Cambridge Waste Water Treatment Plant Relocation Project
Anglian Water Services Limited

Appendix 6.2: Agricultural Impact Assessment

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1 Introduction

1.1.1 The agricultural impact assessment (AIA) has been prepared as part of the application to the Planning Inspectorate (PINS) for development consent. It reports the impacts and significance of the Proposed Development on existing farm holdings, including impacts to the farm business, agricultural land, and soil resources.

1.1.2 In particular, the receptors assessed by the AIA comprise:

- Agricultural land – the prevalence of 'best and most versatile' (BMV) land, determined via desktop data and an Agricultural Land Classification (ALC) survey;
- Soil resources – the sensitivity of soils to handling determined via desktop data and an ALC survey; and
- Farm business – impact on farm businesses of land loss, land severance, infrastructure damage and disruption to activities determined via interviews with landowners and tenants.

1.2 Policy overview

1.2.1 As outlined in the Agricultural Transition Plan (Defra, 2020), the Government seeks to maintain an environment in which a competitive and sustainable agricultural industry can flourish.

1.2.2 This policy objective forms the basis of the AIA with regard to the proposed development and defines the scope of the impacts to be identified and examined in this study. These are:

- Farm business:
  - The sensitivity of affected farm businesses with respect to the genre and set-up of agricultural activity; and
  - The impact on farm businesses of land loss, land severance, infrastructure damage and disruption to activities.
- Agricultural land:
  - The sensitivity of agricultural land in the area, based on the prevalence of 'best and most versatile' (BMV) land; and
  - The impact on agricultural land with particular reference to the quantity and quality of agricultural land that would be temporarily and permanently taken by the development.
- Soil resources:
  - The sensitivity of soil resources with regard to their resilience to handling; and

- The impact on the quality and quantity of affected soil resources.

2 Assessment approach

2.1 Guidance

2.1.1 There is no set guidance applicable for the purpose of AIA. The general approach adopted by this study has been derived from the following:

- HS2 document (CT-001-000/2) (HS2, 2013);
- Highways England (Highways England, 2018); and
- IEMA guidance (IEMA, 2022).

2.1.2 ALC guidelines (Ministry of Agriculture, Fisheries and Food 1988) set out categories for land in England and Wales, based on physical or chemical properties that impose long-term limitations on agricultural use. This provides the industry standard framework for classifying land with respect to developments impacting agricultural land. The framework uses the following grade definitions:

- Grade 1 (excellent quality agricultural land). 'Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality';
- Grade 2 (very good quality agricultural land). 'Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1';
- Grade 3 (good to moderate quality agricultural land). 'Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown, yields are generally lower or more variable than on land in Grades 1 and 2';
- Subgrade 3a (good quality agricultural land). 'Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops';
- Subgrade 3b (moderate quality agricultural land). 'Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year';
- Grade 4 (poor quality agricultural land). 'Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited

to grass with occasional arable crops (e.g., cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high but there may be difficulties in utilisation. The grade also includes very droughty arable land'; and

- Grade 5 (very poor quality agricultural land). 'Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops'.

2.1.3 Grades 1, 2 and 3a are classified as BMV land, denoting land which is 'most flexible, productive and efficient in response to inputs and which can best deliver future crops for food and non-food uses' (Natural England 2021).

2.2 Assessment methodology

2.2.0 The general approach to assessment is described in Chapter 5: EIA Methodology (Application Document Reference 5.2.5).

2.2.1 Following the preliminary assessment of the likely significant effects of the Proposed Development, any further mitigation measures (secondary mitigation, Section 2.7) are identified and described. These mitigation measures would further reduce an adverse effect. The assessment of likely significant effects is then carried out taking into account the identified secondary mitigation measures to identify the 'residual' environmental effects.

2.2.2 The assessments are based upon a baseline study, intrusive soils surveys (ALC survey and soil nutrient sampling), and an AIA survey. The methodology of each is outlined below.

2.2.3 The significance of an effect is determined based on the magnitude of an impact and the sensitivity of the receptor affected by the impact of that magnitude. This section describes the criteria applied in this chapter to characterise the magnitude of potential impacts and sensitivity of receptors.

Impact assessment criteria - soil resources

2.2.4 The terms used to define magnitude and sensitivity in relation to soil resources stem from guidance published by IEMA (IEMA 2022).

Magnitude of impact – soil resources

2.2.5 The criteria for defining magnitude for the assessment of impacts to soil resources are defined within Table 2-1.

Table 2-1: Impact magnitude for soil resources

Magnitude	Criteria
High	Permanent, irreversible loss of one or more soil functions or soil volumes (including land quality downgrading), over an area of more than 20ha, including effects from temporary developments.
Medium	Permanent, irreversible loss of one or more soil functions or soil volumes (including land quality downgrading), over an area of 5ha - 20ha, including effects from temporary developments.
Low	Permanent, irreversible loss of one or more soil functions or soil volumes (including land quality downgrading), over an area of less than 5ha, including effects from temporary developments.
Negligible	No discernible loss or reduction or improvement of soil functions or soil volumes that restrict current or proposed land use.

Source: Table adapted from (IEMA 2022)

Sensitivity of receptor – soil resources

2.2.6 The criteria for defining receptor sensitivity for the assessment of impacts to soil resources are defined in Table 2-2.

Table 2-2: Receptor sensitivity for soil resources

Magnitude	Criteria
High	• Soils with high clay and silt fractions and organo-mineral and peaty soils where the Field Capacity Days[1] (FCD) are 150 or greater; or • Medium-textured soils where the FCDs are 225 or greater.
Medium	• 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; or • Medium-textured soils where FCDs are fewer than 225; or • Sands, loamy sands, sandy loams and sandy silt loams where the FCDs are 225 or greater or are in wetness classes WCIII and WCIV.
Low	• Soils with a high sand fraction (sands, loamy sands, sandy loams and sandy silt loams) where the FCDs are fewer than 225.

Source: Table adapted from (IEMA 2022)

[1] Field capacity is the maximum amount of water a soil type can hold after excess water has drained under the influence of gravity and the rate of downward movement has become negligible. This typically takes place one to three days after rain or irrigation in pervious soils of uniform structure and texture.

Significance of effects – soil resources

2.2.7 The overall significance of the development for soil resources was determined as a function of impact magnitude and receptor sensitivity. A significance rating was calculated as shown in Table 2-3.

Table 2-3: Significance matrix – soil resources

Sensitivity of receptor \ Magnitude of Impact	High	Medium	Low	Negligible
High	Major: significant	Major/moderate: significant	Moderate: significant	Minor: not significant
Medium	Major/moderate: significant	Moderate: significant	Minor: not significant	Negligible: not significant
Low	Moderate: significant	Minor: not significant	Negligible: not significant	Negligible: not significant

Residual effect – soil resources

2.2.8 The assessment of effects on soil resources follows the approach set out within Chapter 5: EIA Methodology (App Doc Ref 5.2.5). Effects have been assessed to take into account for both embedded (primary) mitigation and legal requirements (tertiary mitigation), and after the application of further mitigation measures (secondary mitigation). Effects after mitigation are referred to as 'residual effects'.

Impact assessment criteria – farm businesses

2.2.9 The definitions of magnitude and sensitivity in relation to farm businesses are based on those published by HS2 (HS2 2013). These are the most comprehensive methods available and deemed best practice.

2.2.10 Throughout this document, a 'farm holding' is defined as 'an area of land that consists of one or more land parcels or group of fields that are managed by a named person or named business entity as an owner, tenant or in any other commercial agricultural capacity, for the production of food, forage or fibre'.

2.2.11 Farm holdings are considered to comprise (i) a farm business and (ii) agricultural land.

2.2.12 The farm business is the activity within the farm holding that generates income. The agricultural land refers to the area of land used for agricultural production.

Magnitude of impact – farm businesses

2.2.13 For Table 2-4, the overall impact magnitude for a farm holding is assigned as the highest magnitude identified among the four criteria (land required, severance, infrastructure, disruptive effects). For example, a farm holding experiencing a high

impact from land severance but medium impact for other criteria would experience an overall high impact magnitude. The impact magnitude was then used in the quantification of significance (Table 2-6).

2.2.14 A distinction was made between land required permanently by the development and land required temporarily and returned to agriculture, with a lower scale of impact assigned for temporary impacts than for permanent impacts.

2.2.15 Where the farm holding forms part of a larger business (that extends beyond the extent of the Scheme Order Limits of the Proposed Development), the percentage of land acquired from that farm business was calculated according to the area of the larger business.

Table 2-4: Impact magnitude criteria for farm businesses

Impact magnitude	Land required (permanently)	Land required (temporarily)	Severance	Infrastructure	Disruptive effects
High	Removal or loss of soil function of >20% of all land farmed	Removal or loss of soil function of >50% of all land farmed	No access available to severed land	Direct loss of farm dwelling, building or structure	Disruption discontinues land use or enterprise
Medium	Removal or loss of soil function of 10% - 20% of all land farmed	Removal or loss of soil function of 26% - 50% of all land farmed	Access available to severed land via the public highway	Loss of or damage to infrastructure affecting land use	Disruption necessitates change to scale or nature of land use or enterprise
Low	Removal or loss of soil function of 5% - 10% of all land farmed	Removal or loss of soil function of 10% - 25% of all land farmed	Access available to severed land via private way	Infrastructure loss/damage does not affect land use	Disruption does not affect land use or enterprise
Negligible	Loss of soil function of <5% of all land farmed	Loss of soil function of <10% of all land farmed	No new severance	No impact on farm infrastructure	No disruption on land use or enterprise

Source: Table adapted from (HS2 2013) and (Highways England 2018).

Sensitivity of receptor – farm businesses

2.2.16 The sensitivity of a farm business refers to the relationship between land and key infrastructure, flexibility in the normal course of operations, and the degree of commercialisation.

2.2.17 The sensitivity was determined according to the criteria within Table 2-5.

Table 2-5: Receptor sensitivity criteria – farm businesses

Sensitivity	Criteria
High	Farm types in which the operation of the enterprise is dependent on the spatial relationship of land to key infrastructure, and where there is a requirement for frequent and regular access between the two, or dependent on the existence of the infrastructure itself, e.g.: • Dairying, in which milking cows must travel between fields and the parlour at least twice a day; • Irrigated arable cropping and field-scale horticulture, which are dependent on irrigation water supplies; and • Intensive livestock or horticultural production that is undertaken primarily within buildings, often in controlled environments.
Medium	Farm types in which there is a degree of flexibility in the normal course of operations, e.g.: • Combinable arable farms; and • Grazing livestock (other than dairying).
Low	Farm types and land uses undertaken on a non-commercial basis. For example, smallholdings where the main source of income is not derived from the agricultural business.

Source: Table adapted from (HS2 2013) and (Highways England 2018).

Significance of effects – farm businesses

2.2.18 The overall significance of the development for individual farm businesses was determined as a function of impact magnitude and receptor sensitivity. A significance rating was calculated for the farm businesses using Table 2-6.

Table 2-6: Significance matrix – farm businesses

Sensitivity of receptor	Magnitude of Impact: High	Medium	Low	Negligible
High	Major: significant	Major/moderate: significant	Moderate: significant	Minor: not significant
Medium	Major/moderate: significant	Moderate: significant	Minor: not significant	Negligible: not significant
Low	Moderate: significant	Minor: not significant	Negligible: not significant	Negligible: not significant

Residual effect – farm businesses

2.2.19 The assessment of effects farm businesses follows the approach set out within Chapter 5: EIA Methodology. Effects have been assessed to take into account for both embedded (primary) mitigation and legal requirements (tertiary mitigation), and after the application of further mitigation measures (secondary mitigation). Effects after mitigation are referred to as 'residual effects'.

Impact assessment criteria – agricultural land

2.2.20 The definitions of magnitude and sensitivity in relation to farm businesses are based on those published by HS2 (HS2 2013). These are the most comprehensive methods available and deemed best practice.

Magnitude of impact – agricultural land

2.2.21 The magnitude of impact on agricultural land was determined according to the criteria in Table 2-4.

2.2.22 The percentage of BMV land was calculated based on the results of the ALC survey reported in the ALC (App Doc Ref 5.4.6.1) and desktop predicted ALC grades (Natural England 2020).

2.2.23 The ranking of impact is independent of the requirement to consult Natural England where development would involve loss of 20ha or more of BMV land.

Table 2-7: Impact magnitude for agricultural land.

Impact magnitude	The percentage of agricultural BMV land required for the development
High	> 60%
Medium	20% - 60%
Low	< 20% or < 10ha, whichever is higher.
Negligible	< 2%

Source: Table adapted from (HS2 2013) and (Highways England 2018).

Sensitivity of receptor – agricultural land

2.2.24 Agricultural land sensitivity was determined according to the criteria in Table 2-8 using the rationale that the resource with the highest sensitivity corresponds to areas of agricultural land where BMV land is scarce and therefore most sensitive.

2.2.25 The likelihood of BMV land occurring was identified using Natural England's Strategic Scale Maps (Defra 2001) which provide a prediction of the occurrence of BMV land.

Table 2-8: Receptor sensitivity criteria – agricultural land

Sensitivity	Criteria
High	Best and most versatile land where 'low likelihood of best and most versatile land' is the most extensive category in a 2km radius according to the Defra Likelihood maps.

Sensitivity	Criteria
Medium	Best and most versatile land where 'moderate likelihood of best and most versatile land' is the most extensive category in a 2km radius according to the Defra Likelihood maps.
Low	Best and most versatile land where 'high likelihood of best and most versatile land' is the most extensive category in a 2km radius according to the Defra Likelihood maps.

Source: Table adapted from (HS2 2013) and (Highways England 2018).

Significance of effects – agricultural land

2.2.26 The overall significance of the development for agricultural land was determined as a function of impact magnitude and receptor sensitivity. A significance rating was calculated for the impact on agricultural land using Table 2-9.

Table 2-9: Significance matrix - agricultural land

Sensitivity of receptor	Magnitude of Impact: High	Medium	Low	Negligible
High	Major: significant	Major/moderate: significant	Moderate: significant	Minor: not significant
Medium	Major/moderate: significant	Moderate: significant	Minor: not significant	Negligible: not significant
Low	Moderate: significant	Minor: not significant	Negligible: not significant	Negligible: not significant

Residual effect – agricultural land

2.2.27 The assessment of effects on agricultural land follows the approach set out within Chapter 5: EIA Methodology. Effects have been assessed to take into account for both embedded (primary) mitigation and legal requirements (tertiary mitigation), and after the application of further mitigation measures (secondary mitigation). Effects after mitigation are referred to as 'residual effects'.

2.2.28 For all farm holdings, the residual effect is the same as the significance of effect before secondary mitigation because secondary mitigation measures reduce the impact on soil resources but not on the area of land required from the farm business.

2.3 Study area

Agricultural land classification and soil resources

2.3.1 The study area for the ALC survey and soil comprised the location of land permanently required for the proposed WWTP and area of land required for the landscape masterplan. Provisional ALC information was obtained for the Waterbeach

pipeline and final effluent pipeline, outfall, transfer tunnel and new access connection connecting with Horningsea Road. The ALC survey is reported in Agricultural Land Classification (App Doc Ref 4.5.6.1).

Farm holdings

2.3.2 All farm holdings wholly or partially within the Scheme Order Limits have been considered within this assessment.

2.3.3 The farm holdings assessed were categorised as follows:

- holdings for which the largest impact was from the proposed WWTP and landscape masterplan – permanent acquisition of land;
- holdings for which the largest impact was from land temporarily required for the construction of the transfer tunnel, shafts, final effluent pipeline and outfall - temporary acquisition of land; and
- holdings for which the largest impact was from land temporarily required for the construction of the Waterbeach transfer pipeline - temporary acquisition of land.

2.3.4 To retain farm anonymity, farm holdings were assigned an alphanumeric code (e.g. Y039).

2.4 Baseline study

2.4.1 In total, 23 different agricultural holdings were identified for assessment as a result of potential effects (temporary and/or permanent). Desktop information on plot data, farm holdings and ALC data across the Proposed Development has been obtained from desk based and survey information summarised below. One of the identified holdings has been excluded from the assessment due to lack of access and agricultural activity.

Desktop data

2.4.2 Baseline information was collected through a detailed desktop review of existing studies and datasets. The information used and source are summarised in Table 2-10.

2.4.3 In particular, the ALC system provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use.

2.4.4 The principal physical factors influencing agricultural production are climate, site and soil. These factors together with interactions between them form the basis for classifying land into one of five grades, described in Section 2.1.2.

2.4.5 Preliminary ALC information was used to conduct the AIA on the Waterbeach pipeline (temporary land acquisition).

Table 2-10: Desktop information sources

Baseline data	Data sets reviewed	Year	Data owner
Provisional ALC grades	Magic Map Application	2021	Defra
Likelihood of BMV land strategic scale maps	Natural England's Strategic Scale Maps (Defra, 2001)	2021	Natural England
Soil types	The Soils Guide, LandIS	2021	Cranfield University
Geology: bedrock and superficial deposits	Geology of Britain viewer	2021	British Geological Survey
Climate data	UK climate averages	2021	Met Office
Flooding data	Flood map for planning.	2021	Environment Agency

Surveys

2.4.6 In addition to existing information, non-intrusive and intrusive surveys were completed within the area of land required for the Proposed Development. The Agricultural Land Classification (App Doc Ref 5.4.6.1) details the intrusive surveys for agriculture and soil resources completed in relation to the Proposed Development.

2.4.7 The ALC survey was undertaken in accordance with ALC guidelines (Ministry of Agriculture, Fisheries and Food 1988) and Soil Survey Handbook (Hodgson 1997). Soil nutrient sampling was conducted in accordance with the guidelines outlined in Natural England Technical Information Note TIN035 (Natural England 2008).

2.4.8 The information obtained from intrusive soil surveys was used to conduct the AIA on in relation to permanent land acquisition in the area of land required for the proposed WWTP and Landscape Masterplan.

2.4.9 Agricultural impact assessment surveys were completed through consultation with landowners and tenants for farm holdings within the Scheme Order Limits. Appendix A includes a copy of the questionnaire adopted to understand the use of each farm holding. The results are provided in Appendix B.

2.5 Assumptions and limitations

2.5.1 It is assumed that the loss of agricultural land quality and land area from the farm holding would remain as assessed during the construction phase of the Proposed Development. Changes to the extent of land required, either temporarily or permanently may trigger the need for re-assessment and identification of further mitigation.

2.5.2 It is assumed that all soils within the land required for the construction of the proposed WWTP and the landscape masterplan as set out within the LERMP (App Doc Ref 5.4.8.14) can be reused within the landscaping proposals.

2.5.3 The estimates for soil volumes re-used within the landscape masterplan are initial estimates and the ultimate volume will be dependent on the actual thickness of the topsoil encountered.

2.5.4 The assessment of residual effects is based on the assumption that a detailed SMP based on the outline SMP (App Doc Ref. 5.4.6.3) will be duly implemented to maintain high-quality soil handling practices.

2.5.5 Engagement with landowners, their agents and tenants has established the size (ha) of the plots directly affected by the Proposed Development. Information on farm holdings was collected by the Applicant's Land Team and it is assumed to be suitable for the purpose of assessment.

2.5.6 In operation, there will be residual easements in relation to sub-surface structures. These easements are designed to avoid disruption to buried assets and to afford permissions for future access (such as for inspections and maintenance or infrequent emergency situations). These easements will not prevent the ongoing agricultural use of the land in holdings affected by easements.

2.5.7 Financial compensation would be available under existing statutory arrangements to offset these impacts. However, it is not a consideration in the assessment of effects on farm holdings.

2.5.8 Where land acquisition may affect viability of a farm holding as identified through discussions between the landowner, their agents, tenants and the applicant, the applicant will seek to establish appropriate mitigation and/or compensation. Any necessary land negotiations and acquisition(s) will be considered by the application in accordance with the government's compulsory purchase and compensation: guide 3 (Department for Levelling Up, Housing and Communities 2021).

2.6 Impacts scoped out of the assessment

2.6.1 None of the impacts assessed in a standard AIA have been scoped out of the report.

2.7 Design/mitigation measures adopted as part of the Proposed Development

2.7.1 This section refers to the mitigation types, as defined in Chapter 5: EIA Methodology, and how they apply to the assessment of Agriculture and Soils.

2.7.2 In developing the Proposed Development through an iterative process including consultation and engagement with consultees, and through the Environmental Impact Assessment (EIA) the Applicant has sought to identify and incorporate suitable measures and mitigation for potentially significant adverse effects, as well as maximising beneficial effects where possible.

2.7.3 Some measures are 'embedded' in the design of the Proposed Development for which consent is sought by virtue of the scope of the authorised development as set out in Schedule 1 to the DCO and the accompanying Works Plans. For example, adjustment of Order Limits to avoid sensitive features, amending the sizing and location of temporary access routes and compounds.

2.7.4 Chapter 5: EIA Methodology sets out required permits and consents related to the Proposed Development.

2.7.5 Other measures are either secondary, such as control plans, or measures integrated into legal requirements through environmental permits and consents (termed tertiary).

2.7.6 The following sets out the embedded measures (primary), legal requirements (tertiary) and additional measures (secondary) relevant to the assessment of Agriculture and Soils.

Embedded (primary and tertiary measures)

2.7.7 Table 2-11 sets out the embedded mitigation measures that will be adopted during the construction, operation, maintenance and decommissioning of the Proposed Development.

Table 2-11: Design/mitigation measures relating to Agricultural Land, Soil Resources and Farm business adopted as part of the Proposed Development

Mitigation measures	Type	Applied to	Justification
Construction			
Agricultural land			
Minimising land required	Primary	Overall Scheme Order Limits extent	In line with the NPS for Waste Water, the Proposed Development has sought to reduce the extent of disturbance to agricultural land and the wider environment.
Minimising construction widths of the Waterbeach pipeline corridor.	Primary	Waterbeach pipeline corridor	In line with the NPS for Waste Water, the Proposed Development has sought to reduce the extent of disturbance to agricultural land and the wider environment.
Selection of trenchless techniques for sections of the Waterbeach pipeline and the waste water transfer tunnel and tunnel corridor.	Primary	Crossings of the River Cam, A14 and railway on the Waterbeach pipeline, and land affected by the waste water transfer tunnel.	To minimise adverse impact on agricultural soil quality.
Farm businesses			
Minimisation of land required and orientation of Scheme Order Limits to avoid severance and creation of land slivers.	Primary	Overall Scheme Order Limits extent	The size and shape of land that can be farmed is dependent on the size of farm machinery. Farm businesses may be reliant on the spatial relation between fields and infrastructure.
Creation of temporary haul route section parallel to Hatridges' Lane to allow farming activities to continue.	Primary	G108, P106, GO37, R106, R107, and R040;	Requirement to agree temporary access through coordination with landowners, tenants and/or land agents via implementation of section 7.6 of the CoCP Part A (Traffic and Transport) (App Doc Ref 5.4.2.1). Farmers need access to their fields in order to carry out their operations.
Coordinate with the landowner for the final position of air valves.	Primary	G037	To minimise adverse impact on agricultural activities.
Soil resources			

Mitigation measures	Type	Applied to	Justification
Minimising land required	Primary	Overall Scheme Order Limits extent	In line with the NPS for Waste Water, the Proposed Development has sought to reduce the extent of disturbance to agricultural land and the wider environment.
Minimising construction widths of the Waterbeach pipeline corridor.	Primary	Waterbeach pipeline corridor	In line with the NPS for Waste Water, the Proposed Development has sought to reduce the extent of disturbance to agricultural land and the wider environment.
Selection of trenchless techniques for sections of the Waterbeach pipeline and the waste water transfer tunnel and tunnel corridor.	Primary	Crossings of the River Cam, A14 and railway on the Waterbeach pipeline, and land affected by the waste water transfer tunnel.	To minimise adverse impact on soil resources.
Operation			
Farm businesses			
Orienting the area of the proposed WWTP and landscape masterplan to avoid severing land and making it unavailable for agriculture.	Primary	Land required for the construction of the proposed WWTP and landscape masterplan.	In line with the NPS for Waste Water, the Proposed Development has sought to reduce the extent of disturbance to agricultural land and the wider environment.

Additional measures (secondary mitigation)

Construction

2.7.8 During the construction phase, the CoCP and associated management plans specify the range of measures to avoid and minimise impacts that may occur in construction (CoCP Part A (App Doc Ref 5.4.2.1)).

2.7.9 During the construction phase, the CTMP (App Doc Ref: 5.4.19.7) and the Code of Construction Practice (CoCP) (App Doc Ref 5.4.2.1). and associated management plans specify the range of measures to avoid and minimise impacts that may occur in construction.

2.7.10 The CoCP Part A Section 3 (Community Consultation and Engagement) requires a proactive approach to communication with the local community and stakeholders. Through a Community Liaison Plan the local community and stakeholders will be informed of the works taking place, including durations, particularly where these will involve works outside of the core working hours or impact community facilities and business and local infrastructure such as Public Rights of Way (PRoW)/cycleways.

2.7.11 An outline SMP (App Doc Ref 5.4.6.3) has been prepared in a manner specific to the site in accordance with the guidance in the CCoP (Defra 2009). The CCoP (Defra 2009) provides general measures that are required to be in place to ensure that soil is appropriately managed during construction and suitable for its final use.

2.7.12 The outline SMP will provide the basis for the final SMP which will be prepared by the Principal Contractor prior to construction. The final SMP will detail these measures as applicable to the particular soil types of the site and should be adhered to during and after the Construction Phase.

2.7.13 Specific measures in the CoCP and LERMP relevant to Agriculture and Soils are described below.

COCP

2.7.14 Section 4.4 of the CoCP Part A (Construction Environment Management Plan (CEMP)): application of appropriate soil handling practices through implementation of the outline SMP to prevent degradation of soil resources.

2.7.15 Section 7.4 of the CoCP Part A: return land that is temporarily required during construction to its previous use via the application of a SMP based on the outline SMP. This is to prevent degradation of soil resources.

2.7.16 Section 5.14 of the CoCP Part A (Other watercourses/drainage channels/Land drains): provision/reinstatement of land drainage.

2.7.17 Section 7.6 of the CoCP Part A (Traffic and Transport): siting work areas and access to avoid severance of farm holdings as much as possible and the provision of farm and field access to enable agricultural operations to continue during construction and operation. Temporary access will be agreed through coordination with landowners, tenants and/or land agents.

2.7.18 Section 7.6 of the CoCP Part A (Traffic and Transport): creation of a temporary access from the B1047 Horningsea Road to land required for the construction of the transfer tunnel and avoidance of existing farm access to Poplar Hall. Affected farms are R037 and Y039.

2.7.19 Section 7 of the CoCP Part A): The use of fencing in locations where construction might result in disturbance to crops, livestock or horses. The working area will be delineated by post and rope fence except in fields where livestock is present, in which case livestock or horse fencing will be used.

LERMP

2.7.20 Reuse soils for planting and landscaping as indicated within the LERMP. The management of soil resources in relation to the LERMP is critical to appropriately manage newly created habitats for soil health.

Operation

2.7.21 An Operational Logistics Management Plan and Operational Workers Travel Plan form part of the mitigation measures for the operational of the proposed WWTP. The purpose of these plans is summarised below:

- Operational Logistics Management Plan: details the overall traffic management strategy for operational traffic; and
- Outline Workers Travel Plan: details operation work and programme, site access requirements for staff, staff travel patterns and expected workforce locations.

2.7.22 The LERMP is included within the Application (App Doc Ref 5.4.8.14). The purpose of the LERMP is to set out how landscape, recreational features and ecological habitat and enhancements (vegetation and habitats) would be protected and managed following construction for a period of 30 years.

2.7.23 The implementation of the Drainage Strategy (App Doc Ref 5.4.20.12) will provide green field run off from the area of land required for the proposed WWTP and landscape masterplan.

Decommissioning

2.7.24 Decommissioning of the existing Cambridge WWTP would be subject to a Decommissioning Management Plan which is to be agreed with the Environment Agency. An outline Decommissioning Management Plan (App Doc Ref 5.4.2.3) describes measure applied to this activity.

3 Assessment results

3.1 Assessment areas

3.1.1 All farm holdings wholly or partially within the Scheme Order Limits have been considered within this assessment and are mapped in the Technical chapter figures.

3.1.2 The farm holdings assessed were categorised by location as follows:

- holdings for which the largest impact was from the proposed WWTP and landscape masterplan – permanent acquisition of land;
- holdings for which the largest impact was from temporary land-take for the construction of the waste water transfer tunnel, shafts, final effluent pipeline and the outfall - temporary acquisition of land; and
- holdings for which the largest impact was from temporary land-take for the construction of the Waterbeach pipeline - temporary acquisition of land.

3.1.3 For holdings affected by more than one aspect of the Proposed Development (e.g., holdings that are affected by both the Waterbeach pipeline and the waste water transfer tunnel), the assessment has addressed all impacts. The holding was categorised under the subheading of the project component that affected the largest area.

3.1.4 To retain farm anonymity, farm holdings were assigned an alphanumeric code (e.g., Y039).

3.1.5 The distribution of land parcels affected is presented in the technical chapter figures and results are summarised in Sections 3.2 - 3.4.

3.2 Farm holdings affected by the construction of the proposed WWTP

3.2.1 This section sets out the assessment of effects in relation to the proposed WWTP including the landscaping proposals, treated effluent pipeline, outfall, transfer tunnel and new access connection connecting with Horningsea Road.

3.2.2 The construction of the proposed WWTP and landscape masterplan acquisition of land requires the permanent acquisition of land. The farm holdings assessed that are affected by this work include G036, R037 and Y039.

Permanent use of agricultural land

Proposed WWTP and landscaping proposals

3.2.3 The impact magnitude is **high** because 80% of land to be lost permanently for the proposed WWTP and landscaping constitutes BMV land and comprises 30ha grade 2 (very good quality agricultural land) and 50ha grade 3a (good quality agricultural land).

3.2.4 The sensitivity of BMV land is **low** due to a high prevalence of BMV land within a 2km radius of the site.

3.2.5 There will be a **moderate permanent significant** effect on BMV land due to permanent acquisition for the proposed WWTP. This is due to a high impact on BMV land and **low** sensitivity of the receptor.

3.2.6 The residual effect is the same as the significance of effect before secondary mitigation because secondary mitigation measures reduce the impact on soil resources but not on the area of land required.

Transfer tunnel and shafts

3.2.7 The magnitude of the impact on agricultural land is medium as 57% of land is grade 2, considered BMV. The remaining land is grade 4 or non-agricultural.

3.2.8 The sensitivity of agricultural land is **low** due to a high prevalence of BMV land within a 2km radius of the site.

3.2.9 There will be a **minor temporary effect**, which is **not significant**. The residual effect remains **minor**, which is **not significant**.

Permanent use of soil resources for landscaping

3.2.10 The main functions provided by soils, other than for food and biomass production, include flood water attenuation, carbon storage and/or supporting habitats of biodiversity value. Chapter 10: Carbon (App Doc Ref 5.2.10) includes a consideration of the land type arable land and land use change as defined in the LERMP (App Doc Ref 5.4.8.14) in terms of carbon sequestration.

3.2.11 The magnitude of the impact of a change to the use of soils is high because over 20 ha of soils will be affected by the construction of the proposed WWTP.

3.2.12 The sensitivity of soils is medium as they comprise medium and heavy clay loams (based on the ALC survey, App Doc Ref 5.4.6.1) with field capacity days that are lower than 150.

3.2.13 In the absence of implementing secondary mitigation in the form of a SMP (App Doc Ref 5.4.6.3), the significance of effects is major/moderate and is significant.

3.2.14 If soils are handled following following guidance in the outline SMP, the residual effect will be negligible and not significant.

Permanent use of land from farm holdings

Permanent use of land from farm holdings

3.2.15 The farm holdings affected by permanent land acquisition due to the proposed WWTP, landscaping proposals, transfer tunnel and shafts are G036, G040, R037 and Y039.

3.2.16 For all farm holdings, the residual effect is the same as the significance of effect before secondary mitigation because secondary mitigation measures reduce the impact on soil resources but not on the area of land required.

Farm G036

3.2.17 This is a 100ha holding that is part of a larger 378ha enterprise and comprises land in arable rotation. The business has medium sensitivity.

3.2.18 There will be negligible land acquisition (4.9ha of permanent acquisition of land for landscaping, whilst 0.7ha of land will be temporarily required), which accounts for 1.2% of all land farmed. Severance is deemed negligible as there will be no change in access. The old railway line for which change of status to a bridleway is sought will remain usable by the farmer. Disruption is medium as a change in the scale of the farm enterprise is required.

3.2.19 The magnitude of impact on the farm holding is medium due to the disruption, resulting in an overall **moderate permanent effect**, which is **significant**.

Farm G040

3.2.20 This is a 26.63ha holding with a strong focus on ecological diversity and sustainability and is part of a larger 46ha business. The holding comprises mixed arable, permanent pasture and conservation areas. The farm holding has a **medium** sensitivity.

3.2.21 There will be permanent acquisition of land approximately 24ha (53% of total land) for the transfer tunnel, shafts, final effluent pipeline and the creation of a ditch habitat. This is a high impact. During construction, there will be temporary severance of the land parcel, with odd parcels remaining. There will be no infrastructure loss. The magnitude of impact on the farm holding is high due to the permanent land acquisition and land severance of odd land parcels.

3.2.22 Overall, the farm holding will experience a **major/moderate effect**, which is **significant.**

Farm R037

3.2.23 This is a 116ha farm holding that is part of a larger 5000ha business. The land comprises arable rotation with some traditional agricultural farm buildings. The farm holding has medium sensitivity.

3.2.24 There will be 80ha (1.7% of farm business) of land permanently acquired for landscaping, whilst 8ha of land (0.17%) will be required for the creation of a ditch habitat. There will be temporary land severance via a public byway, requiring the provision of an alternative crossing point. This severance will not, however, be permanent. Due to the shape of the land remaining after severance, the disruption will make the land unworkable, particularly given the size of machinery deployed by the farmer. The magnitude of impact on the farm holding is therefore **medium**, due to the severance.

3.2.25 Overall, the farm holding will experience a **moderate permanent effect**, which is **significant.**

Farm Y039

3.2.26 This is a 57ha holding that is part of a larger 1000ha enterprise. The holding comprises land in arable rotation. The business has a **medium** sensitivity.

3.2.27 There will be 20ha of land (2% of land of whole farm business) permanently acquired acquisition of land for the proposed WWTP and landscaping, whilst 2.8ha of land

(0.28%) will be temporarily required for the Waterbeach pipeline. This is negligible. Severance will not render the remaining land uneconomical to farm but planned crossing points will be required. There will be loss of a hard standing in front of a barn that is not currently in use. As a consequence, the impact magnitude is considered **low**.

3.2.28 Overall there is a **minor permanent effect**, which is **not significant**.

Temporary use of land from farm holdings

3.2.29 The farm holdings affected by temporary land acquisition due to the proposed WWTP, landscaping proposals, transfer tunnel and shafts are P119, G040 and Y844.

Farm G036

3.2.30 This farm is covered in section 3.2.15 as it is affected by permanent land acquisition.

Farm P119

3.2.31 This is a 5.8ha farm holding comprising permanent pasture for ten horses and ponies. The farm holding has low sensitivity.

3.2.32 There will be no permanent acquisition of land whilst 100% of land (5.8ha) will be temporarily required for the construction of a transfer tunnel and shafts, which is a high impact. During construction, the landowner will only have 0.8ha remaining for their horses and ponies. The stables will be severed, making it challenging to maintain the horses and ponies on a small area of land without access to transport, food between the field and the stables. Due to the large area of land required temporarily, severance and disruption to activities, the magnitude of impact on the farm holding is **high**.

3.2.33 Overall, the farm holding will experience a temporary, reversible, **moderate effect**, which is **significant**.

Farm Y844

3.2.34 This is a 3.74ha farm holding comprising permanent pasture for ten horses and ponies. The farm holding has a **low** sensitivity.

3.2.35 There will be no permanent acquisition of land whilst Horizontal Directional Drilling (HDD) for the construction of a transfer tunnel and shafts will occur beneath 97% of land. Taking into consideration the use of trenchless construction methods, the land will remain in use with disruption to the horses. There will be no land severance or damage to infrastructure. As there will be no disruption, land acquisition and severance, the magnitude of impact on the farm holding is negligible.

3.2.36 Overall, the farm holding will experience a **negligible effect**, which is **not significant**.

3.3 Farm holdings affected by the construction of the Waterbeach transfer pipeline

3.3.1 This section sets out the assessment of effects in relation to the Waterbeach transfer pipeline, which consists of a transfer section running from the north near Waterbeach to Low Fen Drove Way, a section crossing the area of land required for the construction of the proposed WWTP, a section south of the A14 which connects to the area of land where the existing Cambridge WWTP is located.

3.3.2 The construction of the Waterbeach transfer pipeline acquisition of land requires the temporary use of land in construction. The farm holdings assessed that are affected by this work include B107, G037, G041, G042, G108, G109, G110, O025, O108, O842, P025, P106, P881, R040, R106, R107 and Y041.

Agricultural land

3.3.3 The magnitude of the impact on agricultural land is high as more than 60% of land required for the construction of the Waterbeach pipeline is BMV. At least 42ha of land are predicted to be BMV land (grades 1 and 2). In addition, 8ha of grade 3 land which may be BMV depending on sub-grade. 10ha are predicted to be grade 4 land.

3.3.4 The sensitivity of agricultural land is low due to a high prevalence of BMV land within a 2km radius of the site.

3.3.5 The effect of construction of the Waterbeach pipeline is **moderate,** which is **significant.**

3.3.6 The residual effect is the same as the significance of effect before secondary mitigation because secondary mitigation measures reduce the impact on soil resources but not on the area of land required.

Soil resources

3.3.7 The magnitude of the impact of a change to the use of soils is high because approximately 70ha of soil resources may be affected.

3.3.8 The soil resources are judged to have medium sensitivity as they have field capacity days that are lower than 150 and are anticipated to have high clay fractions or be peaty as per National soil association mapping.

3.3.9 In the absence of implementing secondary mitigation in the form of a SMP (Application Document Ref 5.4.6.3), the significance of effects is **major/moderate** and is **significant**.

3.3.10 If the soils are handled following guidance in the outline SMP, the residual effect will be **negligible** and **not significant**.

Temporary use of land from farm holdings

3.3.11 The following farms will be affected by temporary land use for the construction of the Waterbeach pipeline: B107, G108, G109, G110, G037, G041, O025, O108, O842, P025, P106, P881, R040, R106 and R107 and Y041.

3.3.12 For all farm holdings except one (Y041), the residual effect is the same as the significance of effect before secondary mitigation because secondary mitigation measures reduce the impact on soil resources but not on the area of land required.

Farm B107

3.3.13 This is a 1.47ha farm holding that is part of a larger 40ha business. It comprises of grass ley with heifers and therefore the farm holding has **medium** sensitivity.

3.3.14 There will be no permanent acquisition of land acquisition of land whilst 6% of land will be temporarily required by the Waterbeach transfer pipeline. There will be no land severance or disturbance to infrastructure. Due to the temporary acquisition of land, the magnitude of impact on the farm holding is **negligible**.

3.3.15 Overall, the farm holding will experience a **negligible effect**, which is **not significant.**

Farm G108

3.3.16 This is a 0.76ha farm holding. The farm holding comprises rough grassland for the purpose of amenity. The farm holding has **low** sensitivity. There will be no permanent acquisition of land acquisition of land whilst 30% of land will be temporarily required during construction. This results in a **medium** magnitude of impact on the farm holding.

3.3.17 Overall, the farm holding will experience a **minor effect,** which is **not significant**.

Farm G109

3.3.18 This is a 1.09ha farm. The farm holding comprises horticultural and vegetable crops, poultry as well as a car parking area. The farm holding has medium sensitivity. There will be no permanent acquisition of land acquisition of land whilst 35% of land will be temporarily required. This results in a **medium** magnitude of impact on the farm holding.

3.3.19 Overall, the farm holding will experience a **moderate effect,** which is **significant**.

Farm G037

3.3.20 This is a 53ha arable farm holding that is part of a larger 250ha business. The farm holding has **medium** sensitivity.

3.3.21 There will be no permanent acquisition of land acquisition of land whilst 5% of land will be temporarily required by the Waterbeach pipeline. There will be temporary severance of a 0.3ha strip with the potential for a small area of permanent severance due to fixtures at ground level rendering parts of the holding unusable. There will be no disturbance to infrastructure. The magnitude of impact on the farm holding is **low**.

3.3.22 Overall, the farm holding will experience a temporary **minor effect,** which is **not significant**.

Farm G041

3.3.23 This is a 93ha holding that is part of a larger 235ha business, although this holding is the main source of revenue. The holding is a mixed grass and arable holding with farm buildings, a dwelling, a saddlery business and a campsite. The farm holding has a **medium** sensitivity.

3.3.24 There will be no permanent acquisition of land whilst 2.4% of land will be temporarily required for the construction of the Waterbeach transfer pipeline. The land temporarily required is arable with herbal ley for a breeding flock of sheep (treated as grassland for the purposed of assessment). There will be temporary severance which requires planned crossing points. The severance leaves several parcels of less than 0.3ha, which will be impractical to farm during the construction process, although the combined size of these odd parcels remains negligible. There is the potential for the construction to disrupt the operation of the campsite due to marred tranquility and there is a likely temporary drainage impact. There is no infrastructure loss.

3.3.25 The magnitude of impact on the farm holding is **medium**, resulting in an overall reversible, temporary and **moderate effect**, which is **significant**.

Farm G110

3.3.26 This is a 4.2ha holding that is part of a larger 55ha business. The holding is in arable rotation and has **medium** sensitivity.

3.3.27 There will be no permanent acquisition of land whilst 3.7% of land will be temporarily required for the Waterbeach pipeline. There will be temporary severance which has the potential to make the land impractical to farm during the construction process. There will be a drainage impact but no infrastructure loss.

3.3.28 The magnitude of impact on the farm holding is **medium**, resulting in an overall reversible, temporary and **moderate effect**, which is **significant**.

Farm O025

3.3.29 This is a 46ha holding that is part of a larger 111ha business. The holding is in arable rotation and has **medium** sensitivity.

3.3.30 There will be no permanent acquisition of land whilst 2.7% of land will be temporarily required for the construction of the Waterbeach transfer pipeline. There will be temporary severance which renders the land impractical to farm during the construction process.

3.3.31 The magnitude of impact on the farm holding is **medium**, resulting in an overall reversible, temporary and **moderate effect**, which is **significant.**

Farm O108

3.3.32 This is a 0.18ha farm holding. The farm holding comprises rough grassland for the purpose of amenity. The farm holding has **low** sensitivity. There will be no permanent acquisition of land acquisition of land whilst 0.03ha (16%) of the farm holding will be temporarily required. This results in a **low** magnitude of impact on the farm holding.

3.3.33 Overall, the farm holding will experience a **negligible effect**, which is **not significant**.

Farm O842

3.3.34 This is a 1.3ha farm holding comprising a residential property set in paddock. Its use is for amenity with ponies and horses occasionally residing in the paddock. Therefore, the farm holding has **low** sensitivity.

3.3.35 There will be no permanent acquisition of land acquisition of land whilst 88% of land will be temporarily required. There will be no land severance. Overall, the magnitude of impact on the farm holding is **high**.

3.3.36 Overall, the farm holding will experience a reversible, temporary and **moderate effect**, which is **significant**.

Farm O848

3.3.37 This is 1ha of land between the A14 and the off-slip. No assessment is conducted.

Farm P106

3.3.38 This is a 7ha holding that is part of a larger 40ha business. The holding comprises grass ley with 5 store cattle. The business has **medium** sensitivity.

3.3.39 There will be no permanent acquisition of land whilst 2% of land will be temporarily required for the construction of the Waterbeach transfer pipeline. There will be no severance or disruption to infrastructure.

3.3.40 The magnitude of impact on the farm holding is **low**, resulting in an overall **minor effect**, which is **not significant.**

Farm P025

3.3.41 This is a 10ha holding that is part of a larger 111ha business. The holding is in arable rotation and has **medium** sensitivity.

3.3.42 There will be no permanent acquisition of land whilst 5% (5.54ha) of land from the larger business (111ha) will be temporarily required for the construction of the Waterbeach transfer pipeline. There will be temporary severance which renders the land impractical to farm during the construction process.

3.3.43 The magnitude of impact on the farm holding is **medium,** resulting in an overall reversible, temporary and **moderate effect**, which is **significant**.

Farm R106

3.3.44 This is a 5.93ha farm holding that is part of a larger 240ha business. The land comprises permanent pasture with store cattle and a small area sublet by informal agreement. The farm holding therefore has **medium** sensitivity.

3.3.45 There will be no requirement for permanent land acquisition. However, 0.11% of land will be temporarily required. Overall, the magnitude of impact on the farm holding is **low** due to severance.

3.3.46 Overall, the farm holding will experience a **minor effect**, which is **not significant**.

Farm R107

3.3.47 This is a 9ha holding and on the east side of Burgess Drove. The holding, which is part of a larger 55ha business, comprises arable and rough grassland. The business has **medium** sensitivity.

3.3.48 There will be no permanent acquisition of land whilst 2.5% of land will be temporarily required for the construction of the Waterbeach transfer pipeline. There will be no severance or damage to infrastructure. The magnitude of impact on the farm holding is **low**, resulting in an overall reversible, temporary, and **minor effect**, which is **not significant**.

Farm R040

3.3.49 This is a 75ha holding. The holding comprises arable land, dwellings and a range of agricultural farm buildings some of which are converted and let as commercial units. The business has **medium** sensitivity.

3.3.50 There will be no permanent acquisition of land whilst 4% of land will be temporarily required for the construction of the Waterbeach transfer pipeline. There will be temporary severance requiring planned access points but this does not render fields uneconomical to farm. There may be restriction to use of buildings unless works are appropriately planned.

3.3.51 The magnitude of impact on the farm holding is **low**, resulting in an **overall minor effect**, which is **not significant**.

Farm Y041

3.3.52 This is a 96.4ha farm holding that is part of a larger 1800ha business. The land comprises arable rotation with a range of agricultural farm buildings and housed store cattle. The farm holding has **high** sensitivity due to the spatial relationship between land and key infrastructure.

3.3.53 There will be no permanent acquisition of land, whilst 0.3% of land will be temporarily required. There will be temporary land severance via a public right of way 130/8 (PRoW), requiring the provision of an alternative crossing point. This severance will not, however, be permanent. There is a potential risk that the severed land will be difficult to farm with the size of machinery deployed by the farmer. Drainage will be affected temporarily. Overall, the magnitude of impact on the farm

holding is **medium** in the absence of mitigation. However, the magnitude of the impact is reduced to **low** if a provision of access is agreed.

3.3.54 Overall, the farm holding will experience a temporary major/moderate effect in the absence of mitigation, which is significant.

3.3.55 The residual effect after mitigation is **moderate**, which is **significant**.

Farm P881

3.3.56 This is a 90ha farm holding that is part of a larger 5000ha business. The land comprises arable rotation with some traditional agricultural farm buildings. The farm holding has **medium** sensitivity.

3.3.57 There will be no permanent acquisition of land whilst 0.34% of land will be temporarily required. This severance will not, however, be permanent. There is a risk that the severed land will be difficult to farm with the size of machinery deployed by the farmer. Drainage is likely to be affected. Overall, the magnitude of impact on the farm holding is **medium**.

3.3.58 Overall, the farm holding will experience a temporary **moderate effect**, which is **significant**.

Farm Y039

3.3.59 This holding is primarily affected by permanent land acquisition for the proposed WWTP. The land required temporarily for the Waterbeach pipeline is negligible and this farm holding is therefore assessed in detail in paragraphs 3.2.26 – 3.2.28.

3.4 Summary of all farm holdings

Overall,
Table 3-1 and Table 3-2 provide a summary of the assessment results by area of the Proposed Development. The criteria in

3.4.1 Table 3-1 feed into the impact magnitude in Table 3-2.

Table 3-1: Breakdown of impact magnitude on aspects of farm business

Farm Holding ID	Land required (permanently)	Land required (temporarily)	Severance	Infrastructure	Disruptive effects
Holdings affected by proposed WWTP and landscaping					
Permanent acquisition of land					
G036	Negligible	Non-applicable	Negligible	Negligible	Medium
R037	Negligible	Non-applicable	Medium	Negligible	Low
Y039	Negligible	Non-applicable	Low	Low	Low
G040	High	High	High	Negligible	High

Farm Holding ID	Land required (permanently)	Land required (temporarily)	Severance	Infrastructure	Disruptive effects
Temporary use of land					
P119	Non-applicable	High	High	Medium	High
Y844	Non-applicable	Negligible	Negligible	Negligible	Negligible
Holdings affected by Waterbeach pipeline					
B107	Non-applicable	Negligible	Negligible	Negligible	Negligible
G108	Non-applicable	Medium	Negligible	Negligible	Low
G109	Non-applicable	Medium	Negligible	Negligible	Medium
G037	Non-applicable	Low	Negligible	Negligible	Low
G041	Non-applicable	Negligible	Low	Low	Medium
G110	Non-applicable	Negligible	Medium	Negligible	Medium
O025	Non-applicable	Negligible	Negligible	Negligible	Medium
O108	Non-applicable	Low	Negligible	Negligible	Low
O842	Non-applicable	High	Negligible	Negligible	Low
P025	Non-applicable	Negligible	Negligible	Negligible	Medium
P106	Non-applicable	Negligible	Negligible	Low	Low
P881	Non-applicable	Negligible	Low	Low	Medium
R040	Non-applicable	Negligible	Low	Low	Low
R106	Non-applicable	Negligible	Negligible	Negligible	Low
R107	Non-applicable	Negligible	Negligible	Negligible	Low

Farm Holding ID	Land required (permanently)	Land required (temporarily)	Severance	Infrastructure	Disruptive effects
Y041	Non-applicable	Negligible	Medium (low after secondary mitigation)	Low	Low

3.4.2 Table 3-2 provides a summary of individual farm business.

Table 3-2: Summary of magnitude and sensitivity of farm business

Farm name	Impact magnitude	Receptor Sensitivity	Significance of effect	Residual effect
Holdings affected by proposed WWTP and landscaping				
Permanent acquisition of land				
G036	Medium	Medium	Moderate: significant	Moderate: significant
R037	Medium	Medium	Moderate: significant	Moderate: significant
Y039	Low	Medium	Minor: not significant	Minor: not significant
G040	High	Medium	Major/moderate: significant	Major/moderate: significant
Temporary use of land				
P119	High	Low	Moderate: significant	Moderate: significant
Y844	Negligible	Low	Negligible: not significant	Negligible: not significant
Holdings affected by Waterbeach Pipeline				
Temporary use of land				
B107	Negligible	Medium	Negligible: not significant	Negligible: not significant
G108	Medium	Low	Minor: not significant	Minor: not significant
G109	Medium	Medium	Moderate: significant	Moderate: significant
G110	Medium	Medium	Moderate: significant	Moderate: significant
G037	Low	Medium	Minor: not significant	Minor: not significant
G041	Medium	Medium	Moderate: significant	Moderate: significant
O025	Medium	Medium	Moderate: significant	Moderate: significant
O108	Low	Low	Negligible: not significant	Negligible: not significant
O842	High	Low	Moderate: significant	Moderate: significant

Farm name	Impact magnitude	Receptor Sensitivity	Significance of effect	Residual effect
P025	Medium	Medium	Moderate: significant	Moderate: significant
P106	Medium	Low	Minor: not significant	Minor: not significant
P881	Medium	Medium	Moderate: significant	Moderate: significant
R040	Low	Medium	Minor: not significant	Minor: not significant
R106	Low	Medium	Minor: not significant	Minor: not significant
R107	Low	Medium	Minor: not significant	Minor: not significant
Y041	Medium (low after secondary mitigation)	High	Major/moderate: significant	Moderate: significant effect

4 Conclusion and summary

Agricultural land

4.1.1 Overall, 80% of land to be lost permanently for the proposed WWTP and landscaping constitutes BMV land and comprises 30ha grade 2 (very good quality agricultural land) and 50ha grade 3a (good quality agricultural land) land.

4.1.2 The high prevalence of BMV land within a 2km radius of the **proposed WWTP** means that the sensitivity of the agricultural land is low (as its value is reduced), resulting in a **moderately significant** impact on **agricultural land**.

4.1.3 The large prevalence of BMV land in this area means that there is no alternative location to building the Proposed Development at this location. Best measures should be taken to minimise the footprint of the development, retain soil quality and reuse it in the best possible manner.

4.1.4 Measures to offset as much as possible the significant adverse effect include adhering to industry best practice (CoCP, SMP) to preserve soil quality and reusing the soil for landscaping.

4.1.5 Provisional mapping of land required for the construction of the Waterbeach pipeline showed that at least 42ha of land are predicted to be BMV land (grades 1 and 2). In addition, 8ha of grade 3 land may be BMV depending on sub-grade. 10ha are predicted to be grade 4 land.

4.1.6 The high prevalence of BMV land within a 2km radius of the **Waterbeach pipeline** means that the sensitivity of the agricultural land is low (as its value is reduced), resulting in a temporary **moderately significant residual effect** on **agricultural land**.

4.1.7 Land temporarily required for the construction of the **transfer tunnel**, outfall and final effluent pipeline would have a temporary **minor residual effect** on agricultural land, which is **not significant**.

Soil resources

4.1.8 Soil resources will be preserved as much as possible through soil reuse in landscaping, reinstatement and adherence to SMP and CoCP requirements.

4.1.9 In the absence of mitigation, there will be a major/moderate impact on soils due to the deterioration of soil quality.

4.1.10 However, with mitigation measures including the SMP, deterioration of soil resources is likely to **be minor, not significant**, as adherence to the SMP will facilitate the retention soil quality and structure during construction and landscaping works.

Farm businesses

4.1.11 Land permanently required for the proposed WWTP and area of landscaping would have a **major/moderate significant residual** effect on **1 farm business, moderate**

significant residual effect on **2 farm businesses** and **minor non-significant residual** effect on **1 farm business**.

4.1.12 Overall, land temporarily required for the construction of the Waterbeach transfer pipeline would have a temporary **moderate significant residual** effect on **8 farm businesses**, and a **non-significant (minor or negligible) residual** effect on **8 businesses**.

4.1.13 Land temporarily required for the construction of the transfer tunnel, outfall and final effluent pipeline would have a temporary **moderate significant residual** effect on **1 farm business**, and **a non-significant (negligible)** effect on **1 farm business**.

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Appendix A: Agricultural Impact Assessment Questionnaire

Agricultural Impact Assessment Survey

Farm Name:		**Farm ID:**	
Postal Address:			
Name of contact:		**Date:**	

1. Land-Take

Permanent Land-take:	ha
Temporary Land-take:	ha

2. Land Use; General

Farm Holding size	ac/ha
Land currently in arable rotation (including fallow and grass grown for seed)	ac/ha
Land currently in Vegetable production	ac/ha
Permanent grassland & long-term leys currently involved in Livestock production	ac/ha
Grassland used for forage	ac/ha
Grassland used for zero grazing systems	ac/ha

3. Livestock

Dairy				ac/ha
No. of milking cows		No. of heifers		
Beef				ac/ha
No. of breeding stock		No. of sores/fatteners		
Sheep				ac/ha
Herd size (Permanent)		Other (Winter keep)		
Pigs				ac/ha
No. of Outdoor Breeding Stock		No. of rearing stock		
Horses				ac/ha
No. of Horses mules and Donkeys				
Other				ac/ha
Please specify				

4. Land Use: Current within land-take area	**Temporary Land-take**	**Permanent Land-take**
Arable, including fallow and grass grown for seed	ac/ha	ac/ha
Vegetable production	ac/ha	ac/ha
Permanent grassland & long-term leys	ac/ha	ac/ha

5. Land Severance

Will there be any severance of land parcels?	Y / N
If No: Go to section **6**	
If Yes:	
Will there be no access available to the severed land?	Y / N
Would new access be via the public highway or byway?	Y / N
Would new access be via a private way?	Y / N
Would new access be considered seasonal or weather linked? *(waterlogging / ford crossing)*	Y / N

6. Farm Infrastructure:

Will there be any loss of Farm Infrastructure?			Y / N
If No: Go to section **7**			
If Yes:			
Will this include the main farm dwelling?	Y / N	Employees' permanent dwellings?	Y / N

Will this include any farm buildings? – If yes what is the current use of each building? Y / N

What is the current use of each building? (please list below)

*Do **NOT** include any third party use of buildings here (see section 8)*

Building 1: .....

Building 2: .....

Building 3: .....

Building 4: .....

(Additional buildings - please include in **Notes** section below)

Are there any other buildings in proximity that could be re-commissioned? Y / N

If Yes: Please give brief explanation in **Notes** section below

Do any fields involved in permanent land-take have permanent irrigation features? Y / N

If Yes: Please state which here

.....

.....

Approxiamately what percentage of the rest of the farm holding is regularly irrigated? %

Will there be loss of other infrastructure features? Y / N

(Irrigation reservoirs, slurry ponds, solar panels, paved tracks, pest-proof fencing etc)

If Yes please list here: .....

.....

7. Disturbance:

Are there any buildings that will be in close proximity to the construction that you think may be impacted by the construction (noise, dust, vibration) Y / N

If yes, please specify

(ie Lambing sheds – sensitive to noise during lambing)

(fully controlled growth/storage environments – sensitive to dust levels etc)

.....

.....

8. Other Farm Income

Is there any other source of farm income that may be affected by the construction? Y / N

If yes, please specify

Shooting? Y / N

Stabling? Y / N

Agro-environmental schemes? *(ELS/HLS etc)* Y / N

If yes: when are these due to end? *mm/yyyy*

Woodland? *(managed for income)* Y / N

Third party use of buildings? Y / N

Other? *(please state below)* Y / N

.....

.....

9. NOTES:

Please provide additional information here:

Appendix B: Agricultural Impact Assessment Results

Holding ID	Holding size (Ha)	Land take Order Limits based on Con 3 Works Plan (Ha)	Land Take Permanent (Ha)	Does this holding form part of a wider operation	Overall Farmed area (Ha)	Holding land use description	Occupiers core operation (agricultural, horticultural, equine, amenity)	Land taken land use description	Are there livestock on the holding	Type of Livestock	Numbers of Livestock on Holding	Land severance (permanent) Y(include description)/N	Land severance (temporary) Y(include description)/N	Does temporary severance render pt fields temporarily uneconomic /impractical to farm	Farm infrastructure loss (Roads; Dwellings; Farm Buildings; irrigation) - If yes provide description and numbers lengths etc	Disturbance of use of adjacent existing buildings	Land Drainage impacted?	Land drainage plans available?	Are there any other revenue sources from the holding that might be impacted (if yes provide details Environmental schemes, sporting, minerals, options)	Notes
O025	46.35	3.05	0	Yes	111.43	Arable - bareland and concrete pad	Agricultural	Arable rotation	No	n/a	n/a	No	Yes (part used for site compound)	Yes	No loss but access will be shared use with access to site compound	No	tbc	tbc	Not so far as we are aware at this stage	
P025	10.43	5.54	0	Yes	111.43	Arable - bareland	Agricultural	Arable rotation	No	n/a	n/a	No	Yes (will be used for Site compound)	Yes	Loss of area for site compound	No	tbc	tbc	Not so far as we are aware at this stage	
R107	9.15	1.37	0	Yes	55	Arable and rough grassland/pond	Agricultural	Arable rotation	No	n/a	n/a	No	N	No	No	No	Yes	Yes	Not so far as we are aware at this stage	
G110	4.21	2.04	0	Yes	55	Arable - bareland	Agricultural	Arable rotation	No	n/a	n/a	No	Yes possible either side of working area	Possibly uneconomical to farm retained land either side of working area but TBC	No	No	Yes	Yes	Not so far as we are aware at this stage	
G109	1.09	0.38	0	No	1.09	Horticultural	Horticultural	Horticultural/vegetable s/car parking area	Yes	Poultry	?	No	N		No	No - as long as pipe is drilled	No	No	Not so far as we are aware at this stage	All on the basis that the pipes wil be drilled under these fields
O108	0.18	0.03	0	No	0.18	Land and Building	Amenity	Rough grassland	No	n/a	n/a	No	N		No	No - as long as pipe is drilled	n/a	No	Not so far as we are aware at this stage	All on the basis that the pipes wil be drilled under these fields
G108	0.76	0.23	0	No	0.76	Rough grassland	Amenity	Rough grassland	No	n/a	n/a	No	N		No	No - as long as pipe is drilled	n/a	No	Not so far as we are aware at this stage	All on the basis that the pipes wil be drilled under these fields
B107	1.47	0.25	0	Yes	40	Grass Ley	Agricultural	Grass ley	Yes	Heifers	?	No	N		No	No	n/a	tbc	Not so far as we are aware at this stage	
P106	6.76	0.9	0	Yes	40	Grass ley (3.19ha)	Agricultural	Grass ley	Yes	Store Cattle	5	No	N		No	No	n/a	tbc	Not so far as we are aware at this stage	
R106	5.93	0.27	TBC	Yes	240	Permanent Pasture with small area sublet by informal agreement to the Cam sailing club on the river bank	Agricultural	Permanent Pasture	Yes	Store Cattle	TBC	No	Yes - so need planned crossing points as access severed	No	No	n/a	Unlikely	TBC	No	All on the basis that the pipes wil be drilled under these fields
G042	2.27	0.05	0	Yes	TBC	Amenity grassland and footpath	Amenity	Permanent Pasture	No			No	No	No	No	No	No	n/a	Not so far as we are aware at this stage	All on the basis that the pipes wil be drilled under these fields
Y041	96.41	3.36	TBC	Yes	1800+	Arable holding with range of agricultural farm buildings	Agricultural	Land in arable rotation	Yes	Housed Store Cattle	TBC	No	Yes - so need planned crossing points	Potentially - retained areas of 1.5 and 1.0 ha will be quite difficult to farm with the size of machinery deployed by Eastern Farms (uncertain whether 24 or 30m Tramline spacings)	No	Yes access has the potential to temporarily restrict the use of the buildings if not worked through with occupier prior to works commencing	Yes	TBC	Not so far as we are aware at this stage	
R040	75.02	3.27	TBC	No	75.02	Arable holding with dwelling and range of agricultural farm buildings some of which are converted and let as commercial units	Agricultural	Land in arable rotation	No	n/a	n/a	No	Yes - so need planned crossing points	No	No	Yes access has the potential to temporarily restrict the use of the buildings if not worked through with occupiers prior to works commencing	Almost certainly	TBC	There are at least 2 businesses in the converted farm buildings care must be taken to mitigate any impact on these	04.04 - This farming operation is farmed in isolation from Roberts interests at Fulbourn
P881	90.09	1.69	TBC	Yes	5000	Arable bareland - with some quite traditional farm buildings offlying	Agricultural	Land in arable rotation	No	n/a	n/a	No	Yes - so need planned crossing points	Potentially - retained areas of 1.5 and 0.85 ha will be quite difficult to farm with the size of machinery deployed by Eastern Farms (uncertain whether 24 or 30m Tramlines)	No	n/a	Almost certainly	TBC	Not so far as we are aware at this stage	
G041	93.20	5.71	TBC	Yes but this is the main holding	235	Mixed grass and arable holding with farm buildings, dwelling a saddlery business and a campsite	Agricultural	Arable roation including herbal ley for grazing of sheep	Yes	Breeding Flock of Sheep	TBC	No	Yes - so need planned crossing points	The proposed working width leaves odd parcels of 0.25ha, 0.06ha; 0.03ha as well as an area estimated to be 0.25 which will be unable to be farmed for the duration of the works	No	Potential to impact on the ability to operate campsite if relative tranquility and view marred for extended periods	Almost certainly	TBC	There is a campsite that overlooks the working width and a saddlery business is understood to be run from one of the farm buildings	04.04 - All arable at Gayton - remainder is rough grazing on a variety of licence agreements and short term FBTs. c 75% of income from Gayton Farm
Y039	56.60	22.83	TBC	Yes	TBC	Arable - bareland (one redundant farm building)	Agricultural	Land in arable rotation	No	n/a	n/a	No but there will be some land unusable without reworking of field boundaries	Yes - so need planned crossing points	No	Loss of hardstanding outside the redundant barn.	Redundant barn - not currently used - just confirm this at interview	Almost certainly	TBC	Not so far as we are aware at this stage	
R037	116.49	87.23	TBC	Yes	5000	Arable bareland - with some quite traditional farm buildings offlying	Agricultural	Land in arable rotation	No	n/a	n/a	Yes - land to the north of Low Fen Drove will be severed by the proposed planting/landscaping. Access across this wil need to be generated or new access created direct from Horningsea Road	Yes - so need planned crossing points	The proposed land take leaves an odd parcels of 1.8ha, which will be reasoanble incapable of being farmed for the duration of the works owing to the odd angles left etc	No	n/a	Yes	TBC	Not so far as we are aware at this stage	
G036	100.50	4.91	TBC	Yes	TBC	Arable - bareland	Agricultural	Land in arable rotation	No	n/a	n/a	Yes - through the adoption of the old railwayline as a bridle path this potentially severs the ability to use the main haul road to Mulberry Farm from the main Quy Farms Limited holding at Allicky Farm.	Possibly - so project team need to consider access when any works are being proposed to the bridlepath	Questionalbe in arable context in terms of size 2.1Ha given the odd angles resulting	Ability to use old railway line as haul road?	n/a	Almost certainly	TBC	Not so far as we are aware at this stage	Residual field size and shape is quite marginal in arable context
G037	52.56	13.04	TBC	Yes	250	Arable - bareland	Agricultural	Land in arable rotation	No	n/a	n/a	TBC - as small amount of permanent severance may be created by location of fixtures at ground level rendering parts of holding unusable	Yes but so small no need to create temp accesses	Yes 0.30ha or thereabouts (which strictly forms part of P038 farmed in with this field) will be unviable owing to residueal thin strip	No	n/a	Almost certainly	TBC	Not so far as we are aware at this stage	
G040	26.63	26.25	TBC	Yes	45.63	Mixed arable and grassland holding with strong focus on ecological diversity and sustainability	Agricultural	Combination of Arable land, permanent pasture and conservation/setaside areas	No	n/a	n/a	No assuming shaft heads do not require extensive land take	Yes assuming all the land indicated is taken	No residue to speak of	No	TBC	Almost certainly	TBC	Not so far as we are aware at this stage	04.04 - further 47 acres over at Lode. Farming is not their main source of income with both having careers in the public sector.
O842	1.28	1.12	TBC	No	1.28	Residential property set in paddock adjacent to River Cam	Amenity	Amenity (extented garden)/conservation/ permanent pasture	Occasionally	Horses/Ponies	TBC	No	No	No	No	n/a	Not assuming drilled underneath at reasonbable depth to avoid heave	TBC	Not so far as we are aware at this stage	
Y844	3.74	3.63	TBC	No	3.74	Equine	Equine	Permanent Pasture	Yes	Horses/Ponies	10	No	No	No	No	n/a	Unlikely	TBC	Not so far as we are aware at this stage	No where else to put horses
P119	5.82?	3.03	TBC	No	TBC	Equine	Equine	Permanent Pasture	Yes	Horses/Ponies	10	No	Yes - so need planned crossing points	Yes - all residue useless	No	Yes	Unlikely	TBC	Not so far as we are aware at this stage	No where else to put horses

Get in touch

You can contact us by:

Emailing at **info@cwwtpr.com**

Calling our Freephone information line on **0808 196 1661**

Writing to us at **Freepost: CWWTPR**

Visiting our website at [redacted]

You can view all our DCO application documents and updates on the application on The Planning Inspectorate website:

https://infrastructure.planninginspectorate.gov.uk/projects/eastern/cambridge-waste-water-treatment-plant-relocation/