Scotland England Green Link 2 - English Onshore Scheme

Environmental Statement: Volume 2

Chapter 12: Agriculture and Soils

May 2022

For: National Grid Electricity Transmission

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12. Agriculture and Soils

12.1 Introduction

This chapter reports the results of baseline studies and the assessment of the potential impacts of the English Onshore Scheme on agriculture and soils. The assessment will consider the following receptors:

- agricultural land and land use in terms of the loss of best and most versatile (BMV) land; and
- soil resources in terms of potential damage and loss.

This chapter should be read in conjunction with the following chapters of this Environmental Statement (ES):

- Chapter 7: Ecology and Nature Conservation;
- Chapter 10: Geology and Hydrogeology;
- Chapter 11: Hydrology and Land Drainage; and
- Chapter 15: Socio-Economics, Recreation and Tourism.

This chapter is supported by the following figures:

- **Figure 12-1**: Provisional Agricultural Land Classification;
- **Figure 12-2**: Predictive Agricultural Land Classification;
- **Figure 12-3**: ALC Survey for Converter Station (Permanent Development); and
- **Figure 12-4**: Soil Associations.

12.1.1 Definitions

The following definitions are provided as they provide context to this chapter:

- Agricultural Land Classification (ALC) - is a standardised method for classifying agricultural land according to its versatility, productivity and workability, based upon inter-related parameters including climate, relief, soil characteristics and drainage. These factors form the basis for classifying agricultural land into one of five grades (with Grade 3 land divided into Subgrades 3a and 3b), ranked from excellent (Grade 1) to very poor (Grade 5). ALC is determined using the Ministry of Agriculture, Fisheries and Food (MAFF) Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land,1988 (Ref 12-1).
- Best and Most Versatile (BMV) - agricultural land is described in the National Planning Policy Framework, 2019 (NPPF) (Ref 12-2), which defines BMV agricultural land as land of excellent (ALC Grade 1), very good (Grade 2) and good (Subgrade 3a) agricultural quality. BMV land is afforded a degree of protection against development within planning policy. Moderate, poor and very poor quality land is designated Subgrade 3b or Grades 4 and 5, respectively, and is restricted to a narrower range of agricultural uses.
- Soil series are the lowest category in the soil classification system and are precisely defined based upon particle-size distribution, parent material (substrate) type, colour and mineralogical characteristics. Soil associations are groupings of related soil series.

12.2 Planning Policy and Applicable Legislation

12.2.1 Introduction

This section sets out the legislative and policy framework for agriculture and soils within the UK.

12.2.2 Legislation

A summary of the relevant legislation is given in **Table 12-1.**

Table 12-1 Legislation relevant to agriculture and soils

Legislation Reference	Legislation Context
The Town and Country Planning (Development Management Procedure) (England) Order 2015 (**Ref 12-3**)	
Schedule 4, Para 1, Part (y)	Requires that the local planning authority consults Natural England if the area of a proposed permanent development exceeds 20 ha of BMV land
The Agriculture Act, November 2020 (**Ref 12-4**)	
Chapter 1 'New Financial Assistance Powers', section 1	The Secretary of State may give financial assistance for, or in connection with, …protecting or improving the quality of soil.

As the UK has now left the EU, the UK is not likely to adopt the Soil Strategy for 2030, however, the current government has stated its intention to match or better European environmental protection legislation and so it is likely that many of the principles of the Soil Strategy for 2030 will be carried forward into UK policy over time. The implications of any new legislation which may come into force during the planning stages of the English Onshore Scheme will be fully considered where applicable.

12.2.3 National Policy

A summary of the relevant national planning policies is given in **Table 12-2.**

Table 12-2 National planning policy relevant to agriculture and soils

Policy Reference	Policy Context
Overarching National Policy Statement for Energy (EN-1), 2011 latest (**Ref 12-5**) (Draft update available in September 2021)	
Paragraph 5.10.8 of Section 5: Land use including open space, green infrastructure & Green Belt	Minimise impacts on BMV land and direct development towards non-agricultural land or land of poorer quality. Identify any effects and seek to minimise impacts on soil quality taking into account any mitigation measures proposed.
National Policy Statement for Electricity Networks Infrastructure (EN-5), 2011 latest (**Ref 12-6**) (Draft update available in September 2021)	
Paragraph 1.7.5 of Section 1	The effects of electricity network infrastructure on soil to be considered both in the short-term and long-term, taking into consideration specific location and the sensitivity of the receiving environment.
Paragraph 2.8.9	Recognises that undergrounding of cables will have a greater environmental consequence to soils than an overhead line will.
National Planning Policy Framework (NPPF), 2021 latest (**Ref 12-2**)	
Paragraph 174	Protection and enhancement of soils. Recognition of the economic and other benefits of the best and most versatile agricultural land.
Paragraph 175 (footnote to)	Where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a higher quality.
25 Year Environmental Plant 'Green Future: Our 25 Year Plan to Improve the Environment', 2018 latest (**Ref 12-7**)	
Section 1, Chapter 1, Point 3	Aims to protect the best agricultural land; manage soils in a sustainable way by 2030 (Goal 5: Using resources from nature more sustainably and efficiently); and restore and protect peatland.

12.2.4 Local Policy

A summary of the relevant local planning policies is given below.

12.2.4.1 East Riding

East Riding Local Plan Strategy Document, 2016 (Ref 12-8)

Policy S4 (A.3.), Supporting development in Villages and the Countryside Seeks to protect BMV land, requires that development '*does not involve a significant loss of best and most versatile agricultural land*'.

East Riding of Yorkshire and Kingston upon Hull Joint Minerals Local Plan 2016-2033 (Ref 12-9)

Policy DM4: Best & Most Versatile Agricultural Land, is considered as policies relate to development in which there is temporary disturbance to soils and agricultural land for the underground High Voltage Direct Current (HVDC) and High Voltage Alternating Current (HVAC) cables. Proposals which would result in the loss of BMV agricultural land will only be supported if the loss is temporary and there would be no overall loss of soil quality following final restoration; or other beneficial after uses can be secured, which would not sterilise the soil resource; or there is a need for the mineral which cannot be met in a suitable, alternative location of lower quality agricultural land.'

12.2.4.2 Selby District

Selby District Core Strategy, 2013 (Ref 12-10)

Policy SP18 and Objective 17. Seeks to protect BMV agricultural land by steering development to areas of least agricultural quality.

Selby District Local Plan Adoption Draft: Part One (General Policies), 2005 (Ref 12-11)

Chapter 5 – Housing. Seeks to protect and preserve BMV land.

Selby District Council Local Plan Preferred Options (Consultation 2021) (Ref 12-12)

Preferred Approach SG5 - Development in the Countryside. Protect and avoid (where possible) the irreversible loss of the best and most versatile land. Avoid development of Grade 1 agricultural land unless there are exceptional circumstances where the significantly outweigh the loss. Direct development towards land of the lowest quality available. Demonstrate soil resources have been protected and used sustainably in line with best practice.

Paragraph 4.23. Requires consultation with Natural England (NE) regarding large-scale non-agricultural development on best and most versatile land that is not in accordance with the development plan.

Saved Policies of the North Yorkshire Waste Local Plan, 2006 (Ref 12-13)

Policy 4/7: Protection of agricultural land. Considered as policies relate to developments in which there is temporary disturbance to soils and agricultural land for underground HVDC and HVAC cables. Directs development towards non-agricultural land and land of lower agricultural quality (non-BMV). An overriding need for the development of BMV land must be proven.

Minerals and Waste Joint Plan (North Yorkshire County Council, York City Council, North York Moors National Park Authority) - at examination stage (Ref 12-14 and Ref 12-15)

Policy D12: Protection of agricultural land and soils. Considered as policies relate to developments in which there is temporary disturbance to soils and agricultural land for underground HVDC and HVAC cables. BMV land will be protected from unnecessary and irreversible loss. Where development is justified, protection and enhancement of soils and the long-term potential to recreate BMV land is prioritised. Where relevant, development will be subject to aftercare requirements and will be required to demonstrate that all practicable steps will be taken to conserve and manage on-site soil resources, including soils with environmental value, in a sustainable way. Development which would disturb or damage soils of high environmental value such as intact peat will not be permitted.

12.3 Approach to Assessment

12.3.1 Introduction

This section describes the approach to the identification and assessment of impacts resulting from the construction and operation of the English Onshore Scheme on agriculture and soils.

12.3.2 Summary of Consultation

12.3.2.1 Scoping Opinion Review

Table 12-3 summarises the consultee comments raised in the scoping opinion in relation to agriculture and soils and outlines how and where this has been addressed in subsequent chapters of the ES. A copy of the scoping opinions is included in **Appendix 5B**.

Table 12-3: Scoping Opinion (Agriculture and Soils)

Consultee	Summary of comment	How and where addressed
Selby District Council (SDC)	Noted that BMV land and soils are considered to be potentially significantly affected and are to be taken forward for further consideration. Noted that agricultural operations are not considered to be potentially significantly affected and is not to be taken forward for further consideration.	The agriculture and soils assessment focuses on the identification of the soil types and the BMV status of land which may be impacted by the English Onshore Scheme. The assessment criteria (see Section 12.3.3: Assessment Methodology) are based upon the degree damage (disturbance/harm) to, and the loss of soil resource; and the loss of BMV agricultural land.
Natural England (NE)	*Policies on the protection of BMV land and consideration of the sustainable use of soils in paragraph 170 of the NPPF* (Ref 12-2) should be considered.* *The assessment should consider:* the degree of harm or disturbance to soils and whether 'BMV agricultural land is impacted; the need for ALC survey; and details of how impacts to soils can be minimised, including reference to DEFRA's Construction Code of Practice (Ref 12-16); *New sites or extensions to sites for peat extraction should not be granted permission by Local Planning Authorities of proposed in development*	Relevant paragraph of the NPPF (Ref 12-2) is referenced in Table 12-2. The agriculture and soils assessment focuses on the identification of the soil types and the BMV status of land which may be impacted by the English Onshore Scheme. The assessment criteria (see Section 12.3.3: Assessment Methodology) are based upon the degree damage (disturbance/harm) to, and the loss of soil resource; and the loss of BMV agricultural land. A methodology is put forward for the identification of BMV and non-BMV land. A scheme of targeted ALC survey is used to inform the baseline conditions. DEFRA's Construction Code of Practice (Ref 12-16) and the good practice measures set out therein are referenced within Section 12.6.2 Embedded Mitigation and Section 12.7 Mitigation. There are no proposals for peat extraction related to the English Onshore Scheme. The identification of soil types will assist in the avoidance, where possible, of any peats or organic rich soils which have the potential to be impacted by the English Onshore Scheme.

Consultee	Summary of comment	How and where addressed
**When Natural England's scoping response was issued, the current version of the NPPF was dated 2019. An update to the NPPF was subsequently issued in July 2021 (Ref 12-2), as referenced in Table 12-2. The 2021 update made no change to policy requirements regarding soils and agricultural land, and the text remained unaltered. However, paragraph numbers were updated with paragraph 170 of the NPPF 2019 becoming paragraph 174 of the NPPF 2021 and so on.*		

It is noted that the scoping opinion from East Riding of Yorkshire Council (ERYC) summarised relevant text from the scoping report and acknowledged the inclusion of the Agriculture and Soils assessment but did not make specific recommendations or comments to be addressed within the chapter.

12.3.2.2 Additional Consultation

No additional consultation has been undertaken with the relevant statutory and non-statutory consultees in relation to this chapter. However, it is noted that the Project Lands Team's will maintain ongoing communications with farmers and landowners throughout the planning and construction phases of the English Onshore Scheme. The site-specific data gained from the discussions with the farmers and landowners have and will assist in defining the micrositing of infrastructure; and in describing project specific mitigation, if required, to ensure that the effect of construction and operation of the English Onshore Scheme on agriculture and agricultural operations are minimised. For example, specific mitigation will be identified such as the identification of preferred locations for designated crossing points to minimise disruption to the movement of livestock and machinery; or details of how works could be programmed to avoid specific locations (for example lambing sheds) during sensitive times in the farming calendar (for example during lambing season). Engagement with landowners and tenants has been ongoing during project design, and will be ongoing throughout the Project's lifespan.

12.3.3 Assessment Method

12.3.3.1 Overview

This section describes the assessment methodology used in this chapter. It is in accordance with the latest and applicable technical guidance and also the consultants' expertise.

The early identification of significant adverse environmental effects enables appropriate mitigation (e.g. measures to avoid, reduce or offset significant adverse effects) to be identified and incorporated into the design of a project (mitigation by design), or commitments to be made to environmentally sensitive construction methods and practices (project specific mitigation). The likely significant effects of the English Onshore Scheme will, therefore, be identified and assessed, appropriate mitigation will be put forward (where required) and the residual (post-mitigation) effects reassessed to ensure that the overall effect of the English Onshore Scheme on agriculture and soils is acceptable in planning terms.

The relevant technical guidance is summarised in **Table 12-4.**

Table 12-4 Technical guidance relevant to agriculture and soils

Technical Guidance Document	Context
Planning Practice Guidance for the Natural Environment (PPGNE) 2019 (**Ref 12-17**)	
Paragraphs 001 and 002	Sets out the need for planning decisions to take into account the value of soils and agricultural land to enable informed choices on the future use of soil resources and agricultural land within the planning system.
Natural England (2012) Technical Information Note 049 (TIN049): Agricultural Land Classification: Protecting the Best and Most Versatile agricultural land (**Ref 12-18**)	
	Explains the Government Policy to protect agricultural land; and the ALC system and its uses.
Natural England (2021) Guide to assessing development proposals on agricultural land (Ref 12-19)	
	Provides a summary and signpost of all relevant policy and legislation concerning the assessment of developments on agricultural land. The overarching aims being protecting the best and most versatile (BMV) agricultural land from significant,

Technical Guidance Document	Context
	inappropriate or unsustainable development proposals, and protecting all soils by managing them in a sustainable way.
Department for the Environment, Food and Rural Affairs (DEFRA): Construction Code of Practice for the Sustainable Use of Soil on Development Site (2009) (**Ref 12-16**)	
	Technical Guidance on the handling, storage and (re)use of soil within construction projects.
Institute of Quarrying (2021) Good Practice Guide for Handling Soils in Mineral Workings (Ref 12-20)	
	Details the correct stripping, handling, storage, reinstatement and management of soil resources. This guide is and update and replaces the MAFF Good Practice Guide for Handling soils (2000).
Ministry of Agriculture, Fisheries and Food (MAFF) Agricultural Land Classification of England and Wales Revised guidelines and criteria for grading the quality of agricultural land (**Ref 12-1**)	
	The current guidelines and criteria for grading the quality of agricultural land in England and Wales.

It is noted that the Institute of Environmental Management and Assessment (IEMA) issued their new guidance document 'A New Perspective on Land and Soil in Environmental Impact Assessment' on 17 February 2022. This document comprises the first published guidance on the consideration of soils and land in EIA but does not include a methodology for how such assessment should be undertaken. All soil survey and assessment for the English Onshore Scheme had been completed prior to the issue of the guidance and therefore it is not specifically incorporated into the assessment methodology, and the assessment has been undertaken as agreed in the scoping opinion. However, the aims of the guidance are to advocate 'a broader approach that involves assessing the natural capital and functional ecosystem services provided by land and soils'. The assessment methodology presented below considers the sensitivity of soil resources to damage and loss (i.e., the resistance and resilience of the soil environment, not the importance of the land for agricultural use). It is therefore assessing the potential for loss of, or damage to, soil functions and the ability of the soils to provide ecosystem services. Consequently, stated measures to prevent soil loss and damage due to the English Onshore Scheme also mitigate against impacts to soil function and ecosystem services and preserve natural capital.

12.3.3.2 Agricultural Land

BMV agricultural land (Grades 1, 2, and Subgrade 3a) is considered to be a finite national resource and is given special consideration under the NPPF (Ref 12-2). However, there are no defined criteria for the assessment of effects on agricultural land (understood as a permanent land use change to a built development), and no threshold given for BMV loss (permanent land use change) which should be regarded as significant within an EIA.

Statutory Instrument 2015 No. 595, The Town and Country Planning (Development Management Procedure) (England) Order 2015, Schedule 4, Part (y) (Ref 12-3), requires that the local planning authority consults Natural England if the area of a proposed permanent development exceeds 20 hectares (ha) of BMV land. Although the guidance does not state that this threshold should be used to determine the significance of loss, for the purpose of EIA, it is a guide to consider significance where 20 ha or more of BMV is affected by a development. To determine the level of significance, other factors are considered, including whether the development is temporary or permanent and the extent of BMV in the locality.

Therefore, the loss of agricultural land will be assessed by estimating the amount and quality of land that may be affected by the English Onshore Scheme, with a threshold of 20 ha of permanent BMV loss used to determine whether the loss is significant or not. Magnitude of effect and receptor sensitivity classifications are not assigned. Rather, any permanent BMV loss that exceeds 20 ha is assessed as significant, whilst any that is temporary or occupies less than 20 ha is assessed as not significant.

The assessment of the loss of agricultural land, therefore, does not consider temporary land use change, as this land would be returned to agricultural use once construction is complete. Within the loss of agricultural land assessment, the areas of temporary land use change will be reported for illustrative purposes only.

12.3.4 Soil Resources

There are no defined criteria, or policy guidance on the assessment of the effects of development on soil resources. Therefore, the assessment of the effect of permanent and temporary development as a consequence of the English Onshore Scheme will be assessed in terms of the identified soil resources, their sensitivity, and the degree of damage to/or loss of soil resource. The assessment criteria will be based on professional experience which has been adopted in other assessments.

The disturbance of soil resources will be assessed by reporting the workability of topsoils and their suitability for reinstatement, and effects assessed on the assumption that good working practice for the handling of soils, such as set out in Defra's code of practice (Ref 12-16) and the Institute of Quarrying's (IQ) Good Practice Guide (Ref 12-20) is followed. Assessing the sensitivity of soil resources to damage (i.e. resistance and resilience of the soil environment, not the importance of the land for agricultural use) is complicated, as soil resources provide a range of functions (ecosystem services), such as supporting plant growth (including food and other crops), water filtration and regulation (role in flood control), nutrient transformation (e.g. role in the nitrogen cycle), carbon storage and sequestration, and supporting biodiversity. The sensitivity criteria for soil resources are based on the erodibility of soils or the presence of ecologically important soils, such as peat. The soil resources assessment will consider both temporary and permanent damage. The receptor sensitivity criteria are provided in **Table 12-5**. The magnitude of change from the baseline will be defined in terms of the damage to soil resource and loss of soil resources, as provided in **Table 12-6.**

Soil erodibility is a measure of the susceptibility of soils to loss both *in-situ* (i.e. as an undisturbed soil profile) and during soil stockpiling, due to wind or water erosion (natural erosion potential). Soil erodibility is considered in the rating of soil sensitivity, with the sensitivity classification of the different soils encountered based upon data compiled by Cranfield University (Ref 12-21). Therefore, as a rule, heavy (clay rich) soils are classified as low sensitivity (low soil erodibility), whilst light sandy soils are classified as high sensitivity (high soil erodibility).

However, it is important to note that soils of differing texture and structural development may be subject to a range of potential impacts during and following reinstatement. For example, the incorrect handling/reinstatement of a heavy (clay rich) soil whilst in a plastic state may result in a reinstated soil profile with a reduced natural drainage compared to the natural soil profile and a subsequent increased risk of soil loss (erosion) due to surface water run-off. Whereas the permeable nature of light sandy soils means that the natural structural recovery and drainage potential of the soils is more easily maintained upon reinstatement. However, as standard good practice measures for soil management will mitigate against any potential adverse impacts during reinstatement regardless of the soil texture or prevailing structure, only soil erodibility (i.e. the sensitivity of the undisturbed soil profile or soil stockpiles) is considered in the sensitivity criteria of the soil assessment.

Table 12-5 Receptor sensitivity (soil resources)

Receptor (Soil Resources)	Sensitivity	Justification
Soils with very high to high risk of erosion and organic soils (peat).	High	Development on those soils should be avoided, however if this is not possible, they require special consideration and careful planning of construction methods, e.g. use of temporary working surfaces, careful storage, protection from drying out, in order to preserve their functions. Soils of high biodiversity value. High importance as a carbon store and active role in carbon sequestration, which have little capacity to tolerate change.
Soils with moderate risk of erosion.	Medium	Standard soil management measures would provide appropriate protection to these soils; however, damage is likely to occur if worked in less than ideal conditions, e.g. when wet. These soils should be given appropriate consideration because of their importance for agricultural production.

Receptor (Soil Resources)	Sensitivity	Justification
Soils with small or very small risk of erosion.	Low	These soils are generally more resistant to damage. Standard soil management measures would provide appropriate protection to these soils (except peat soils).
Poor quality soils with no risk of erosion.	Negligible	These soils are generally more resistant to damage. Standard soil management measures would provide appropriate protection to these soils (except peat soils).

The magnitude of effect will be assessed in terms of the change from baseline conditions, as defined in **Table 12-6**.

Table 12-6 Criteria to assess the magnitude of impact (soil resources)

Magnitude	Damage to Soil Resources	Loss of Soil Resources
High	Permanent irreversible or long-term reversible damage to soil quality through handling, and stockpiling. Storage for more than 2 years.	<25% of soil resources suitable for reuse and retained on site.
Medium	Medium-term (6 months to 2 years) temporary disturbance. Reversible damage to soil quality through handling, stockpiling, machinery traffic, *etc.*	25-50% of soil resources suitable for reuse and retained on site.
Low	Short-term (<6 months) disturbance of soil resources. Reversible damage to soil quality through handling, stockpiling, machinery traffic, *etc.*	51-95% of soil resources suitable for reuse and retained on site.
Negligible	No damage or very small-scale surface damage equivalent to that done by a typical farm machinery traffic.	>95% of soil resources suitable for reuse and retained on site.

The classification of effects for loss and damage of soil resources will be assessed using **Table 12-7** below. Where effects are determined as major adverse or moderate adverse, the effect will be considered significant. Where effects are determined as minor adverse or negligible, the effect will be considered not significant.

Table 12-7 Classification of effects (soil resources)

		Magnitude of Change			
		Negligible	**Low**	**Medium**	**High**
Sensitivity of Receptor	**High**	Minor (Not Significant)	Moderate (Significant)	Major (Significant)	Major (Significant)
	Medium	Negligible (Not Significant)	Minor (Not Significant)	Moderate (Significant)	Major (Significant)
	Low	Negligible (Not Significant)	Negligible (Not Significant)	Minor (Not Significant)	Moderate (Significant)
	Negligible	Negligible (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)	Minor (Not Significant)

12.4 Study Area

12.4.1 Overview

The study area for the agriculture and soils assessment is the English Onshore Scheme planning application boundary as defined in **Chapter 3: Description of the English Onshore Scheme** and shown in **Figure 3.2**; excluding areas considered to be marine or intertidal which do not have the potential to contain soils or agricultural land. The study area covers 628.7 ha, shown in **Figure 12-1.** No buffer was applied as the impacts to soils and agricultural land only occur on the land that is directly impacted by the English Onshore Scheme and is thus only likely to be a small fraction of this overall area.

Given the scale and geographical extent of the English Onshore Scheme, and its location within the administrative areas of both ERYC and SDC , for ease of assessment by the Local Planning Authorities (LPA) and consultees, the study area has been divided into four sections:

- Section 1 – Landfall to Bainton (covering 221.5 ha of the study area);
- Section 2 – Bainton to Market Weighton (covering 158.4 ha of the study area);
- Section 3 – Market Weighton to River Ouse (covering 214.2 ha of the study area); and
- Section 4 – River Ouse to Drax Substation (covering 34.6 ha of the study area).

Sections 1 to 3 lie in the administrative area of ERYC, whilst Section 4 lies in the administrative area of SDC. The geographical extent of each Section is shown in **Figure 12-1**; and data for each Section are presented separately.

For the assessment of baseline conditions, for each Section two areas are considered with the same methodologies being applied to both.

Firstly, data are presented for the whole of the Section study area to provide baseline conditions for the wider area in which the works (disturbance) could be located should changes to the agreed design freeze be required.

Secondly, data are presented for the proposed working areas (cable installation corridor, landfall, converter station, temporary compounds and other associated works areas, etc.) within the Section to provide an indication of the actual area of soil disturbance and land take due to the English Onshore Scheme. The cable installation corridor will be linear along the proposed cable route alignment, consisting of a 40 m wide working width and temporary construction compounds as required.

It is noted that to provide additional context to the discussion of agricultural land, the impacts will also be considered in the wider context of the administrative boundaries of ERYC and SDC.

12.5 Baseline Environment

12.5.1 Published Data Sources

In preparation of this chapter, the following sources of published information have been used to establish the baseline environment for soils and agricultural land:

- The Soil Survey of England and Wales: Northern England (1984) (Ref 12-22);
- Soils of England and Wales, Sheet 1: Northern England 1:250,000 Map (1984) (Ref 12-22);
- Provisional ALC 1:250,000 mapping of the Eastern Region (MAFF, 1993) (Ref 12-23);
- Likelihood of Best and Most Versatile Agricultural Land - Strategic scale map, Eastern Region (Natural England, 2017) (Ref 12-24);
- Google Maps (©2021) (Ref 12-25);
- Google Streetview (©2021) (Ref 12-26);
- Multi-Agency Geographical Information for the Countryside (MAGIC). (DEFRA) (Ref 12-27);

- Cranfield University (2015). 'Research to develop the evidence base on soil erosion and water use in agriculture: Final Technical Report (Ref 12-21); and
- Met Office (1989) Climatological Data for Agricultural Land Classification (ALC) (Ref 12-28).

12.5.2 Data Gathering Methodology – Agricultural Land

The 1:250,000 scale Provisional ALC mapping (Ref 12-23), which is also available via the Government's geographic information website, Magic.gov.uk (Ref 12-27), is the most current and detailed published ALC data covering the study area. However, it is important to note that these data pre-date the revised ALC methodology issued in 1988 (Ref 12-1) and as a result, the data do not provide a distinction between ALC Subgrades 3a (BMV) and 3b (non-BMV). Additionally, the scale of the mapping is such that it does not pick up variations in ALC grade for areas less than approximately 80 ha. The Provisional ALC mapping therefore provides an indication of the land quality in the region, but the extent and distribution of BMV agricultural land within the study area cannot be defined from the Provisional mapping alone.

Published ALC survey data collated after the revised ALC methodology (Ref 12-1) was issued do provide a distinction between Subgrades 3a and 3b. These data are available on Government's geographic information website, Magic.gov.uk (Ref 12-27); and are known as Post-1988 surveys. There are no Post -1988 survey data within the study area.

Therefore, for areas of temporary development (for example the proposed DC cable route, temporary access roads and construction compounds, where the land will be restored to its original use at the end of the construction period), the Provisional ALC Mapping has been used to directly determine the proportions of ALC Grades 1, 2, 4 and 5. For areas Provisionally mapped as Grade 3, the relative proportions of Subgrade 3a and 3b have been calculated using Natural England's Likelihood of Best and Most Versatile (BMV) Agricultural Land mapping (Ref 12-24); also known as Predictive ALC mapping. In a change to the methodology provided at scoping, rather than purchase the Predictive ALC data through LandIS, they have been digitised from the publicly available data set (Ref 12-24). These data spatially map the percentage chance (likelihood) of BMV land occurring within a particular area. The Predictive mapping was devised by Natural England (NE) based on soil association data from the 1:250,000 scale national soil map (Soil Survey of England and Wales, 1984) (Ref 12-22). The methodology assessed each soil association on a regional basis using MAFF's 1988 ALC guidelines (Ref 12-1). The published ALC data used in the assessment were taken from detailed site surveys, where available, and the Provisional ALC mapping data; along with climatic data from the Met Office (Ref 12-28).

The data provide the likely proportion of BMV agricultural land to be encountered, using the following categories:

- *High Likelihood*: Areas where more than 60% of the land is likely to be BMV;
- *Moderate Likelihood*: Areas where 20% to 60% of the land is likely to be BMV; and
- *Low Likelihood*: Areas where less than 20% of the land is likely to be BMV.

For the purpose of this assessment and to provide a robust quantification of the area of BMV land within the study area, land mapped as High Likelihood has been considered as Subgrade 3a; whereas land mapped as Low Likelihood has been considered as Subgrade 3b. The land mapped as Moderate Likelihood has been split 50/50 between Subgrades 3a and 3b.

The combination of the areas identified as High Likelihood of BMV and 50% of the areas identified as Moderate Likelihood of BMV land (Ref 12-24) (mapped as Grade 3 on the Provisional mapping); and the Provisionally mapped ALC Grade 1 and 2 land, have therefore been used to provide the total potential area of BMV within the study area.

It is noted that the relative proportions of Subgrade 3a and 3b within the study area could only be presented in a tabular form and not represented in a mapped format (due to the 50/50 split of the Moderate Likelihood of BMV land). The lack of spatial information does not affect the reporting or impact assessment as this considers the total permanent loss of BMV land for the English Onshore Scheme as a whole.

This methodology of applying a desk-based approach to the gathering of baseline soils and ALC data for areas of temporary development has been used in other linear projects such as Viking Link (an interconnector from Denmark with 60 km underground cable through Lincolnshire) and ensures that the baseline is adequately described to ensure that all potentially significant effects are identified and a thorough and robust impact assessment to be undertaken.

The only permanent development associated with the English Onshore Scheme is the proposed converter station at Drax (**Chapter 3: Description of the English Onshore Scheme**). Works associated with the connection to the existing Drax Substation will be within operational land and are therefore non-agricultural (as indicated on **Figure 12-1**). The proposed converter station is to be constructed on agricultural land to the east of the existing substation. In line with standard NE guidelines (Ref 12-18, Ref 12-19), the converter station site was subject to detailed ALC survey at an approximate density of one inspection per ha, including one soil pit per 10 ha. It is noted that the survey area was extended beyond the proposed development footprint (5.9 ha) to incorporate the whole field in which it is sited, the overall survey area totalled 14.0 ha, as shown on **Figure 12-3**. The surveys were undertaken on 4th November 2021 by experienced soil surveyors using manual tools (soil auger and spade), sample locations are shown on **Figure 12-3**. To confirm the field determination of soil texture which gives a valid, but an approximate, result, three soil samples were analysed for particle size distribution (PSD) by NRM Laboratories, accredited by UKAS to the internationally recognised standard for competence; ISO/IEC 17025. This was to determine the topsoil texture, a key component of ALC grading and often the determining factor in ALC classification, with greater precision.

A reconnaissance survey of the study area would normally be undertaken in order to provide an overview of the current land-use and characteristics of the agricultural land present. However, due to the Covid-19 pandemic, this was considered to be unnecessary travel and instead current land-use has been informed by the use of the most current aerial and Streetview© imaging provided by Google (Ref 12-25 and Ref 12-26); and by the author's knowledge of the local area.

12.5.3 Data Gathering Methodology - Soils

As discussed above, the only permanent development on agricultural land associated with the English Onshore Scheme is the proposed converter station. As noted above, although the proposed footprint is 5.9 ha (including the permanent access track and permanent attenuation ponds), the survey area was extended to incorporate the whole field resulting in an area of 14.0 ha being surveyed, as shown on **Figure 12-3**. The survey area was subject to detailed (one inspection per ha) scale surveys, as described in Section 12.5.2 Data Gathering Methodology - Agricultural Land. The surveys were conducted on 4th November 2021, by experienced soil surveyors using manual tools (soil auger and spade).

For the areas of temporary development presented in this chapter the data are taken from Soil Survey of England and Wales (Ref 12-22). The scale of the data/mapping is such that it is not accurate to the field level and does not pick up small-scale local variations in soil type. It does however provide a general indication of the soil types within the study area which can be utilised for the assessment. Consequently, in the absence of more detailed soil baseline information, the effects have been assessed on a worst case scenario and could be overstated.

As such post consent and pre construction, detailed soil surveys will be focused in areas which have not been previously surveyed, to inform the construction soil management planning for areas of temporary development (for example, the proposed underground DC cable route and temporary accesses) will be completed post-consent when the precise routeing and placement of infrastructure are known, ensuring the surveys are targeted to areas directly impacted by the English Onshore Scheme. The surveys will be undertaken following standard sampling procedures as set out in the ALC guidelines (Ref 12-18 and Ref 12-19). Site specific data from these pre-construction surveys will be used to inform soil management planning for the English Onshore Scheme.

For both areas of temporary and permanent development, the data on the erodibility of Soil Associations (from Cranfield University, (2015) (Ref 12-21)) has been used to identify potential areas of increased soil sensitivity.

Data are presented for the study area, which comprised the full LOD for the English Onshore Scheme, and the proposed working area which comprised the temporary development within the c. 40 m wide working width for the HVDC route. In Section 4 data are also presented for the areas of permanent development at the converter station site.

12.5.4 Section 1 – Landfall to Bainton

12.5.4.1 Land-use

The Section 1 study area covers 221.5 ha, 9.1 ha of which is Sea at the landfall, the remaining land is all of which is mapped as agricultural land (Ref 12-23, **Figure 12-1**), owing to the planning application boundary within Section 1 having been designed to exclude areas of existing development such as the villages of Wansford, Skerne and Hutton. The proposed working area is 112.4 ha.

The current land-use has been informed by the use of aerial and Streetview© imaging provided by Google (Ref 12-25 and Ref 12-26). The majority of the study area within Section 1 has been identified to be in arable production, this finding corroborates the ALC data presented below, as higher quality (BMV) land is more productive and better suited to arable use than land of lower quality. The arable land is interspersed with permanent pasture and woodland/treebelts. Therefore, for the purpose of this assessment, it is assumed that agricultural land use is closely related to agricultural land quality and current land use is therefore reflected in the ALC assessment.

12.5.4.2 Agricultural Land Classification

The most detailed published data covering the Section 1 study area are the 1:250,000 scale Provisional ALC data (Ref 12-23). As described above, this mapping is not accurate at the field scale and does not provide a distinction between Subgrade 3a (good quality, BMV) and Subgrade 3b (moderate quality, non-BMV) land.

A summary of the Provisional ALC grading within Section 1 is presented in **Table 12-8** and their geographical distribution is shown in **Figure 12-1**.

Assuming a 50:50 split of the mapped Grade 3 land into Subgrade 3a and 3b, as described in Section 12.5.2: Data Gathering Methodology – Agricultural Land, the Provisional data identify the land within the Section 1 study area as predominantly of BMV quality (151.8 ha, 68.6%), comprising a mixture of Grade 2 and Grade 3 agricultural land. The parcels of Grade 2 and Grade 3 land appear to be fairly evenly distributed within the Section 1 study area. The Grade 4 land is associated with marshy land adjacent to the River Hull and 9.1 ha of non-agricultural areas where the sea is included in the LOD.

The proposed working area in Section 1 covers 112.4 ha; and comprises predominantly of BMV land (82.6 ha, 73.5 %) made up of Grade 2 and Grade 3 (with a 50:50 split into Subgrade 3a: Subgrade 3b) land. The remaining land comprises of non-BMV quality (29.8 ha, 26.5 %). Although the proportion of BMV land within the proposed working area is higher than within the planning application boundary, the distribution of ALC gradings is such that reducing the proportion of BMV would not be possible without substantially increasing the area of land.

Table 12-8: Provisional Agricultural Land Classification – Section 1

ALC Grade	Area (ha)	Percentage of land in Section 1 (%)
Study area (planning application boundary)		
Grade 2	93.2	42.1
Grade 3	117.2	52.9
Grade 4	2.0	0.9
Non-agricultural	**9.1**	**4.1**
Total	**221.5**	**100**
Total BMV*	**151.8**	**68.6**
Proposed working area (working width)		

ALC Grade	Area (ha)	Percentage of land in Section 1 (%)
Grade 2	52.8	47.0
Grade 3	59.6	53.0
Total	112.4	100
Total BMV*	82.6	73.5
***** *The land mapped as Grade 3 has been split 50/50 between Subgrades 3a (BMV) and 3b (non-BMV).*		

The Predictive ALC data (Ref 12-24) for the Section 1 study area are shown in **Figure 12-2** and summarised in **Table 12-9**. These data indicate that the majority of agricultural land within the Section 1 study area (207.6 ha, 93.7 %) have been calculated as having a high likelihood of being BMV quality; with the remaining land being classified as having a moderate likelihood of being BMV quality.

The data for the proposed working area also show the majority of the land as being calculated as having a high likelihood of being BMV quality (105.9 ha, 94.3 %). Again, given the distribution of the predictive ALC, the avoidance of high likelihood for medium likelihood would not be possible without greatly increasing the area covered.

Table 12-9: Predictive Agricultural Land Classification – Section 1

ALC Grade	Area (ha)	Percentage of land in Section 1 (%)
Study area (planning application boundary)		
High likelihood of BMV land (>60 % area BMV)	207.6	93.7
Moderate likelihood of BMV land (20 - 60 % area BMV)	13.9	6.3
Low likelihood of BMV land (<= 20 % area BMV)	0.0	0.0
Total	**221.5**	**100**
Proposed working area (working width)		
High likelihood of BMV land (>60 % area BMV)	105.9	94.3
Moderate likelihood of BMV land (20 - 60 % area BMV)	6.4	5.7
Low likelihood of BMV land (<= 20 % area BMV)	0.0	0.0
Total	**112.4**	**100**

As per the methodology set out in Section 12.5.2: Data Gathering Methodology – Agricultural Land, the ALC gradings for Section 1 have been calculated using a combination of the Provisional ALC dataset (Ref 12-23, **Figure 12-1**) to define areas of Grade 2 and 4 land; and the Predictive ALC dataset to provide the Subgrade 3a:Subgrade 3b subdivision for the land Provisionally mapped as Grade 3. The calculated ALC gradings for Section 1 are set out in **Table 12-10** and show that 204.6 ha (92.4 %) of the agricultural land within the Section 1 study area is calculated to be BMV quality.

Within the proposed working area, the area of BMV quality agricultural land is 109.9 ha (97.8%). Given the distribution of provisional ALC and Predictive mapping, avoiding areas of BMV quality agricultural land within this section would not be possible.

Table 12-10: Calculated ALC grading - Section 1

ALC Grade	Area (ha)	Percentage
Study area (planning application boundary)		
Grade 2 (BMV)	93.2	42.1

ALC Grade	Area (ha)	Percentage
Subgrade 3a (BMV)	111.4	50.3
Subgrade 3b (non-BMV)	5.8	2.6
Grade 4 (Non-BMV)	2.0	0.9
Non-Agricultural (Sea at landfall)	9.1	**4.1**
Total	**221.5**	**100**
Total BMV	**204.6**	**92.4**
Proposed working area (working width)		
Grade 2 (BMV)	52.8	47.0
Subgrade 3a (BMV)	57.2	50.9
Subgrade 3b (non-BMV)	2.5	2.2
Total	**112.4**	**100**
Total BMV	**109.9**	**97.8**
Provisionally mapped Grade 3 identified as High Likelihood assigned as Subgrade 3a; Moderate Likelihood assigned 50/50 between Subgrades 3a and 3b; and Low Likelihood assigned Subgrade 3b.		

12.5.4.3 Soils

Soil Survey of England and Wales Soils Mapping for Northern England (Ref 12-22) identifies six soil associations within the Section 1 study area. As stated previously, the scale of the mapping is such that it is not accurate to the field level and does not pick up small-scale local variations in soil type. It does however provide a general indication of the soil types within the study area.

The associations are listed from east to west in order first encountered within **Table 12-11,** however as shown in **Figure 12-4,** their distribution is mosaic-like across the Section 1 study area. Erodibility data are taken from Cranfield University (Ref 12-21).

Table 12-11: Soil Associations – Section 1

Soil Association	Amount within Study Area (ha)	Amount within proposed working area (ha)	General Description*	Erodibility
Wick 1 (541r)	13.5	6.2	Deep well drained coarse loamy and sandy soils locally over gravel. Some similar soils affected by groundwater. Slight risk of water erosion.	Moderate risk (water and wind)
Holderness (711u)	141.9	77.0	Slowly permeable seasonally waterlogged fine loamy soils and similar soils with only slight waterlogging. Narrow strips of clayey alluvial soils.	Small risk (water)
Rockcliffe (811d)	6.6	3.8	Deep stoneless silty and fine sandy soils variably affected by groundwater depending on artificial drainage. Flat land.	Very small risk (water)
Bishampton 1 (572s)	12.8	5.4	Deep fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging associated with well drained fine and coarse loamy soils in an undulating landscape. Some slowly permeable seasonally waterlogged fine loamy soils.	Moderate risk (water)

Soil Association	Amount within Study Area (ha)	Amount within proposed working area (ha)	General Description*	Erodibility
Frome (812a)	20.5	9.2	Shallow calcareous and non-calcareous loamy soils over flint gravel affected by groundwater. Small areas of peat. Risk of flooding.	Very small risk (water)
Burlingham 2 (572o)	17.1	10.8	Deep fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Some slowly permeable seasonally waterlogged fine loamy soils. Some well drained fine and coarse loamy soils.	Small risk (water)
*From Soil Survey of England and Wales (1984) (**Ref 12-22**)				

The most commonly encountered soil association in the Section 1 study area is the Holderness association at 64.1 %. Soils of the Holderness, Rockcliffe and Burlingham associations cover approximately 74.8% of the Section 1 study area; and are described as being at small or very small risk of erosion. Therefore, following the criteria in **Table 12-5**, they are classified as being low sensitivity.

Soils of the Wick 1 and Bishampton 1 associations cover approximately 11.9 % of the Section 1 study area; are described as being at moderate risk of erosion. Therefore, following the criteria in **Table 12-5**, they are classified as being medium sensitivity.

Soils of the Frome association cover approximately 9.3 % of the Section 1 study area. Although they are classed by Cranfield University (Ref 12-19) as being of very small risk of erosion, from the soil description presented in **Table 12-11,** it is noted that they have the potential to contain small areas of peat. Of the five soil series making up the Frome association, it is only the Adventurer's series which comprises peats and organic rich soils (the other series comprising mineral soils) (Ref 12-28). As this association accounts for only 5% of all soils in the Frome Association, the risk of them being present within the Section 1 study area is low, but cannot be discounted. Therefore, for the purposes of the assessment and in line with the criteria in **Table 12-5**, soils of the Frome association are considered high sensitivity. It is noted that the Frome association soils straddle the study area and therefore cannot be avoided by the proposed underground DC cable route.

Within the proposed working area, all soil associations are encountered, again the most commonly encountered soil is the Holderness association (68.5 %). Soils with a very small risk of erosion (water), Frome and Rockcliffe associations, make up 11.6 % of the proposed working area. Soils with a small risk of erosion (water), Holderness and Burlingham associations, make up the majority of soils within the proposed working width at 77.4 %. Soils with a moderate risk of erosion (water and wind, and water only), Wick 1 and Bishampton associations, make up 10.3 % of the proposed working area.

12.5.5 Section 2 – Bainton to Market Weighton

12.5.5.1 Land-use

The Section 2 study area covers 158.4 ha all of which is mapped as agricultural land (Ref 12-23, **Figure 12-1**), owing to the planning application boundary within Section 1 having been designed to exclude areas of existing development. The proposed working area is 76.6 ha.

The current land-use has been informed by the use of aerial and Streetview© imaging provided by Google (Ref 12-25 and Ref 12-26). The majority of the study area within Section 2 has been identified to be in arable production, this finding corroborates the ALC data presented below, as higher quality (BMV) land is more productive and better suited to arable use than land of lower quality. The arable land is interspersed with permanent pasture and small woodlands/treebelts. Therefore, for the purpose of this assessment, it is assumed that agricultural land use is closely related to agricultural land quality and current land use is therefore reflected in the ALC assessment.

12.5.5.2 Agricultural Land Classification

The most detailed published data covering the Section 2 study area are the 1:250,000 scale Provisional ALC data (Ref 12-23). As described above, this mapping is not accurate at the field scale and does not provide a distinction between Subgrade 3a (good quality, BMV) and Subgrade 3b (moderate quality, non-BMV) land.

A summary of the Provisional ALC gradings within Section 2 is presented in

Table 12-12 and their geographical distribution is shown in **Figure 12-1**.

The majority of land in the Section 2 study area (158.4 ha) is Provisionally graded as Grade 2 (69.3 %), with Grade 3 land accounting for a further 22.4 %. Assuming a 50:50 split of the mapped Grade 3 land into Subgrade 3a and 3b, as described in Section 12.5.2: Data Gathering Methodology – Agricultural Land, the Provisional data identify 127.6 ha of BMV land within the Section 2 study area (80.6 % of the land area). Grade 4 land accounts for 8.3 % of the Section 2 study area and is associated with an area of marshy or wet ground to the east of Market Weighton (Ref 12-25).

The proposed working area in Section 2 covers 76.6 ha; the majority of which is also Provisionally graded as Grade 2 (75.7 %), with Grade 3 accounting for a further 23.1 %. Assuming a 50:50 split of the mapped Grade 3 land into Subgrade 3a and 3b, the Provisional data identify 66.9 ha of BMV land within section 2 of the proposed working area. Grade 4 makes up the remaining 1.2 % of land, again associated with an area of marshy or wet ground to the east of Market Weighton (Ref 12-25).

Table 12-12: Provisional Agricultural Land Classification – Section 2

ALC Grade	Area (ha)	Percentage of land in Section 2 (%)
Study area (planning application boundary)		
Grade 2	109.8	69.3
Grade 3	35.6	22.4
Grade 4	13.1	8.3
Total	**158.4**	**100**
Total BMV*	**127.6**	**80.6**
Proposed working area (working width)		
Grade 2	58.0	75.7
Grade 3	17.7	23.1
Grade 4	0.9	1.2
Total	**76.6**	**100**
Total BMV*	**66.9**	**87.3**
***** *The land mapped as Grade 3 has been split 50/50 between Subgrades 3a (BMV) and 3b (non-BMV).*		

The Predictive ALC data (Ref 12-24) for the Section 2 study area are shown in **Figure 12-2** and summarised in **Table 12-13.** These data indicate that the majority of agricultural land within the Section 2 study area has been calculated as having a high likelihood of being BMV quality (86.8 %); with the remaining land being classified as having either a moderate or low likelihood of being BMV quality (12.1 % and 1.1 % respectively).

The data for the proposed 76.6 ha working area also show the majority of the land as being calculated as having a high likelihood of being BMV quality. Land being identified as having a high likelihood of BMV is 90.6 %, with moderate likelihood being 8.5 % and low likelihood being 0.9 %. The distribution of BMV within the study area is such that altering the route to avoid high likelihood BMV areas would not be possible without greatly increasing the length of the route and increasing the size of the proposed working area.

Table 12-13: Predictive Agricultural Land Classification – Section 2

ALC Grade	Area (ha)	Percentage of land in Section 2 (%)
Study area		
High likelihood of BMV land (>60 % area BMV)	137.4	86.8
Moderate likelihood of BMV land (20 - 60 % area BMV)	19.2	12.1
Low likelihood of BMV land (<= 20 % area BMV)	1.7	1.1
Total	**158.4**	**100**
Proposed working area		
High likelihood of BMV land (>60 % area BMV)	69.3	90.6
Moderate likelihood of BMV land (20 - 60 % area BMV)	6.5	8.5
Low likelihood of BMV land (<= 20 % area BMV)	0.7	0.9
Total	**76.6**	**100**

As per the methodology set out in Section 12.5.2: Data Gathering Methodology – Agricultural Land, the ALC gradings for Section 2 have been calculated using a combination of the Provisional ALC dataset (Ref 12-23, **Figure 12-1**) to define areas of Grade 2 and 4 land; and the Predictive ALC dataset to provide the Subgrade 3a:Subgrade 3b subdivision for the land Provisionally mapped as Grade 3. The calculated ALC gradings for Section 2 are set out in **Table 12-14** and show that 137.7 ha (86.9 %) of the agricultural land within the Section 2 study area is calculated to be BMV quality.

Within the proposed working area, the area of BMV quality agricultural land is 72.6 ha (94.8 %). Given the distribution of provisional ALC and Predictive mapping, avoiding areas of BMV quality agricultural land within this section would not be possible.

Table 12-14: Calculated ALC grading - Section 2

ALC Grade	Area (ha)	Percentage
Study area		
Grade 2 (BMV)	109.8	69.3
Subgrade 3a (BMV)	27.9	17.6
Subgrade 3b (non-BMV)	7.8	4.9
Grade 4 (Non-BMV)	13.1	8.3
Total	**158.5**	**100**
Total BMV	**137.7**	**86.9**
Proposed working area		
Grade 2 (BMV)	58.0	75.8
Subgrade 3a (BMV)	14.6	19.0
Subgrade 3b (non-BMV)	3.1	4.0
Grade 4 (Non-BMV)	0.9	1.1
Total	**76.6**	**100**
Total BMV	**72.6**	**94.8**
Provisionally mapped Grade 3 identified as High Likelihood assigned as Subgrade 3a; Moderate Likelihood assigned 50/50 between Subgrades 3a and 3b; and Low Likelihood assigned Subgrade 3b.		

12.5.5.3 Soils

Soil Survey of England and Wales Soils Mapping for Northern England (Ref 12-22) identifies eight soil associations within the Section 2 study area. As stated previously, the scale of the mapping is such that it is not accurate to the field level and does not pick up small-scale local variations in soil type. It does however provide a general indication of the soils types within the study area.

The associations are listed from east to west in order first encountered within **Table 12-15,** as shown in **Figure 12-4**. Erodibility data are taken from Cranfield University (Ref 12-21).

Table 12-15: Soil Associations – Section 2

Soil Association	Amount within Study Area (ha)	Amount within proposed working area (ha)	General Description*	Erodibility
Burlingham 2 (572o)	18.1	11.1	Deep fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Some slowly permeable seasonally waterlogged fine loamy soils. Some well drained fine and coarse loamy soils.	Small risk (water)
Panholes (511c)	67.5	31.7	Well drained calcareous fine silty soils over chalk. Associated similar shallow soils and deeper non-calcareous fine silty soils.	Small risk (water)
Hunstanton (571r)	18.7	10.2	Deep well drained often reddish fine and coarse loamy soils. Some similar calcareous soils over chalk.	Small risk (water)
Andover 1 (343h)	19.4	6.3	Shallow well drained calcareous silty soils over chalk on slopes and crests. Deep calcareous and non-calcareous fine silty soils in valley bottoms. Striped soil patterns locally.	Moderate risk (water)
Icknield (341)	0.5	0.0	Shallow, mostly humose, well drained calcareous soils over chalk on steep slopes and hill tops. Deeper flinty calcareous silty soils in small coombes and valleys.	Small risk (water)
Swaffham Prior (511e)	10.9	7.0	Well drained calcareous coarse and fine loamy soils over chalk rubble. Some similar shallow soils. Deep non-calcareous loamy soils in places. Striped and polygonal soil patterns locally. Slight risk of water erosion.	Small risk (water)
Newport 1 (551d)	15.1	5.7	Deep well drained sandy and coarse loamy soils. Some sandy soils affected by groundwater. Risk of wind and water erosion.	Very high risk (water and wind)
Everingham (821a)	8.2	4.5	Deep stoneless permeable fine sandy soils some with bleached subsurface horizon. Groundwater controlled by ditches. Risk of wind erosion.	High risk (wind)
**From Soil Survey of England and Wales (1984) (Ref 12-22)*				

The most commonly encountered soil association in the Section 2 study area is the Panholes association, and like this association, most of the soils within the Section 2 study area are formed over chalk as the study area passes through the Wolds.

Soils of the Burlingham 2, Panholes, Hunstanton, Icknield and Swaffham Prior associations cover approximately 115.7 ha or 73.0 % of the Section 2 study area; and are described as being at small or very small risk of erosion. Therefore, following the criteria in **Table 12-5**, they are classified as being of low sensitivity.

The fine silty soils of the Andover 1 association cover approximately 19.4 ha or 12.2 % of the Section 2 study area; and are described as being at moderate risk of erosion. Therefore, following the criteria in **Table 12-5**, they are classified as being medium sensitivity.

The light sandy soils of the Everingham and Newport 1 associations are found to the west of the Section 2 study area and cover 23.3 ha or 14.7 % of the study area. These soils are classed as being at high and very high risk of erosion, respectively. Therefore, following the criteria in **Table 12-5**, they are classified as being high sensitivity. As these soils are mapped as bands straddling the study area, they cannot be avoided by the proposed underground DC cable route.

Within the proposed working area, the Icknield (341) association has been avoided and does not appear within the proposed route. All other associations would be encountered. The most abundant being the Panholes association (31.7 ha).

12.5.6 Section 3 – Market Weighton to River Ouse

12.5.6.1 Land-use

The Section 3 study area covers 214.2 ha, all of which is mapped as agricultural land (Ref 12-22, **Figure 12-1**). It is noted that the planning application boundary within Section 3 has been designed to exclude areas of existing development. The proposed working area is 108.8 ha.

The current land-use has been informed by the use of aerial and Streetview© imaging provided by Google (Ref 12-25 and Ref 12-26). The majority of the study area within Section 3 has been identified to be in arable production, this finding corroborates the ALC data presented below, as higher quality (BMV) land is more productive and better suited to arable use than land of lower quality. The arable land is interspersed with permanent pasture and small woodlands/treebelts. Therefore, for the purpose of this assessment, it is assumed that agricultural land use is closely related to agricultural land quality and current land use is therefore reflected in the ALC assessment.

12.5.6.2 Agricultural Land Classification

The most detailed published data covering the Section 3 study area are the 1:250,000 scale Provisional ALC data (Ref 12-23). As described previously, this mapping is not accurate at the field scale and does not provide a distinction between Subgrade 3a (good quality, BMV) and Subgrade 3b (moderate quality, non-BMV) land.

A summary of the Provisional ALC gradings within Section 3 is presented in **Table 12-16** and their geographical distribution is shown in **Figure 12-1**. The majority of land in the Section 3 study area is Provisionally mapped as Grade 3 (73.2 %). However, it must be noted that Section 3 also contains a relatively high proportion of Grade 1 (39.4 ha. 18.4 %) which is located to the far west of the study area associated with alluvial soils derived in the tidal flood plain of the River Ouse (Ref 12-29). Small pockets of Grade 2 (5.1 %), Grade 4 (2.9 %), and non-agricultural (0.4 %) land are also present.

The proposed working area in Section 3 covers 108.8 ha; the majority of the land within the proposed area is also Grade 3 (75.3 %), followed by Grade 1 (17.9 %), small pockets of Grade 2 and Grade 4 are still present.

Table 12-16: Provisional Agricultural Land Classification – Section 3

ALC Grade	Area (ha)	Percentage of land in Section 3 (%)
Study area (planning application boundary)		
Grade 1	39.4	18.4
Grade 2	11.0	5.1
Grade 3	156.8	73.2
Grade 4	6.2	2.9
Non-agricultural	0.8	0.4

ALC Grade	Area (ha)	Percentage of land in Section 3 (%)
Total	**214.2**	**100**
Total BMV*	**128.8**	**60.1**
Proposed working area (working width)		
Grade 1	19.5	17.9
Grade 2	4.9	4.5
Grade 3	81.9	75.3
Grade 4	2.6	2.3
Total	**108.8**	**100**
Total BMV*	**65.4**	**60.1**
***** *The land mapped as Grade 3 has been split 50/50 between Subgrades 3a (BMV) and 3b (non-BMV).*		

The Predictive ALC data (Ref 12-24) for the Section 3 study area are shown in **Figure 12-2** and summarised in **Table 12-17.** These data indicate that the majority of agricultural land within the Section 3 study area (57.8 %) has been calculated as having a moderate likelihood of being BMV quality; although the proportion of land calculated as having a high likelihood of being BMV quality is also high (39.9 %). There remaining land comprises small areas of low likelihood of being BMV (1.6 %) and non-agricultural land or Urban areas (0.35 % and 0.35% respectively).

The data for the proposed 108.8 ha working area also show the majority of the land as being calculated as having a moderate likelihood of being BMV quality (56.3 %), followed by high likelihood of being BMV quality (42.6 %) and low likelihood of being BMV quality (1.1 %).

Table 12-17: Predictive Agricultural Land Classification – Section 3

ALC Grade	Area (ha)	Percentage of land in Section 3 (%)
Study area (planning application boundary)		
High likelihood of BMV land (>60 % area BMV)	85.5	39.9
Moderate likelihood of BMV land (20 - 60 % area BMV)	123.8	57.8
Low likelihood of BMV land (<= 20 % area BMV)	3.4	1.6
Non-agricultural	0.8	0.35
Urban or Urban and Industrial	0.8	0.35
Total	**214.2**	**100**
Proposed working area (working width)		
High likelihood of BMV land (>60 % area BMV)	46.3	42.6
Moderate likelihood of BMV land (20 - 60 % area BMV)	61.3	56.3
Low likelihood of BMV land (<= 20 % area BMV)	1.2	1.1
Total	**108.8**	**100**

As per the methodology set out in Section 12.5.2: Data Gathering Methodology – Agricultural Land, the ALC gradings for Section 3 have been calculated using a combination of the Provisional ALC dataset (Ref 12-23, **Figure 12-1**) to define areas of Grade 2 and 4 land; and the Predictive ALC dataset to provide the Subgrade 3a:Subgrade 3b subdivision for the land Provisionally mapped as Grade 3. The calculated ALC gradings for Section 3 are set out in **Table 12-18.**

The majority of agricultural land within the Section 3 study area (45.0 %) is calculated to be Subgrade 3a, with Subgrade 3b being the next common grading (28.2 %). 146.7 ha (68.5 %) of the agricultural land within the Section 3 study area is calculated to be BMV quality.

Within the proposed working area, the area of BMV quality agricultural land is 76.2 ha (70.0 %). Given the distribution of provisional ALC and Predictive mapping, avoiding areas of BMV quality agricultural land within this section would not be possible.

Table 12-18: Calculated ALC grading - Section 3

ALC Grade	Area (ha)	Percentage
Study area		
Grade 1 (BMV)	39.4	18.4
Grade 2 (BMV)	11.0	5.2
Subgrade 3a (BMV)	96.3	45.0
Subgrade 3b (non-BMV)	60.5	28.2
Grade 4 (Non-BMV)	6.2	2.9
Non-agricultural	0.8	0.4
Total	**214.2**	**100**
Total BMV	**146.7**	**68.5**
Proposed working area		
Grade 1 (BMV)	19.5	17.9
Grade 2 (BMV)	4.9	4.5
Subgrade 3a (BMV)	51.8	47.6
Subgrade 3b (non-BMV)	30.0	27.6
Grade 4 (Non-BMV)	2.6	2.4
Total	**108.8**	**100**
Total BMV	**76.2**	**70.0**

Provisionally mapped Grade 3 identified as High Likelihood assigned as Subgrade 3a; Moderate Likelihood assigned 50/50 between Subgrades 3a and 3b; and Low Likelihood assigned Subgrade 3b.

12.5.6.3 Soils

Soil Survey of England and Wales Soils Mapping for Northern England (Ref 12-22) identifies seven soil associations within the Section 3 study area. As stated previously, the scale of the mapping is such that it is not accurate to the field level and does not pick up small-scale local variations in soil type. It does however provide a general indication of the soils types within the study area.

The associations are listed from east to west in order first encountered within **Table 12-19,** as shown in **Figure 12-4**. Erodibility data are taken from Cranfield University (Ref 12-21).

Table 12-19: Soil Associations – Section 3

Soil Association	Amount within Study Area (ha)	Amount within proposed working area (ha)	General Description*	Erodibility
Everingham (821a)	37.0	22.4	Deep stoneless permeable fine sandy soils some with bleached subsurface horizon. Groundwater controlled by ditches. Risk of wind erosion.	High risk (wind)

Soil Association	Amount within Study Area (ha)	Amount within proposed working area (ha)	General Description*	Erodibility
Holme Moor (641c)	21.7	10.1	Deep stoneless, naturally very acid, fine sandy soils, with a bleached subsurface horizon, affected by groundwater. Where cultivated groundwater is controlled by ditches. Some well drained very acid sandy soils. Risk of wind erosion.	Moderate risk (wind)
Sessay (831b)	30.4	16.6	Fine and coarse loamy often stoneless, permeable soils affected by groundwater. Associated with slowly permeable seasonally waterlogged fine loamy over clayey and clayey soils. Generally flat land.	Small risk (wind)
Fladbury 3 (813d)	2.8	0.9	Stoneless clayey, fine silty and fine loamy soils affected by groundwater. Flat land. Risk of flooding.	Very small risk (water)
Foggathorpe 2 (712i)	73.1	36.0	Slowly permeable seasonally waterlogged stoneless clayey and fine loamy over clayey soils. Some similar coarse loamy over clayey soils.	Very small risk (water)
Romney (532b)	30.1	14.7	Deep stoneless permeable calcareous coarse and fine silty soils. Flat land. Groundwater controlled by ditches and pumps.	Very small risk (water)
Newport 1 (551d)	19.2	8.1	Deep well drained sandy and coarse loamy soils. Some sandy soils affected by groundwater. Risk of wind and water erosion.	Very high risk (water and wind)
From Soil Survey of England and Wales (1984) (Ref 12-22)				

The most abundant soil association in the Section 3 study area is the Froggathorpe 2 association (73.1 ha, 34.1 %). Soils of this association, the Ronmey and Fladbury 3 associations are all classed as being of very small risk of erosion. Soils of the Sessay association are classed as being of small risk of erosion. Together, the soils of these four associations comprise 316.4 ha, 63.7 % of the Section 3 study area; and following the criteria in **Table 12-5**, are classified as low sensitivity.

The fine sandy soils of the Holme Moor association cover approximately 21.7 ha, 10.1 % of the Section 3 study area and are described as being at moderate risk of erosion. Therefore, following the criteria in **Table 12-5**, they are classified as medium sensitivity.

The fine sandy soils of the Everingham association are found to the east of the Section 3 study area; whilst the sandy soils of the and Newport 1 are found to the west. Together these associations cover 56.2 ha, 26.2 % of the study area. These soils are classed as being at high and very high risk of erosion, respectively. Therefore, following the criteria in **Table 12-5**, they are classified as being of high sensitivity. As these soils are mapped as bands straddling the study area, they cannot be avoided by the proposed underground DC cable route.

Within the proposed working area all associations that were present within the study area remain present. The most abundant soil association is Foggathorpe 2 (712i) association.

12.5.7 Section 4 – River Ouse to Drax Substation

12.5.7.1 Land-use

The Section 4 study area covers 34.6 ha, the majority of which is mapped as agricultural land (Ref 12-23, **Figure 12-1**), with a portion classed as non-agricultural land and comprises land associated with the existing Drax substation. It is noted that elsewhere in the Section the planning application boundary has been designed to exclude areas of existing development. The proposed working area for temporary development is 7.4 ha. The proposed area for permanent development is 5.9 ha.

The current land-use has been informed by the use of aerial and Streetview© imaging provided by Google (Ref 12-25 and Ref 12-26). The majority of the study area within Section 4 has been identified to be in arable production, this finding corroborates the ALC data presented below, as higher quality (BMV) land is more productive and better suited to arable use than land of lower quality. The arable land is interspersed with permanent pasture and small woodlands/treebelts. Therefore, for the purpose of this assessment, it is assumed that agricultural land use is closely related to agricultural land quality and current land use is therefore reflected in the ALC assessment.

12.5.7.2 Agricultural Land Classification

The most detailed published data covering the Section 4 study area are the 1:250,000 scale Provisional ALC data (Ref 12-23). As described previously, this mapping is not accurate at the field scale and does not provide a distinction between Subgrade 3a (good quality, BMV) and Subgrade 3b (moderate quality, non-BMV) land.

A summary of the Provisional ALC gradings within Section 4 is presented in **Table 12-20** and their geographical distribution is shown in **Figure 12-1**. All agricultural land in the Section 4 study area is Provisionally mapped as either Grade 1 or Grade 2 and therefore of BMV quality. Using the methodology set out in Section 12.5.2: Data Gathering Methodology – Agricultural Land, the ALC grading for Section 4 can therefore be derived from the Provisional mapping alone, without reference to the Predictive ALC data. The predictive ALC data is however shown in **Table 12-21** for illustrative purposes. Within the proposed 7.4 ha working area of Section 4; 100 % is provisionally mapped as being of BMV quality.

Table 12-20: Provisional Agricultural Land Classification – Section 4

ALC Grade	Area (ha)*	Percentage of land in Section 4 (%)
Study area (planning application boundary)		
Grade 1	4.9	14.3
Grade 2	29.0	83.9
Non-agricultural (Drax substation)	0.6	1.8
Total	**34.6**	**100**
Total BMV	**34.0**	**98.3**
Proposed working area (working width)		
Grade 1	1.5	20.3
Grade 2	5.9	79.7
Total	**7.4**	**100**
Total BMV	**7.4**	**100**
Permanent Development (converter station)		
Grade 2	5.9	100
Total	**5.9**	**100**
Total BMV	**5.9**	**100**
***** *Study Area and proposed working area not including the circa 8.5 ha of permanent development located within the converter station site.*		

The Predictive ALC data (Ref 12-24) for the Section 4 study area are shown in **Figure 12-2** and summarised in **Table 12-21.** These data calculate all the agricultural land within the Section 4 study area as having a high likelihood of being BMV quality; which is to be expected given that all agricultural land is Provisionally mapped as Grades 1 and 2. The remaining land is described as non-agricultural use and totals 1.2 ha (3.5 %). The data for the proposed 7.4 ha working area also show the whole area of land as having a high likelihood of being BMV quality. The area for permanent development at the converter station is also mapped as having a high likelihood of being BMV (5.9 ha).

Table 12-21: Predictive Agricultural Land Classification – Section 4

ALC Grade	Area (ha)*	Percentage of land in Section 4 (%)
Study area		
High likelihood of BMV land (>60 % area BMV)	33.4	96.5
Non-agricultural use and Urban (Drax substation and River Ouse Corridor)	1.2	3.5
Total	**34.6**	**100**
Proposed working area		
High likelihood of BMV land (>60 % area BMV)	**7.4**	**100**
Total	**7.4**	**100**
Permanent Development		
High likelihood of BMV land (>60 % area BMV)	**5.9**	**100**
Total	**5.9**	**100**

The only permanent development located on agricultural land for the English Onshore Scheme is the proposed converter station to the east of the existing Drax substation. As described in Section 12.5.2: Data Gathering Methodology – Agricultural Land, the proposed footprint of the converter station is circa 5.9 ha, but the survey area was extended to incorporate the whole field resulting in an area of 14.0 ha being surveyed, as shown on **Figure 12-3**.

The Provisional ALC data shown the whole survey area to be located in Grade 2 land, but the site survey showed there to be some localised variation. This was confirmed by the detailed soil survey which found the land within the site to be of Grade 2 (3.0 ha, 21.4 %) and Subgrade 3b (11.0 ha, 78.6 %) quality. The ALC results from the survey are presented in **Table 12-22**, with a breakdown of the area which would be subject to permanent and temporary loss within the converter station site. Supporting data from the soil survey are included in **Appendix 12-1**.

Table 12-22: Surveyed ALC – Converter Station

ALC Grade	Total area (ha)*	Permanent loss of agricultural land (ha)**	Temporary loss of agricultural land (ha)***
Proposed Converter Station			
Grade 2	3.0	1.7	0.1
Subgrade 3b	11.0	4.2	2.6
Total	**14.0**	**5.9**	**2.7**
Total BMV	**3.0**	**1.7**	**0.1**
**The soil survey took a 'whole field approach' of the 14.0 ha field where the proposed converter station will be situated.* ***The Permanent development includes the converter station footprint and attenuation ponds.* ****The temporary development includes the 40 m working width and temporary construction compounds.*			

As per the methodology set out in Section 12.5.2: Data Gathering Methodology – Agricultural Land, the ALC gradings for Section 4 have been calculated using a combination of the Provisional ALC dataset (Ref 12-23, **Figure 12-1**) to define areas of Grade 1 and 2 land; and the detailed ALC survey conducted within the 14.0 ha survey area at the proposed converter station site on 4th November 2021, shown in

Table 12-22. The Predictive ALC dataset was not required to provide a split between Subgrade 3a:Subgrade 3b land as no land Provisionally mapped as Grade 3 was present within the study area or proposed working area for Section 4.

The majority of agricultural and within the Section 4 study area (65.2 %) is Grade 2, Subgrade 3b being the next common grading (18.8 %). In total 27.5 ha (79.5 %) of the agricultural land within the Section 4 study area is calculated to be BMV quality.

Within the proposed working area, not including the converter station, the area of BMV quality agricultural land is 7.2 ha (97.3 %). The area of permanent development on BMV land at the converter station is 1.6 ha (28.0 %). The difference between the Provisional and the Predictive mapping and the calculated ALC grading, is the area which was subject to the detailed soil survey, which found Subgrade 3b to make up the majority of the converter station site.

Table 12-23: Calculated ALC grading - Section 4

ALC Grade	Area (ha)	Percentage
Study area (planning application boundary)		
Grade 1	4.9	14.3
Grade 2	22.6	65.2
Subgrade 3b	6.5	18.8
Non-agricultural (Drax substation)	0.6	1.8
Total	**34.6**	**100**
Total BMV	**27.5**	**79.5**
Temporary development (working width)		
Grade 1	1.5	20.3
Grade 2	5.7	77.0
Subgrade 3b	0.2	2.7
Total	**7.4**	**100**
Total BMV	**7.2**	**97.3**
Permanent development (proposed converter station)		
Grade 2	1.7	28.8
Subgrade 3b	4.2	71.2
Total	**5.9**	**100**
Total BMV	**1.7**	**28.8**

12.5.7.3 Soils

Soil Survey of England and Wales Soils Mapping for Northern England (Ref 12-22) identifies three soil associations within the Section 4 study area. As stated previously, the scale of the mapping is such that it is not accurate to the field level and does not pick up small-scale local variations in soil type. It does however provide a general indication of the soils types within the study area. The associations are listed from east to west in order first encountered within **Table 12-24,** as shown in **Figure 12-4.** Erodibility data are taken from Cranfield University (Ref 12-19).

The only detailed soil survey data for the Section 4 study area, and the English Onshore Scheme study area as a whole, is from the detailed ALC survey conducted within the 14.0 ha survey area at the proposed converter station site on 4th November 2021. This area is mapped as belonging to the Foggathorpe 2 association. The soil survey confirmed the presence of the Foggathorpe 2 association, specifically the Portington and Foggathorpe soil series. The soils therefore do correspond to the association mapped by the Soil Survey of England and Wales.

Table 12-24: Soil Associations – Section 4

Soil Association	Amount within Study Area (ha)	Amount within proposed working area (ha)	General Description*	Erodibility
Romney (532b)	8.1	3.1	Deep stoneless permeable calcareous coarse and fine silty soils. Flat land. Groundwater controlled by ditches and pumps.	Very small risk (water)
Foggathorpe 2 (712i)	25.0	3.6	Slowly permeable seasonally waterlogged stoneless clayey and fine loamy over clayey soils. Some similar coarse loamy over clayey soils.	Very small risk (water)
Wick 1 (541r)	1.5	0.8	Deep well drained coarse loamy and sandy soils locally over gravel. Some similar soils affected by groundwater.	Moderate risk (water and wind)
From Soil Survey of England and Wales (1984) (Ref 12-22)				

Soils of the Froggathorpe 2 and Ronmey associations are the most abundant in the Section 4 study area (totalling 33.1 ha, 95.7 %); and are classed as being of very small risk of erosion. Following the criteria in **Table 12-5**, these soils are therefore classified as low sensitivity.

The soils of the Wick 1 association cover the remaining land in the study area, however it is noted that a proportion of these soils are likely no longer in situ, having been stripped to allow development of the existing Drax substation. These soils are classed as being at moderate risk of erosion, and therefore, following the criteria in **Table 12-5**, are classified as being of medium sensitivity.

Soils of the Froggathorpe 2 and Ronmey associations are the most abundant in the Section 4 within the proposed working area, with a combined total of 6.7 ha, 90.5 %. Following the criteria in **Table 12-5,** these soils are, therefore, classified as low sensitivity.

The soils of the Wick 1 association cover the remaining land in the proposed working are (0.8 ha). These soils are classed as being at moderate risk of erosion, and therefore, following the criteria in **Table 12-5**, are classified as being of medium sensitivity.

12.5.8 Summary of ALC and Soils Within the Study Area

To summarise the soils and agricultural land that may be affected by the English Onshore Scheme, the ALC gradings for the whole study area are shown in **Table 12-25** and the soil associations for the whole study area in **Table 12-26**.

The proportion of BMV land within the study area and areas of temporary development is similar, at 83.4 % and 86.4 % respectively. Comparatively the detailed Post1988 survey conducted at the proposed converter station provided a detailed assessment of the soils, where only 24.4 % of the area of permanent development will be situated on BMV land. **Figure 12-1** and **Figure 12-2** show that in Section 1 Provisional Grade 3, of High likelihood BMV was most prevalent, for Section 2 this was Provisional Grade 2, Section 3 was predominantly Provisional Grade 3 with areas of High, Moderate and Low likelihood of BMV and an area of Provisional Grade 1, and Section 4 was wholly Provisional Grade 1 and 2, however the detailed soil survey (**Figure 12-3**) found the land at the proposed converter station to constitute Grade 2 and Subgrade 3b.

Table 12-25: Calculated ALC Grading – Summary

ALC Grade	Area (ha)				Total Area (ha)	Percentage (%)
	Section 1	Section 2	Section 3	Section 4		
Study area (planning application boundary)						
Grade 1	0.0	0.0	39.4	4.9	44.3	7.0
Grade 2	93.2	109.8	11.0	22.6	236.6	37.6
Subgrade 3a	111.4	27.9	96.3	0.0	235.6	37.5
Subgrade 3b	5.8	7.8	60.5	6.5	80.5	12.8
Grade 4	2.0	13.1	6.2	0.0	21.3	3.4
Non-agricultural	9.1	0.0	0.8	0.0	9.9	1.6
Urban	0.0	0.0	0.0	0.6	0.6	0.1
Total	**221.5**	**158.5**	**214.2**	**34.6**	**628.8**	**100.0**
Total BMV	**204.6**	**137.7**	**146.7**	**27.5**	**516.5**	**82.1**
Temporary Development (40 m swathe)						
Grade 1	0.0	0.0	19.5	1.5	21.0	6.9
Grade 2	52.8	58.0	4.9	5.7	121.6	39.9
Subgrade 3a	57.2	14.6	51.8	0.0	123.6	40.5
Subgrade 3b	2.5	3.1	30.0	0.2	35.6	11.7
Grade 4	0.0	0.9	2.6	0.0	3.5	1.1
Total	**112.4**	**76.6**	**108.8**	**7.4**	**305.2**	**100.0**
Total BMV	**109.9**	**72.6**	**76.2**	**7.4**	**266.2**	**87.2**
Permanent Development (proposed converter station)						
Grade 2	-	-	-	1.7	**1.7**	**28.8**
Subgrade 3b	-	-	-	4.2	**4.2**	**71.2**
Total	**-**	**-**	**-**	**5.9**	**5.9**	**100**
Total BMV	**-**	**-**	**-**	**1.7**	**1.7**	**28.8**

The soil associations within the study area as a whole show that the most prevalent soil association is the Holderness (711u) association 141.9 ha, which has a small risk of erosion, followed by the Foggathorpe 2 (712i) association 98.0 ha, which has a very small risk of erosion. This is also true for the proposed working area where 77.0 ha of the Holderness (711u) association and 39.6 ha of the Foggathorpe 2 (712i) association is still present in the largest proportions.

The soil associations with a very small to small risk of erosion include: Holderness (711u), Rockcliffe (811d), Frome (812a), Burlingham 2 (572o), Panholes (511c), Hunstanton (571r), Icknield (341), Swaffham Prior (511e), Sessay (831b), Fladbury 3 (813d), and Romney (532b). These soils cove the majority of the study area 480.4 ha (76.4 %) and the proposed working area 235.6 ha (77.2 %).

The soil associations with a moderate risk of erosion include: Wick 1 (541r), Bishampton 1 (572s), Andover 1 (343h), Holme Moor (641c), and Foggathorpe 2 (712i). These soils cover 68.8 ha (10.9 %) of the study area and 28.8 ha (9.4 %) of the proposed working area.

The soil associations with a high to very high risk of erosion include Newport 1 (551d) and Everingham (821a). These soils cover 79.5 ha (12.6 %) of the study area, and 40.8 ha (13.4 %) of the proposed working area.

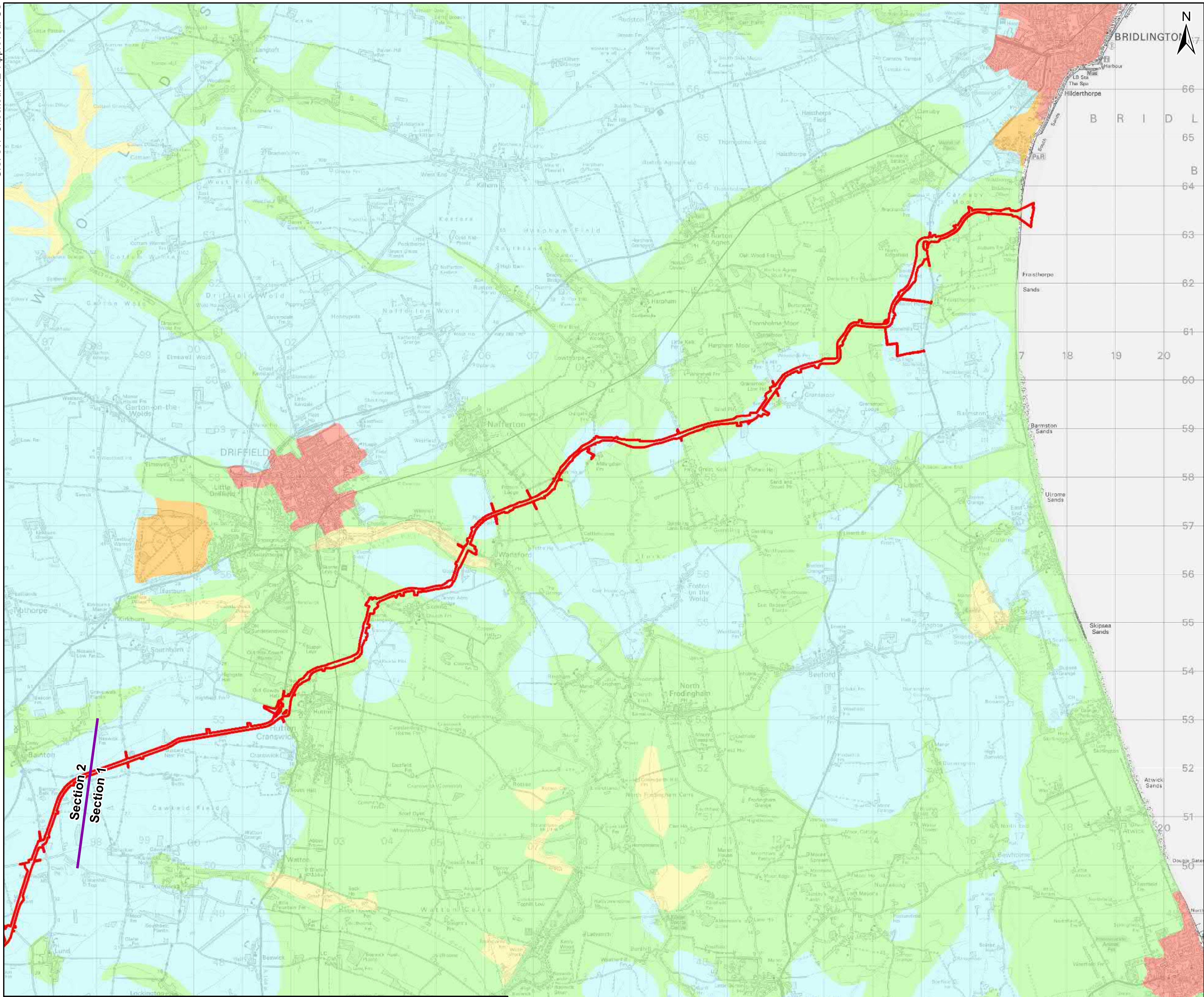
Due to the distribution of the soil associations within the study area (**Figure 12-4**), which band across the width of the route in most places, it is not possible to avoid any associations. The only soil association that was present within the study area (0.5 ha) and not the proposed working area was the Icknield (341) association.

Table 12-26: Soil Associations – Summary

Soil Association	Amount within Study Area (ha)	Amount within proposed working area (ha)	General Description*	Erodibility
Wick 1 (541r)	15.0	7.0	Deep well drained coarse loamy and sandy soils locally over gravel. Some similar soils affected by groundwater. Slight risk of water erosion.	Moderate risk (water and wind)
Holderness (711u)	141.9	77.0	Slowly permeable seasonally waterlogged fine loamy soils and similar soils with only slight waterlogging. Narrow strips of clayey alluvial soils.	Small risk (water)
Rockcliffe (811d)	6.5	3.8	Deep stoneless silty and fine sandy soils variably affected by groundwater depending on artificial drainage. Flat land.	Very small risk (water)
Bishampton 1 (572s)	12.7	5.4	Deep fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging associated with well drained fine and coarse loamy soils in an undulating landscape. Some slowly permeable seasonally waterlogged fine loamy soils.	Moderate risk (water)
Frome (812a)	20.5	9.2	Shallow calcareous and non-calcareous loamy soils over flint gravel affected by groundwater. Small areas of peat. Risk of flooding.	Very small risk (water)
Burlingham 2 (572o)	35.2	21.9	Deep fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Some slowly permeable seasonally waterlogged fine loamy soils. Some well drained fine and coarse loamy soils.	Small risk (water)
Panholes (511c)	67.5	31.7	Well drained calcareous fine silty soils over chalk. Associated similar shallow soils and deeper non-calcareous fine silty soils.	Small risk (water)
Hunstanton (571r)	18.7	10.2	Deep well drained often reddish fine and coarse loamy soils. Some similar calcareous soils over chalk.	Small risk (water)
Andover 1 (343h)	19.4	6.3	Shallow well drained calcareous silty soils over chalk on slopes and crests. Deep calcareous and non-calcareous fine silty soils in valley bottoms. Striped soil patterns locally.	Moderate risk (water)
Icknield (341)	0.5	0.0	Shallow, mostly humose, well drained calcareous soils over chalk on steep slopes and hill tops. Deeper flinty calcareous silty soils in small coombes and valleys.	Small risk (water)
Swaffham Prior (511e)	10.9	7.0	Well drained calcareous coarse and fine loamy soils over chalk rubble. Some similar shallow soils. Deep non-calcareous loamy soils in places. Striped and polygonal soil patterns locally. Slight risk of water erosion.	Small risk (water)
Newport 1 (551d)	34.3	13.8	Deep well drained sandy and coarse loamy soils. Some sandy soils affected by groundwater. Risk of wind and water erosion.	Very high risk (water and wind)

Soil Association	Amount within Study Area (ha)	Amount within proposed working area (ha)	General Description*	Erodibility
Everingham (821a)	45.2	27.0	Deep stoneless permeable fine sandy soils some with bleached subsurface horizon. Groundwater controlled by ditches. Risk of wind erosion.	High risk (wind)
Holme Moor (641c)	21.7	10.1	Deep stoneless, naturally very acid, fine sandy soils, with a bleached subsurface horizon, affected by groundwater. Where cultivated groundwater is controlled by ditches. Some well drained very acid sandy soils. Risk of wind erosion.	Moderate risk (wind)
Sessay (831b)	30.4	16.6	Fine and coarse loamy often stoneless, permeable soils affected by groundwater. Associated with slowly permeable seasonally waterlogged fine loamy over clayey and clayey soils. Generally flat land.	Small risk (wind)
Fladbury 3 (813d)	2.8	0.9	Stoneless clayey, fine silty and fine loamy soils affected by groundwater. Flat land. Risk of flooding.	Very small risk (water)
Foggathorpe 2 (712i)	98.0	39.6	Slowly permeable seasonally waterlogged stoneless clayey and fine loamy over clayey soils. Some similar coarse loamy over clayey soils.	Very small risk (water)
Romney (532b)	38.2	17.7	Deep stoneless permeable calcareous coarse and fine silty soils. Flat land. Groundwater controlled by ditches and pumps.	Very small risk (water)
Total	**628.7**	**305.2**		
Total very small and small risk soils	**480.4**	**235.6**		
Total moderate risk soils	**68.8**	**28.8**		
Total high and very high risk soils**	**79.5**	**40.8**		

From Soil Survey of England and Wales (1984) (Ref 12-22**)*
***All high and very high-risk soils fall within the ERYC area in sections 2 and 3.*



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Scale @ A3 1:75,000

GIS: SW Checked: KE Approved: GS

nationalgrid

PROJECT

Scotland England Green Link 2

KEY

- 60 m Wide LOD

Provisional Agricultural Land Classification

- Grade 2
- Grade 3
- Grade 4
- Non Agricultural
- Urban
- Route Section Break

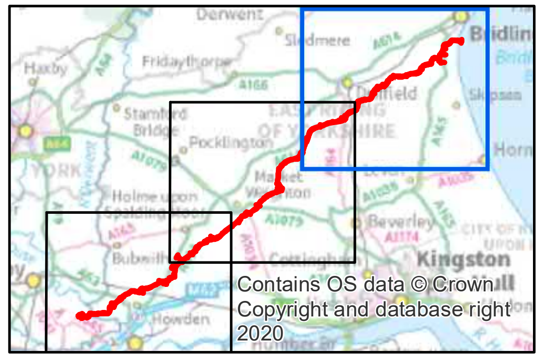

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Figure 12-1
Provisional ALC

REFERENCE

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SHEET NUMBER 1 of 3

DATE 23/05/2022

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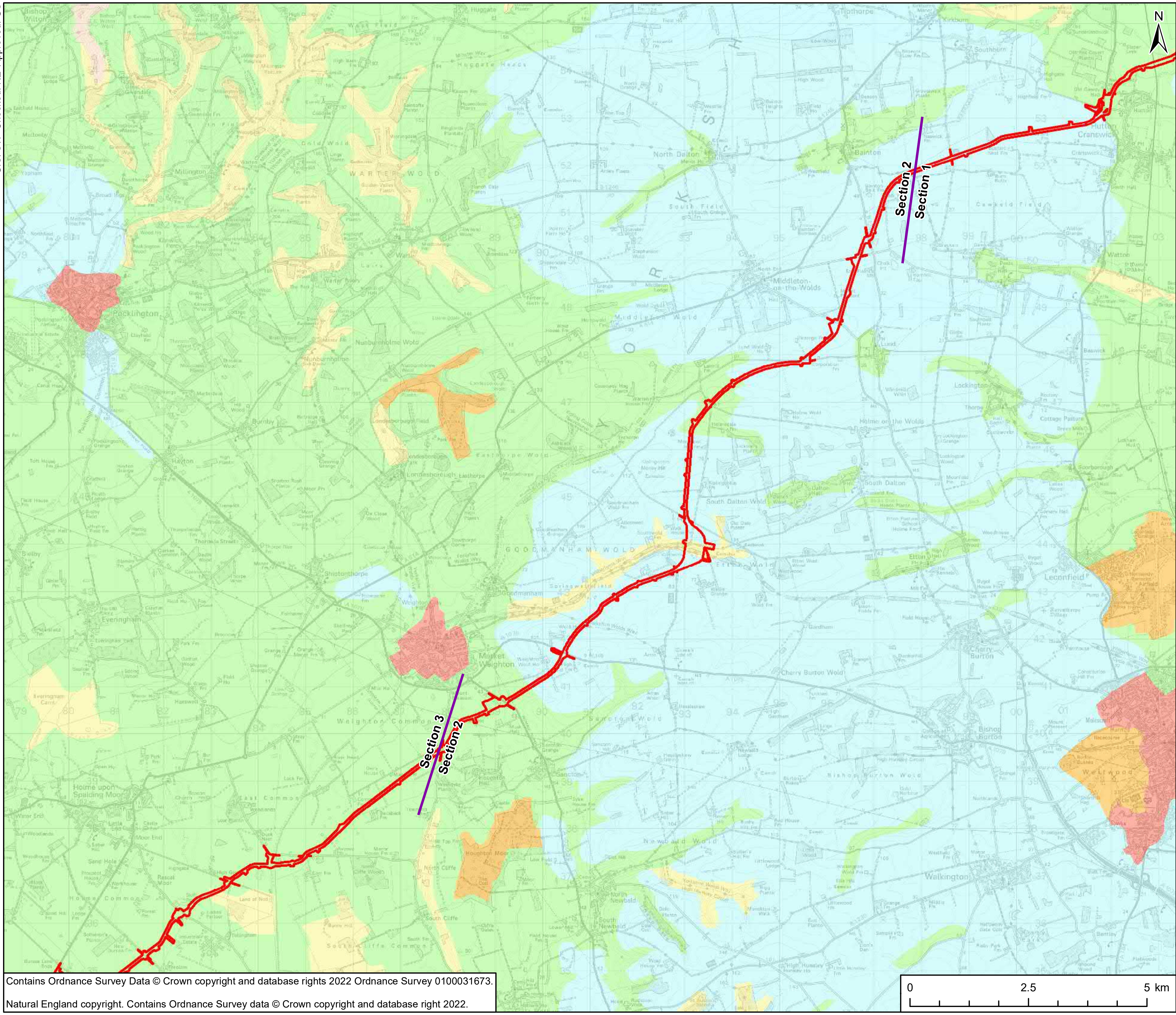

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nationalgrid

PROJECT

Scotland England Green Link 2

KEY

- 60 m Wide LOD

Provisional Agricultural Land Classification

- Grade 2
- Grade 3
- Grade 4
- Grade 5
- Non Agricultural
- Urban
- Route Section Break

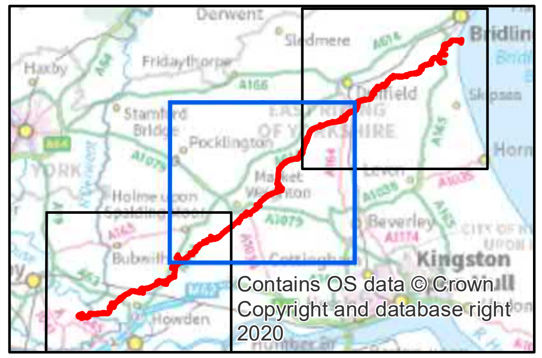

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Figure 12-1
Provisional ALC

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2 of 3 | 23/05/2022

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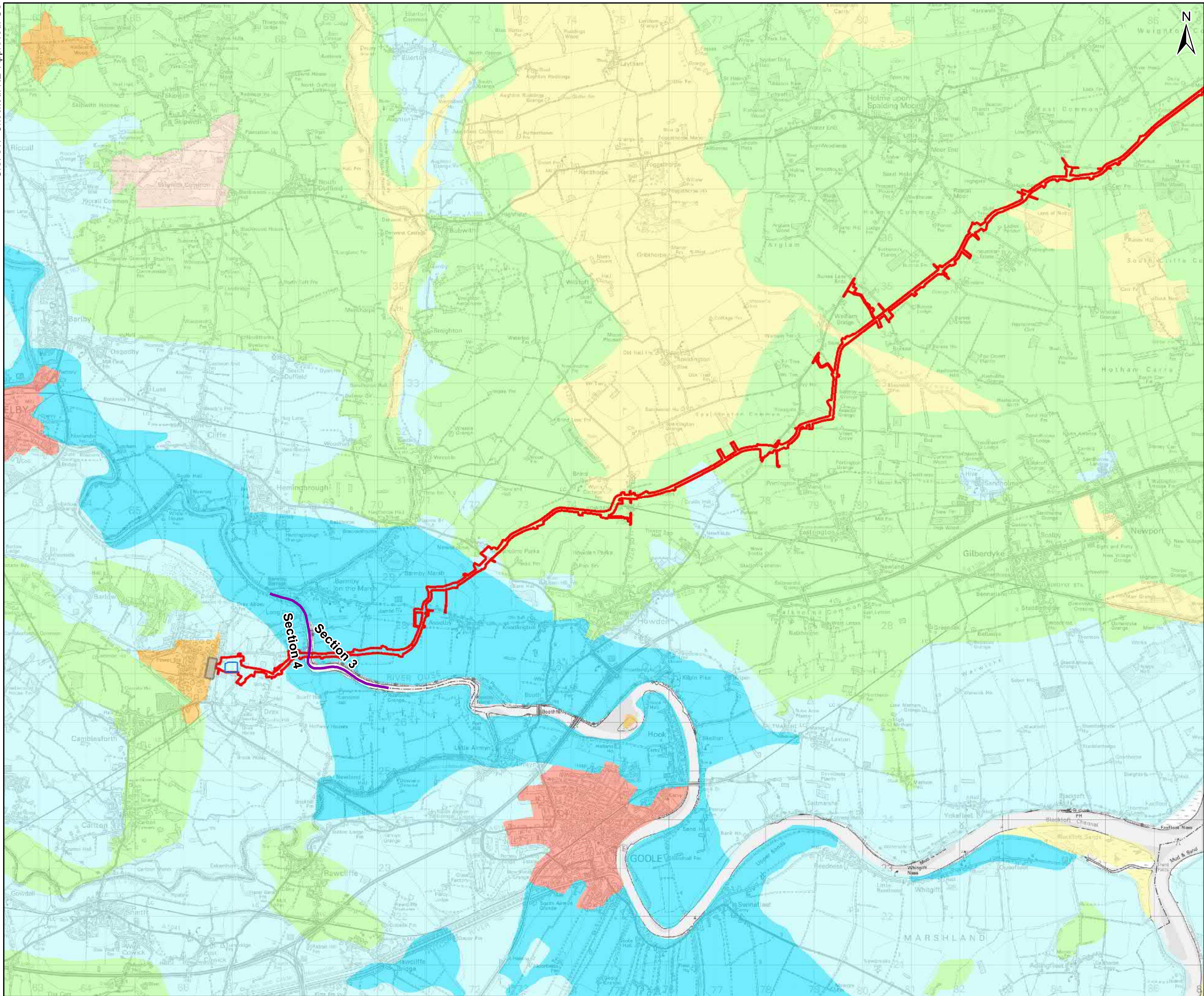

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Scale @ A3 1:75,000

nationalgrid

PROJECT

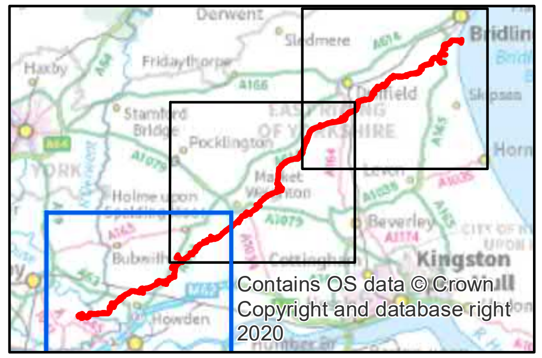
Scotland England Green Link 2

KEY

- 60 m Wide LOD
- Converter Station Extent
- Existing Drax 400kV Substation

Provisional Agricultural Land Classification

- Grade 1
- Grade 2
- Grade 3
- Grade 4
- Grade 5
- Non Agricultural
- Urban
- Route Section Break



TITLE

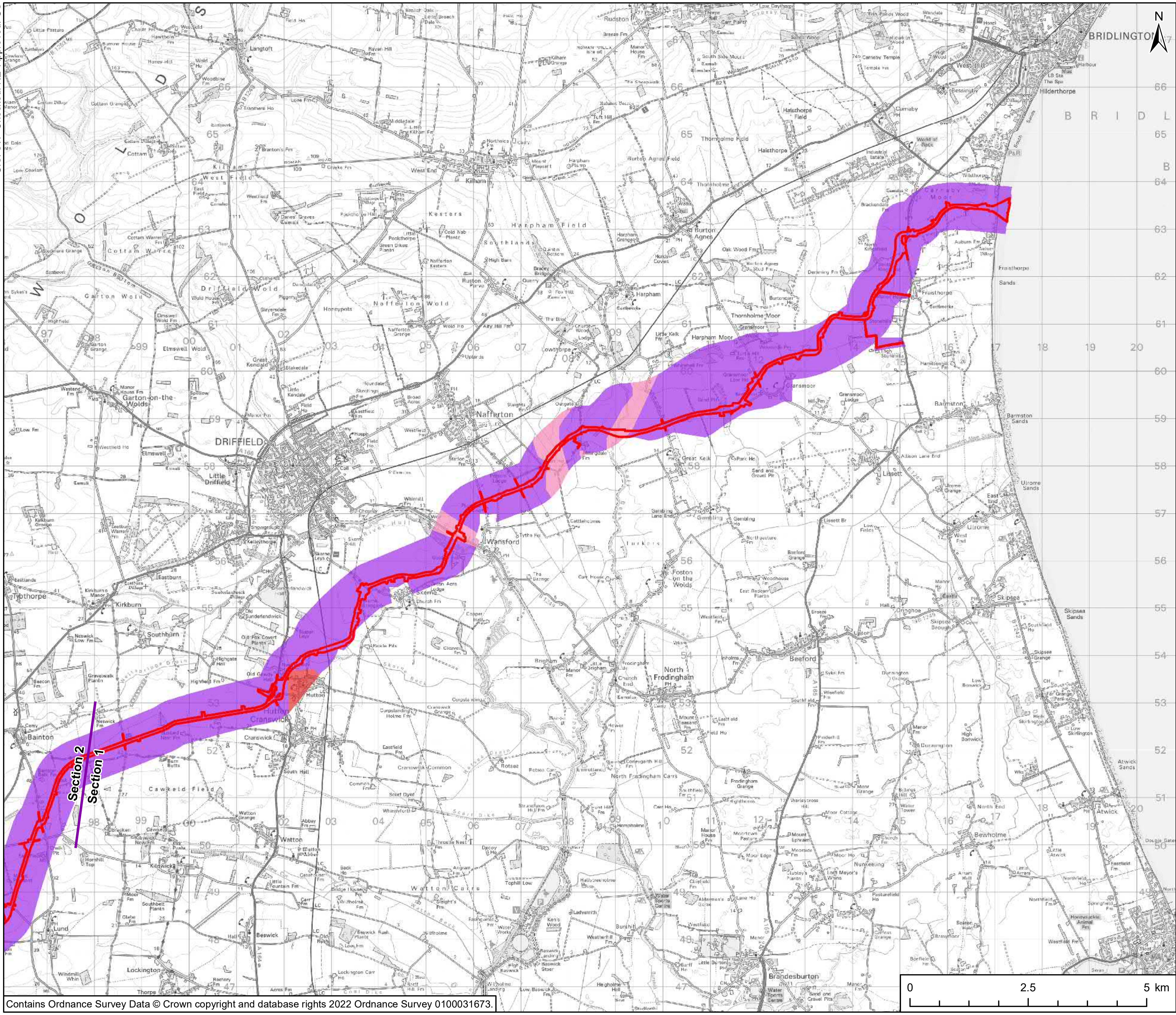
Figure 12-1
Provisional ALC

REFERENCE

SEGL2_T_ES_12-1_v2_20220523

SHEET NUMBER | DATE

3 of 3 | 23/05/2022



Coordinate System: British National Grid

Scale @ A3 1:75,000

nationalgrid

PROJECT

Scotland England Green Link 2

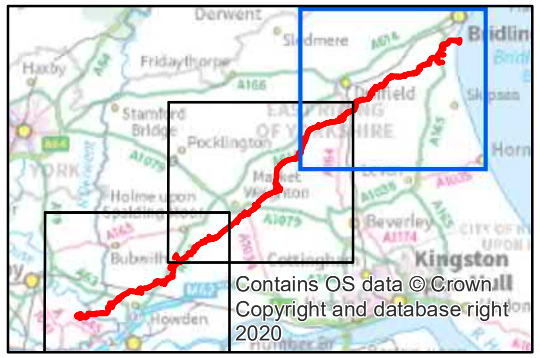
KEY

- 60 m Wide LOD

Likelihood of BMV Assessment

- High likelihood of BMV land (>60 % area BMV)
- Moderate likelihood of BMV land (20 - 60 % area bmv)
- Urban / Industrial
- Route Section Break

NOTE:



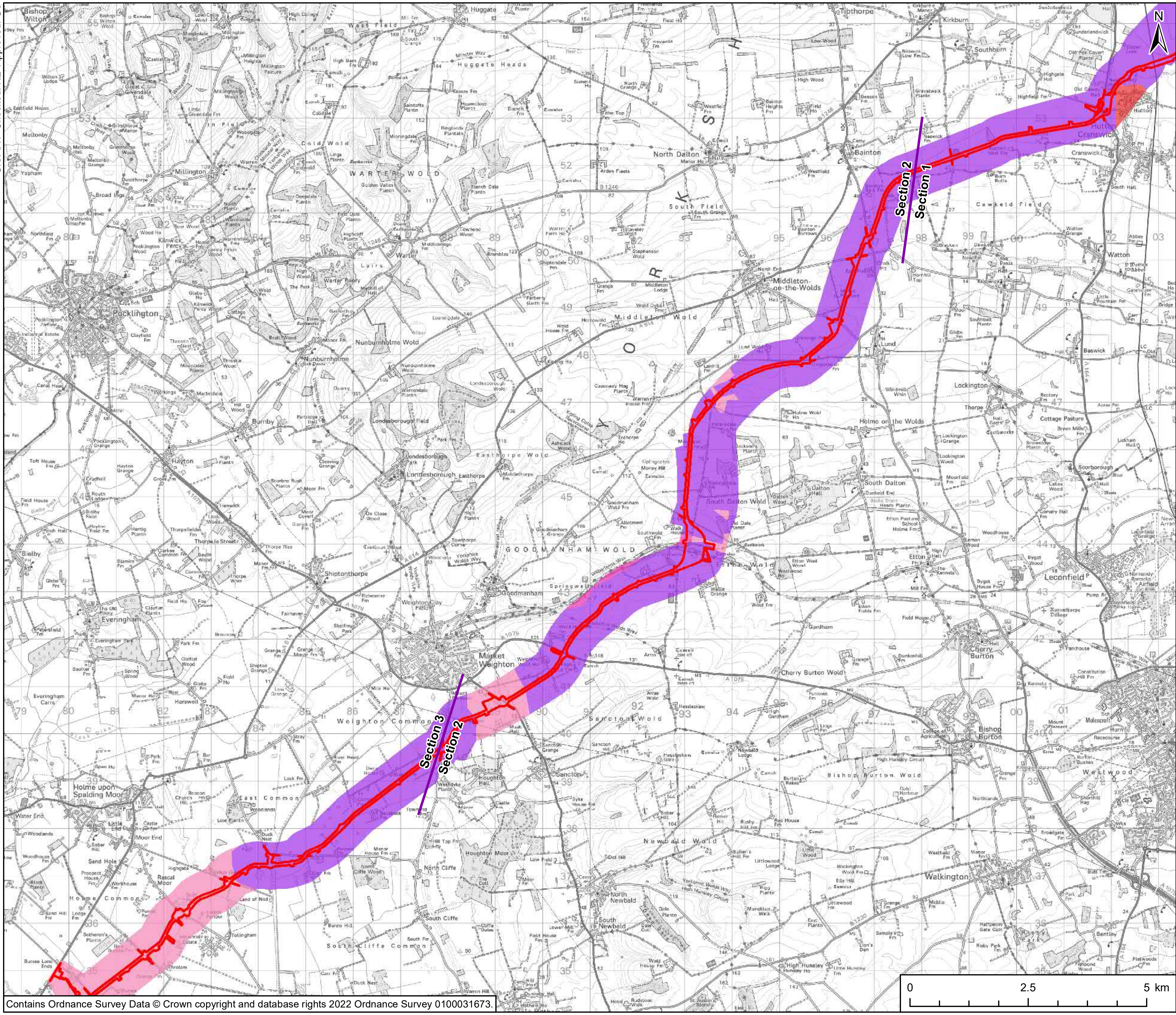
TITLE

Figure 12-2
Predictive ALC

REFERENCE

SEGL2_T_ES_12-2_v3_20220517

SHEET NUMBER	DATE
1 of 3	17/05/2022



Coordinate System: British National Grid

Scale @ A3 1:75,000

nationalgrid

PROJECT

Scotland England Green Link 2

KEY

60 m Wide LOD

Likelihood of BMV Assessment

High likelihood of BMV land (>60 % area BMV)

Moderate likelihood of BMV land (20 - 60 % area bmv)

Low likelihood of BMV land (<= 20 % area BMV)

Urban / Industrial

Route Section Break

NOTE:

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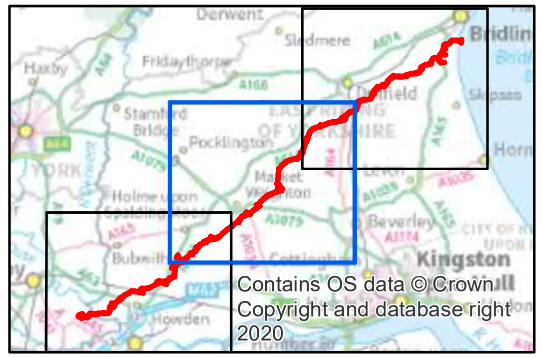


TITLE

Figure 12-2
Predictive ALC

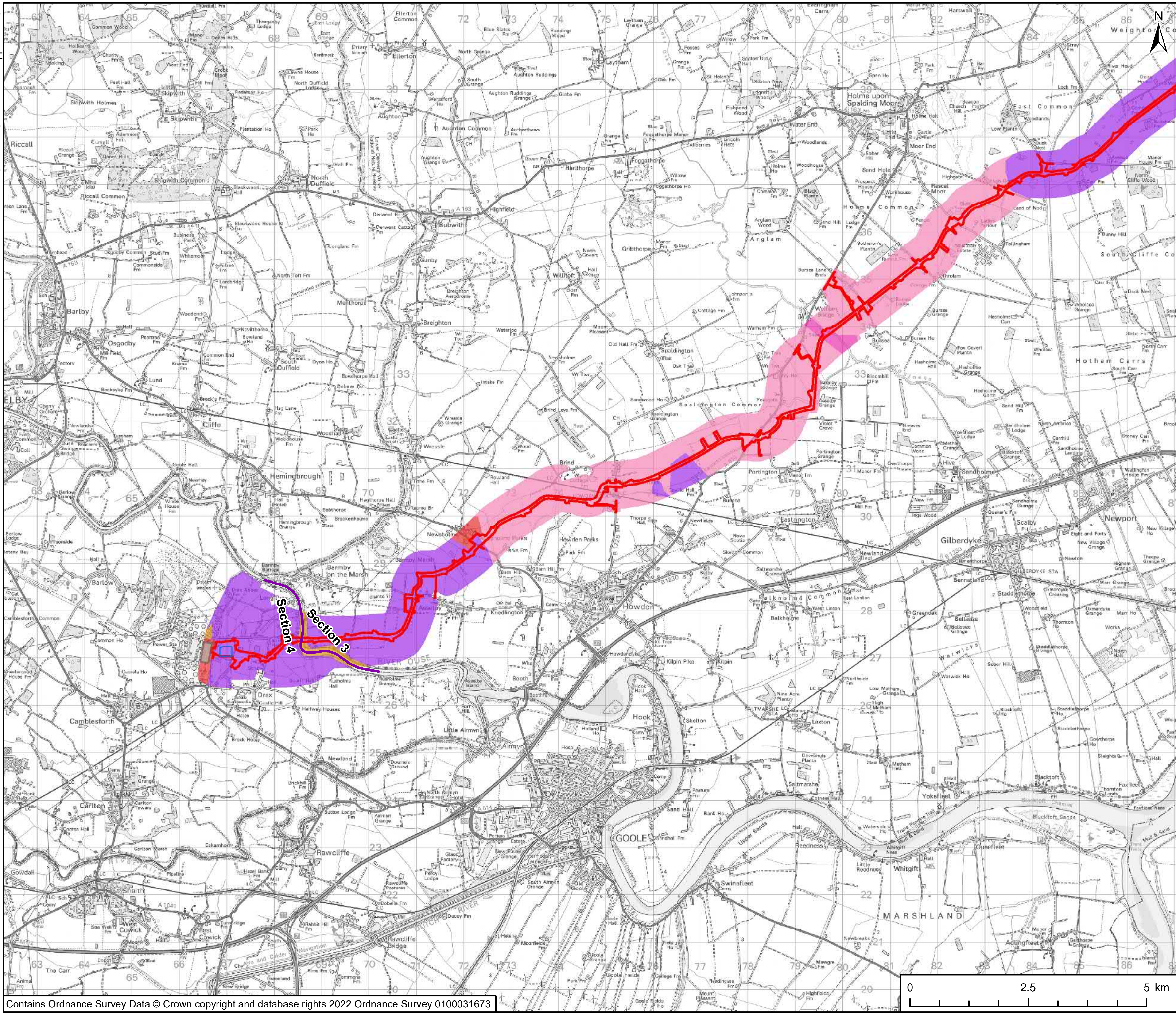
REFERENCE

SEGL2_T_ES_12-2_v3_20220517

SHEET NUMBER 2 of 3

DATE 17/05/2022

GIS: SW Checked: KE Approved: GS



Coordinate System: British National Grid

Scale @ A3 1:75,000

nationalgrid

PROJECT

Scotland England Green Link 2

KEY

- 60 m Wide LOD

RouteType

- Converter Station Extent
- Existing Drax 400kV Substation

Likelihood of BMV Assessment

- High likelihood of BMV land (>60 % area BMV)
- Moderate likelihood of BMV land (20 - 60 % area bmv)
- Low likelihood of BMV land (<= 20 % area BMV)
- Non-agricultural use
- Urban / Industrial
- Route Section Break

NOTE:

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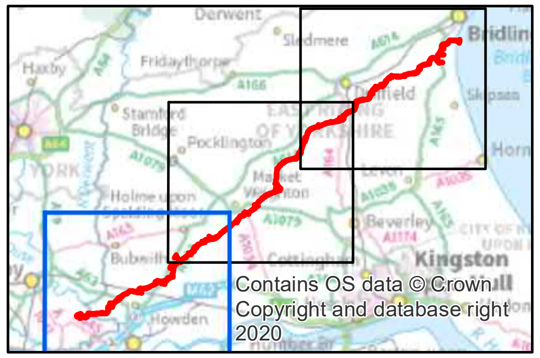


TITLE

Figure 12-2
Predictive ALC

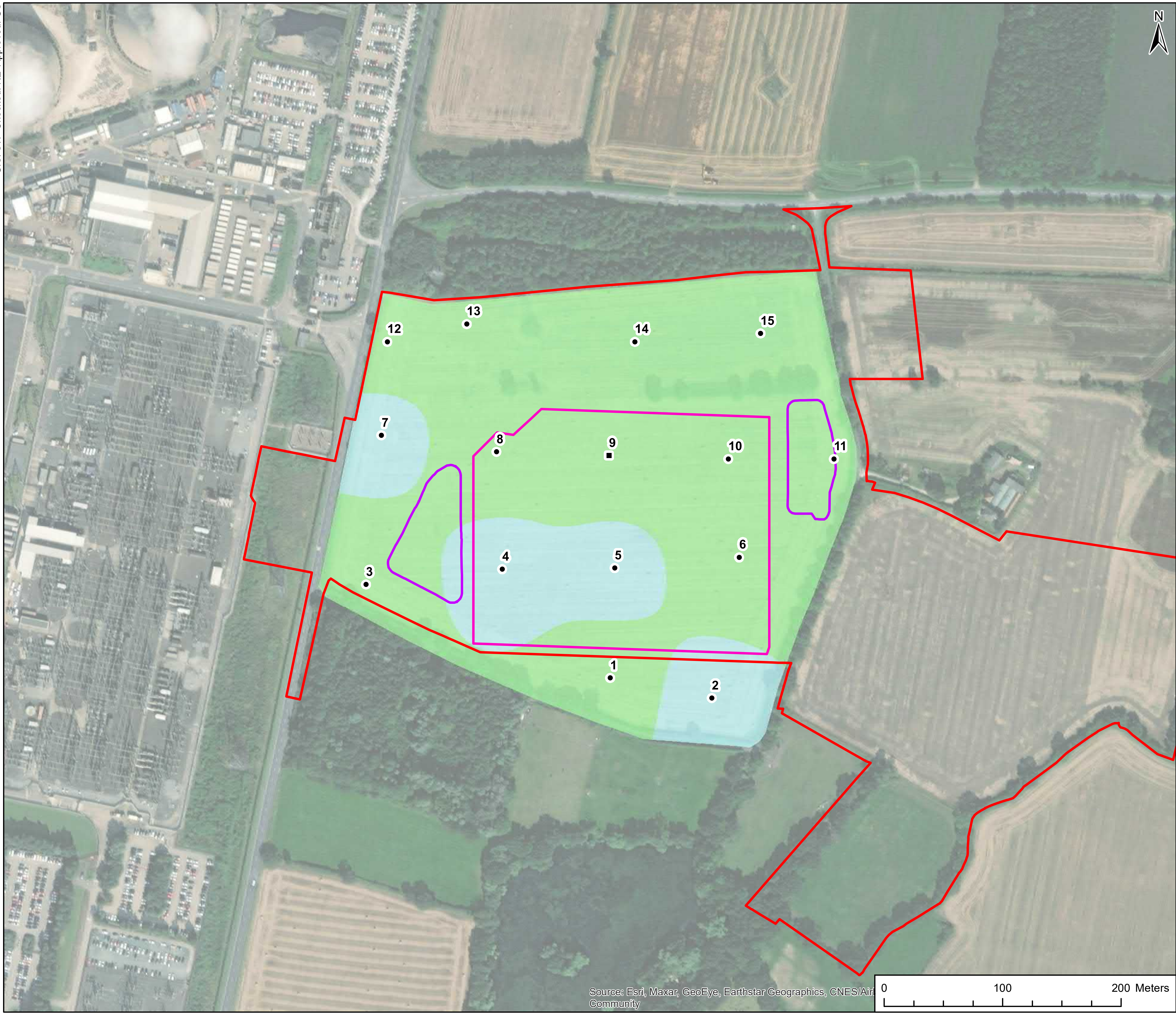
REFERENCE

SEGL2_T_ES_12-2_v3_20220517

SHEET NUMBER 3 of 3

DATE 17/05/2022

GIS: SW Checked: KE Approved: GS



Coordinate System: British National Grid

Scale @ A3 1:3,000

nationalgrid

PROJECT

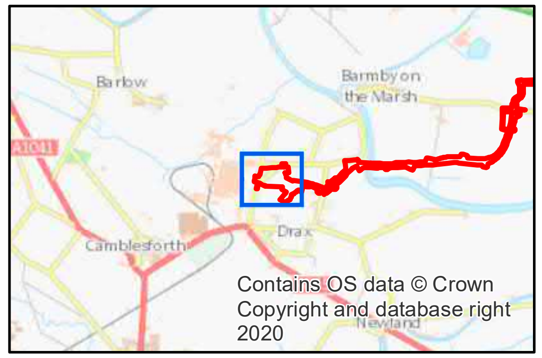
Scotland England Green Link 2

KEY

- 60 m Wide LOD
- Attenuation Pond
- Converter Station Extent

Agricultural Land Classification

- Grade 2
- Subgrade 3b
- Auger Core
- Profile Pit



TITLE

Figure 12-3
Agricultural Land Classification in Areas of Permanent Development

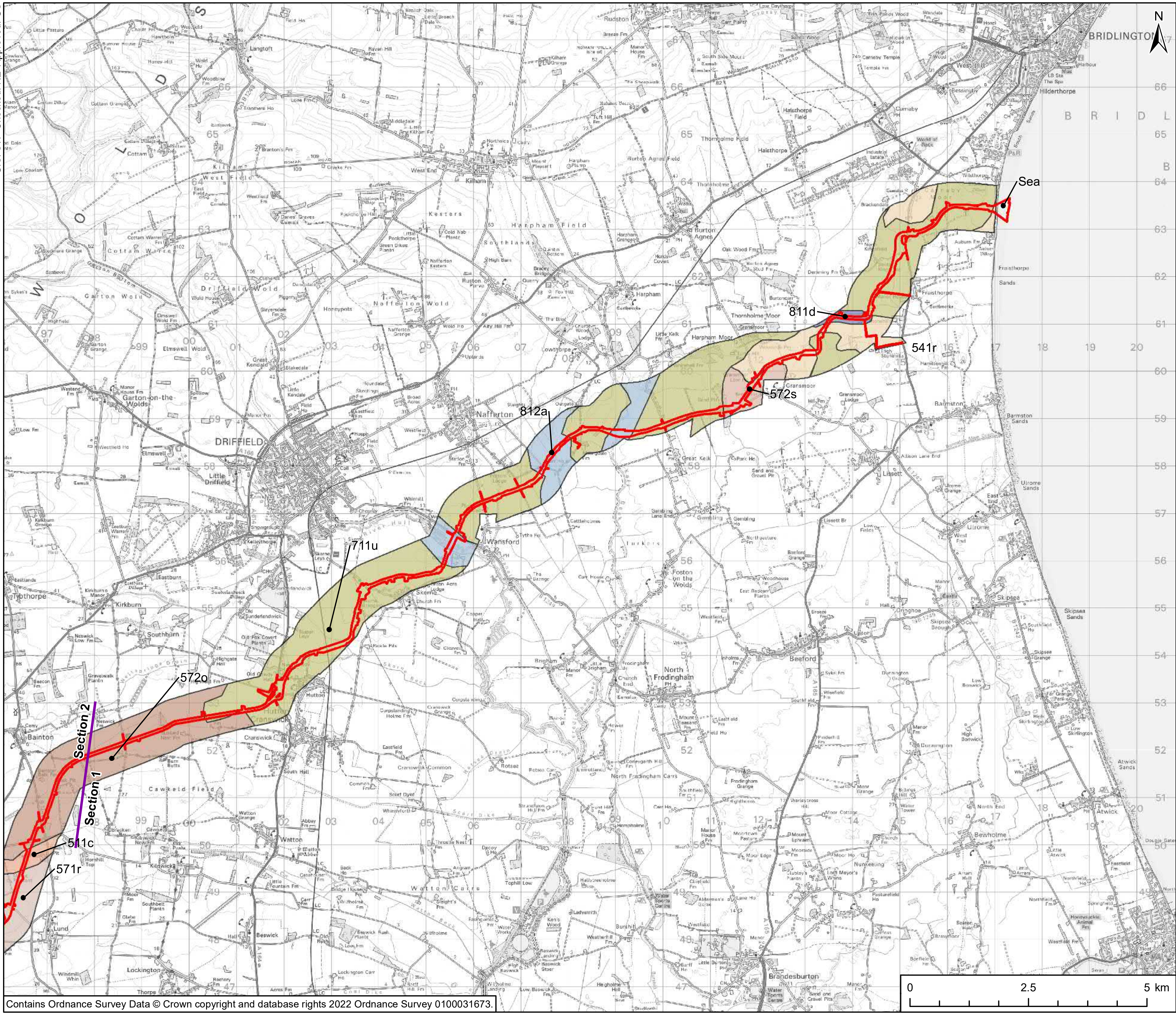
REFERENCE

SEGL2_T_ES_12-3_v2_20220517

SHEET NUMBER: 1 of 1

DATE: 17/05/2022

GIS: SW Checked: KE Approved: GS



Coordinate System: British National Grid

Scale @ A3 1:75,000

nationalgrid

PROJECT

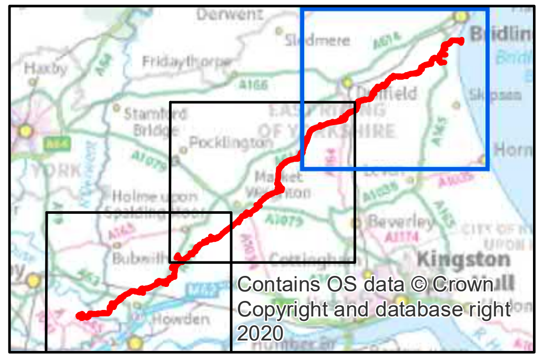
Scotland England Green Link 2

KEY

- 60 m Wide LOD
- **Soil Associations**
- Panholes (511c)
- Wick 1 (541r)
- Hunstanton (571r)
- Burlingham 2 (572o)
- Bishampton 1 (572s)
- Holderness (711u)
- Rockcliffe (811d)
- Frome (812a)
- Route Section Break

NOTE:

Soils information taken from the Soil Survey of England and Wales: Northern England (1984) and associated map Sheet 1 Northern England



TITLE

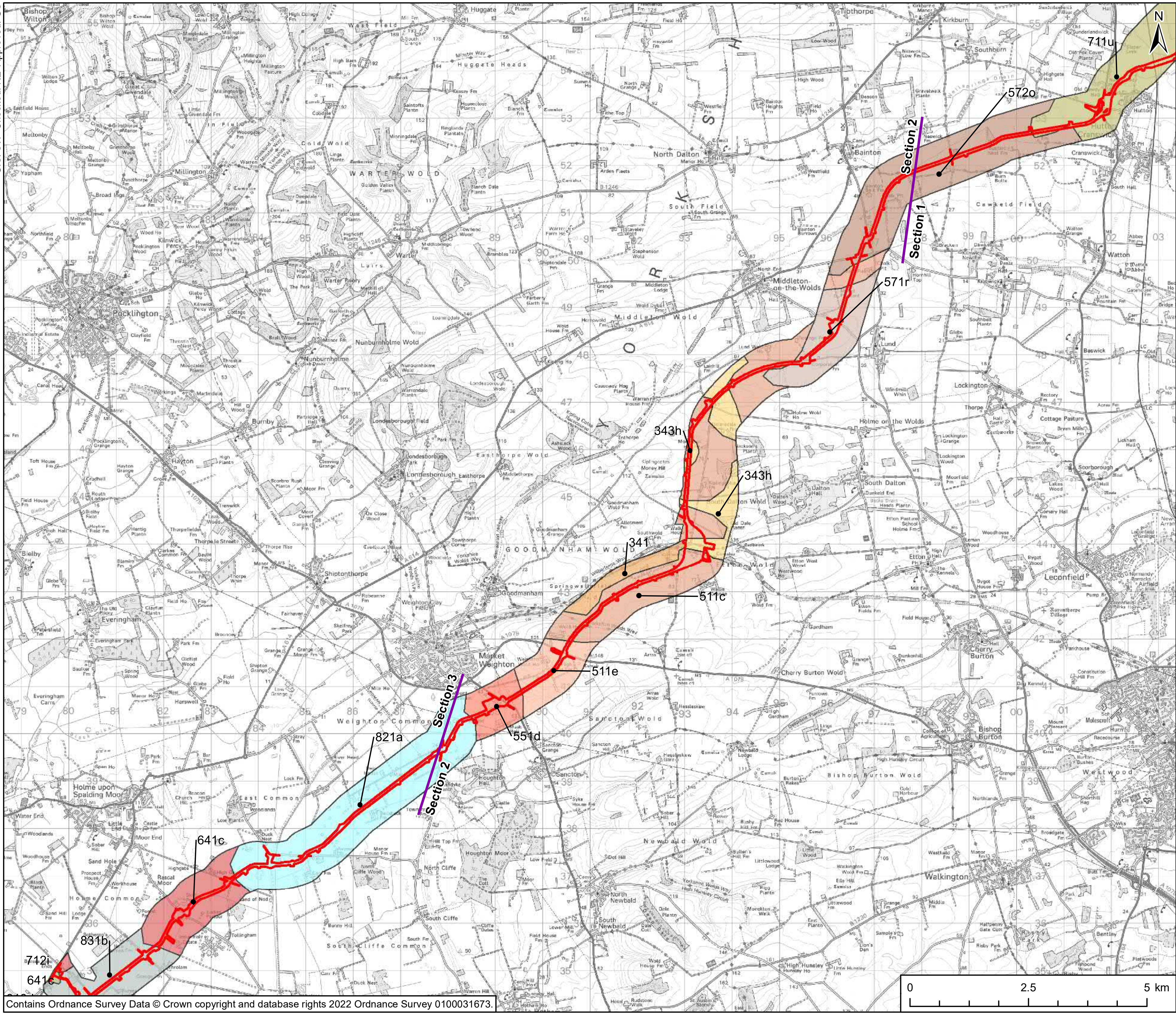
Figure 12-4
Soil Associations

REFERENCE

SEGL2_T_ES_12-4_v3_20220523

SHEET NUMBER 1 of 3

DATE 23/05/2022



Coordinate System: British National Grid

Scale @ A3 1:75,000

nationalgrid

PROJECT

Scotland England Green Link 2

KEY

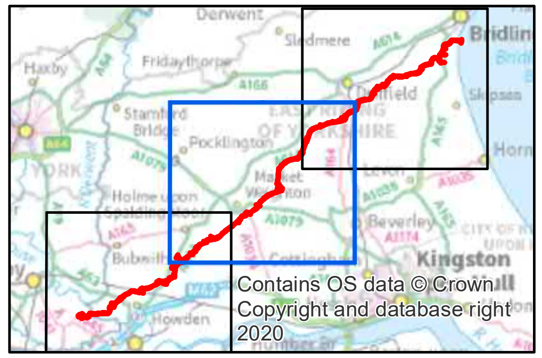
- 60 m Wide LOD

Soil Associations

- Icknield (341)
- Andover 1 (343h)
- Panholes (511c)
- Swaffham Prior (511e)
- Newport 1 (551d)
- Hunstanton (571r)
- Burlingham 2 (572o)
- Holme Moor (641c)
- Holderness (711u)
- Foggathrope 2 (712i)
- Fladbury 3 (813d)
- Everingham (821a)
- Sessay (831b)
- Route Section Break

NOTE:

Soils information taken from the Soil Survey of England and Wales: Northern England (1984) and associated map Sheet 1 Northern England



TITLE

Figure 12-4
Soil Associations

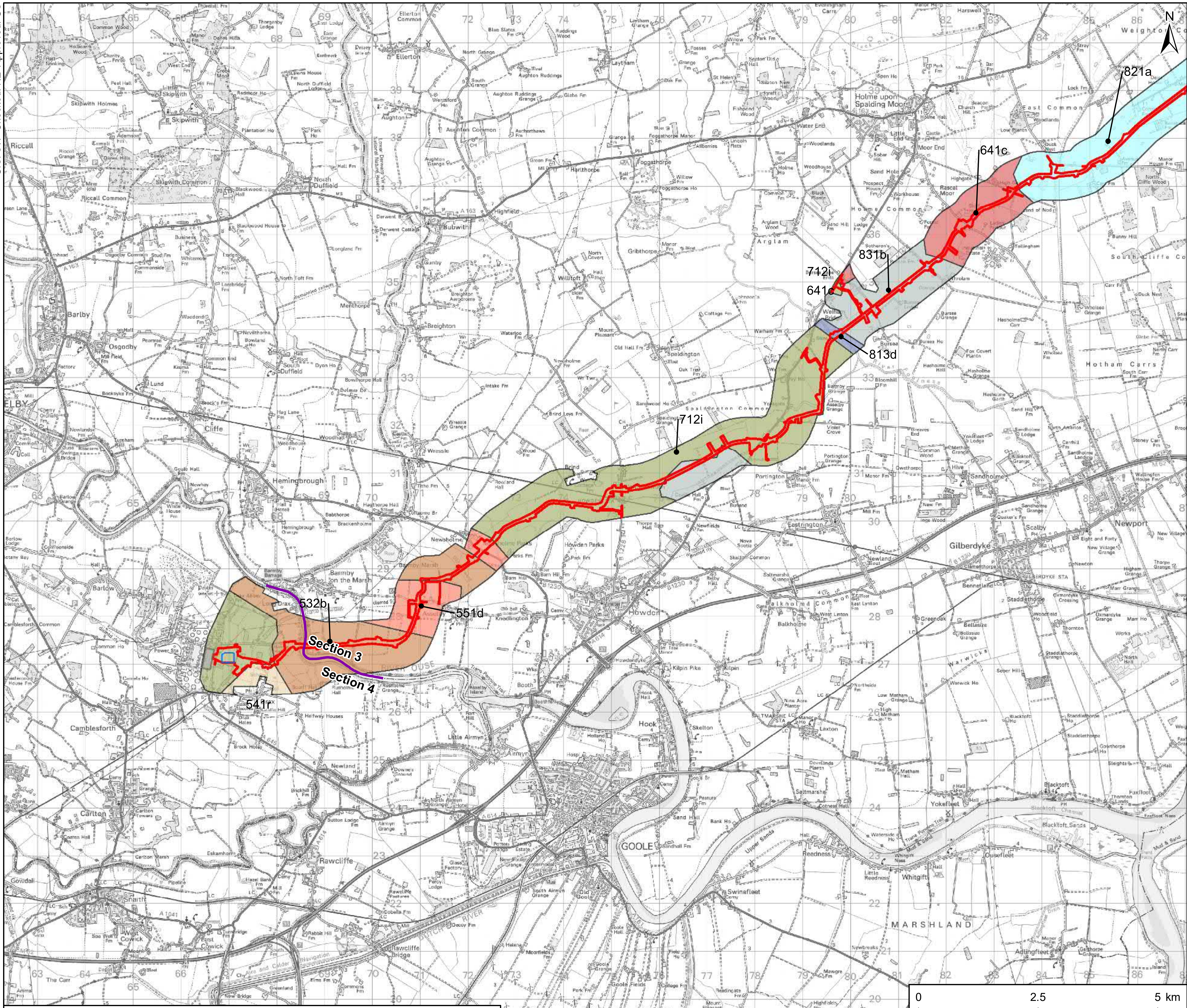
REFERENCE

SEGL2_T_ES_12-4_v3_20220523

SHEET NUMBER 2 of 3

DATE 23/05/2022

GIS: SW Checked: KE Approved: GS



Coordinate System: British National Grid

Scale @ A3 1:75,000

nationalgrid

PROJECT

Scotland England Green Link 2

KEY

- 60 m Wide LOD

RouteType

- Converter Station Extent

Soil Associations

- Romney (532b)
- Wick 1 (541r)
- Newport 1 (551d)
- Holme Moor (641c)
- Foggathrope 2 (712i)
- Fladbury 3 (813d)
- Everingham (821a)
- Sessay (831b)
- Existing Drax 400kV Substation
- Route Section Break

NOTE:

Soils information taken from the Soil Survey of England and Wales: Northern England (1984) and associated map Sheet 1 Northern England

TITLE

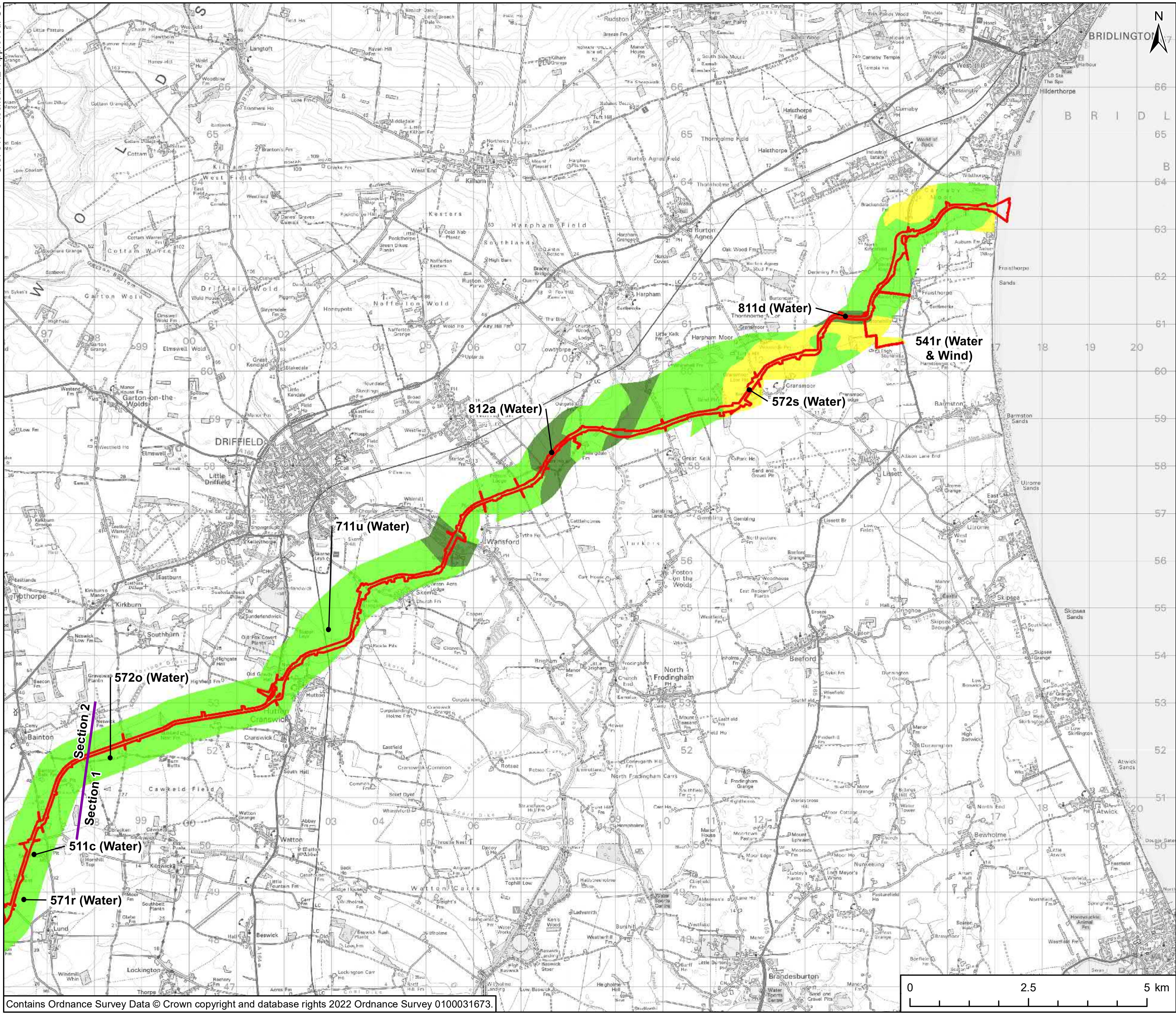
Figure 12-4
Soil Associations

REFERENCE

SEGL2_T_ES_12-4_v3_20220523

SHEET NUMBER 3 of 3

DATE 23/05/2022



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Coordinate System: British National Grid

Scale @ A3 1:75,000

nationalgrid

PROJECT

Scotland England Green Link 2

KEY

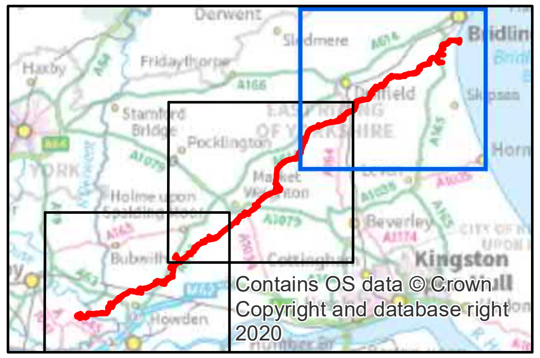
- 60 m Wide LOD

Erosion Risk (type given in brackets)

- Moderate risk
- Small risk
- Very small risk
- Route Section Break

NOTE:

Soils information taken from the Soil Survey of England and Wales: Northern England (1984) and associated map Sheet 1 Northern England



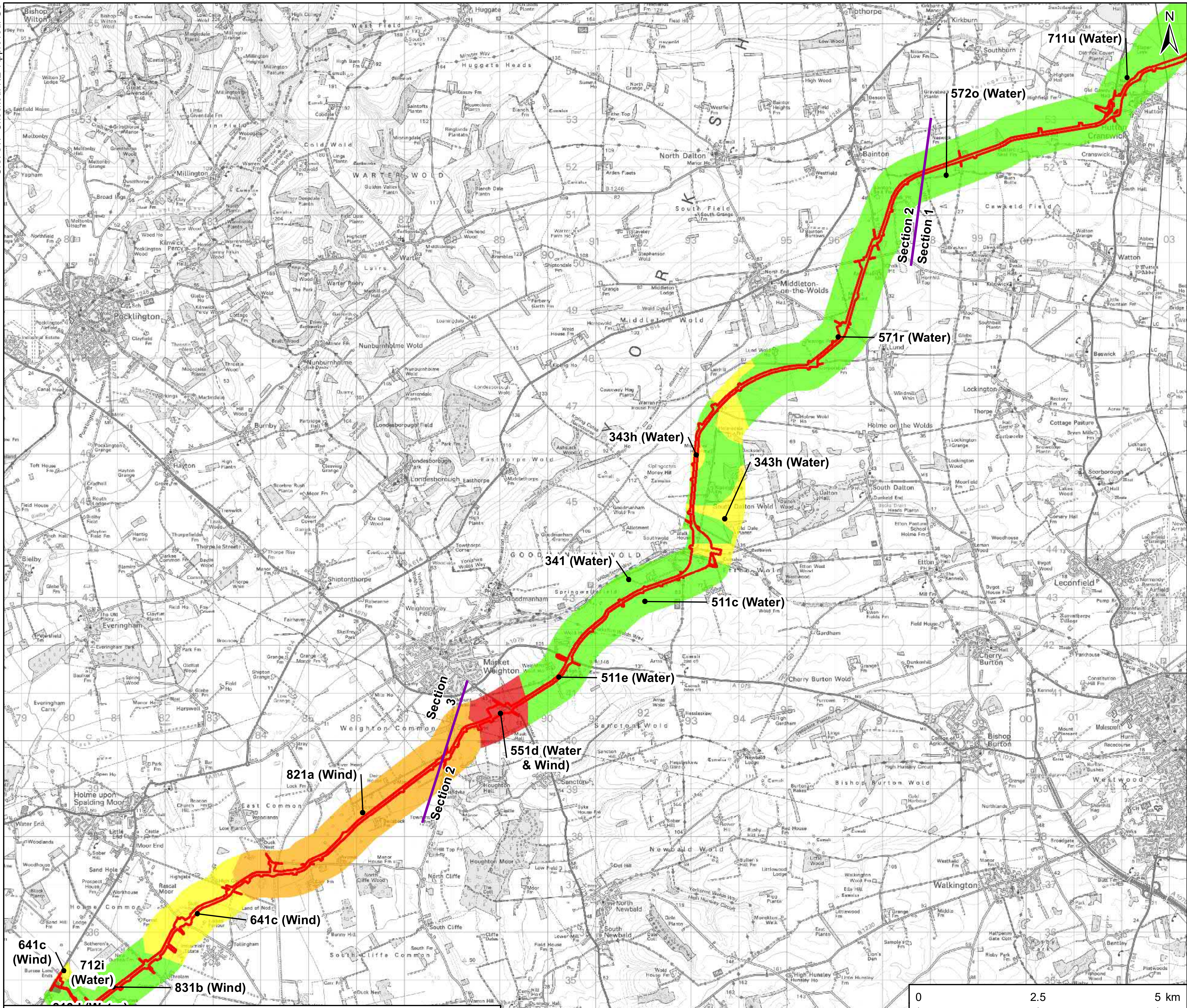
TITLE

Figure 12-5
Soil Erodibility

REFERENCE

SEGL2_T_ES_12-5_v1_20220523

SHEET NUMBER	DATE
1 of 3	23/05/2022



Coordinate System: British National Grid

Scale @ A3 1:75,000

nationalgrid

PROJECT

Scotland England Green Link 2

KEY

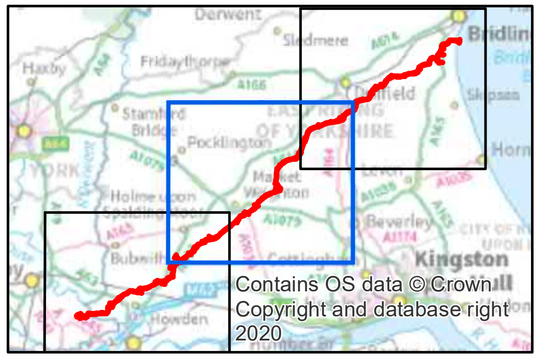
- 60 m Wide LOD

Erosion Risk (type given in brackets)

- Very high risk
- High risk
- Moderate risk
- Small risk
- Very small risk
- Route Section Break

NOTE:

Soils information taken from the Soil Survey of England and Wales: Northern England (1984) and associated map Sheet 1 Northern England



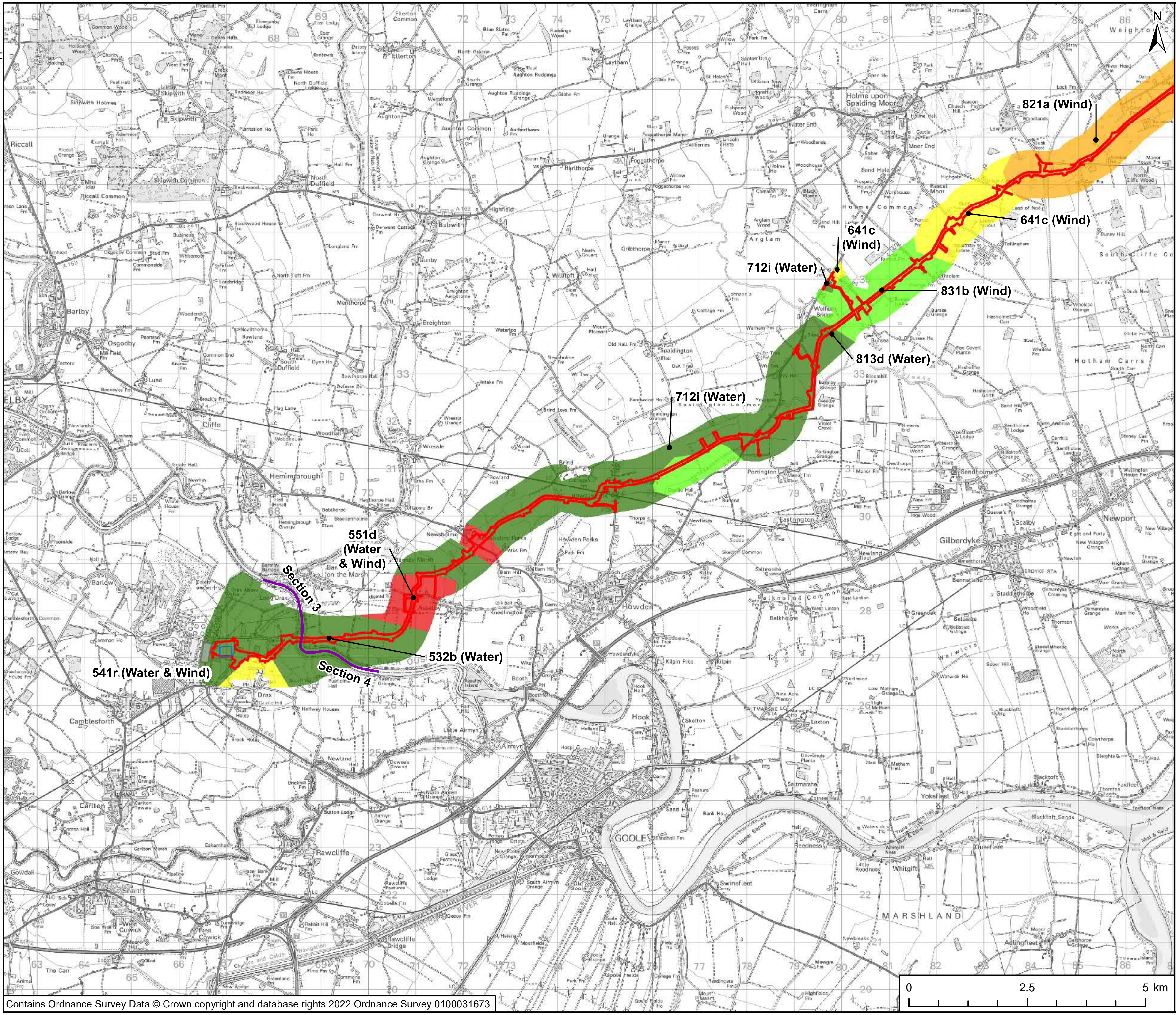
TITLE

Figure 12-5
Soil Erodibility

REFERENCE

SEGL2_T_ES_12-5_v1_20220523

SHEET NUMBER	DATE
2 of 3	23/05/2022



Coordinate System: British National Grid

Scale @ A3 1:75,000

nationalgrid

PROJECT

Scotland England Green Link 2

KEY

- 60 m Wide LOD

RouteType

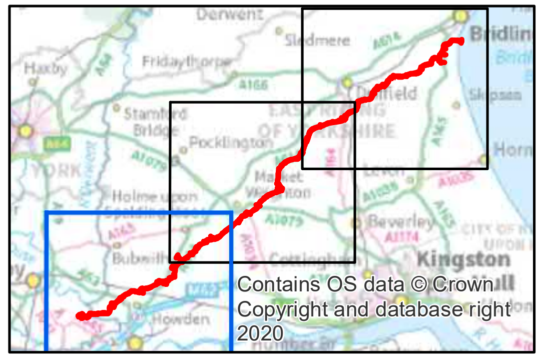
- Converter Station Extent

Erosion Risk (type given in brackets)

- Very high risk
- High risk
- Moderate risk
- Small risk
- Very small risk
- Existing Drax 400kV Substation
- Route Section Break

NOTE:

Soils information taken from the Soil Survey of England and Wales: Northern England (1984) and associated map Sheet 1 Northern England



TITLE

Figure 12-5
Soil Erodibility

REFERENCE

SEGL2_T_ES_12-5_v1_20220523

SHEET NUMBER

3 of 3

DATE

23/05/2022

12.5.9 ALC in Selby and the East Riding

For comparative purposes

Table 12-27 details the ALC grading in the administrative areas of ERYC and SDC. The data are taken from the Provisional ALC (Ref 12-23), with an assumed 50:50 split of Grade 3 into Subgrade 3a (BMV) and Subgrade 3b (non-BMV) land, which is likely to be an over estimation of BMV, but presents a worst case.

ERYC covers an area of 240,872.2 ha of which 232,530.5 ha is agricultural land. The data show that the majority of agricultural land in the County is classified as Grade 2 or Grade 3, which comprise 45.7% and 46.2 % of the total land within the County, respectively. Small areas of Grade 1 land area also present (2.9 %) focussed along the flood plains of the Rivers Ouse, Derwent and Aire. Grade 4 land (4.9 %) is concentrated to the west and north west of the County. Isolated pockets of Grade 5 land (0.3 %) are also present for example comprising the military training grounds at Strensall Camp; and the marshy/wet habitats of Skipworth Common. The urban land (2.6 %) incorporates areas of built development, whereas non-agricultural land (0.9 %) comprises land-uses such as the disused airfields at Normandy Barracks and Driffield; Beverley Racecourse; and areas of forestry/woodland (Ref 12-26). In total 166,716.5 ha (69.2 %) of the available agricultural land within the County is predicted to be of BMV quality.

SDC covers an area of 60,192.2 ha of which 57,831.6 ha is agricultural land. The data show that the majority of agricultural land in the SDC is classified as Grade 2 or Grade 3, which comprise 55.1 % and 35.1 % of the total land within the District respectively. Small areas of Grade 1 land area also present (4.7 %), focussed along the flood plains of the Rivers Ouse, Derwent and Aire; and pockets of Grade 4 (0.9 %) and Grade 5 (0.5 %) land also occur. The urban land (1.3 %) incorporates areas of built development, whereas non-agricultural land (2.6 %) is mainly attributable to large scale forestry plantations such as Bishop Wood (Ref 12-26). In total 46,426.0 ha (77.1 %) of the available agricultural land within the District is predicted to be of BMV quality.

Table 12-27: ALC Grading in Selby District and the East Riding of Yorkshire

ALC Grade	Area (ha)	Percentage (%) of total land area	Percentage (%) available agricultural land*
East Riding of Yorkshire			
Grade 1	6,841.3	2.8	2.9
Grade 2	106,155.2	44.1	45.7
Grade 3	107,440.1	44.6	46.2
Grade 4	11,370.2	4.7	4.9
Grade 5	723.8	0.3	0.3
Non-Agricultural	2,154.2	0.9	
Urban	6,187.5	2.6	
Total	**240,872.2**	**100.0**	**100.0**
Total BMV**	**166,716.5**	**69.2**	**71.7**
Selby District			
Grade 1	2,699.4	4.5	4.7
Grade 2	33,174.6	55.1	57.4
Grade 3	21,103.9	35.1	36.5
Grade 4	563.1	0.9	1.0

ALC Grade	Area (ha)	Percentage (%) of total land area	Percentage (%) available agricultural land*
Grade 5	290.6	0.5	0.5
Non-Agricultural	1,586.7	2.6	
Urban	773.9	1.3	
Total	**60,192.2**	**100**	**100**
Total BMV**	**46,426.0**	**77.1**	**80.3**

***** *Excludes land mapped as non-agricultural or urban*

***The land mapped as Grade 3 has been split 50/50 between Subgrades 3a (BMV) and 3b (non-BMV).*

12.5.10 Future Baseline

The baseline presented in this chapter has the potential to change due to other new developments within the vicinity of the English Onshore Scheme throughout the lifetime of the project, i.e. any new development that would affect the land use or quality, in areas that may be required for access to maintain, decommission and/or upgrade the English Onshore Scheme infrastructure. Committed new developments which are lodged within the planning system (or as otherwise agreed with the Planning Authority), are addressed via the cumulative assessment below.

Owing to the predominantly temporary nature of the construction phase, it is anticipated that the agricultural baseline will not change significantly as a result of natural processes and systems during this period.

It is acknowledged, however, that during the predicted operational lifespan of the English Onshore Scheme, the baseline has the potential to alter due to changes in land use and farming practice. This may include, but is not limited to, the adoption or surrender of Agri-Environmental Schemes (it being noted that under the Agriculture Act 2020 (Ref 12-4) there is an emphasis towards incentivising landowners to better protect and improve soils); shift from pasture to arable agriculture; and implementation of field drainage schemes. Changes to the baseline may be beneficial or adverse.

There is also the potential for long-term changes to the baseline due to climate change. These long-term changes could potentially lead to alterations in agricultural land quality (ALC grade), for example through increased levels of soil wetness in the winter and increased droughts in the summer. This may in turn influence extent and location of BMV land. Changes in rainfall may also affect decomposition rates and soil organic matter content. Changes to the baseline may be beneficial or adverse.

Although there is the potential for the baseline presented in this chapter to change over time; it is considered that the data presented provides a good representation of land use and agricultural conditions at this stage of the English Onshore Scheme; and to be a good platform upon which to base the assessment.

12.6 Potential Impacts

12.6.1 Introduction

The potential impacts of the development on soil resources and agricultural land have been split into construction phase and operational phase of the development. Potential impacts have been assessed based on the methodology outlined in section 12.3.3 and in **Chapter 5: Approach to EIA**, where a description of impact definitions is provided in **Table 5-2**. For soils and agricultural land, the potential impacts can be categorised as loss of agricultural land, disturbance to soil resources and loss of soil resources.

12.6.1.1 Loss of agricultural land

There is the potential for loss of land available for agriculture due to the direct impacts of the English Onshore Scheme. For example, this may be a temporary loss during construction phase (where areas are restored to agriculture at the end of the construction period); or a permanent loss through the construction of permanent English Onshore Scheme infrastructure or permanent land use change for example the establishment of permanent landscaping or habitat creation on areas of former agricultural land.

12.6.1.2 Disturbance to soil resources

For both the construction and operational phase, activities that will cause disturbance to and potentially impact upon soils include the following:

- stripping and stockpiling of topsoil and subsoil, storage and reinstatement;
- ground excavation;
- trenchless drilling;
- stockpiling materials;
- levelling ground;
- trenching;
- haul road construction;
- vehicle movements onsite; and
- construction of permanent infrastructure.

The disturbance of soil resources may occur *in situ*, for example through trafficking by vehicles or through soil removal, handling, storage and subsequent reinstatement. This disturbance may result in the impairment of soil function, quality and resilience. This effect comprises such changes as:

- compaction and smearing (damage to soil structure);
- conditions within the soil profile conducive to excessive drying or wetness;
- mixing of distinct soil horizons (e.g. topsoil with subsoil) reducing their potential reuse;
- damage or removal of vegetation layer;
- changes in the soil profile stone content;
- loss of nutrients (e.g. nitrogen), biota (e.g. bacteria, fungi, earthworms) and reduction in soil fertility; and
- loss of ecosystem services, such as the ability of the soil to support food production and habitat creation.

12.6.1.3 Loss of soil resources

During the construction activities, there may be a physical loss of soil resource as a result of inappropriate management of soils during removal, handling and storage in the construction phase, where soils are temporarily stripped to enable construction activities. Loss of soils may also include the unauthorised exportation of soil resources. It is assumed that in the areas of temporary development, all soil resources will be retained onsite and not exported for reuse elsewhere. There is unlikely to be surplus soil from the proposed permanent development, if this is to occur all soil will be retained for reuse on site.

The inappropriate removal, handling and storage of soil resources during construction activities may also render them unsuitable for reuse in site restoration and, therefore, also constitutes a loss of soil resource (e.g. the mixing of topsoil and subsoil; the mixing of soils of differing textures, or the mixing of soils with non-soil substrate or other unsuitable materials) as this mixing cannot be reversed nor the constituent materials returned to their original state. Incorrect handling leading to mixing and loss of suitability is considered the greatest risk to soil retention.

The loss of soil resource may result in the impairment of the remaining soils' function, quality and resilience. This also comprises such changes as reduction of topsoil depth.

During large-scale projects, there is the potential for disease and pathogen transfer between different areas of agricultural land (i.e. a biosecurity risk). This is considered in the loss of soil resource as the main cause of potential disease and pathogen transfer and is due to the transfer of soil from infected to uninfected areas via heavy plant.

12.6.1.4 Additional Considerations

There is a potential for airborne dust to be generated during soil handling operations and, as a consequence, of wind erosion of dry soil stockpiles. This dust has the potential to impact surrounding crops during construction. Soil erosion (dust generation) is considered in the assessment of loss of soil resources.

There is a potential for a disruption to agricultural land drainage. This is not assessed within this chapter. Any land drainage installed for the scheme, and any drainage impacted by the scheme, will be installed or reinstated as per agreement between NGET and each individual landowner pre-construction. Details on the impacts to hydrology regimes has been considered in **Chapter11: Hydrology and Land Drainage**.

The Agriculture and Soils assessment considers the potential effects of English Onshore Scheme on agricultural land capability and soil resources. Potential effects on farm businesses as a result of temporary loss of land during construction are not assessed within the EIA. The effects on farm businesses will be addressed through land rights agreements, compensation negotiations and reinstatement discussions between NGET and the affected landowner or occupier.

The impact of heat generated by the cables on the above ground crops is not considered sufficient to cause 'sterile strips' on agricultural land, and the continuing viability of land above cables can be readily witnessed in areas where existing underground cables are installed. The underground cables which will be installed as part of the English Onshore Scheme, are designed to have a low resistance and, hence, low losses to prevent the cable heating up under normal operating conditions. During events when there is a fault, there is potential for heat to be generated, but the heat would not be sufficient in scale or in duration to cause sterile strips. Therefore, the potential impact of heat generation is not considered further.

12.6.2 Mitigation by Design

Where possible, mitigation measures have been incorporated into the design of the English Onshore Scheme such that they inform its alignment and/or how it shall be constructed. Through iterative assessment, potential impacts have been predicted and opportunities to mitigate them identified with the aim of preventing or reducing impacts as much as possible. This approach provides the opportunity to prevent or reduce potential adverse impacts from the outset.

This embedded mitigation/mitigation by design approach has been taken into account when evaluating the significance of the potential impacts. Residual impacts described in Section 12.8 are those which remain taking into account any further proposed project specific mitigation. See Section 5.6 for further information on the approach to mitigation taken in this document.

For soils and agricultural land, no major route revisions have been made during the design process, however soils and agricultural land were considered during route selection and via stakeholder engagement and change requests.

It is expected that industry standard guidance/current best working practice will be followed in relation to soil workings throughout the construction and operational lifespan of the English Onshore Scheme and, as such, is considered to provide embedded mitigation. This includes:

- The Institute of Quarrying's Good Practice Guide for Handling Soils in Mineral Workings (Ref 12-20); and
- DEFRA's Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Ref 12-16).

As part of this EIA submission there will be an outline Soil Management Plan (SMP) (Appendix 12B), this will form the basis of the detailed SMP to be produced by the contractor which will be informed by the detailed pre-construction soil surveys and form part of the detailed Construction Environmental Management Plan (CEMP). The site-specific Soil Management Plan will detail the site-specific mitigation measures that will be required to follow good practice when working with soils. This include best practice measures to minimise the risk of damage to soil structure, for example the following main rules should be observed during all soil handling tasks:

- No trafficking/driving of vehicles/plant or materials storage to occur outside designated areas;
- No trafficking/driving of vehicles/plant on reinstated soil (topsoil or subsoil);
- Only direct movement of soil from donor to receptor areas (no triple handling and/or ad hoc storage);
- No soil handling to be carried out when the soil moisture content is above the lower plastic limit;
- Soils should only be moved under the driest practicable conditions, and this must take account of prevailing weather conditions;
- No mixing of topsoil with subsoil, or of soil with other materials;
- Soil only to be stored in designated soil storage areas;
- Plant and machinery only work when ground or soil surface conditions enable their maximum operating efficiency;
- All plant and machinery must always be maintained in a safe and efficient working condition;
- Daily records of operations undertaken, and site and soil conditions should be maintained; and
- Low ground pressure (LGP models) or tracked vehicles should be used where possible.

12.6.2.1 Highly Sensitive Soils

Within route Sections 2 and 3 are the highly sensitive soils of the Newport 1 (551d) and Everingham (821a) associations. It is also possible that in Section 1 the Frome (812a) association will be present with the Adventurer’s series where small areas of peat may be present, although this is very unlikely.

Best practice measures for highly sensitivity soils which are prone to erosion will include: the future post-consent/pre-commencement detailed soil surveys to accurately identify the extent of highly sensitive soils within the working area; and detail field scale mitigation measures that may be required during construction. This information will be available for any maintenance operations that may occur in the future. It is advised that the mitigation measures included within the detailed SMP (which will be informed by the detailed soil survey pre-commencement) allow for the dynamic management of the soils and adopt to site conditions as they occur. Mitigation measures that could be implemented in areas of high sensitivity may include but are not limited to:

- Pre-construction survey to identify the in-field location and extent of soils of high sensitivity;
- Suitable location of stockpile on a flat area of ground away from areas where there may be high runoff or water ponding;
- Covering of the soil stockpiles in a suitable geotextile to reduce the chance of erosion from water and wind;
- The use of specialist surface run-off control systems;
- Erection of wind barriers; and
- Stand-off procedures for adverse weather conditions.

As set out in the Scoping Report, pre-commencement soil and ALC survey of all land which will be subject to direct disturbance (including the cable route and associated temporary works) and which has yet to be subject to a detailed soil survey as part of the English Onshore Scheme will be undertaken. This will aid in the production of and implementation of the detailed SMP, as well as providing baseline land quality data for the reinstatement land within the proposed working area of the cable route.

12.6.3 Construction Impacts

12.6.3.1 Loss of agricultural land

During construction activities, there will be the temporary loss of approximately 305.2 ha of agricultural land within the working width (for all four sections, combined) of which 266.2 ha (87.2 %) is likely to be BMV agricultural land. There will also be the permanent loss of 5.9 ha of agricultural land for the construction of the converter station, of which 1.7 ha is BMV agricultural land. As set out in section 12.3.3, a threshold of 20 ha of permanent BMV loss is used to determine whether the loss of agricultural land is significant or not significant. As the permanent loss of BMV land due to the English Onshore Scheme is less than 20 ha, the effect is considered to be **Not Significant**.

12.6.3.2 Disturbance to soil resources

Construction activities will result in a temporary disturbance to soil resource which are low to high in sensitivity within the planning application boundary. The application of appropriate good practice construction mitigation measures, such as those described in section 12.6.2, will ensure that the structure, function and resilience of soil resources are protected and maintained.

With the embedded mitigation in place, the low sensitivity soils would have a low magnitude of change and the resulting impact would be **Negligible (Not Significant),** and the medium sensitivity soils would have a low magnitude of change and the resulting impact would be **Minor (Not Significant).** The high sensitivity soils in Section 2 and 3, and the potential to encounter peaty soils which are of high sensitivity in Section 1 (although unlikely) would have a low magnitude of change and the resulting impact would be Moderate (Significant). However it is our professional judgement that as the disturbance will be temporary, these soils only cover a small portion of the working area, and best practice mitigations will be followed, it is it is considered that the overall impact would be **Minor (Not Significant)**. Hence the potential effect on soil disturbance during construction (shown in **Table 12-28**) would be Not Significant.

12.6.3.3 Loss of soil resources

The application of (appropriate) embedded mitigation, such as the good practice described in section 12.6.2, will prevent the unauthorised export of soils; minimise or prevent soil loss through erosion and trafficking on plant wheels; and ensure that soils are maintained in a state suitable for reuse during reinstatement (ensuring that no more than 5 % of soil resources are lost, retaining more than 95 % onsite and being suitable for reuse). The mitigation of loss of soil would also help ensure biosecurity by minimising the potential for the transfer of disease, pathogens and weeds.

With the embedded mitigation in place, the low and medium sensitivity soils would have a negligible magnitude of change and the resulting impact would be **Negligible (Not Significant).** The high sensitivity soils in section 2 and 3, and potentially in Section 1, would have a negligible magnitude of change and the resulting impact would be **Minor (Not Significant).** Hence the potential effect on soil disturbance during construction (shown in **Table 12-28**) would be Not Significant.

12.6.4 Operation Impacts

For the purposes of this EIA, operational effects are those that would occur as a result of the operational activities associated with the English Onshore Scheme. This would include activities such as maintenance and emergency repairs.

12.6.4.1 Loss of agricultural land

No long-term or permanent loss of agricultural land is foreseen during the operational phase of the English Onshore Scheme. The temporary loss of land to agricultural use may occur due to the need for maintenance works along the underground cable route, but these are likely to be short term, small scale works for maintenance and remediation. As there would be no permanent loss of BMV land during the operational phase, the effect is considered to be **Not Significant**.

12.6.4.2 Disturbance to soil resources

The disturbance of soil resources within the planning application boundary is largely restricted to construction. During the operational lifetime of the English Onshore Scheme, however, there is a potential for additional disturbance (excavation) of soil resources to occur during any maintenance or remedial works which may be required. The scale and extent of these works would be far less than required for initial construction, being confined to the specific areas of cable where maintenance is required, and works would adhere to standard industry practice (i.e. embedded mitigation measures) and soil management as per the construction phase of works. With the embedded mitigation in place, the low sensitivity soils would have a low magnitude of change and the resulting impact would be **Negligible (Not Significant)**, the medium sensitivity soils would have a low magnitude of change and the resulting impact would be **Minor (Not Significant)**, and the high sensitivity soils would have a low magnitude of change and the resulting impact would be Moderate (Significant effect), however using our professional judgement as the disturbance would be temporary, these soils only cover a small portion of the study area, the scale of operational activities would be infrequent and likely small scale, and best practice mitigations would be followed, it is it is considered that the overall impact would be **Minor (Not Significant)**.

12.6.4.3 Loss of soil resources

The disturbance of soil resources and the potential for soil loss within the planning application boundary is largely restricted to construction. However, during the operational lifetime of the English Onshore Scheme, in the absence of appropriate handling and storage measures (mitigation), there is a potential for additional loss of soil resources to occur during any maintenance or remedial works which may be required; for example, through erosion, excess trafficking on plant wheels, or unauthorised export; or through the soils being rendered unsuitable for reuse at reinstatement. The scale and extent of maintenance or remedial works and, hence, the potential scale of soil loss, would be far less than for initial construction, such works would follow the embedded mitigation measures and soil management as per the construction phase of works (ensuring that no more than 5 % of soil resources are lost, retaining more than 95 % onsite and being suitable for reuse).

With the embedded mitigation in place, the low and medium sensitivity soils would have a low magnitude of change and the resulting impact would be **Negligible (Not Significant)**. The high sensitivity soils would have a negligible magnitude of change and the resulting impact would be **Minor (Not Significant)**.

12.6.5 Decommissioning Impacts

The scale and nature of activities undertaken during decommissioning would be similar to those described previously for construction, and they would be temporary during the period of decommissioning activities on site. Following the removal of the structures and the reinstatement of the land there would be no further potential effects on agricultural land and soil resources. The potential effects from decommissioning should therefore be regarded as the same as construction as described in greater detail below.

12.7 Project Specific Mitigation

As the potential impacts from the construction and operation phases of the English Onshore Scheme have been assessed as Not Significant with the best practice mitigation measures in place, no further mitigation above that of the embedded mitigation is proposed.

12.8 Residual Impacts

Residual effects of the English Onshore Scheme due to the construction and operational phase of the project are shown in **Table 12-28**. The main impacts on soils and agricultural land being the loss of agricultural land due to temporary development, potential loss of soil resources and potential degradation of soil resources.

Table 12-28: Residual effects of the English Onshore Scheme

Project Phase	Receptor Description	Value/ Sensitivity	Description of Potential Impact	Mitigation Measure(s)	Residual Effect	
					Magnitude	Significance
Section 1 – Landfall to Bainton (EYRC)						
Construction	Agricultural land	NA	Temporary loss of agricultural land. Permanent loss of BMV agricultural land falls under 20 ha consultation threshold.	NA	NA	Not Significant
	Disturbance to soil resources	Low - Medium High*	Incorrect handling and storage of soils during construction leading to damage to the structure, function and resilience of the soil resource.	With the embedded mitigation measures in place, no further mitigation measures are proposed.	Low Low	Negligible to Minor (Not Significant) Minor (Not Significant)
	Loss of soil resources	Low - Medium High*	Incorrect handling and storage of soils during construction, resulting in less than 5 % of soil resources being lost or rendered unsuitable for reuse.	With the embedded mitigation measures in place, no further mitigation measures are proposed.	Negligible Negligible	Negligible (Not significant) Minor (Not Significant)
Operation	Agricultural land	NA	Temporary loss of agricultural land during maintenance works.	NA	NA	Not Significant
	Disturbance to soil resources	Low - Medium High*	Incorrect handling and storage of soils during maintenance or remediation works leading to damage to the structure, function and resilience of the soil resource.	With the embedded mitigation measures in place, no further mitigation measures are proposed.	Low Low	Negligible to Minor (Not significant) Minor (Not Significant)
	Loss of soil resources	Low - Medium High*	Incorrect handling and storage of soils during maintenance or remediation works resulting in less than 5 % of soil resources being lost or rendered unsuitable for reuse.	With the embedded mitigation measures in place, no further mitigation measures are proposed.	Negligible Negligible	Negligible (Not significant) Minor (Not significant)

Project Phase	Receptor Description	Value/ Sensitivity	Description of Potential Impact	Mitigation Measure(s)	Residual Effect	
					Magnitude	Significance
Section 2 – Bainton to Market Weighton (ERYC)						
Construction	Agricultural land	NA	Temporary loss of agricultural land. Permanent loss of BMV agricultural land falls under 20 ha consultation threshold.	NA	NA	Not Significant
	Disturbance to soil resources	Low - Medium High	Incorrect handling and storage of soils during construction leading to damage to the structure, function and resilience of the soil resource.	With the embedded mitigation measures in place, no further mitigation measures are proposed.	Low Low	Negligible to Minor (Not significant) Minor (Not Significant)
	Loss of soil resources	Low - Medium High	Incorrect handling and storage of soils during construction, resulting in less than 5 % of soil resources being lost or rendered unsuitable for reuse.	With the embedded mitigation measures in place, no further mitigation measures are proposed.	Negligible Negligible	Negligible (Not significant) Minor (Not Significant)
Operation	Agricultural land	NA	Temporary loss of agricultural land during maintenance works.	NA	NA	Not Significant
	Disturbance to soil resources	Low - Medium High	Incorrect handling and storage of soils during maintenance or remediation works leading to damage to the structure, function and resilience of the soil resource.	With the embedded mitigation measures in place, no further mitigation measures are proposed.	Low Low	Negligible to Minor (Not significant) Minor (Not Significant)
	Loss of soil resources	Low - Medium High	Incorrect handling and storage of soils during maintenance or remediation works resulting in less than 5 % of soil resources being lost or rendered unsuitable for reuse.	With the embedded mitigation measures in place, no further mitigation measures are proposed.	Negligible Negligible	Negligible (Not significant) Minor (Not significant)

Project Phase	Receptor Description	Value/ Sensitivity	Description of Potential Impact	Mitigation Measure(s)	Residual Effect	
					Magnitude	Significance
Section 3 – Market Weighton to River Use (ERYC)						
Construction	Agricultural land	NA	Temporary loss of agricultural land. Permanent loss of BMV agricultural land falls under 20 ha consultation threshold.	NA	NA	Not Significant
	Disturbance to soil resources	Low - Medium High	Incorrect handling and storage of soils during construction leading to damage to the structure, function and resilience of the soil resource.	With the embedded mitigation measures in place, no further mitigation measures are proposed.	Low Low	Negligible to Minor (Not significant) Minor (Not Significant)
	Loss of soil resources	Low - Medium High	Incorrect handling and storage of soils during construction, resulting in less than 5 % of soil resources being lost or rendered unsuitable for reuse.	With the embedded mitigation measures in place, no further mitigation measures are proposed.	Negligible Negligible	Negligible (Not significant) Minor (Not Significant)
Operation	Agricultural land	NA	Temporary loss of agricultural land during maintenance works.	NA	NA	Not Significant
	Disturbance to soil resources	Low - Medium High	Incorrect handling and storage of soils during maintenance or remediation works leading to damage to the structure, function and resilience of the soil resource.	With the embedded mitigation measures in place, no further mitigation measures are proposed.	Low Low	Negligible to Minor (Not significant) Minor (Not Significant)
	Loss of soil resources	Low - Medium High	Incorrect handling and storage of soils during maintenance or remediation works resulting in less than 5 % of soil resources being lost or rendered unsuitable for reuse.	With the embedded mitigation measures in place, no further mitigation measures are proposed.	Negligible Negligible	Negligible (Not significant) Minor (Not significant)

Project Phase	Receptor Description	Value/ Sensitivity	Description of Potential Impact	Mitigation Measure(s)	Residual Effect	
					Magnitude	Significance
Section 4 – River Ouse to Drax Substation (SDC)						
Construction	Agricultural land	NA	Temporary loss of agricultural land. Permanent loss of BMV agricultural land falls under 20 ha consultation threshold.	NA	NA	Not significant
	Disturbance to soil resources	Low - Medium	Incorrect handling and storage of soils during construction leading to damage to the structure, function and resilience of the soil resource.	With the embedded mitigation measures in place, no further mitigation measures are proposed.	Low	Negligible to Minor (Not significant)
	Loss of soil resources	Low - Medium	Incorrect handling and storage of soils during construction, resulting in less than 5 % of soil resources being lost or rendered unsuitable for reuse.	With the embedded mitigation measures in place, no further mitigation measures are proposed.	Negligible	Negligible to Minor (Not significant)
Operation	Agricultural land	NA	Temporary loss of agricultural land during maintenance works.	NA	NA	Not significant
	Disturbance to soil resources	Low - Medium	Incorrect handling and storage of soils during maintenance or remediation works leading to damage to the structure, function and resilience of the soil resource.	With the embedded mitigation measures in place, no further mitigation measures are proposed.	Low	Negligible to Minor (Not significant)
	Loss of soil resources	Low - Medium	Incorrect handling and storage of soils during maintenance or remediation works resulting in less than 5 % of soil resources being lost or rendered unsuitable for reuse.	With the embedded mitigation measures in place, no further mitigation measures are proposed.	Negligible	Negligible to Minor (Not significant)

***It is** noted that in Section 1, high sensitivity soils may not be encountered. The high sensitivity soils are included here because the Frome (812a) soil association which covers 20.5 ha of the study are comprises the Adventurer’s soil series, which are peats and organic rich soils, however they only contribute c. 5% of the total mapped Frome (812a) soil association in England and Wales.*

12.9 Cumulative Effects

This section provides an assessment of the combined and cumulative effects of the English Onshore Scheme on soils and agricultural land. Full definitions of terminology and details of other projects considered in this assessment see **Chapter 17: Cumulative and In-Combination Effects**.

12.9.1 Assessment of Intra-Project Effects

As outlined in **Chapter 1: Introduction**, the English Onshore Scheme forms one element of the wider Project, along with the Marine Scheme and Scottish Onshore Scheme. Due to the distances of separation between the English Onshore Scheme and the Scottish Onshore Scheme, intra-Project cumulative effects to individual receptors will not occur, for example no property or ecological site would experience effects from both the English Onshore Scheme and Scottish Onshore Scheme. Similarly, although there is a slight overlap of the English Onshore Scheme and Marine Scheme in the intertidal area between Mean High Water Springs and Mean Low Water Springs (as shown in Figure 1-2), as the HVDC cable reaches the landfall site (part of the English Onshore Scheme) via HDD, the works which could give rise to environmental impacts are physically separated and hence no significant intra-Project cumulative effects to individual receptors are predicted to occur. For receptors such as agricultural land where the resource could be considered as a whole across the entire Project, it is considered that there would be no significant cumulative effects due to the mitigation measures proposed by each element of the Project.

The separate EIA/EA reports produced for the English Onshore Scheme, Marine Scheme and Scottish Onshore Scheme provide an environmental assessment of each topic area for which potential environmental effects could arise from that element. Once the assessment of the other elements of the Project is complete, a Bridging Document will be prepared which summarises the main interactions of these three individual environmental assessments. The Bridging Document will be made available as soon as it is available, but as highlighted above, there are no significant in-combination impacts between the English Onshore Scheme, Marine Scheme or Scottish Onshore Scheme. This section, therefore, provides an assessment of the combined and cumulative effects relating to the English Onshore Scheme only. For full definitions of terminology and details of other projects considered in this assessment see **Chapter 17: Cumulative and In-Combination Assessment**.

The receptors identified within this chapter may also qualify as receptors for other technical specialisms. For example, this chapter (**Chapter 12: Agriculture & Soils**) may have receptors in common with the **Chapter 7: Ecology & Nature Conservation** and **Chapter 10: Geology and Hydrogeology**. Intra-cumulative effects with the ecology chapter comprise those associated with the loss of agricultural land (associated with ground-nesting birds). For more detail regarding this (and any other intra-cumulative effects identified), reference should be made to **Chapter 17: Cumulative and In-Combination Effects**.

12.9.2 Assessment of Inter-Project Effects

A list of 27 developments were identified for inclusion within the short list to be considered cumulatively with the English Onshore Scheme has been agreed by NG in conjunction with LPAs, details of the schemes are provided in **Chapter 17: Cumulative and In-Combination Assessment** Section 17.2.4.

To assess the cumulative effects **Table 12-29** presents each of the projects to be considered in the cumulative assessment with commentary on the soils and agricultural land for each project where information is available, and figures extracted or a likely loss of BMV agricultural land area (where relevant). The cumulative effect on the loss of agricultural land, disturbance of soil resources and loss of soil resources has bene discussed in sections 12.9.2.1 and 12.9.2.2 after the table.

Table 12-29: Cumulative inter-project effects of the English Onshore Scheme

ID	Planning Reference	Summary of Scheme	ALC Breakdown (figures area areas in ha)*							Loss of BMV (ha)**
			Grade 1	Grade 2	Grade 3	Subgrade 3a	Subgrade 3b	Non-agricultural	Notes	
NSIP										
NSIP-1	EN010098	Development of the Hornsea Project Four offshore wind farm. This is within the western area of the former Hornsea known as Zone 4, under the Round 3 offshore wind licencing arrangements. The landfall area and export cable route are located between Bridlington and Hornsea.		16.73	17.26				Project has assumed all Provisional Grade 3 is Subgrade 3a. This permanent area for the substation is 16 ha, all other works are temporary.	16.0
NISP-4	EN010120	Post combustion carbon capture technology at up to two of the existing 600 MWe biomass power generating units at the Drax Power Station in Selby, North Yorkshire.						all	NA for ALC.	0.0
NSIP-9	Humber Low Carbon Pipelines by National Grid Carbon (NGC)	Construction of carbon dioxide (to facilitate CCUS) and hydrogen (H2) transportation pipelines between Drax in North Yorkshire and Easington in East Riding of Yorkshire, connecting various emitters and generators in the Humber.							No information for ALC at this stage.	NA
East Riding of Yorkshire										
ERYC-2	20/01338/STREM 14/03565/STOUT	Erection of 470 dwellings with associated infrastructure, open space and landscaping.		20.6		2.6			23.2 ha, 8.51 ha surveyed as Grade 2 and Subgrade 3a, 15.05 ha not surveyed but provisionally grade 2. c. 5 ha to be retained in agricultural use.	20.8
ERYC-3	17/02265/STOUT 19/04158/STREM	Erection of 175 dwellings following Outline Permission			6.9	1.1	0.9		8.9 ha. Partially surveyed as Subgrade 3a and 3b. Remainder Provisionally Grade 3.	5.7
ERYC-4	20/00300/CME	Extension of excavation area to Gransmoor Quarry and remediation to lake following ceasing of operation		0.62					Provisional ALC	0.6
ERYC-6	20/03551/PLF	Siting of 28 chalets (14 twin units), creation of footpath and associated parking and landscaping following demolition of commercial and leisure buildings.						1.3		0.0

ID	Planning Reference	Summary of Scheme	ALC Breakdown (figures area areas in ha)*							Loss of BMV (ha)**
			Grade 1	Grade 2	Grade 3	Subgrade 3a	Subgrade 3b	Non-agricultural	Notes	
ERYC-7	20/02567/PLF	Change of use of land for siting of 46 static caravans etc			1.28			0.55	Provisional ALC, areas of non-agri removed based on aerial imagery.	0.6
ERYC-9	21/00216/STPLF	Change of use of land and excavation works to create access from Driffield Canal and form a 22 berth marina for mooring leisure boats with access and car park		3.4					Provisional ALC	3.4
ERYC-13	20/02502/REM	Erection of 40 dwellings and associated access, parking, landscaping and infrastructure following Outline approval 19/04199/OUT (all matters to be considered) (AMENDED PLANS)			1.06			0.07	Provisional ALC non-agricultural based on aerial	0.5
ERYC-15	19/04161/STPLF	Change of use of existing buildings and land to provide a holiday park, artisan workshops with associated retail, artisan bakery, delicatessen, boulangerie, offices, craft pods, workshop, café/tearooms, farm shop, tackle shop display, exhibition and fishing lake including associated alterations to farm house and buildings, operational development, landscaping, vehicular access and drainage.			13.5				Provisional ALC	6.8
ERYC-16	21/01568/PLF	Installation of a ground mounted solar PV array		0.03					Provisional ALC	0.03
ERYC-18	21/02765/STOUT	Erection of up to 40 dwellings (access to be considered)		2.5				1.2	1.6 ha phase 1, 2.1 ha phase 2. c. 2.5 ha of agri land provisionally mapped as Grade 2. 1.2 ha of farm buildings and non ag land.	2.5
ERYC-20	19/04321/STPLF	Construction of a solar farm and battery storage facility together with all associated works, equipment and necessary infrastructure					99		Post-1988 survey dara, all Subgrade 3b.	0.0
ERYC-22	20/01962/STPLF	Installation and operation of a solar farm with associated infrastructure, including photovoltaic panels, mounting frames, transformers/inverters, substation, access tracks, pole mounted CCTV cameras and fencing					55		Provisional ALC	0.0
ERYC-35	22/00702/STREM 15/00305/STOUT	Erection of 600 dwellings with associated access, parking and infrastructure (access, appearance, landscaping, layout and scale to considered) following outline approval		28.6				1.4		28.6
Selby District Council										

ID	Planning Reference	Summary of Scheme	ALC Breakdown (figures area areas in ha)*							Loss of BMV (ha)**
			Grade 1	Grade 2	Grade 3	Subgrade 3a	Subgrade 3b	Non-agricultural	Notes	
SE-1	2020/1357/FULM	Development of an energy storage facility including battery storage containers; substations; power conversion systems; transformers and associated switchgear; HVAC equipment; communications and grid compliance equipment; temporary construction compound; CCTV; fencing; infrared lighting; access, drainage and landscaping works and associated development					3.0			NA
SE-2	2020/0994/FUL	Demolition of Drax Power Ltd Flue Gas Desulphurisation (FGD) plant and associated restoration works						All		NA
SE-3	2021/0601/FUL	Construction of battery energy storage system to provide energy balancing services to the National Grid including bund and landscaping.	0.9							0.9
SE-4	2021/0788/EIA	Development of ground-mounted solar farm including associated infrastructure	0.9	30.5		20.7	53.2	7.4	Some long-term temporary infrastructure likely. Agricultural land could be grazed by sheep, reducing the loss of BMV land from agricultural use, however this is not certain.	52.1
SE-5	2021/1089/FULM	Development of a battery storage facility, associated infrastructure, access and grid connection				0.53	0.99			0.5
SE-8	2021/0512/FULM	Erection of 45 No dwellings with associated infrastructure | Street Record Selby Road Camblesforth North Yorkshire		0.25	15.75				Provisional ALC	8.1
SE-14	2021/0120/FULM	Development of an existing horticultural facility for indoor farming and agri-tech, including the construction of 3 No halls with associated process, service and administration buildings, landscaping, access improvements and additional car park access and associated infrastructure following partial demolition of existing buildings						2.7		NA
SE-16	2021/0348/SCN	EIA Screening opinion request for 5 wind turbines							Provisional ALC Grade 1. Unknown site area, not clear how much of the land will be lost to	TBC

ID	Planning Reference	Summary of Scheme	ALC Breakdown (figures area areas in ha)*							Loss of BMV (ha)**
			Grade 1	Grade 2	Grade 3	Subgrade 3a	Subgrade 3b	Non-agricultural	Notes	
									the wind farm development at this time.	
SE-17	2022/0287/SCN	EIA scoping opinion for a 50 MW battery storage system (BESS) on land off Barlow Common Road. Land Adjacent Barlow Common Barlow Common Road Barlow Selby North Yorkshire			1.4				Provisional ALC	0.7
SE-18	2022/0153/FULM	HGV park and welfare building and warehouse to serve existing Sedamyl UK Ltd plant and employment unit with associated landscaping, infrastructure works and vehicular, pedestrian circulation at | Land Adjacent To A63 And East Common Lane Barlow Selby North Yorkshire				0.25	1.59		Post-1988 data available on magic.	0.3
SE-20	2022/0107/NYSCO	Consultation on NY/2022/0027/SCO request for EIA scoping opinion for Barlow Ash Mound, North West of Drax Power Station	1.0	59.7	56.7	24.6	4.6	4.2	c. 156 ha. Provisional ALC Grades 1-3 with Post-1988 2-4. Unclear at this time how much of the area will be lost.	138.3
	Total									**292.8**
	Grade 1 and 2 taken from Post-1988 and provisional mapping. Grade 3 from provisional mapping. Subgrade 3a and Subgrade 3b from Post-1988 data. ***Assuming 50:50 subgrade 3:Subgrade 3b split for land graded Provisional Grade 3.* *It is also noted that not all projects had information available for the ALC breakdown for each project.*									

12.9.2.1 Loss of Agricultural Land

As shown in **Table 12-29,** the majority of projects would, in isolation, result in the loss of BMV land less than 20 ha, with four of the developments potentially resulting in the permanent loss of BMV land greater than 20 ha individually. They are ERYC-2 new housing development (20.8 ha of BMV), ERYC-35 new housing development (28.6 ha of BMV), SE-4 Solar Farm (52.1 ha of BMV) and SE-20 Ash mining (138.3 ha of BMV). In isolation, these developments would result in the potential loss of more than 20 ha of BMV land, the ERYC-2 and ERYC-35 would result in the permanent loss of agricultural land, the effect of which is be considered to be **Significant**. The SE-4 and SE-20 developments have the potential for the land to be restored to agriculture after the planned use, and may be assessed as **Not Significant**.

Based upon the criteria presented in section 12.3.3, the potential total cumulative loss of 292.8 ha of BMV land due to the developments listed within **Table 12-29,** of which 102.4 ha would be permanent in combination with the English Onshore Scheme is be considered to be **Significant**. Combined the proportion of cumulative inter-project loss of BMV land (102.4 ha) within ERYC and SDC is only 0.06 % of the total BMV land (163,142.5 ha).

It is assumed that all of the proposed developments would be subject to the same governing regulations and industry best practice management methodologies intended (enforced via the planning system) to prevent and limit potential adverse impacts from occurring. With such best practice and industry standard guidance (e.g. Ref 12-16 and Ref 12-20) in place for all of the developments, the cumulative effect to soils of low and moderate sensitivity is likely to fall in line with the impact assessment for this project and the effect would be **Not Significant** for soils with low to moderate sensitivity. If the other developments are sited within areas of soils with high sensitivity, the effect may be **Significant**. The developments comprise of a mixture of renewable energy projects, new build dwellings, commercial units and associated infrastructure. As such there may be excess soil that may need to be exported, if it cannot be reused onsite. It is assumed that the exportation of any soil is done in line with industry standard guidance and reused sustainably elsewhere and, as such, the effect would be **Not Significant**.

12.9.2.2 Soil Resources

NSIP-9 and NSIP-4 are the only projects which limits intersect with the English Onshore Scheme, and where combined effects directly disturbing soils and agricultural land would occur. Whilst details of the other projects are not fully known the majority of the impact to soil resources would be temporary. It is also reasonable to assume that the construction would be undertaken following industry standard best practice and guidance, and assuming the sustainable reuse of soils, it is anticipated that the any cumulative effect on soil resources would be **Not Significant**.

12.10 Summary of Assessment

The study area for soils and agricultural land comprises the planning application boundary, totalling 628.7 ha. Within the proposed working area of the cable route, impacts to soils and agricultural land would be temporary given the short-term nature of the excavation and installation of the cable route (305.2 ha), with permanent development only occurring in the 5.9 ha of the converter station where loss of agricultural land would be permanent.

Soils within the English Onshore Scheme comprise seasonally waterlogged and clayey in texture. The sensitivity of the soil resources within the study area was found to be predominantly low to moderate, with a smaller area of high sensitivity where Newport 1 an Evingham soil associations are present.

Within the study area, the BMV agricultural land **comprises 516.5 ha (82.1 % of the study area)**, of which **1.7 ha (0.3 % of BMV land within the study area)** would be permanently lost to the English Onshore Scheme. The effect of this permanent loss of BMV land has been assessed as **Not Significant**.

Impacts on soils due to disturbance to soil resources and loss of soil resources are possible, but the adoption of embedded mitigation measures (i.e. industry best practice, including pre-commencement survey of remaining agricultural land, and production and implementation of a site-specific Soil

Management Plan) would help to prevent/lessen these. With these measure in place, the residual effects of the English Onshore Scheme to soils and agricultural land are considered to be **Not Significant**.

No intra-project combined impacts on soils and agricultural land are anticipated. The cumulative effect of the English Onshore Scheme and the identified developments would result in a Significant effect on loss of agricultural land, but this this is due to four larger developments that would each result in the loss of more than 20 ha of BMV agricultural land each and a Significant effect in isolation. By following industry standard guidance and assuming the sustainable reuse of soils, it is anticipated that the any cumulative effect on soil resources would be **Not Significant**.

In the ERYC study area (comprising 594.1 ha) all of the proposed development is temporary, the proposed working area of 297.8 ha (50.1 % of the EYRC study area) comprises 258.8 ha of BMV agricultural land (43.6 % of the EYRC study area). As all development will be temporary, there will be no permanent loss of agricultural land. The soil resources are of low to high sensitivity, and the impact on the disturbance of soil resources and the loss of resources where all best practice mitigation measures are implemented, has been assessed as **Not Significant**.

In the SDC study area (comprising 34.6 ha) 1.6 ha (4.6 % of the SDC study area) of BMV agricultural land will be permanently lost to the development of the new converter station, the total agricultural land lost to permanent development is 5.9 ha (16.5 % of the SDC study area), and **Not Significant**. The proposed working area comprises 7.4 ha (21.4 % of the SDC study area) of which 7.2 ha is BMV agricultural land. This has been assessed to be Not Significant. The soil resources are of low to medium sensitivity, and the impact on the disturbance of soil resources and the loss of resources where all best practice mitigation measures are implemented has been assessed as **Not Significant**.

12.11 References

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