

# Cottam Solar Project

## Preliminary Environmental Information Report: Chapter 11: Ground Conditions and Contamination

Prepared by: Delta Simons  
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## Issue Sheet

**Report Prepared for: Cottam Solar Project Ltd.**

### **Preliminary Environmental Information Report: Chapter 11: Ground Conditions and Contamination**

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## 11 Ground Conditions and Contamination

### 11.1 Introduction

11.1.1 The Ground Conditions and Contamination chapter of the PEIR assesses the land associated with Cottam 1, Cottam 2 and Cottam 3 (the “Sites”) and the cable corridors, as shown on the plans in **Appendix 3.1**; and identifies and evaluates the likely significant environmental effects posed by the Scheme during its construction, operation, management and decommissioning phases in relation to sensitive receptors (human health and controlled waters).

11.1.2 This chapter is supported by the following Appendices:

- **Appendix 11.1-11.3:** Delta-Simons Preliminary Geo-Environmental Risk Assessment Reports for Cottam 1, Cottam 2 and Cottam 3.

### 11.2 Policy context

#### Legislation

11.2.1 Part IIA of the Environmental Protection Act 1990 (**EPA 1990**) aims to ensure that contaminated land is identified and remediated where it poses unacceptable levels of risk. Section 78A(2) of the EPA 1990, provides the definition of “contaminated land” for the purposes of Part 2A, which is:

- (2) “Contaminated Land” is any land which appears to the Local Authority in whose area it is situated to be in such a condition by reason of substances in, on or under the land, that –
- (a) significant harm is being caused or there is a significant possibility of such harm being caused; or
  - (b) significant pollution of controlled water is being caused; or there is a significant possibility of such pollution being caused’.

11.2.2 In Section 78A(4) of the, EPA 1990, harm is defined as meaning ‘harm to the health of living organisms or other interference with the ecological systems of which they form part and in the case of man includes harm to his property’.

11.2.3 In addition, Sections 161 to 161D of the Water Resources Act 1991 gives powers to the Environment Agency to take action to prevent or remedy the pollution of controlled waters. A “works notice” served under Section 161A specifies what works or operations have to be carried out and in what time periods. A “works notice” is served on any responsible person where it appears that:

- any poisonous, noxious or polluting matter or any waste matter is or has been present in, or is likely to enter, any controlled waters; or
- any controlled waters are being or have been harmed, or are likely to be harmed, by any event, process or other source of potential harm

### Guidance

11.2.4 The statutory government guidance to Part 2A (DEFRA, 2012), describes the concept of the 'contaminant linkage' in Sections 3.8 to 3.11 as quoted below:

3.8 *"Under Part 2A, for a relevant risk to exist there needs to be one or more contaminant-pathway-receptor linkages – "contaminant linkage" – by which a relevant receptor might be affected by the contaminants in question. In other words, for a risk to exist there must be contaminants present in, on or under the land in a form and quantity that poses a hazard, and one or more pathways by which they might significantly harm people, the environment, or property; or significantly pollute controlled waters. For the purposes of this Guidance:*

(a) *A "contaminant" is a substance which is in, on or under the land and which has the potential to cause significant harm to a relevant receptor, or to cause significant pollution of controlled waters.*

(b) *A "receptor" is something that could be adversely affected by a contaminant, for example a person, an organism, an ecosystem, property, or controlled waters. The various types of receptors that are relevant under the Part 2A regime are explained in later sections.*

(c) *A "pathway" is a route by which a receptor is or might be affected by a contaminant.*

3.9 *The term "contaminant linkage" means the relationship between a contaminant, a pathway and a receptor. All three elements of a contaminant linkage must exist in relation to particular land before the land can be considered potentially to be contaminated land under Part2A, including evidence of the actual presence of contaminants. The term "significant contaminant linkage", as used in this Guidance, means a contaminant linkage which gives rise to a level of risk sufficient to justify a piece of land being determined as contaminated land. The term "significant contaminant" means the contaminant which forms part of a significant contaminant linkage.*

3.10 *In some cases the local authority may encounter land where risks are presented by groups of substances which are likely to behave in the same manner, or a substantially very similar manner, in relation to the risks they may present (e.g. as may be the case with organic substances found in oils). For the purposes of identifying and assessing contaminant linkages and taking regulatory decisions in*

*relation to such linkages, the local authority may treat such groups of contaminants as being in effect a single contaminant and multiple contaminant linkages as being in effect a single contaminant linkage. The authority should only do this if there is a scientifically robust reason for doing so, and it should state clearly why this approach has been taken in relevant documentation (including the risk summary discussed later in this Section) if the land is later determined as contaminated land.*

3.11 In considering contaminant linkages, the local authority should consider whether:

(a) *The existence of several different potential pathways linking one or more potential contaminants to a particular receptor, or to a particular class of receptors, may result in a significant contaminant linkage.*

(b) *There is more than one significant contaminant linkage on any land. If there are, the authority should consider whether or not each should be dealt with separately, since different people may be responsible for the remediation of individual contaminant linkages."*

11.2.5 The guidance also mentions that its broader approach may include using the planning system to ensure land is made 'suitable for use'.

11.2.6 The UK government guidance titled 'Land affected by contamination', updated in July 2019, provides guiding principles on how planning can deal with land affected by contamination including identifying and remediating statutorily defines contaminated and, the use of buildings regulations and permitting. Guidance is also provided as to how to determine if land is contaminated through the use of several recommended data sources (such as River Basin Management Plans, National Land Use Database, Historical Ordnance Survey Maps, Local Planning Authority Records and Natural England's MAGIC site).

11.2.7 The Environment Agency's, 'Managing and reducing land contamination: guiding principles', issued in March 2010 and updated in April 2016, sets out how to undertake a risk assessment focusing on risk to water, how to undertake a remediation options appraisal and how to implement remediation.

11.2.8 This assessment has been undertaken in general accordance with guidance on Land Contamination: Risk Management pages of the GOV.UK web pages, the relevant requirement of the National Planning Policy Framework (NPPF) (as revised 2021) (paragraphs 174 & 183-184) and the Planning Practice Guidance (Land Affected by Contamination). Further relevant UK Guidance relevant to this chapter includes;

- British Standard BS 5930: Code of practice for ground investigations
- British Standard BS 8485: Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings

- British Standard BS 8576: Guidance on investigations for ground gas – permanent gases and volatile organic compounds
- CIRIA C665: Assessing risks posed by hazardous ground gases to buildings

### Policy

11.2.9 National Policy Statements (NPSs) form a principal part of the decision-making process for Nationally Significant Infrastructure Projects (NSIPs); the policy statements of relevance to the Facility are:

- The overarching NPS for Energy (EN-1) (Department of Energy and Climate Change (DECC) 2011a) and draft revised NPS EN-1,
- NPS for Electricity Networks Infrastructure (EN-5), and
- Draft revised NPS EN-3 Renewable Energy Infrastructure.

11.2.10 Sections of the NPSs relevant to this chapter include;

- EN-1 Section 5.10.5 - The ES should identify existing and proposed land uses near the project, any effects of replacing an existing development or use of the site with the proposed project or preventing a development or use on a neighbouring site from continuing. Applicants should also assess any effects of precluding a new development or use proposed in the development plan.
- EN-1 Section 5.10.7 - During any pre-application discussions with the Applicant the LPA (Local Planning Authority) should identify any concerns it has about the impacts of the application on land use, having regard to the development plan and relevant applications and including, where relevant, whether it agrees with any independent assessment that the land is surplus to requirements.
- EN-1 Section 5.10.8 - Applicants should seek to minimise impacts on the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification) and preferably use land in areas of poorer quality (grades 3b, 4 and 5) except where this would be inconsistent with other sustainability considerations. Applicants should also identify any effects and seek to minimise impacts on soil quality taking into account any mitigation measures proposed. For developments on previously developed land, Applicants should ensure that they have considered the risk posed by land contamination.

11.2.1 The NPPF (Ministry of Housing, Communities and Local Government (MHCLG), 2021) does not contain specific policies relating to NSIPs. However, some policy requirements detailed in the NPPF may be of relevance. The policies relating to this chapter include:

- Planning policies and decisions should contribute to and enhance the natural and local environment by inter alia preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability; and remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate. (para 174)
- Planning policies and decisions should also ensure that: a) A site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation); b) After remediation, as a minimum land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; c) Adequate site investigation information, prepared by a competent person, is available to inform these assessments. (para 183)
- Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner. (para 184)
- Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. (para 185)

11.2.2 Cottam 1, 2 and 3 are located within the jurisdiction of West Lindsey District Council. The West Lindsey Local Plan was replaced by the Central Lincolnshire Local Plan on 24<sup>th</sup> April 2017. Local Policy 16 - Development on Land Affected by Contamination is relevant to this chapter.

11.2.3 The grid connection is at Cottam Power Station within the jurisdiction of Bassetlaw District Council. Bassetlaw Local Plan was published in August 2021 and Policy 49 – Contaminated and Unstable Land is relevant to this chapter.

11.2.4 The cable routes straddle both authority areas.

### **11.3 Consultation**

11.3.1 A summary of the consultation of particular related to contaminated land and ground conditions is detailed in Table 11.1 below.



**Table 11.1: Consultation and Responses**

<b>Consultee and Date</b>	<b>Response</b>	<b>Chapter Section Where Consultation Comment is Addressed</b>
<p>The Planning Inspectorate, 9th March 2022</p>	<p>Scoping Report paragraph 10.5.1 proposed to scope out ground conditions and contamination impacts from Cottam one to three sites from the ES on the basis that the potential for impacts is low and mitigation measures will reduce potential impacts to negligible.</p> <p>Appendix 10 provides a Preliminary Risk Assessment (PRA) for Cottam Sites one to three. This sets out potential sources of contamination and contamination pathways; only limited contamination sources and pathways have been identified at each site and mitigation measures are described and committed to in Scoping Report paragraph 10.4.7 and 10.4.12.</p> <p>It is noted that Cottam one and two, ground gas sources have been identified and it is recommended that a further limited investigation be carried out once the site layout design in complete.</p> <p>The Inspectorate is content to scope out ground conditions and contamination at the Cottam three site on the bases of the PRA information. In light of the identified ground gas source at Cottam 1 and 2 the ES should include an assessment of impacts arising from ground gas sources where significant effects are likely to occur and describe and secure any associated mitigation. The approach to ground has emission assessment should be agreed with the local planning authority where possible.</p>	<p>The risk from ground gases are addressed in Section 11.6.6 following the confirmation of the proposed site layout which at the time of the PRAs was not included. No specific mitigation measures are considered to be required.</p>

## 11.4 Assessment Methodology and Significance Criteria

- 11.4.1 The baseline conditions associated with the soil and groundwater in order to determine the risk to human health and controlled waters have been obtained from a desktop review (Preliminary Geo-Environmental Risk Assessment (PRA)), for Cottam 1, Cottam 2 and Cottam 3 including the identification of the environmental setting, a review of historical and present-day maps and a review of regulatory information. The reports are dated November 2021 and are included in **Appendix 11.1-11.3** and the locations are as shown in **Appendix 3.1**. The Environmental setting information has been obtained from a variety of sources including; British Geological Survey (BGS) online data, Environment Agency (EA) data, a Landmark Envirocheck<sup>®</sup> Report for the assessment sites, Coal Authority (CA) online data and information provided by West Lindsey District Council.
- 11.4.2 The Site conditions are used to form a Conceptual Site Model (CSM) which considered the sources of contamination and potential pathways to determine the risk to a receptor and provide a qualitative risk assessment via the method described in Section 11.2.3.
- 11.4.3 Following the Preliminary Risk Assessment, the sensitivity and magnitude of impact has been determined by considering the nature of the change, its severity, the duration of an effect, the likelihood of an effect occurring, and the relative extent of the effects of contamination to the receptor. Therefore, the risk assessment has been based on a qualitative assessment and professional judgement. Potential effects in terms of ground conditions tend to be local given the nature of potential sources of contamination also generally being localised with the exception of naturally occurring elevated contaminants. Therefore, the effects have not been considered in relation to different geographical contexts.

## 11.5 Baseline Conditions

- 11.5.1 The baseline conditions are summarised for Cottam 1, Cottam 2 and Cottam 3 below comprising a description of the site and surrounding area, the geology, hydrogeology, hydrology and the historical uses including mining legacy. This description is provided given it forms the basis of the conceptual site model, identifies potential sources, pathways and receptors. All information provided below is summarised from the PRAs included in **Appendix 11.1-11.3** which should be read for full details.

### Cottam 1

#### **Site and Surrounding Area**

- 11.5.2 Cottam 1 consists of a series of agricultural fields (Fields A to G as shown on Figure 2 within **Appendix 11.1**) separated by hedgerows, drains and occasional trees. The

fields are accessed via existing farm tracks. Cottam 1 is centred around the village of Coates.

11.5.3 Three concrete slabs are present in the southern and western areas of Field D and northern Field C. A number of farmyards, residential dwellings and woodland areas are encompassed by the Site in the southern and northern areas.

11.5.4 Overhead electrical powerlines and associated pylons area present across Fields D and E in the southern and western areas. The surrounding area is predominantly rural agricultural land with the villages of Willingham by Stow, Sturton by Stow and Normandy by Stow to the west, Ingham to the east and Scampton to the south east.

### **Geology**

11.5.5 Published British Geological Survey (BGS) data indicates Cottam 1 to be underlain by superficial Till (Diamicton), Alluvium (Clay, Silt, Sand and Gravel), Glacio-fluvial Deposits (Sand and Gravel) and River Terrace Deposits (Sand and Gravel), as follows:

- Field A - Till across the majority of the area with Alluvium in the north west;
- Field B - Till across the majority of the area with Alluvium in the east and west;
- Field C - Till in the south and east with a band of Alluvium running through the central area in an east-west orientation. River Terrace Deposits may encroach along the south western boundary;
- Field D - Till in the south and east with a band of Alluvium in the north east and running through the western area in a north-south orientation. Glacio-fluvial deposits are mapped in the west. No superficial deposits are mapped in some western and eastern areas;
- Field E - No superficial deposits mapped across the majority of the area with a band of Alluvium along the east and northern boundaries;
- Field F - No superficial deposits are mapped across the majority of the area with a band of Alluvium running through the central area in a south east to north west orientation; and
- Field G - No superficial deposits are mapped across the majority of the area with River Terrace Deposits in the south east.

11.5.6 The bedrock is mapped as the Charmouth Mudstone Formation across the eastern areas (Field A, B, C and the majority of D and most eastern area of E) and the Scunthorpe Mudstone Formation (Mudstone and Limestone) across the western areas (Field F, G, most western area of D and majority of E).

- 11.5.7 Made Ground is anticipated in the three concrete storage areas, however, it is likely to be limited in thickness.

### **Hydrogeology**

- 11.5.8 The Environment Agency (EA) classify the superficial Till as a Secondary Undifferentiated Aquifer and the Alluvium, Glacio-fluvial and River Terrace Deposits as Secondary A Aquifers.
- 11.5.9 Bedrock of the Charmouth Mudstone Formation as Secondary Undifferentiated Aquifer and the Scunthorpe Mudstone Formation is classified as a Secondary B Aquifer.
- 11.5.10 The EA also indicate that Cottam 1 is not located within a Groundwater Source Protection Zone (SPZ). There are no licensed groundwater abstractions recorded within 500 m of Cottam 1.

### **Hydrology**

- 11.5.11 There are a series of unnamed drains across Cottam 1 and along the boundary. The River Till is present in the western area and dissects, or is present along the boundary of Fields D, E and F.

### **Mining**

- 11.5.12 Coal Authority data indicates Cottam 1 is not within a Coal Mining Report Area. As such a Coal Mining Assessment is not required under the planning regime.
- 11.5.13 There are no BGS recorded mineral sites on or in the immediate area.

### **Historic Summary**

- 11.5.14 Cottam 1 has remained largely undeveloped and comprises a series of agricultural fields with associated drains, ponds and sparse areas of development associated with concrete hardstanding for storage and development in the north western area of Field D.
- 11.5.15 Ponds in the central area of field A and B, the north western area of field D and northern and southern areas of Field G are all noted to have been potentially infilled. Development in Field D was no longer mapped by the 1980's and assumed demolished.

## Cottam 2

### **Site and Surrounding Area**

- 11.5.16 Cottam 2 consists of a series of agricultural fields separated by hedgerows, drains and occasional trees. The fields are accessed via existing farm tracks. A farmyard and residential house are present adjacent to the central area with associated vehicular access route.
- 11.5.17 Corringham Beck and Yewthorpe Beck are present along the northern and eastern boundaries, respectively. The surrounding area predominantly comprises rural agricultural land with the village of Corringham to the west.

### **Geology**

- 11.5.18 Published BGS data indicates Cottam 2 to be underlain by superficial Till (Diamicton) across the majority of the Site with superficial Alluvium (Clay, Silt, Sand and Gravel) along the eastern and north eastern area.
- 11.5.19 The bedrock is mapped as the Scunthorpe Mudstone Formation (Mudstone and Limestone).

### **Hydrogeology**

- 11.5.20 The EA classify the superficial Till and Alluvium as Secondary Undifferentiated and Secondary A Aquifers, respectively.
- 11.5.21 Bedrock of the Scunthorpe Mudstone Formation is classified as a Secondary B Aquifer. The EA also indicate that Cottam 2 is not located within a Groundwater Source Protection Zone (SPZ).
- 11.5.22 There are three licensed groundwater abstraction records within 500 m of Cottam 2. All of which are located approximately 480 m north east and relate to extraction for use in the petrochemical industry.

### **Hydrology**

- 11.5.23 There are a series of unnamed drains across Cottam 2 and along the boundary. Corringham Beck and Yewthorpe Beck are present along the western and eastern boundaries, respectively.

### **Mining**

- 11.5.24 Coal Authority data indicates Cottam 2 is not within a Coal Mining Report Area. As such a Coal Mining Assessment is not required under the planning regime. There are no BGS recorded mineral sites on or in the immediate area.

### **Historic Summary**

- 11.5.25 The Site has remained undeveloped and comprises a series of agricultural fields with associated drains. A pond was located in the northern area prior to 1999 and was potentially infilled.

#### Cottam 3

### **Site and Surrounding Area**

- 11.5.26 Cottam 3 consists of a series of agricultural fields (Fields J and K as shown in Figure 2 of **Appendix 11.3**) separated by hedgerows, drains and occasional trees. The fields are accessed via existing farm tracks.
- 11.5.27 Field K historically formed Blyton Airfield, prior to reclamation as agricultural land in the 1990's. An access road is present in the southern area of Field K which leads to a hay storage area.
- 11.5.28 The surrounding area is semi-rural with agricultural land to the east and south. Commercial properties are present to the north of Field K associated with distribution. The wider former airfield is in use as a motorsport track and driving centre. The village of Blyton is present to the south west.

### **Geology**

- 11.5.29 Published BGS data indicates Cottam 3 to be underlain by superficial Till (Diamicton) across the majority of the Site with superficial Glacio-fluvial (Sand and Gravel) deposits along the western boundary.
- 11.5.30 The bedrock is mapped as the Scunthorpe Mudstone Formation (Mudstone and Limestone). Made Ground is anticipated in developed areas, although is likely to be limited in thickness.

### **Hydrogeology**

- 11.5.31 The EA classify the superficial Till as a Secondary Undifferentiated Aquifer and the Glacio-fluvial Deposits as a Secondary A Aquifer.
- 11.5.32 Bedrock of the Scunthorpe Mudstone Formation is classified as a Secondary B Aquifer. The EA also indicate that Cottam 3 is not located within a Groundwater Source Protection Zone (SPZ).
- 11.5.33 There are no licensed groundwater abstractions recorded within 500 m of Cottam 3.

### **Hydrology**

- 11.5.34 There are a series of unnamed drains across Cottam 3 and along the boundary.

### **Mining**

- 11.5.35 Coal Authority data indicates Cottam 3 is not within a Coal Mining Report Area. As such a Coal Mining Assessment is not required under the planning regime.
- 11.5.36 There are no BGS recorded mineral sites on or in the immediate area.

### **Historic Summary**

- 11.5.37 The southern Field J has remained undeveloped and comprises a series of agricultural fields with associated drains and ponds. Ponds in the central and southern western ponds were noted prior to 1972 and were potentially infilled.
- 11.5.38 The northern Field K was largely undeveloped comprising agricultural fields and a residential dwelling in the southern area prior to forming part of Blyton Airfield between the 1940's and 1950's. The Site has since been reclaimed as agricultural land by the early 2000's.

### Cable Corridors

#### **Site and Surroundings**

- 11.5.39 The cable corridors link the sites to the grid connection point running from Cottam Power Station north-east towards Blyton, as shown in Appendix 3.1. Agricultural land comprises the majority of the land within the corridor and other land use types that the corridor crosses include the River Trent between Marton and Coates.

#### **Geology**

- 11.5.40 Some of the cable corridors affect areas of search and safeguarded sand and gravel reserves. These routes include the corridor linking Cottam 3 to 2 which runs through the sand and gravel area of search around Blyton and the sand and gravel safeguarded area around Aisby/Corringham, and corridors linking the various parcels on the western side of the Cottam 1 Site southeast of Willingham by Stow. All options running west from Cottam 1 across the Trent Valley affect the Trent Valley sand and gravel area of search and sand and gravel safeguarded area within Lincolnshire and the corresponding sand and gravel safeguarded areas within Nottinghamshire.

## Hydrology

- 11.5.41 The proposed cable routes cross watercourses and therefore pass-through Flood Zones 1,2 and 3 on the EA's Flood Risk Map for Planning.

## Mining

- 11.5.42 None of the cable corridor falls within a Coal Mining Report Area.

## Historical Summary

- 11.5.43 The most significant land use change within the cable corridor historically, has been the construction of Cottam Power Station where construction started in 1968.

## 11.6 Identification and Evaluation of Likely Significant Environmental Effects

- 11.6.1 A risk assessment of the identified plausible contaminated linkages has been undertaken for Cottam 1, 2 and 3 as part of the PRAs included in **Appendix 11.1 to 11.3**. The underlying principle is the evaluation of pollutant linkages via the Conceptual Site Model in order to assess whether the presence of a source of contamination could potentially lead to significant harm. A contaminant linkage consists of three elements:
- A “contaminant” is a substance which is in, on or under the land and which has the potential to cause significant harm to a relevant receptor, or to cause significant pollution of controlled waters.
  - A “receptor” is something that could be adversely affected by a contaminant, for example a person, an organism, an ecosystem, property, or controlled waters. The various types of receptors that are relevant under the Part 2A regime are explained in later sections.
  - A “pathway” is a route by which a receptor is or might be affected by a contaminant.
- 11.6.2 The sensitivity is based on the relative importance of the receptor, as detailed in Table 11.2.



**Table 11.2: Sensitivity Criteria**

Sensitivity	Definition
High	Land to be used for human consumption (e/g agricultural, allotments), highly sensitive ecosystems (eg. SPA, SAC, SSSI, NNR) and the receptor being a public drinking water supply.
Medium	Parks and open spaces, regional or locally sensitive ecosystems and water bodies of medium quality.
Low	Commercial or industrial land uses, low to non-sensitive ecosystems (e.g derelict land, solar farms), water bodies of low quality and not a public water supply.

11.6.1 The magnitude of impact on the receptor is detailed in Table 11.3.

**Table 11.3: Magnitude of Impact**

Sensitivity	Definition
High	The proposal will cause the release of contamination which is significantly above guideline values (such as C4SLs, soil guidance values, SoBRA guidance values, etc. specific to the source, receptor and development) or release hazardous contamination for the operational timescale of the develop. Remediation will be required.
Medium	The proposal will cause the release of contamination close to the guidance values (such as C4SLs, soil guidance values, SoBRA guidance values, etc. specific to the source, receptor and development) during construction or operational timescale of the development. Remediation may be required.
Low	The proposals will cause the release of contamination which is below the guideline values (such as C4SLs, soil guidance values, SoBRA guidance values, etc. specific to the source, receptor and development) for short period of time. Remediation will be not required; however, mitigation measures may be used to reduce the potential impact.
Negligible	Contaminants found at very low concentrations. Remediation not required.

11.6.2 The significance of any environmental effects is determined by the interaction of the magnitude of any impacts and the sensitivity of the receptor and can be positive or negative. The significance of an effect should be established with refence to Table 11.4.

**Table 11.4: Criteria for assessing the significance of effects**

Sensitivity	High	Medium	Low
Magnitude			
High	Major	Major/Moderate	Moderate
Medium	Major/Moderate	Moderate	Moderate/Minor
Low	Moderate	Moderate/Minor	Minor
Negligible	Moderate/Minor	Minor	Negligible
Neutral	Neutral	Neutral	Neutral

11.6.3 The following potential contaminant linkages were assessed and the PRAs indicate that the risk is generally classified as Moderate to Minor across Cottam 1, 2 and 3 based on the data identified and reviewed within the PRA's in the absence of mitigation/control measures and site specific geo-environmental ground investigation data:

- Construction Workers – Direct contact/ingestion and inhalation of dust, vapours and asbestos fibres – Moderate/Minor significance
- Adjacent site users or residents – Direct contact/ingestion and inhalation of dust, vapours and asbestos fibres- Moderate/Minor significance
- Controlled waters – Leaching of contamination into groundwater and vertical/lateral migration through permeable deposits below the Site - Minor to Moderate significance
- Future site users - Direct contact/ingestion and inhalation of dust, vapours and asbestos fibres -Moderate/Minor significance
- Built Environment – Direct contact between and accumulation of gas in enclosed spaces and sub-floor voids - Minor significance

11.6.4 Potential contaminant linkages from contaminated soils to human receptors (construction workers, future Site users and adjacent Site users) are considered to be Moderate/Minor as limited potential sources of contamination have been identified across the mainly agricultural use. The northern area of Cottam 3 historically formed part of Blyton Airfield, however, has since undergone land reclamation back to agricultural use. A full list of potential sources for Cottam 1,2 and 3 is provided in the PRAs in **Appendix 11.1 to 11.3**.

11.6.5 None of the Sites are located within designated groundwater Source Protection Zones (SPZs) and significant sources of contamination have not been identified, as such the risk to controlled waters is considered very low.

- 11.6.6 Small and minor areas of potentially infilled ponds/Made Ground have been identified across Cottam 1, 2 and 3, however, given the small scale of these features and the age of any infill material, the potential for gas generation is low. Furthermore, based on the proposed infrastructure, the potential for hazardous ground gases to accumulate within confined spaces is considered very low. Furthermore, no buildings are proposed in the vicinity of potentially infilled ponds/pits across all four areas and no further assessment is required.
- 11.6.7 Significant environmental impacts of the development during operation and management are covered under separate chapters given the ground conditions are unlikely to be disturbed during operation. Any maintenance construction should follow the below remedial measures.
- 11.6.8 Prior to mitigation, the potential impact for construction, operation, management and decommissioning are of a moderate/minor or minor significance. As assessed within the PRAs and summarised above.

## 11.7 Cumulative and In-combination Effects

- 11.7.1 A 'long list' of potential cumulative development sites is provided in **Appendix 2.2** of the PEIR and the more substantial developments are shown on the plan at **Appendix 2.3**. Of particular relevance to any cumulative assessment is the West Burton Solar Project and Gate Burton Solar Project (both NSIP schemes).
- 11.7.2 A comprehensive CEMP will be required for this development (as for other developments) to ensure there are no adverse impacts arising in respect of contamination. Given modern methods of construction and the low sensitivity end use, there is not considered to be any cumulative effects to human health or controlled waters. Therefore, the risk of cumulative effects occurring is considered to be negligible.
- 11.7.3 There are no potential in-combination sources identified during the Preliminary Risk Assessment. Therefore, the risk of in-combination effects is considered to be negligible.
- 11.7.4 The Ground Conditions ES chapter will present a full assessment of the cumulative sites that are agreed with the relevant consultees.

## 11.8 Mitigation Measures

- 11.8.1 A Construction Environmental Management Plan (CEMP) will be secured via a DCO requirement, which will describe the construction related mitigation measures outline below. The plan will clearly set out best practise to ensure any environmental impacts during construction and in terms of land contamination are minimal. An Outline CEMP has been provided within the PEIR at **Appendix 4.3**.

- 11.8.2 Limited potential sources of contamination have been identified across Cottam 1, 2 and 3 which are detailed within the PRAs included in **Appendix 11.1 to 11.3**. Site workers will be made aware of the possibility of encountering localised contamination through toolbox talks and good standards of personal hygiene, including welfare facilities on-site and the use of appropriate levels of personal protective equipment (PPE), will be enforced.
- 11.8.3 Site workers will adhere to health, safety and environmental precautions in order to reduce the potential for any accidents and incidents.
- 11.8.4 A 'Discovery Strategy' protocol should be drawn upon to ensure that any contamination identified during construction is assessed by a specialist in land contamination. This will include but not be limited to stopping works in the area and ensuring the identified contamination does not pose a risk until an environmental specialist undertakes an assessment and a method is agreed to deal with the identified contamination. If required, the Local Planning Authority will be notified.
- 11.8.5 Methods will be used to reduce the amount of dust, e.g. washing down of vehicle's wheels, dampening down, etc.
- 11.8.6 Any bulk fuels or chemical used on site should be stored appropriately, within an impervious bund of 110% of the volume of the container in order to reduce the potential for any contamination source in the event of a container failure/ leak of battery fire and associate fire waters. Also, any spillages will be promptly addressed by appropriate measures, such as spill kits.

## **11.9 Residual Effects**

- 11.9.1 The PRAs have identified that the potential contaminant linkages associated with the development across Cottam 1, 2 and 3 as moderate/minor or minor significance.
- 11.9.2 With mitigation outline above and the implementation of well-established good industry practises in construction for managing contaminated land which will be incorporated into the CEMP, it is considered that the potential effects of contamination or risk of contamination will be negligible and not significant.