

19.7.22 Therefore, the residual operation effects are not significant.

Route Section 5

19.7.23 Following restoration of all except 0.13ha to farming and with no additional impacts in terms of noise and weeds, the magnitude of impact is assessed as Negligible. Therefore, the residual effect of the Scheme on this holding of Medium sensitivity is assessed as **Neutral**.

Route Section 6

19.7.24 The permanent loss of 7.22ha to an agricultural holding of Medium sensitivity is assessed as a Minor impact, and with small changes to management it should continue as before. The residual effect is therefore **Slight adverse** which is not significant.

19.7.25 There will be no change to the existing impacts of noise and weeds and the residual effect of these is assessed as Neutral.

Table 19-6 Residual effect of loss of land on agricultural holdings (operation)

Route Section	Affected farm	Sensitivity	Impact magnitude before mitigation	Mitigation	Impact magnitude after mitigation	Residual effect
4 – Colne Bridge and Battyeford	Helm Farm	Medium	Minor, due to loss 7.83ha of land	Restoration of 4.97ha of land to agricultural land	Minor, due to permanent loss of 2.86ha	Slight adverse
5 – Mirfield and Lower Hopton	Sands	Medium	Minor, due to loss of only 1.25ha of land	Restoration of 1.12ha of land to agricultural land	Permanent loss of 0.13 ha is negligible.	Neutral
6 – Ravensthorpe and Westtown	Ouzelwell Hall Farm	Medium	Minor, due to loss of 12.69ha of land	Restoration of 5.47ha of land to agricultural land	Minor, due to permanent loss of 7.22ha	Slight adverse

19.8 Cumulative effects

19.8.1 Cumulative effects can include intra-scheme impacts and inter-Scheme impacts. Intra-Scheme impacts are where in-combination impacts arise from the Scheme. Inter-Scheme impacts occur due to impacts from more than one scheme.

19.8.2 The approach for the cumulative impact assessment is detailed in Chapter 22 (Cumulative effects) of this ES.

Intra-Scheme (synergistic) effects

19.8.3 Potential intra-Scheme effects may occur from interaction with other environmental topics.

19.8.4 Potential synergistic impacts have been identified that correspond to agriculture. These include:

- Biodiversity;
- Air quality;
- Water environment;
- Waste and materials;
- Noise and vibration; and
- Population and human health.

19.8.5 Given the mitigation measures proposed in relation to these environmental topics and the overall effects that have been assessed, it is expected that there will be only Minor intra-Scheme cumulative effects and it is not considered that any of these would be significant.

12.1.1 Receptors that are affected by two or more residual effects have been identified within Chapter 22 (Cumulative effects) of this ES.

Inter-Scheme effects

19.8.6 Inter-Scheme cumulative effects may occur from interaction with other proposed developments (Reasonably Foreseeable Future Projects (RFFPs) located near the Scheme. When combined with the works for the Scheme, these could cumulatively affect sensitive receptors. Inclusion of RFFPs includes their proximity to the Scheme, likely impacts and timing of construction and operation.

19.8.7 An area of around 160ha of agricultural land in the Ravensthorpe area (Route Section 6) has been designated for future use as housing through the adopted Kirklees Local Plan (2019). Kirklees Local Plan Allocation HS61 (Dewsbury Riverside) would provide 4000 residential units (1869 units during plan period, with potential for a further 2131 beyond the plan period).

19.8.8 The Scheme proposes the permanent loss of around 7.22ha of land in Route Section 6 allocated for the Dewsbury Riverside development, which is 4.5% of the 160ha, and therefore is not significant when compared to the wider housing allocation site which will likely result in large adverse effects to agricultural soils, including BMV land and agricultural holdings, which cannot be mitigated.

19.8.9 No formal application has been made in relation to the housing development, so the precise impact is not fully understood at this stage. It is anticipated that any planning application for the proposed housing development will consider the potential effects of the Scheme and this will also include land lost due to the works proposed to upgrade the railway.

19.8.10 Based on professional judgement and considering the residual effect of this Scheme, it is unlikely there will be a significant cumulative effect.