Grand Union Canal Transfer

Chapter 7: Agriculture and Soils

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7. Agriculture and Soils

7.1 Introduction

7.1.1 This Preliminary Environmental Information (PEI) Report chapter presents the preliminary assessment of likely significant environmental effects arising from the Proposed Development in relation to agriculture and soils. This preliminary assessment follows the methodology outlined within the Environmental Impact Assessment (EIA) Scoping Report and Scoping Opinion (provided in **Appendices 5-PD-1** and **5-PD-2** in PEI Report **Volume 4**) and is based on the environmental information obtained to date and the description of the Proposed Development as presented in **Chapter 3: The Proposed Development** in PEI Report **Volume 2**.

7.1.2 The agriculture and soils assessment presented in this PEI Report chapter covers agricultural land classification, including best and most versatile (BMV) land and soil resources. It describes the methodology and datasets used within the assessment, presents an overview of the baseline conditions, identifies the potential likely significant effects and the assessment to be provided within the Environmental Statement (ES).

7.1.3 Supporting information, including figures and appendices, is listed in **Table 7-1**.

Table 7-1: Supporting documentation

Reference	Title
Figures (provided in PEI Report Volume 3)	
Figure 7-P1-1	Part 1 Provisional Agricultural Land Classification
Figure 7-P1-2	Part 1 Soil Associations
Figure 7-P4-1	Part 4 Provisional Agricultural Land Classification
Figure 7-P4-2	Part 4 Soil Associations
Figure 7-P4A-1	Part 4a Agricultural Land Classification
Appendices (provided in PEI Report Volume 4)	
Appendix 7-PD-1	Consultation

7.1.4 There are interrelationships between the potential effects on agriculture and soils and other environmental topics. Therefore, please also refer to the following:

a. **Chapter 13: Terrestrial — Ecology** in PEI Report **Volume 2**, where habitat mapping identifies land use, particularly where soil is fundamental to a habitat and its biodiversity, and the soil requirements for habitat creation proposals;

b. **Chapter 14: Ground Conditions** in PEI Report **Volume 2**, which includes the base geology beneath soil formation and detail of groundwater receptors that could be impacted by any land contamination or pollution related impacts from the Proposed Development;

c. **Chapter 16: Landscape and Visual Amenity** in PEI Report **Volume 2**, where soils are significant in characterising landscapes and the soil requirements for establishing vegetation for landscaping;

d. **Chapter 20: Socio-economics** in PEI Report **Volume 2**,consideration is given to agricultural functioning and effects on the land holding; and

e. **Chapter 22: Water Environment and Flood Risk** in PEI Report **Volume 2**, which includes the connection between the surface water cycle, drainage and agriculture.

7.2 Legislation, Policy and Guidance

7.2.1 Legislation, policy[1], and standards and guidance relating to the scope method and potential mitigation for air quality and odour comprises of the documents listed in the following sections.

National Policy

7.2.2 National policy considered in the assessment:

a. National Policy Statement for Water Resources Infrastructure (NPSWRI) (Ref. 1) the relevant national policy statement that has effect in relation to the Proposed Development; and

b. National Planning Policy Framework (NPPF) (Ref. 2).

Local Policy

7.2.3 Local policy considered includes relevant Local Plans (both adopted and emerging) and other adopted policy documents attributed with the ten local authorities that the Proposed Development would be situated within. More detail is provided in Table 1-4 in **Chapter 1: Introduction** in PEI Report **Volume 2**.

[1] For the purposes of this PEI Report an overview of relevant policy is provided to show how relevant policy has informed scope, method and in some cases mitigation. It is not the purpose of the PEI Report (or the ES) to present a review of the compliance of the Proposed Development with the requirements of policy. The Planning Statement, to be submitted with the Development Consent Order (DCO) application, will present an assessment of the extent to which the Proposed Development accords with policy.

National Guidance

7.2.4 National guidance to be considered includes:

a. Planning Practice Guidance – Guidance on soils and agricultural land is found in the Planning Practice Guidance for the Natural Environment (PPGNE) (Ref. 3);

b. The Ministry of Agriculture, Fisheries and Food's (MAFF) Agricultural Land Classification (ALC) of England and Wales Revised guidelines and criteria for grading the quality of agricultural land (Ref. 5) provides the current guidelines and criteria for grading the quality of agricultural land in England and Wales;

c. Natural England's Guide to Assessing Development Proposals on Agricultural Land (Ref. 6). The guidance also summarises the required survey methodology (also presented in Natural England's 2012 Technical Information Note 049 (TIN049) (Ref. 7); and

d. Defra's Construction Code of Practice for the Sustainable Use of Soil on Construction Sites (Ref. 8) provides technical guidance on the handling, storage and (re)use of soil within construction projects.

Other Guidance

7.2.5 Other guidance include the following:

a. A New Perspective on Land and Soil in Environment Impact Assessment (Ref. 4) published by Institute of Sustainability and Environmental Professionals'[2] (ISEP) (the 'ISEP guidance') for the consideration of the impacts of development on soils and land in EIA;

b. The Institute of Quarrying Good Practice Guide for Handling Soils in Mineral Workings (Ref. 9) contains information that is applicable to soils outside of mineral workings, containing details of good practice methods for stripping, handling, storage, reinstatement and management of soil resources; and

c. The British Society of Soil Science (BSSS) Guidance Document 3: Working with Soil Guidance Note on Benefitting from Soil Management in Development and Construction (Ref. 10).

7.3 Consultation

7.3.1 This section provides an overview of consultation undertaken to date in relation to agriculture and soils.

[2] Formerly the Institute of Environmental Management and Assessment (IEMA).

Phase One Public Consultation

7.3.2 Phase One Public Consultation, undertaken between 11 September and 25 October 2024, identified key concerns regarding agriculture and soils, specifically the potential impacts of pipeline construction on agricultural land. These impacts are included within the scope of the assessment, and will be addressed by Natural England as a statutory consultee.

7.3.3 This topic has been taken into consideration for the Proposed Development and EIA[3].

EIA Scoping

7.3.4 **Appendix 7-PD-1** in PEI Report **Volume 4** provides a summary of the key comments raised in the EIA Scoping Opinion (provided in **Appendix 5-PD-2** of PEI Report **Volume 4**), such as amending the original scope or request for further justification / evidence to agree the EIA scope. It also and outlines how and where these issues have been addressed within the PEI Report or will be later addressed within the ES to ensure they are taken account of as part of the agriculture and soils assessment.

7.3.5 Where the EIA Scoping Opinion has resulted in amendment to the scope of the agriculture and soils assessment (or where further justification or evidence is required to confirm an effect can remain scoped out), this has been presented in section 7.4.

7.3.6 The scope of the agriculture and soils assessment is presented in **Table 7-2**.

7.4 Scope of Assessment

7.4.1 No changes have been made to the scope of the agriculture and soils assessment following EIA Scoping and subsequent consultation, design development, surveys / studies and continued assessment.

7.4.2 **Table 7-2** provides a summary of all matters scoped in and out of the agriculture and soils assessment. Construction of parts 1b, 4a and 4b have been scoped in for the construction phase, because of the potential to result in significant effects during the EIA Scoping process. All parts have been scoped out of the operational phase. The table uses the following coding:

a. In = refers to likely effects that are considered significant and therefore do require further assessment in the EIA;

[3] A Phase One Public Consultation Report has been made available at Phase Two Public Consultation, which sets out activities undertaken to deliver the consultation and provides a summary of the key themes and issues raised, and how the project has considered these.

b. Out = refers to likely effects that are not considered significant and therefore do not require further assessment. Alternatively, it refers to effects that are considered within another chapter of the EIA, in which case, cross-referencing is provided; and

c. n/a = refers to where there is no prospect of an effect from a particular Proposed Development Part(s), either due to the particular nature or location of the Proposed Development Part and/or the absence of a receptor within the study area for that particular Proposed Development Part.

Table 7-2: Summary of agriculture and soils assessment scope

Likely significant impact	Receptor(s)	Parts of the Proposed Development					
		1a	1b	2	3	4a	4b
Construction Phase							
Agricultural soils with low resilience to structural damage (particularly clayey soils) could potentially be adversely affected, although good practice soil handling measures would be implemented through a SMP during construction.	Soil resources	Out	In	Out	Out	In	In
Temporary and some permanent loss of agricultural land is likely to include BMV land. This could potentially affect agricultural land and restrict agricultural operations.	Agricultural Land	Out	In	Out	Out	In	In
Impacts on agricultural land holdings through restriction to agricultural land use[4]	Farm holdings	Out	Out	Out	Out	Out	Out
Operational Phase							
The construction phase assessment will account for both temporary and permanent loss of agricultural land, and the majority of land required for construction would be returned to its pre-construction land use.	Soil resources	Out	Out	Out	Out	Out	Out
The construction phase assessment will account for both temporary and permanent loss of agricultural land, and therefore no further significant effects are anticipated.	Agricultural land	n/a	Out	n/a	n/a	Out	Out
Impacts on agricultural land holdings through restriction to agricultural land use[5]	Farm holdings	Out	Out	Out	Out	Out	Out

[4] The impacts on agricultural land use are assessed in **Chapter 20: Socio-economics** in PEI Report **Volume 2**.

[5] The impacts on agricultural land use are assessed in **Chapter 20: Socio-economics** in PEI Report **Volume 2**.

7.5 Assessment Methodology

7.5.1 This section presents the methodology used to assess the potential effects on agriculture and soils during the construction and operational phases of the Proposed Development.

7.5.2 ISEP guidance (Ref. 4) advocates a wider approach to assessing the soil functions, ecosystem services and natural capital provided by land and soils. It does not include a definitive methodology, nonetheless, it establishes sensitivity of receptors and proposes thresholds for impact magnitude. The proposed assessment methodology is therefore based on determining the sensitivity of receptors and magnitude of impacts in order to derive a conclusion on the significance of effects.

Defining the Study Area

7.5.3 This section sets out the study areas adopted for the Proposed Development. The study area is defined by the Preliminary Order Limits, where agricultural land and soils are potentially directly impacted. No buffer is applied and the study area will be further refined when routes and pipeline construction working areas are defined.

7.5.4 **Table 7-1** lists the supporting figures for agriculture and soils which illustrate the study area and **Table 7-3** provides a summary of the study areas by Proposed Development Part.

Table 7-3: Summary of study areas for the agriculture and soils assessment

Proposed Development Part	Study area
1b: Minworth to Atherstone Pipeline	Preliminary Order Limits, to be subsequently refined to the working width of the pipeline route.
4a: Abstraction, Storage and Treatment	Extent of the Preliminary Order Limits.
4b: Pipeline to Underground Reservoir near Luton	Preliminary Order Limits, to be subsequently refined to the working width of the pipeline route.

Determining Baseline Conditions

7.5.5 This section sets out how the baseline conditions were determined for the assessment.

7.5.6 **Table 7-4** provides an overview of the baseline studies and surveys undertaken to inform the agriculture and soils assessment. The table uses the following coding:

a. ✓ = Completed;

b. O = To be completed for the ES; and

c. n/a = Baseline study / survey is not applicable for that Part of the Proposed Development.

Table 7-4: Summary of baseline agriculture and soils studies and surveys

Study/survey	Receptor(s)	Date completed	Parts of the Proposed Development					
			1a	1b	2	3	4a	4b
Desktop review	A desktop review was undertaken to identify potential agricultural and soil receptors.	January 2025	✓	✓	✓	✓	✓	✓
Field survey of soil resources and ALC	ALC field survey, also providing information on soil resources to support a Soil Management Plan.	September 2025	n/a	n/a	n/a	n/a	✓	n/a
Field survey of soil resources and ALC	ALC field survey, also providing information on soil resources to support a Soil Management Plan.	For ES	n/a	O	n/a	n/a	n/a	O

Assessment of Effects

7.5.7 This section sets out how the scoped in effects are assessed.

7.5.8 Definitions of magnitude of impact, sensitivity or importance of the receptor and significance of effect used as part of the assessment are reported in the following section.

Sensitivity of Receptors

7.5.9 The sensitivity criteria used to inform the assessment of effects on agricultural land and soils are developed from Table 2 of the ISEP guidance (Ref. 4) and are presented in **Table 7-5** and **Table 7-6**.

Table 7-5: Sensitivity of agricultural land

Sensitivity	Description
Very high	ALC Grade 1 & 2
High	ALC Subgrade 3a
Medium	ALC Subgrade 3b
Low	ALC Grade 4 & 5
Negligible	As for low sensitivity but with only indirect, tenuous and unproven links between sources of impact and soil functions.

Table 7-6: Sensitivity of soil resources

Sensitivity	Description
High (low resilience to structural damage)	Soils with high clay and silt fractions (clays, silty clays, sandy clays, heavy silty clay loams and heavy clay loams) and organo-mineral and peaty soils where the field capacity days (FCD) are 150 or greater. Medium-textured soils (silt loams, medium silty clay loams, medium clay loams and sandy clay loams) where the FCDs are 225 or greater. All soils in wetness class (WC) V or VI.
Medium (medium resilience to structural damage)	Clays, silty clays, sandy clays, heavy silty clay loams, heavy clay loams, silty loams and organo-mineral and peaty soils where the FCDs are fewer than 150. Medium-textured soils (silt loams, medium silty clay loams, medium clay loams and sandy clay loams) where FCDs are fewer than 225. Sands, loamy sands, sandy loams, and sandy silt loams where the FCDs are 225 or greater or are in WC III or WC IV.

Sensitivity	Description
Low (high resilience to structural damage)	Soils with a high sand fraction (sands, loamy sands, sandy loams, and sandy silt loams) where the FCDs are fewer than 225 and are in WCI or WCII.

Magnitude of Impact

7.5.10 Magnitude of impact criteria used to inform the assessment of effects to agricultural land and soils are presented in **Table 7-7**. These are taken from Table 3 of the ISEP guidance (Ref. 4). These consider the magnitude (or scale) of change from current baseline conditions, and as described in the guidance are based on "*permanent irreversible loss of one or more soil functions or soil volumes (including the permanent sealing or land quality downgrading*".

Table 7-7: Magnitude of impact on agriculture and soil

Magnitude	Description
Large	Permanent irreversible loss of one or more soil functions or soil volumes (including permanent sealing or land quality downgrading) or permanent improvement of one or more soil functions or soil volumes (due to remediation or restoration) over greater than 20 hectares (ha) of agricultural land.
Medium	Permanent irreversible loss (including permanent sealing or land quality downgrading) or permanent improvement of one or more soil functions or soil volumes (due to remediation or restoration) over greater than 5 ha but less than 20 ha of agricultural land.
Low	Permanent irreversible loss (including permanent sealing or land quality downgrading) or permanent improvement of one or more soil functions or soil volumes (due to remediation or restoration) over less than 5 ha of agricultural land. Temporary reversible loss / reduction of one or more soil functions and restriction to current or approved future use (e.g., through degradation, compaction, erosion of soil resource) or a temporary improvement in one or more soil functions due to remediation or restoration or off-site improvement.
Negligible	No discernible loss / reduction or improvement of soil functions or soil volumes that restrict current or proposed land use.

Significance of Effects

7.5.11 The general approach adopted for evaluating the significance of effects, considering the sensitivity of the receptor and the magnitude of impacts, is outlined in **Table 7-8**. The significance matrix allows for an element of professional judgement to consider, for example, permanent loss of cropped agricultural land for creation of permanent ecological habitats, but where soil function is preserved.

7.5.12 Following the criteria set out in the ISEP guidance (Ref. 4), any permanent loss of highly sensitive Grade 1 or Grade 2 agricultural land will be classed as a significant effect regardless of the scale of that loss. Similarly, permanent loss of BMV land in Subgrade 3a may potentially result in significant effects but is scale dependent.

Table 7-8: Determination of significance matrix

		Sensitivity of Receptor				
		Very high	**High**	**Medium**	**Low**	**Negligible**
Magnitude of Impact	**Large**	Major	Major/ moderate	Moderate/ minor	Minor	Minor/ negligible
	Medium	Major/ moderate	Moderate	Moderate/ minor	Minor/ negligible	Negligible
	Low	Moderate/ minor	Moderate/ minor	Minor	Minor/ negligible	Negligible
	Negligible	Minor/ negligible	Minor/ negligible	Minor/ negligible	Negligible	Negligible

7.5.13 An impact is considered significant if the resultant effect is Major or Moderate. A resultant effect of Minor or Negligible is not considered significant. Professional judgement has been used in concluding the significance of an effect where appropriate. Both positive and negative effects will be considered.

Assumptions, Limitations and Uncertainties

7.5.14 It is assumed that at the end of the construction phase, land temporarily taken by the Proposed Development, within the pipeline corridors within the pipeline corridors for Parts 1b and 4b, will be reinstated and returned to agricultural use, whilst land required permanently for Part 4a of the Proposed Development will remain out of agricultural use.

7.5.15 The provisional ALC data, accessed via MAGIC web mapping service (Ref. 11), within Part 1b and Part 4b, does not differentiate between ALC Subgrades 3a (BMV) and 3b (non-BMV) and consequently cannot be used to determine the quantity or geographical distribution of BMV land. The provisional data is not accurate at the field level and it does not pick up

variations in ALC grade for areas less than approximately 80 ha. Upon finalisation of defined route of the pipeline, soil sampling will be undertaken and the assessment results will be presented in the ES.

7.5.16 Furthermore, the provisional ALC mapping was produced in the 1970s and therefore there is the potential for some areas, which are shown as agricultural land within the mapping (that is, assigned an ALC grade) to have been subject to changes in land use.

7.5.17 Limitations in the use of provisional ALC data would be reduced by use of the new preliminary Natural England ALC data. Headline data from a national analysis of the model were presented by Natural England in summer 2025 leading to anticipation of data release in time for the ES.

7.6 Project-Wide Environmental Design, Standards and Management

7.6.1 This section outlines embedded environmental design, standards and/or management measures in relation to agriculture and soils that are relevant for the construction phases of parts 1b, 4a and 4b, which have been scoped into the assessment. Where embedded environmental design, standards and/or management measures are specific to a Proposed Development Part(s), these have been identified.

Construction Phase

7.6.2 Disturbance to soil resources will occur within the construction phase. Standard measures for the Proposed Development would be adopted throughout the duration of the construction phase. An outline Soil Management Plan (oSMP) will be provided at application, which will contain measures relevant to Agriculture and Soils. The oSMP will then be developed into a detailed SMP post consent with / by the appointed contractor. Standard measures to manage loss of soil functions / volumes include, but are not limited to:

a. Maintaining separation of topsoil and subsoil at stripping soil stripping, stockpiling and reinstatement;

b. Specification for working with wet soils and in rain;

c. Locations for stockpiling materials; and

d. Temporary soil protection materials for trafficking soils and managing vehicle movements onsite.

Operational Phase

7.6.3 There is also the potential for small-scale disturbance during the operational phase, should reactive maintenance of the pipeline be required. However, the scale and extent of these works would be far less than required for initial construction and, therefore, the operational phase has been scoped out.

Part 1b: Minworth to Atherstone Pipeline

7.7 Part 1b: Minworth to Atherstone Pipeline

7.7.1 This section provides a description of the environmental baseline, embedded environmental mitigation, standards and management measures (if in addition to the aforementioned) and presents the preliminary assessment of likely significant effects in relation to agriculture and soils for Part 1b of the Proposed Development.

Baseline Conditions

7.7.2 This section describes the baseline environmental characteristics with specific reference to agriculture and soils. The National Soil Map of England and Wales (NATMAP) vector data is managed within the Land Information System (LandIS) (Ref. 12), a substantial environmental information system, operated by Cranfield University, UK. It contains soil and soil-related information with NATMAP providing the most detailed available soils mapping covering England and Wales. It is based upon survey data from the Soil Survey of England and Wales and provides soil association data at a 1:250,000 scale.

7.7.3 Additionally, the following sources of information were studied.

a. Multi-Agency Geographical Information for the Countryside (MAGIC) (Ref. 11);
b. LandIS Soils Guide (Ref. 12);
c. Provisional ALC 1:250,000 mapping (1993) (accessible via MAGIC map, Ref. 11); and
d. Aerial photography from Google Earth Pro (Ref. 13).

7.7.4 There are no detailed published ALC survey reports or mapping available on MAGIC within the Indicative Working Area for Part 1b of the Proposed Development. The most detailed published ALC data covering the Indicative Working Area are the 1:250,000 scale Provisional ALC mapping (Ref. 11).

Existing Baseline

7.7.5 Simple descriptors of the soil associations present within the study area for Part 1b are provided in **Table 7-9** and illustrated in **Figure 7-P1-2** in PEI Report **Volume 3**. Rounding, to one decimal place, of area measurements presented in **Table 7-9** and **Table 7-10**, accounts for any minor discrepancy of areas between the tables.

Table 7-9: Soil associations within Part 1b

Name	Description	Area (ha)
Midelney	Stoneless clayey soils mostly overlying peat.	17.1
Arrow	Deep permeable coarse loamy soils affected by groundwater.	77.7

Name	Description	Area (ha)
Oxpasture	Fine loamy over clayey and clayey soils with slowly permeable subsoils and slight seasonal waterlogging.	13.0
Bardsey	Slowly permeable seasonally waterlogged loamy over clayey and fine silty soils over soft rock.	24.9
Bromsgrove	Well drained reddish coarse loamy soils mainly over soft sandstone but deep in places.	35.6
Brockhurst1	Slowly permeable seasonally waterlogged reddish fine loamy over clayey soils.	29.0
Whimple2	Reddish fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging.	51.8
Compton	Stoneless mostly reddish clayey soils affected by groundwater.	20.1
Whimple3	Reddish fine loamy or fine silty over clayey soils with slowly permeable subsoils and slight seasonal waterlogging.	14.6
Rufford	Slowly permeable seasonally waterlogged reddish coarse loamy over clayey soils.	1.3
Eardiston2	Well drained often reddish coarse loamy soils over sandstone.	7.0
Powys	Shallow well drained loamy soils over rock.	15.1
Neutral restored opencast	Restored soils mostly from quarry and opencast spoil	3.1

7.7.6 Analysis of provisional ALC grades, for Part 1b of the Proposed Development, is provided in **Table 7-10** and is illustrated in **Figure 7-P1-1** in PEI Report **Volume 3**.

Table 7-10: ALC grades for Part 1b

Provisional ALC grade	Area (ha)
Grade 2	89.2
Grade 3	166.2
Grade 4	15.5
Non-agricultural	29.9
Urban	9.5
Total	310.3

Future Baseline

7.7.7 Potential temporal changes to the baseline conditions for agriculture and soils might occur over the lifespan of the Proposed Development, because of climate change. However, the rate and implications of change cannot be reliably modelled at the field scale. Therefore, for the purposes of the assessment, the future baseline is assumed to be unchanged.

Environmental Design, Standards and Management

7.7.8 This section outlines further embedded environmental design, principles and/or management in relation to agriculture and soils that are specific to Part 1b of the Proposed Development.

Construction Phase

7.7.9 There is potential for disturbance to soils and agricultural land during the construction phase from:

a. Stripping and stockpiling of topsoil and subsoil, storage and reinstatement;
b. Ground excavation;
c. Trenchless drilling;
d. Stockpiling materials; and
e. Vehicle movements onsite.

7.7.10 The construction footprint and working corridor will be minimised. The period for which trenches will be open and soil stockpiled will be minimised. These embedded mitigation measures from the within the oSMP will be developed into a detailed SMP prior to the-commencement of the construction phase.

Assessment of Effects and Significance

7.7.11 This section provides the preliminary assessment of likely significant effects to those aspects of agriculture and soils scoped into this chapter. The potential for effects on agricultural land holdings is addressed in **Chapter 20: Socio-economics** in PEI Report **Volume 2**. Assessment of effects includes determining the level of significance, for Part 1b of the Proposed Development.

7.7.12 There is the potential for both adverse effects from loss of soil functions / volumes and soil-related features from Part 1b, but improvement is also possible from reduction in soil bulk density.

7.7.13 Based on the above, there is likely to be a direct, temporary, short-term, adverse effect which is considered to be minor and not significant. No further mitigation, beyond the good practice to be contained within the SMP, is required.

Additional Mitigation, Enhancement and Monitoring

7.7.14 There will be short-term temporary disturbance of soil resources during construction of Part 1b. There are no proposals for detailed monitoring, and the effects would be localised and negligible and so change to soil structure and bulk density has been discounted from the assessment. There are no mitigation measures additional to the industry standard guidance / current best working practice and arrangements for an oSMP, as described in section 7.7, will be adopted and developed into a detailed SMP pre-construction. Landowner satisfaction with land reinstatement provides a more suitable approach for identifying successful outcomes as the standard approach to ALC reassessment is to delay for five years from construction.

Residual Effect

7.7.15 The residual effect of construction on agricultural land and the soil resource is likely to be a direct, temporary, short-term, adverse effect, whereby land and soil are temporarily unavailable for farming. The impact is low magnitude but affecting some highly sensitive BMV land. The significance matrix identifies this as minor or moderate. However, the resilience of those soils is likely to be high or medium. Applying professional judgement to the very short-term effects it is considered to be minor and not significant.

Summary

7.7.16 **Table 7-11** summarises the residual agriculture and soils effects of Part 1b of the Proposed Development, following the implementation of any identified additional mitigation, enhancement and/or monitoring.

Table 7-11: Summary of residual effects – Part 1b

Receptor	Sensitivity of receptor	Description of impact	Nature of impact / geographic scale	Magnitude of impact	Initial classification of impact (with embedded control)	Additional mitigation, enhancement and/or monitoring	Residual impact significance
Construction Phase							
Grade 2 agricultural land and land use	Very high	Temporary Disturbance of Grade 2 agricultural land and land use	Adverse, localised within a working corridor, short-term,	Low	Moderate/ Minor	None	Minor Adverse (Not significant)
Subgrade 3a Agricultural Land and land use	High	Temporary Disturbance of Grade 3a agricultural land and land use	Adverse, localised within a working corridor, short-term,	Low	Minor	None	Minor Adverse (Not Significant)
Subgrade 3b Agricultural Land and land use	Medium	Temporary Disturbance of Grade 3b agricultural land and land use	Adverse, localised within a working corridor, short-term,	Low	Minor	None	Minor Adverse (Not Significant)
Soil Resources - loss of soil functions / volumes	High to medium	Temporary Disturbance of Soil resources	Adverse, localised within a working corridor, short-term	Low	Minor	None	Minor Adverse (Not Significant)

Part 4a: Abstraction, Storage and Treatment

7.8 Part 4a: Abstraction, Storage and Treatment

7.8.1 This section provides a focused description of the environmental baseline, embedded environmental design principles, and management measures and presents the preliminary assessment of likely significant effects in relation to agriculture and soils for Part 4a of the Proposed Development.

Baseline Conditions

7.8.2 This section describes the baseline environmental characteristics with specific reference to agriculture and soils. The same sources of information as described in paragraphs 7.7.2 and 7.7.3 were referenced.

7.8.3 An ALC survey of Part 4a was conducted in September 2025.

Existing Baseline

7.8.4 Simple descriptors of the soil associations present within Part 4a are provided in **Table 7-12** and illustrated in **Figure 7-P4A-1** in PEI Report **Volume 3**. Rounding, to one decimal place, of area measurements presented in **Table 7-12** and **Table 7-13** accounts for any minor discrepancy of areas between the tables.

Table 7-12: Soil associations in Part 4a

Name	Description	Area (ha)
Bishampton 2	Deep fine loamy and fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging.	11.3
Oxpasture	Fine loamy over clayey and clayey soils with slowly permeable subsoils and slight seasonal waterlogging.	27.8
Fladbury 1	Stoneless clayey soils, in places calcareous variably affected by groundwater.	2.8

7.8.5 Field survey further revealed soils derived from alluvium close to the river, with soils consistent with both river terrace and till superficial deposits over the majority of the site.

7.8.6 Areas of topsoil were found with the volume of large stones (greater than 2 cm) being over 10%. However, where these are present other factors exceed the ALC grade limitation imposed by these stones. ALC grade is not limited by the presence of shallow soils within this site.

7.8.7 The majority of Part 4a has soil with a medium clay loam to clay textured topsoil over a heavy clay loam to clay subsoil. The subsoil impedes the drainage of excess water from the soil leaving the land commonly wet (Wetness Class IV). In combination with the climate factors for the site this land is limited to Grade 3b by soil wetness and workability.

7.8.8 Two separate and smaller areas are found with a lighter sandy loam textured topsoil with a subsoil that only becomes slowly permeable for drainage below a depth of 40 cm. This land is occasionally wet (Wetness Class III) and is limited to Grade 2 by a slight soil wetness and workability limitation. Whilst the Grade 2 land is also limited by soil wetness and workability, the drainage is not as poor and the topsoil has a lower clay content. This reduces the duration of the topsoil being wet and its vulnerability to structural degradation while wet, reducing the severity of the soil wetness limitation. The locations of the Grade 2 and Grade 3 land are shown in **Figure 7-P4A-1** in PEI Report **Volume 3**, and the area of each Grade (in percentage) derived from field data is presented **Table 7-13**.

Table 7-13: ALC grades for Part 4a, derived from field survey

ALC Grade	Area (ha)	Area (%)
2	4.6	11.0
3b	37.2	89.0
Total	41.8	100.0

Future Baseline

7.8.9 Potential temporal changes to the baseline conditions for agriculture and soils might occur over the lifespan of the Proposed Development, because of climate change. However, the rate and implications of change cannot be reliably modelled at the field scale. Therefore, for the purposes of the EIA, the future baseline is assumed to be unchanged.

Environmental Design, Standards and Management

7.8.10 This section outlines further embedded environmental design, standards and/or management in relation to agriculture and soils that are specific to Part 4a (Abstraction, Storage and Treatment) of the Proposed Development.

Construction Phase

7.8.11 There will be disturbance to soils from excavation and construction of Part 4a. This will include:

a. Stripping and stockpiling of topsoil and subsoil, storage and reinstatement;

b. Ground excavation; and

c. Vehicle movements onsite.

7.8.12 Soils to be re-used on site will be subject to good management practices; these will be outlined in the oSMP.

7.8.13 Embedded mitigation within the oSMP will be developed into a detailed SMP pre-construction.

Assessment of Effects and Significance

7.8.14 This section provides the preliminary assessment of likely significant effects, including determining the level of significance, for Part 4a (Abstraction, Storage and Treatment) of the Proposed Development. Where applicable, the requirement for additional mitigation measures and/or monitoring is identified to avoid, prevent, reduce, or if possible, offset any identified significant adverse effects on the environment.

Construction Phase

Agricultural land use

7.8.15 As a result of Part 4a of the Proposed Development, the land will be operational land and no longer used for farming. Hence, there will be long-term loss of land from agricultural use, including some relatively limited areas (low magnitude) of very highly sensitive Grade 2 BMV land, at the periphery of part 4a.

7.8.16 There is a direct, long-term, effect which within **Table 7-8** is presented as a minor / moderate adverse effect (potentially significant). However, it is currently anticipated that the Water Storage will be built on the non-BMV land and will not extent into the areas of BMV land. The soil resource within the BMV land would be conserved for landscape and habitat mitigation, which is to be determined in the ES, to help integrate part 4a within the agricultural landscape. Professional judgement has been applied to identify this effect to minor adverse (not significant).

7.8.17 The development of non-BMV land of medium sensitivity and large magnitude, which is also a direct, long-term, effect which within **Table 7-8** is also presented as a minor / moderate adverse effect (potentially significant). Based on professional judgement the effect due to the extent of loss of non-BMV land is considered likely to be minor (not significant).

Additional Mitigation, Enhancement and Monitoring

7.8.18 During construction, there are no mitigation measures additional to the industry standard guidance / current best working practice (for example measures set out in Defra's Code of Practice (Ref. 8) and IoQ's Good Practice Guide (Ref. 9)) will be followed. The oSMP will form the basis of a detailed SMP to be produced pre-construction, to be adopted by the appointed contractor.

Residual Effect

7.8.19 The residual effect of construction on agricultural land use, including a small component of BMV land, is likely to be a direct, long-term, adverse effect which is considered to be minor for both the BMV and non-BMV areas (not significant) but this will be clarified in the ES following detailed design. Similarly, the adverse effect on soil resources, subject to the design development in the ES, will be minor adverse (not significant). No further

monitoring of ALC is proposed post construction as the land will not be returned to agriculture.

Soil resources

7.8.20 There will be a loss of soil functions / volumes and soil-related features for the water storage site and treatment works. It is anticipated that healthy soil function will be retained in areas of landscaping and habitat creation, the extent of which will be established in the ES through further design work.

7.8.21 Based on the above, there is likely to be a direct, long-term, adverse effect which is considered to be moderate or minor. The soils of medium sensitivity (and moderate resilience) The re-use of soil on site for bunding and landscaping, will be considered in the ES. Assuming that soil is re-used on site then professional judgement indicates that the effect will be minor adverse (not significant).

Additional Mitigation, Enhancement and Monitoring

7.8.22 There will be long-term temporary disturbance of soil resources for water storage and treatment but healthy soil function will be retained on areas of Part 4a. There are no mitigation measures additional to the industry standard guidance / current best working practice and arrangements for a SMP will be adopted.

Residual Effect

7.8.23 The residual effect on soil resources from construction of the water storage site and treatment works is likely to be a direct, long-term, adverse effect which is considered to be minor and potentially not significant.

Summary

7.8.24 **Table 7-14** summarises the residual agriculture and soils effects of part 4a of the Proposed Development, following the implementation of any identified additional mitigation, enhancement and/or monitoring.

Table 7-14: Summary of residual effects – Part 4a

Receptor	Sensitivity of receptor	Description of impact	Nature of impact/ geographic scale	Magnitude of impact	Initial classification of impact (with embedded control)	Additional mitigation, enhancement and/or monitoring	Residual impact significance
Construction Phase							
Grade 2 agricultural land and land use	Very high	Permanent disturbance of Grade 2 agricultural land and land use	Adverse, long-term,	Low	Moderate/ Minor	There are no mitigation measures additional to the industry standard guidance / current best working practice and arrangements for a SMP will be adopted.	Minor Adverse (Not significant)
Subgrade 3b Agricultural Land and land use	Medium	Permanent disturbance of Grade 3b agricultural land and land use	Adverse, long-term,	Large	Moderate/ Minor	There are no mitigation measures additional to the industry standard guidance / current best working practice and arrangements for a SMP will be adopted.	Minor Adverse (Not Significant)
Soil Resources - loss of soil functions/volumes	Medium	Permanent disturbance of Soil Resources	Adverse, long-term	Large	Moderate/ Minor	None	Minor Adverse (Not Significant)

Part 4b: Pipeline to an Existing Underground Reservoir near Luton

7.9 Part 4b: Pipeline to an Existing Underground Reservoir near Luton

7.9.1 This section provides a focused description of the environmental baseline, embedded environmental design, standards and additional management measures and presents the preliminary assessment of likely significant effects in relation to agriculture and soils for Part 4b of the Proposed Development.

Baseline Conditions

7.9.2 This section describes the baseline environmental characteristics with specific reference to agriculture and soils. The same data sources described in paragraphs 7.7.2 and 7.7.3 were referenced.

7.9.3 There are no detailed published ALC survey reports or mapping available on MAGIC within the Indicative Working Area for Part 4b of the Proposed Development (Ref. 11). The most detailed published ALC data covering the Indicative Working Area are the 1:250,000 scale Provisional ALC mapping (Ref. 11).

Existing Baseline

7.9.4 Simple descriptors of the soil associations present within Part 4b are provided in **Table 7-15** and illustrated in **Figure 7-P4-2** in PEI Report **Volume 3**. Rounding, to one decimal place, of area measurements presented in **Table 7-15** and **Table 7-16**, accounts for any minor discrepancy of areas between the tables.

Table 7-15: Soil associations within Part 4b

Name	Description	Area (ha)
Evesham 3	Slowly permeable calcareous clayey, and fine loamy over clayey soils.	102.8
Hanslope	Slowly permeable calcareous clayey soils.	110.2
Block	Moderately permeable calcareous loamy soils over chalky gravel variably affected by groundwater.	88.5
Oxpasture	Fine loamy over clayey and clayey soils with slowly permeable subsoils and slight seasonal waterlogging.	26.1
Batcombe	Fine silty over clayey and fine loamy over clayey soils with slowly permeable subsoils and slight seasonal water logging.	102.9
Frilford	Deep well drained sandy and coarse loamy soils.	13.6

Name	Description	Area (ha)
Bearsted 1	Well drained coarse loamy and sandy soils over sand or sandstone, in places ferruginous.	1.9
Ragdale	Slowly permeable seasonally waterlogged clayey and fine loamy over clayey soils.	46.5
Fladbury 1	Stoneless clayey soils, in places calcareous variably affected by groundwater.	5.5
Upton 1	Shallow well drained calcareous silty soils over chalk. Mainly on moderately steep, sometimes very steep land.	33.1
Wantage 1	Well drained calcareous silty soils, in places shallow over argillaceous chalk.	15.8
Andover 1	Shallow well drained calcareous silty soils over chalk on slopes and crests.	2.1
Coombe 1	Well drained calcareous fine silty soils deep in valley bottoms.	26.2

7.9.5 Analysis of provisional ALC grades, for Part 4b of the Proposed Development, is provided in **Table 7-16** and is illustrated in **Figure 7-P4-1** in PEI Report **Volume 3**.

Table 7-16: ALC grades for Part 4b

Provisional ALC grade	Area (ha)
Grade 2	35.2
Grade 3	423.0
Grade 4	75.9
Non-agricultural	41.0
Total	575.1

Future Baseline

7.9.6 Potential temporal changes to the baseline conditions for agriculture and soils might occur over the lifespan of the Proposed Development, because of climate change. However, the rate and implications of change cannot be reliably modelled at the field scale. Therefore, for the purposes of the EIA, the future baseline is assumed to be unchanged.

Environmental Design, Standards and Management

7.9.7 This section outlines further embedded environmental design, standards and/or management in relation to agriculture and soils that are specific to

Part 4b (Pipeline to an Existing Underground Reservoir near Luton) of the Proposed Development.

Construction Phase

7.9.8 There is potential for disturbance to soils and agricultural land during the construction phase from:

a. Stripping and stockpiling of topsoil and subsoil, storage and reinstatement;
b. Ground excavation;
c. Trenchless drilling ;
d. Stockpiling materials; and
e. Vehicle movements onsite.

7.9.9 The construction footprint and working corridor will be minimised. The period for which trenches will be open and soil stockpiled will be minimised. These embedded mitigation measures from the within the oSMP will be developed into a detailed SMP prior to the-commencement of the construction phase.

Assessment of Effects and Significance

7.9.10 This section provides the preliminary assessment of likely significant effects to those aspects of agriculture and soils scoped into this chapter. The potential for effects on agricultural land holdings is addressed in **Chapter 20: Socio-economics** in PEI Report **Volume 2**. This section provides the preliminary assessment of likely significant effects, including determining the level of significance for Part 4b (Pipeline to an Existing Underground Reservoir near Luton) of the Proposed Development.

7.9.11 There is the potential for both adverse effects from loss of soil functions / volumes and soil-related features from Part 4b, but improvement is also possible from reduction in soil bulk density.

7.9.12 Based on the above, there is likely to be a direct, temporary, short-term, adverse effect which is considered to be minor and not significant. No further mitigation, beyond the good practice to be contained within the SMP, is required.

Construction Phase

Agricultural land and soil resources

7.9.13 Land use for Part 4b will be temporary, with land excluded from agricultural use for the duration of construction only.

7.9.14 There is the potential for loss of soil functions / volumes and soil-related features from Part 4b from disturbance, although improvements in soil quality are possible, from reduction in soil bulk density. However, there are no proposals for detailed monitoring, and the effects would be localised and

negligible within the significance matrix. Hence, it has been discounted from the assessment.

7.9.15 Based on the above, there is likely to be a direct, temporary, short-term, adverse effect which is considered to be minor and not significant.

Additional Mitigation, Enhancement and Monitoring

7.9.16 There will be short-term temporary disturbance of soil resources during construction of Part 4b. There are no proposals for detailed monitoring, and the effects would be localised and negligible and so change to soil structure and bulk density has been discounted from the assessment. There are no mitigation measures additional to the industry standard guidance / current best working practice and arrangements for an oSMP, as described in section 7.7 will be adopted and developed into a detailed SMP pre-construction. Landowner satisfaction with land reinstatement provides a more suitable approach for identifying successful outcomes as the standard approach to ALC reassessment is to delay for five years from construction.

Residual Effect

7.9.17 The residual effect of construction on agricultural land and soil resources is likely to be a direct, temporary, short-term, adverse effect, whereby land and soil are temporarily unavailable for farming. The impact is low magnitude but affecting some highly sensitive BMV land. The significance matrix identifies this as minor or moderate. However, the resilience of those soils is likely to be high or medium. Applying professional judgement to the very short-term effects it is considered to be minor and not significant.

Summary

7.9.18 **Table 7-17** summarises the residual agriculture and soils effects of Part 4b of the Proposed Development, following the implementation of any identified additional mitigation, enhancement and/or monitoring.

Table 7-17: Summary of residual effects – Part 4b

Receptor	Sensitivity of receptor	Description of impact	Nature of impact/ geographic scale	Magnitude of impact	Initial classification of impact (with embedded control)	Additional mitigation, enhancement and/or monitoring	Residual impact significance
Construction Phase							
Grade 2 agricultural land and land use	Very high	Temporary Disturbance of Grade 2 agricultural land and land use	Adverse, localised within a working corridor, short-term, Local	Low	Moderate/ Minor	None	Minor Adverse (Not significant)
Subgrade 3a Agricultural Land and land use	High	Temporary Disturbance of Grade 3a agricultural land and land use	Adverse, localised within a working corridor, short-term	Low	Minor	None	Minor Adverse (Not Significant)
Subgrade 3b Agricultural Land and land use	Medium	Temporary Disturbance of Grade 3b agricultural land and land use	Adverse, localised within a working corridor, short-term	Low	Minor	None	Minor Adverse (Not Significant)
Soil Resources - loss of soil functions / volumes	High to medium	Temporary Disturbance of Soil resources	Adverse, localised within a working corridor, short-term	Low	Minor	None	Minor Adverse (Not Significant)

7.10 Combined Effects between Proposed Development Parts

7.10.1 This section provides a review of the above findings of the individual Parts of the Proposed Development, to understand the potential combined effects on a shared receptor(s) that may be of greater significance when compared to the individual effects arising from one of the six Parts of the Proposed Development. Where combined effects are identified, these are considered additively and qualitatively using professional judgement.

7.10.2 As outlined in section 7.4, Parts 1a, 2, and 3 have been scoped out of this assessment. There are no combined effects on agriculture and soils from non-continuous parts of the Proposed Development, but the cumulative total area of all land affected will be reported but the magnitude of short-term temporary land take will remain low based on ISEP guidelines. Consequently, no interactions are expected between the following Parts:

a. Part 1a and 1b;
b. Part 1b and 2;
c. Part 2 and 3; and
d. Part 3, 4a, and 4b.

7.10.3 The only interface requiring assessment is between Parts 4a and 4b because they are geographically continuous; this section focuses solely on this interface.

7.10.4 As explained in **Chapter 6: Environmental Impact Assessment Methodology**, in PEI Report **Volume 2**, the approach undertaken for this assessment is summarised in the following steps:

a. Step 1: Review and identification of shared receptors from assessments undertaken for each technical chapter for interfacing Parts of the Proposed Development; and
b. Step 2: Assessment of combined effects for any shared receptors identified under Step 1.

7.10.5 The assessment of impacts on soil resources and agricultural land is confined to areas directly affected by the Proposed Development. Combined effects are assessed as additive, with no indication of interactions that would lead to a greater combined impact than the sum of individual effects. The totality of combined effects are no worse than those effects identified for each Part of the Proposed Development.

7.11 Summary and Next Steps

7.11.1 The significance matrix of effects, combining sensitivity and magnitude criteria, yielded a preliminary assessment with potential for minor / moderate adverse effects. The application of professional judgement to differentiate between moderate (significant) and minor (not significant) has been

presented and identifies that at this stage of design development effects are minor.

7.11.2 The BMV land is of limited extent in two locations at the periphery of part 4a. Currently, it is anticipated that, subject to detailed design, the water storage will be built on non-BMV land and will not extent into the BMV land. If confirmed, although BMV land will be permanently withdrawn from agriculture, the soil resource is conserved in-situ for landscaping and habitat mitigation. The low magnitude withdrawal from agriculture of BMV land, while conserving the affected soils, is therefore considered to be a minor effect (not significant) based on professional judgement.

7.11.3 The installation of pipelines in parts 1b and 4b will require temporary use of agricultural land and disturbance of the soil resources This is also anticipated to result in minor adverse effects (not significant). Post-construction the land in parts 1b and 4b will be returned in equivalent condition for agricultural re-use.

7.11.4 The information provided in this PEI Report is preliminary, with the final assessment of likely significant effects to be reported in the ES and subject to final design and detailed pipeline routeing and siting. Soil survey of the defined pipeline route will provide detailed ALC data for the ES and provide understanding of the resilience of the soil resource to temporary disturbance for the SMP.

7.12 References

Ref. 1 Ministry of Housing, Communities and Local Government, Ministry of Housing, Communities & Local Government (MHCLG) (2018 to 2021) and Department for Levelling Up, Housing and Communities (DLUHC) (2025) National Planning Policy Framework – Last updated 7th February 2025. Available at: https://assets.publishing.service.gov.uk/media/675abd214cbda57cacd3476e/NPPF-December-2024.pdf [Accessed 27/01/2026].

Ref. 2 Department for Environment, Food & Rural Affairs (Defra) (2023) National Policy Statement for Water Resources Infrastructure. Available at: https://assets.publishing.service.gov.uk/media/6437e3a2f4d420000cd4a1a7/E02879931_National_Policy_Statement_for_Water_Resources.pdf [Accessed 27/01/2026].

Ref. 3 Ministry of Housing, Communities and Local Government, Ministry of Housing, Communities & Local Government (MHCLG) (2018 to 2021) and Department for Levelling Up, Housing and Communities (DLUHC) (2025), Planning Practice Guidance: Natural Environment Available at: https://www.gov.uk/guidance/natural-environment [Accessed 27/01/2026].

Ref. 4 Institute of Sustainability and Environmental Professionals (ISEP) (2022) A New Perspective on Land and Soil in Environmental Impact Assessment.

Ref. 5 Ministry of Agriculture, Fisheries and Food (MAFF) (1988) Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land. Available at: http://publications.naturalengland.org.uk/publication/6257050620264448. [Accessed 27/01/2026].

Ref. 6 Natural England (2021). Guide to assessing development proposals on agricultural land. Available at: https://www.gov.uk/government/publications/agricultural-land-assess-proposals-for-development/guide-to-assessing-development-proposals-on-agricultural-land. [Accessed 27/01/2026].

Ref. 7 Natural England (2012). Technical Information Note 049 (TIN049), 'Agricultural Land Classification: protecting the Best and Most Versatile agricultural land'. Available at: http://publications.naturalengland.org.uk/publication/35012. [Accessed 27/01/2026].

Ref. 8 Defra (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69308/pb13298-code-of-practice-090910.pdf. [Accessed 27/01/2026].

Ref. 9 Institute of Quarrying (2021) Good Practice Guide for Handling Soils in Mineral Workings.

Ref. 10 British Society of Soil Science (2022) Guidance Document 3: Working with Soil, Guidance Note on Benefitting from Soil Management in Development and Construction.

Ref. 11 Department for Environment, Food & Rural Affairs (2025) MAGIC Map. Available at: https://magic.defra.gov.uk/MagicMap.aspx / [Accessed 27/01/2026].

Ref. 12 Cranfield University. (2025). Land Information System. Available at: https://www.landis.org.uk/ [Accessed 27/01/2026].

Ref. 13 Google Earth Pro (2025). Available at: https://earth.google.com/web/ [Accessed 27/01/2026].