Fosse Green Energy

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EN010154

## 6.1 Environmental Statement

Chapter 9: Water Environment (Tracked)

VOLUME

6

Planning Act 2008 (as amended)

Regulation 5(2)(a)

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended)

20 March 2026

Planning Act 2008

The Infrastructure Planning
(Applications: Prescribed Forms and Procedure) Regulations
2009 (as amended)

Fosse Green Energy

Development Consent Order 202[ ]

# 6.1 Environmental Statement

# Chapter 9: Water Environment

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|---|---|
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# 9. Water Environment

## 9.1 Introduction

9.1.1 This chapter of the Environmental Statement (ES) identifies the potential impacts and effects of the construction, operation, and decommissioning phases of Fosse Green Energy (hereafter referred to as the 'Proposed Development') on surface water features (rivers, streams, ditches, canals, ponds, and lakes) including water quality and hydromorphology, flood risk and drainage. This chapter also considers potential effects on hydrogeology, with ground condition issues discussed in **Section 14.4** of **Chapter 14: Other Environmental Topics** of this ES **[EN010154/APP/6.1]**.

9.1.2 This chapter should be read in conjunction with the Proposed Development description provided in **Chapter 3: The Proposed Development** of this ES **[EN010154/APP/6.1]**. Additionally, water environment interfaces with other aspects and as such, should be considered alongside **Chapter 8: Ecology and Nature Conservation [EN010154/APP/6.1]**, where appropriate. **Chapter 8: Ecology and Nature Conservation [EN010154/APP/6.1]** also includes details of aquatic ecology surveys and assessments.

9.1.3 This chapter is supported by the following figures **[EN010154/APP/6.2]**:

a. **Figure 9-1: Surface Water Features and their Attributes**;
b. **Figure 9-2: Groundwater Water Features and their Attributes**;
c. **Figure 9-3: Fluvial Flood Risk**; and
d. **Figure 9-4: Surface Water Flood Risk**.

9.1.4 This chapter is supported by the following appendices **[EN010154/APP/6.3]**:

a. **Appendix 9-A: Water Environment Policy and Legislation**;
b. **Appendix 9-B: Water Framework Directive Assessment**;
c. **Appendix 9-C: Flood Risk Assessment**; and
d. **Appendix 9-D: Framework Surface Water Drainage Strategy**.

## 9.2 Legislation and Planning Policy

9.2.1 **Appendix 9-A: Water Environment Policy and Legislation [EN010154/APP/6.3]** identifies the legislation, policy, and guidance of relevance to the assessment of significant effects of the Proposed Development on the water environment. A brief summary is provided below, however, **Appendix 9-A [EN010154/APP/6.3]** should be referred to for further detail.

## Legislation

9.2.2 Legislation to be considered includes:

a. Environment Act 2021 (Ref 9-1) - enables better environmental protection to be included by w, includes new binding targets for water, which when set will need to be considered by new development that may affect the water environment;

b. Water Act 2014 (as amended) (Ref 9-2) - mainly deals with regulating the impact of water supply on the water environment and the price of water;

c. Flood and Water Management Act 2010 (as amended) (Ref 9-3) - requires flood management authorities to manage risks in connection with flooding and prepare Strategic Flood Risk Assessments, for which new development must take into account;

d. Land Drainage Act 1991 (as amended) (Ref 9-5) - sets out the functions of internal drainage boards and local authorities (as Lead Local Flood Authority) in relation to land drainage of Ordinary Watercourses[1]. New development wanting to do works that may affect the flow in Ordinary Watercourse may require a consent from the relevant authority);

e. Water Resources Act 1991 (as amended) (Ref 9-6) - regulates water resources, water quality and pollution and flood defences, which new developments may need to take into account;

f. Environmental Protection Act 1990 (as amended) (Ref 9-4) - brings together pollution prevention and disposal regulations, imposes duty of care on those involved with any waste stream;

g. Salmon and Freshwater Fisheries Act 1975 (as amended) (Ref 9-7) - sets out protection for migration routes of salmon and trout;

h. Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (Ref 9-8) - these regulations impose into UK law Directive 2000/60/EC of the European Union (the Water Framework Directive) and aim to improve and integrate the way water bodies are managed throughout the UK for which new development must be compliant or otherwise be carefully justified and include all necessary mitigation and compensation;

i. The Environmental Damage (Prevention and Remediation) Regulations 2015 (as amended) (Ref 9-9) - aims to prevent and remediate damage to the environment;

j. Environmental Permitting (England and Wales) Regulations 2016 (as amended 2018) (Ref 9-10) - aims to streamline the legislative system for activities in England and Wales including those for construction activities which may pose an alteration of flood risk. New developments that may need to do works to a Main River or discharge unclean water, trade or process effluent into a controlled water may need to apply for a permit;

[1] An Ordinary Watercourse is defined as a watercourse that is not a Main River, and includes rivers, streams, drains and ditches, and passages through which water flows.

k. Eels (England and Wales) Regulation 2009 (as amended) (Ref 9-11) - gives powers to the regulators to implement recovery measures in all freshwater and estuarine waters in England and Wales and for which new developments that could impact eels should take into account;

l. Control of Pollution (Oil Storage) (England) Regulations 2001 (as amended) (Ref 9-12) - sets out the requirements for the storage of oil for quantities over 200 litres, which is relevant to any development that may involve the storage of oil during construction or operation.

m. The Control of Substances Hazardous to Health (Amendment) Regulations 2004 (Ref 9-13) - requirements to control and manage risks from hazardous substances, such as may be used on construction sites or as part of the operation of new developments;

n. The Anti-Pollution Works Regulations 1999 (Ref 9-14) - outlines the contents of any-pollution works notices served under the Water Resources Act 1991; and

o. The Water Framework Directive (Standards and Classification) Directions 2015 (Ref 9-15) - includes directions for classification of surface water and groundwater bodies for which new developments must consider as part of any Water Framework Directive (WFD) Assessment.

## National Planning Policy and Guidance

9.2.3 National planning policy and guidance to be considered includes:

a. Overarching National Policy Statement for Energy (NPS EN-1) (2023) (Ref 9-16));

b. National Policy Statement for Renewable Energy (NPS EN-3) (2023) (Ref 9-17);

c. National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2023) (Ref 9-18);

d. National Planning Policy Framework (NPPF) (2024) (Ref 9-19);

e. National Planning Practice Guidance (NPPG) (2024) (Ref 9-20);

f. National Planning Practice Guidance: Flood Risk and Coastal Change (2022) (Ref 9-21);

g. The UK Government's Environmental Improvement Plan 2023 (Ref 9-22);

h. A Green Future: Our 25 Year Plan to Improve the Environment (Ref 9-23);

i. The UK Government's Plan for Water: Our Integrated Approach to Delivering Clean and Plentiful Water (2023) (Ref 9-24);

j. The UK Government's Future Water Strategy (2011) (Ref 9-25);

k. The Non-statutory technical standards for Sustainable Drainage Systems (SuDS) (Ref 9-26);

l. Construction Industry Research and Information Association (CIRIA) Report C753 The SuDS Manual 2nd Edition (2015) (Ref 9-27);

m. The Building Regulations 2010 Approved Document H Drainage and Waste Disposal (Ref 9-28);

n. The BRE Digest 365: Soakaway Design and Sewerage Sector Guidance 2022, Appendix C Design and Construction Guidance (Ref 9-29); and

o. Water UK (2022) Sewerage Sector Guidance (Ref 9-30).

### Regional Guidance

9.2.4 At a regional level, water management is coordinated through ten River Basin Management Plans (RBMPs). The most recent updates to the plans were published in 2022 and will remain in place until 2027, after which the monitoring and protection regime is uncertain until new Government targets and guidance is released. Until then the RBMPs set legally binding, locally specific, environmental objectives, and contain the current Water Framework Directive (WFD) status of the water bodies in the area. More information on these is included in the baseline section of this chapter. The Study Area falls under the Witham Management Catchment within the Anglian RBMP (Ref 9-31) and the Trent Lower and Erewash Management Catchment within the Humber RBMP (Ref 9-32).

### Local Planning Policy and Guidance

9.2.5 The Proposed Development is located within the North Kesteven District Council area. The Central Lincolnshire Joint Strategic Planning Committee (CLJSPC), which includes North Kesteven District Council, adopted the Central Lincolnshire Local Plan in 2023 (Ref 9-33). Further details are given in **Appendix 9-A: Water Environment Policy and Legislation [EN010154/APP/6.3].**

9.2.6 In 2018, Lincolnshire County Council produced the 'Sustainable Drainage Design and Evaluation Guide' (Ref 9-34). This guide links the design of SuDS with the evaluation requirements of planning to facilitate consultation in order to achieve the best possible SuDS design. It is primarily intended for use by developers, designers and consultants who are seeking guidance on the Lead Local Flood Authority (LLFA) standards for the design of sustainable surface water drainage in Lincolnshire.

## 9.3 Consultation

9.3.1 A scoping exercise was undertaken in June 2023 to establish the content, approach and method of the Environmental Impact Assessment (EIA). A request for an EIA Scoping Opinion was issued to the Secretary of State through the Planning Inspectorate in June 2023. Comments received in the EIA Scoping Opinion (**Appendix 1-B [EN010154/APP/6.3]**), and Applicant responses in relation to the Water Environment assessment are summarised in **Table 9-1.**

9.3.2 Further consultation in response to formal pre-application engagement was undertaken through the Preliminary Environmental Information (PEI) Report, issued in October 2024. **Table 9-2** outlines the statutory consultation

responses relating to Water Environment and how these have been addressed through the ES. The **Potential Main Issues for Examination [EN010154/APP/7.11]**, **Consultation Report [EN010154/APP/5.1]** and **Consultation Report Appendices [EN010154/APP/5.2]** provide further detailed responses, as relevant, to the feedback received during statutory consultation.

## Table 9-1: Scoping Opinion Responses (Water Environment)

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| Planning Inspectorate | No matters have been proposed to be scoped out of the assessment. | This comment is noted, no further action has been taken. | N/A |
| Planning Inspectorate | The ES should provide justification for the 1km study area for the water environment assessment and describe any waterbodies located outside of the established 1km study area that have also been included in the assessment, such as those downstream. This should be supported by appropriate figures in the ES. | Noted, the study area is described in full in Section 9.4 of this chapter. Also refer to **Figure 9-1 Surface Water Features and their Attributes [EN010154/APP/6.2]** showing the study area extent. | Section 9.4 of **Chapter 9: Water Environment [EN010154/APP/6.1],** and **Figure 9-1 Surface Water Features and their Attributes [EN010154/APP/6.2]** |
| Planning Inspectorate | The assessment of flood risk should consider the North Kesteven Strategic Flood Risk Assessment, (2009). | Noted. **Appendix 9-C Flood Risk Assessment (FRA) [EN010154/APP/6.3]** has taken account of all local published reports and guidance, including the North Kesteven Strategic Flood Risk Assessment, (2009). The flood risk baseline is also summarised within this chapter. | **Appendix 9-C FRA [EN010154/APP/6.3]** and **Chapter 9: Water Environment [EN010154/APP/6.1].** |
| Planning Inspectorate | The Inspectorate notes the proposed use of mitigation measures, namely Sustainable Drainage Systems (SuDs). The design of such mitigation measures should be informed by relevant and up to date climate change allowances for the lifetime of the Proposed Development. | Noted. **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]** has been prepared and takes account of the most up to date climate change allowances at the time of its development. | **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]**. |
| Planning Inspectorate | The ES should include a description of any measures proposed to reduce pollutant runoff into nearby watercourses, for example, design measures or best practice measures to be secured via | This chapter provides details of all mitigation measures proposed to reduce pollutant runoff into watercourses. This will include, but | **Chapter 9: Water Environment [EN010154/APP/6.1], Framework** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| | the Construction Environmental Management Plan (CEMP) or within the drainage strategy. | not be limited to, measures included in **Framework CEMP [EN010154/APP/7.7]** during construction and **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]** during operation. The water environment impact assessment within this chapter assesses the likelihood of any significant impacts occurring once this embedded mitigation is in place. | **Construction Environmental Management Plan (CEMP) [EN010154/APP/7.7]** and **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3].** |
| Planning Inspectorate | The Scoping Report identifies potential for pollution of surface or groundwater to occur from soil, sediments, oils, fuels and other chemicals from construction activities. The Inspectorate notes that in the absence of a separate chapter for the assessment of major accidents or disasters, that consideration for spillages from hazardous roads as a result of traffic accidents will be considered within existing technical assessments. The water environment assessment should therefore include an assessment of these potential risks, where there is potential for significant effects to occur | This chapter considers all potential water quality risks to watercourses, including the risk of spillages from construction and operational access tracks or roads across or around the site.<br>An assessment of major accidents and disasters is presented within Section 14.6 of **Chapter 14: Other Environmental Topics [EN010154/APP/6.1]** with other ES chapters signposted where relevant. | **Chapter 9: Water Environment** and **Chapter 14: Other Environmental Topics [EN010154/APP/6.1].** |
| Planning Inspectorate | The Inspectorate notes that there is potential for Horizontal Directional Drilling (HDD) to be used as a non-intrusive method of cable laying. Where HDD is proposed for watercourse crossings, the ES should include an assessment of the potential effects from release of drilling fluids during crossings and also consider potential effects on existing flood defences from noise | Noted. This chapter includes assessment of the effects of the release of drilling fluids during HDD beneath watercourses, having taken account of appropriate mitigation that will account for this (including site- | **Chapter 9: Water Environment,** **Chapter 11: Noise and Vibration** and |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
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| | and vibration. This assessment should therefore make appropriate cross reference to the ground conditions and noise and vibration aspect assessments. | specific risk assessment and hydraulic fracture risk assessments). Appropriate cross references have been made to other assessments where appropriate. Refer to **Chapter 11: Noise and Vibration [EN010154/APP/6.1]** for the assessment of noise/vibration impacts from HDD activities. | **Chapter 14: Other Environmental Topics [EN010154/APP/6.1].** |
| Planning Inspectorate | The Scoping Report identifies infrastructure assets, buildings and property as flood risk receptors. In areas of increased flood risk, the ES should also consider the risk to people and employees. | Noted. This has been taken into account in **Chapter 9: Water Environment [EN010154/APP/6.1]** and **Appendix 9-C: FRA [EN010154/APP/6.3].** | **Chapter 9: Water Environment [EN010154/APP/6.1], Appendix 9-C: FRA [EN010154/APP/6.3].** |
| Planning Inspectorate | The ES should differentiate between Flood Zones 3a and 3b in order to determine which parts of the site are located in areas considered as 'high probability of flooding' and 'functional floodplain'. Where development is to be located within Flood Zone 3, then an assessment of the floodplain loss should be made and floodplain compensation provided. This should include consideration of the cumulative losses from solar panel mountings. Essential infrastructure located within Flood Zone 3a should be designed and constructed to remain operational and safe in times of flood and throughout the lifetime of the Proposed Development, taking account of climate change. | Noted. The SFRA mapping published Flood Zone 3b maps; EA mapping including Flood Zone 3b extents have also been obtained. Flood risk and extents have been agreed with the EA as part of the FRA development. Proposed solar PV infrastructure within Flood Zone 3a has been taken into account in **Chapter 9: Water Environment [EN010154/APP/6.1]** and **Appendix 9-C: FRA [EN010154/APP/6.3].** | **Chapter 9: Water Environment [EN010154/APP/6.1], Appendix 9-C: FRA [EN010154/APP/6.3]** |
| Planning Inspectorate | The ES should include an assessment of the potential impacts from construction compounds on water environment receptors. The ES should also explain how flood risk and the location of existing flood defences have been taken into account in the location of construction compounds and the access to them | Noted, this is assessed within this chapter and **Appendix 9-C: FRA [EN010154/APP/6.3].** | **Chapter 9: Water Environment [EN010154/APP/6.1], Appendix 9-C: FRA [EN010154/APP/6.3.** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| Planning Inspectorate | The ES should consider flood risk impacts of decommissioning and how the floodplain may return to its natural state thereafter. The flood risk effects from decommissioning should therefore be discussed with the relevant consultation bodies prior to the production of any outline decommissioning environmental management plan. | Noted, refer to this chapter and **Appendix 9-C: FRA** which considers decommissioning where appropriate. | **Chapter 9: Water Environment [EN010154/APP/6.1], Appendix 9-C: FRA [EN010154/APP/6.3].** |
| Planning Inspectorate | The ES should consider the potential effect that landscaping schemes could have on flood flow routes, including appropriate cross reference to the landscape and visual aspect assessment. | Noted. **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]** takes account of landscaping where appropriate and exceedance flow routes. | **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3].** |
| Environment Agency | Table 17-1 • Climate change: In the absence of any assessment of modelled flood data, we would advise that sea level rise and precipitation are scoped in, as discussed above. • Flood Risk, Drainage and Surface Water: Where possible flood risk should be assessed quantitatively rather than qualitatively. • Landscape and Visual Amenity: Where changes in levels are proposed these should be assessed in relation to impacts on flood risk on site and elsewhere. • Noise and Vibration: Ground-borne vibration from the construction, operation and decommissioning of the Proposed Development should be included. Applicant needs to demonstrate that work will be safe for the flood defences. • Transport and Access: We need to see the access routes in relation to the flood defences. Routes have not been identified so we cannot say yet whether this is a risk. | Effects due to vibration generated from construction and decommissioning activities have been considered in **Chapter 11: Noise and Vibration [EN010154/APP/6.1]**. Operational vibration has been scoped out as agreed with the Planning Inspectorate.<br>Sea level rise and climate change, including precipitation, has been taken into account in this chapter and **Appendix 9-C: FRA [EN010154/APP/6.3].** Drainage, including quantity and quality has been assessed. This has been taken into account in this chapter and **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3].** | **Chapter 11: Noise and Vibration [EN010154/APP/6.1]**, **Chapter 9: Water Environment [EN010154/APP/6.1]**, **Appendix 9-C: FRA** and **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3].** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| Environment Agency | Paragraph 3.2.61 We welcome the use of multifunctional spaces to deliver multiple benefits to biodiversity, carbon savings, water and flood management, and green spaces. | The Applicant notes the Environment Agency comment that welcomes the use of multifunctional spaces to deliver environmental gain. Further detail regarding flood management is given in this chapter and **Appendix 9-C: FRA [EN010154/APP/6.3].** | **Chapter 9: Water Environment [EN010154/APP/6.1]**, **Appendix 9-C: FRA [EN010154/APP/6.3].** |
| Environment Agency | Any enhancement on watercourses within the development area that could address these issues should be incorporated as WFD and/or biodiversity mitigation, this will then provide embedded mitigation for any potential detrimental impact imposed by the cable crossings from the construction of the development | The design of the Proposed Development includes:<br>• mitigation for any potential negative impact due to the cable and access track crossings, e.g. with respect to the WFD and BNG; and<br>• ecological enhancements including biodiversity for those impacted watercourses within the Principal Site, where appropriate.<br>A WFD Mitigation and Enhancement Plan is secured within **Framework CEMP [EN010154/APP/7.7]**. | **Chapter 9: Water Environment [EN010154/APP/6.1]**, **Appendix 9-B: Water Framework Directive (WFD) Assessment [EN010154/APP/6.3].** **Framework CEMP [EN010154/APP/6.1]**. |
| Environment Agency | There may be opportunities to remove existing Ordinary Watercourse culverts as part of the proposal. De-culverting and river restoration will provide environmental improvements and contribute to the delivery of BNG, will help deliver Water Framework Directive (WFD) improvements and will also reduce the risk of flooding. We strongly recommend you consider all options to remove any culverted sections of watercourses as part of your development proposals, restoring watercourses to their natural state. If de-culverting is not possible we would expect to see adequate evidence for this. Works that affect the Ordinary | The Applicant will consider opportunities to remove existing Ordinary Watercourse culverts and to undertake the restoration of watercourses through development of the WFD Mitigation and Enhancement Strategy which is secured within **Framework CEMP [EN010154/APP/7.7].** This will be further developed post consent. The WFD Assessment is provided within | **Framework CEMP [EN010154/APP/7.7], Appendix 9-B WFD Assessment [EN010154/APP/6.3].** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| | Watercourses may require the prior consent of the Lead Local Flood Authority (LLFA). | **Appendix 9-B WFD Assessment [EN010154/APP/6.3].** | |
| Environment Agency | Paragraph 3.2.44 It is indicated that construction activities will include crossing points over drainage ditches. The design of bridges and culverts will need to be carefully designed to avoid ecological, geomorphological and flood risk impacts. Any crossings over Main Rivers are subject to flood risk activity permitting. If non-Main Rivers are affected the consent of the Lead Local Flood Authority would be required | Noted and the design and construction of structures is assessed within this chapter. No new culverts are required. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |
| Environment Agency | We are pleased to see that green infrastructure has been mentioned and the development will be trying to maintain what natural green corridors are already in place, however we advise that the same approach for is used for blue infrastructure. | The design of the Proposed Development will link the habitat creation and increase in biodiversity into the green and blue infrastructure in the wider landscape including the Witham Valley Country Park, Whisby Nature Park Green Wedge and the Local Nature Recovery Network including relevant aspects of the 'Green Infrastructure Strategy for Central Lincolnshire'. | **Chapter 10: Landscape and Visual Amenity [EN010154/APP/6.1]** |
| Environment Agency | Paragraph 10.3.8 Given Policy S21 (Flood Risk and Water Resources) of the Central Lincolnshire Local Plan and the presence of flood storage areas and flood zones 2 and 3 within the development site, the proposal should incorporate enhancements to watercourses and drainage infrastructure within the development footprint to improve natural processes, ecology, geomorphology, ecosystem services, flood storage and water quality. | The Applicant confirms that with respect to Policy S21 (Flood Risk and Water Resources) of the Central Lincolnshire Local Plan and the presence of flood storage areas and flood zones 2 and 3 within the development site, the proposal will incorporate enhancements to watercourses.<br>The design of the Proposed Development includes: | **Chapter 9: Water Environment [EN010154/APP/6.1]**<br>**Framework CEMP [EN010154/APP/7.7],**<br>**Appendix 9-B: WFD Assessment [EN010154/APP/6.3].** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| | | • mitigation for any potential negative impact due to the cable and access track crossings, e.g. with respect to the WFD and Biodiversity Net Gain (BNG); and<br>• ecological enhancements including biodiversity for those impacted watercourses within the Principal Site, where appropriate.<br>This will be delivered through the WFD Mitigation and Enhancement Strategy which is secured within **Framework CEMP [EN010154/APP/7.7]**.<br>Furthermore, Sustainable Drainage Systems (SuDS) will be incorporated within the Proposed Development to ensure no increase in flood risk and betterment where possible, with any appropriate SuDS linked to amenity and biodiversity value where appropriate. **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3**] seeks to mimic existing regimes and water quality with no adverse impact within the Proposed Development area or elsewhere.<br>In addition, the cessation of pesticide and fertiliser inputs and of irrigation, | |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| | | will have a significant benefit to the ecology and water quality of watercourses downstream of the Proposed Development. | |
| Environment Agency | The proposal has the potential to impact statutory Main Rivers. The Environmental Permitting (England and Wales) Regulations 2016 require a permit to be obtained for any activities which will take place: • on or within 8 metres of a Main River (16 metres if tidal) • on or within 8 metres of a flood defence structure or culverted Main River (16 metres if tidal) • on or within 16 metres of a sea defence • involving quarrying or excavation within 16 metres of any Main River, flood defence (including a remote defence) or culvert • in the floodplain of a Main River if the activity could affect flood flow or storage and potential impacts are not controlled by a planning permission For further guidance please visit https://www.gov.uk/guidance/flood-risk-activitiesenvironmental-permits or contact our National Customer Contact Centre on 03708 506 506. We advise that the applicant consults with us at the earliest opportunity where the proposal Where a Flood Risk Activity Permit (FRAP) is required, it is unlikely that our consent will be granted for works that do not allow access for maintenance or repair purpose or that have an unacceptable impact on flood risk or the natural environment. The permanent retention of a continuous unobstructed area is an essential requirement for emergency access to the river for repairs to the bank and for future maintenance and/or improvement works. Where development or works are proposed that would require a FRAP, it is recommended that detailed pre-application planning advice is obtained from us any concerns can be resolved up front. There is no mention at this stage regarding whether the applicant will seek to disapply The Environmental Permitting Regulations in regard to flood risk activities. Whilst | Noted. The consents and permits that are considered to be required in relation to the Water Environment have been included within this chapter. Further discussions are being undertaken with the Environment Agency with regards to disapplication, and will be continued through the Statements of Common Ground for the DCO. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| | disapplication is common practice in DCO proceedings, we still require to be formally notified of this intention. If disapplication is formally notified to us, we still require discussions with the applicant around the proposals and will secure our interests by way of approval of plans through Protected Provisions. There is no guarantee that we will agree to disapply EPR. | | |
| Environment Agency | If dewatering is required, it may require an environmental permit if it doesn't meet the exemption in The Water Abstraction and Impounding (Exemptions) Regulations 2017 Section 5: Small scale dewatering in the course of building or engineering works. Temporary dewatering from excavations to surface water: RPS 261 – GOV.UK (www.gov.uk) If they don't meet the exemption and require a full abstraction licence they should be aware that some aquifer units may be closed for new consumptive abstractions in this area. More information can be found here: Abstraction licensing strategies (CAMS process) – GOV.UK (www.gov.uk) Please note that the typical timescale to process a licence application is 9-12 months. The applicant may wish to consider whether a scheme-wide dewatering application rather than individual applications would be beneficial. We suggest talking to our National Permitting Service (NPS) early in the project planning | Noted. The consents and permits that are considered to be required in relation to the Water Environment have been included within this chapter. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |
| Environment Agency | Where it is not possible to connect foul drainage to the main sewer, under the Environmental Permitting Regulations 2010 any discharge of sewage or trade effluent made to either surface water or groundwater will need to be registered as an exempt discharge activity or hold a permit issued by the Environment Agency, addition to planning permission. This applies to any discharge to inland freshwaters, coastal waters or relevant territorial waters. The applicant may also need to consider discharge of groundwater, especially if it is contaminated. If the | Noted. The consents and permits that are considered to be required in relation to the Water Environment are included in this chapter. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| | developer identifies the need to discharge to surface water during construction, then a permit may also be required. More information can be found here: https://www.gov.uk/guidance/discharges-to-surface-water-and-groundwaterenvironmental-permits A permit does not mean they can deteriorate the watercourse and may not be granted. Only clean, uncontaminated water should be discharged to surface water or groundwater and any permits need to be planned for well in advance of construction. Discharging run-off to watercourses has the potential to transport pollutants such as herbicides/ pesticides/ nitrates/ phosphates and silt and should be a last resort with mitigation in place to reduce the impact. Additional guidance in relation to discharging and permits is available at the following links: https://www.gov.uk/guidance/discharges-to-surface-water-and-groundwaterenvironmental-permits https://www.gov.uk/guidance/get-advice-before-you-apply-for-an-environmentalpermit The use of drilling muds for the directional drilling may require a groundwater activity permit unless the 'de minimis' exemption applies. Early discussion about this is also recommended. | | |
| Environment Agency | The Applicant should consider the effects of vibration on flood defences (as the receptor) utilising relevant guidance e.g., British Standards mentioned in 12.8.3. This should consider plant, works, increase in nearby traffic for all stages of the development (construction, operation, and decommissioning). | Effects due to vibration generated from construction and decommissioning activities have been considered in **Chapter 11: Noise and Vibration [EN010154/APP/6.1]**. Operational vibration has been scoped out as agreed with the Planning Inspectorate. | **Chapter 11: Noise and Vibration [EN010154/APP/6.1]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
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| Environment Agency | Paragraph 12.7.1 and Table 12-6 Construction traffic vibration should be scoped in if in close proximity to flood defences. Similarly for operation of the proposed development. | There will be no significant construction traffic in proximity to flood defences. The Proposed Development has been set back from the River Witham and the River Brant, and these rivers will be crossed via HDD, therefore no vibration impact on flood defences is anticipated.<br>Effects on human disturbance due to construction and operational traffic vibration are scoped out of the ES as agreed with the Planning Inspectorate. The level of vibration required for human disturbance is low in comparison to the level of vibration required for earth movement.<br>As such, an assessment of vibration impacts on flood defences is scoped out. | **Chapter 11: Noise and Vibration [EN010154/APP/6.1]** |
| Environment Agency | The flood extents with consideration of climate change throughout the lifetime of the development should be assessed in relation to fluvial and/or tidal flood sources. Tidal sources are currently scoped out, however in the absence of an assessment of tidal flood modelling including climate change impacts it cannot be certain that the site is not affected. If any development is to be located within Flood Zone 3, then an assessment of the floodplain loss should be made and floodplain compensation provided. This should include the cumulative volume of the stanchions in which solar panels are mounted upon. Any critical | Noted. **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** has been developed through further consultation with the Environment Agency throughout the development of the DCO submission. Refer to the FRA for full details of the assessment undertaken. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
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| | electrical equipment/essential infrastructure should be set above the predicted flood levels, e.g. the 0.1% annual probability flood level where achievable. | | |
| Environment Agency | If buildings will be required, finished floor levels should be raised as high as practicable above ground levels and ensure that any occupants are kept safe in a flood event. | Noted and agreed. | **Appendix 9-C: FRA [EN010154/APP/6.3]** |
| Environment Agency | Witham Washlands Flood Storage Area is not considered in detail but is shown on Figure 10-3 as Flood Storage Area). However, we welcome the reference (10.6.14) to the Lincoln Flood Alleviation Scheme (aka the Witham Washland flood storage area) and that the development should be setback from this area. Development should be avoided in this area and it should not compromise its function. With regards to the boundary crossing of the Witham Washland Flood Storage Area, early engagement is paramount as there are specific legal agreements in place regarding the operation, arrangements, agriculture and land ownership within the Witham Washlands. We are unclear at this point whether the cable will go under the Washlands or solar arrays are proposed within the Washlands. We therefore request further clarity on this. The applicant is therefore advised to engage with ourselves and the landowners in this regard. The applicant should contact our local Customers and Engagement Team (LNenquiries@environment-agency.gov.uk) for more information. | Noted. **Appendix 9-CFRA [EN010154/APP/6.3]** has been developed through further consultation with the Environment Agency throughout the development of the DCO submission. Refer to the FRA for full details of the assessment undertaken. No solar arrays are proposed within any functional flood storage schemes. | **Appendix 9-C: FRA [EN010154/APP/6.3]** |
| Environment Agency | Within the operation section at 10.5.7 it refers to potential permanent physical impacts to watercourse if crossings are required for access and impacts on the rate and volumes of runoff entering the watercourses. We would need more information regards these statements and the likely impact this may have on both watercourses. | This chapter provides an assessment of all potential impacts to watercourses, including hydromorphological or physical impacts where new structures are proposed for access. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
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| Environment Agency | The proposed cable routes crossing the Main Rivers however may be suitable to satisfy the exemption known as Flood Risk Activity 3: Service crossing below the bed of a Main River not involving an open cut technique. This exemption can be located on the gov.uk website: Exempt flood risk activities: environmental permits - GOV.UK (www.gov.uk). We would encourage the applicant to follow the set criteria of this exemption to carry out any service crossings of the Main Rivers. If the applicant feels they cannot satisfy the criteria set out in FRA3 a flood risk bespoke permit will be required. | Noted. The consents and permits that are considered to be required in relation to the Water Environment are outlined within this chapter. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |
| Environment Agency | The applicant has not identified the flood defences (type, position, condition, geometry, etc) within their site. We need to understand how these could be affected and whether they protect the proposal for 75 years (required by NPPF). | This chapter provides an assessment of all potential impacts to flood defences, where appropriate, in line with NPPF requirements. A 10m buffer to all watercourses is incorporated into the design. EA modelling provided has taken into account flood defences (Witham Washlands FSA and surrounding watercourses) and has been taken into account in **Appendix 9-C: FRA [EN010154/APP/6.3]**. The Design life in operation of the Proposed Development is 60 years, and the assessment is based on a 60-year design life. | **Chapter 9: Water Environment [EN010154/APP/6.1], Appendix 9-C: FRA [EN010154/APP/6.3]** |
| Environment Agency | The applicant is advised to contact us to request our flood risk data to inform their FRA. However if the applicant intends to undertake any of their own hydraulic modelling (e.g. to take into account correct climate change allowances) we should be contacted at the earliest opportunity to discuss any modelling | Agreed. Liaison with the EA has been undertaken regarding modelling and data has been requested from the EA where relevant. | **Chapter 9: Water Environment [EN010154/APP/6.1], Appendix 9-C: FRA [EN010154/APP/6.3]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
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| | requirements and to avoid any issues which may present a risk to the project. | | |
| Environment Agency | Paragraphs 3.2.15-21 An understanding of how the proposed structures (64 inverters, 64 transformers, 64 switchgears, and three substations may affect the topography and whether this will adversely affect the current Flood Zones, shown in Figure 2-1b or future Flood Zones within the (assumed) design-life 75 years. | This has been taken into account in **Chapter 9: Water Environment** and **Appendix 9-C: FRA** with permanent built infrastructure located outside of Flood Zone 3 as far as reasonably practicable. The Design life in operation of the Proposed Development is 60 years, and the assessment is based on a 60-year design life. | **Chapter 9: Water Environment [EN010154/APP/6.1], Appendix 9-C: FRA [EN010154/APP/6.3]** |
| Environment Agency | Table 10-1 • It is unclear how the applicant has derived the pre-development flood risk designation of “High”. The applicant should clarify whether this is the likelihood of flooding that is being considered and what the threshold for “High” would be in terms of a quantitative analysis. It is not clear if the vulnerability of receptors has been considered in this analysis. • Is the designation of “High” is representative of the whole site given that some areas are within Flood Zone 1? • What is the evidence that site outside tidal flood extent including climate change impacts? • Are there any residential receptors within the redline boundary and is Less Vulnerable an appropriate designation? | The Proposed Development is classed as Essential Infrastructure under Annex 3 of the NPPF and has been assessed as such for a worst case approach. The majority of the Proposed Development is at low risk; however, due to interaction with several areas of Flood Zone 2 and 3 a high risk has been used for the assessment. | **Chapter 9: Water Environment [EN010154/APP/6.1], Appendix 9-C: FRA [EN010154/APP/6.3]** |
| Environment Agency | Paragraph 10.5.3 Proposal should not increase flood risk | Noted. This has been taken into account in **Chapter 9: Water Environment [EN010154/APP/6.1] Appendix 9-C: FRA [EN010154/APP/6.3]** with no increase in flood risk to the Proposed Development or elsewhere. | **Chapter 9: Water Environment [EN010154/APP/6.1], Appendix 9-C: FRA [EN010154/APP/6.3]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
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| Environment Agency | Paragraph 10.5.7 - Proposed permanent hydrological changes may need to be modelled. | Noted. It is not envisaged there will be any hydrological changes. | **Chapter 9: Water Environment [EN010154/APP/6.1], Appendix 9-C: FRA [EN010154/APP/6.3]** |
| Environment Agency | Paragraph 10.6.15 - We may find the proposal unacceptable if proposed within an area at risk of flooding and this will necessitate hydrological modelling. Flood storage compensation should be local, level-for-level, volume-for-volume, and lead to a net-gain in storage volume. | Noted. **Appendix 9-C: FRA [EN010154/APP/6.3]** has been developed through further consultation with the Environment Agency throughout the development of the DCO submission. Refer to the **FRA** for full details of the assessment undertaken. No solar arrays are proposed within any functional flood storage schemes. | **Appendix 9-C: FRA [EN010154/APP/6.3]** |
| Environment Agency | Paragraphs 10.6.17 and 10.8.3 - The impact assessment should also consider the effect of flood risk on the proposal and any subsequent consequences during construction, operation, and decommissioning e.g., power outage during operation from flood event. | Noted, **Appendix 9-C: FRA [EN010154/APP/6.3]** considers flood risk through all stages of the Proposed Development. The impact of flood risk in EIA terms is also presented in this chapter. | **Chapter 9: Water Environment [EN010154/APP/6.1], Appendix 9-C: FRA [EN010154/APP/6.3]** |
| Environment Agency | Paragraph 10.6.21 Assessment of flood risk should be quantitative (where possible). | Noted and agreed. This has been taken into account in **Appendix 9-C: FRA**. **[EN010154/APP/6.3].** The impact of flood risk in EIA terms is also presented in this chapter. | **Appendix 9-C: FRA [EN010154/APP/6.3]** |
| Environment Agency | Paragraph 10.8.4 - 10 metres would more appropriately be measured from the most landward extent of the flood defence or bank. The buffer zone also helps to ensure that development is | Noted and agreed. Buffers from watercourses will be measured from the top of bank, and buffers from flood defences measured from, the | **Chapter 9: Water Environment [EN010154/APP/6.1]** |

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| | sustainable and that the flood defences are not adversely affected by the proposed works. | most landward extent of the flood defence. | |
| Environment Agency | Paragraph 10.8.6 - We welcome engagement about the proposed modelling required | Noted and agreed. Continued engagement has taken place through development of **Appendix 9-C: FRA**. **[EN010154/APP/6.3].** | **Appendix 9-C: FRA [EN010154/APP/6.3]** |
| Environment Agency | Paragraph 10.8.7 - Where the Applicant is required to assess assets (e.g., flood defences), this may necessitate the clearance of vegetation. We may require a survey of flood defences within the environs | Noted. Surveys will be undertaken post consent where required. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |
| Environment Agency | Paragraph 10.8.9 - We may need to understand how the Applicant may be proposing to change levels and how this could affect flood risk. | Currently it is not proposed to alter existing site levels. SuDS may require lowering and or localised bunding, which will be reviewed to ensure no increase in flood risk will occur within the DCO Site or elsewhere. | **Chapter 9: Water Environment [EN010154/APP/6.1], Appendix 9-C: FRA [EN010154/APP/6.3]** |
| Environment Agency | Paragraph 10.8.10 - Any activity which could have an adverse impact on flood risk should be included. | Noted and agreed. This has been taken into account in this chapter and **Appendix 9-C: FRA [EN010154/APP/6.3].** | **Chapter 9: Water Environment [EN010154/APP/6.1], Appendix 9-C: FRA [EN010154/APP/6.3** |
| Environment Agency | There is an area of land owned by the Environment Agency in relation to the Witham Washlands Flood Storage Area within the scoping area. It is unclear at this stage whether this land will be affected by the proposals, but we would welcome on-going discussions with the applicant about this. | Noted and agreed. Consultation with the EA has been throughout development of the DCO application. | **Chapter 9: Water Environment [EN010154/APP/6.1], Appendix 9-C: FRA [EN010154/APP/6.3** |
| Environment Agency | This chapter relates to the potential effects of the Proposed Development on the water environment, including groundwater. This includes the groundwater in the Secondary and Principal | Noted and agreed. Impacts on groundwater levels and flow and | **Chapter 9: Water Environment [EN010154/APP/6.1]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
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| | aquifers beneath the site, as well as the groundwater source protection zone 3 in the east of the site. | groundwater quality are considered in this chapter. | |
| Environment Agency | The report mentions that a drainage strategy will be compiled for the scheme. The strategy should include measures to prevent pollution. This is particularly important in the areas of the site that are underlain by a Principal aquifer and within the SPZ. The strategy should ensure that any proposed used of sustainable drainage systems (SuDS) is in line with the available guidance on GOV.UK: Sustainable drainage systems: non-statutory technical standards – GOV.UK (www.gov.uk). 'The Environment Agency's approach to groundwater protection' sets out where SuDS drainage is acceptable in relation to controlled waters. The applicant should be particularly mindful of policy G9 in relation to deep bore soakaways. | Noted and agreed. **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]** considers water quality impacts in line with current guidance. The potential impact of the proposed drainage is also assessed within this chapter. | **Chapter 9: Water Environment [EN010154/APP/6.1]** **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]** |
| Environment Agency | We are satisfied with the proposed scoped of the EIA and pleased to see the developers will be following mitigation measures and good practice during construction, operation and for any decommission phase. All efforts must be undertaken to not deteriorate the water quality or hydrology of any water bodies during construction or operation. | Noted. Potential for impacts on the water environment are assessed in **Chapter 9: Water Environment [EN010154/APP/6.1]**, and the potential for deterioration or prevention of future improvement of WFD water bodies assessed within **Appendix 9-B WFD Assessment [EN010154/APP/6.3]**. | **Chapter 9: Water Environment [EN010154/APP/6.1]**, **Appendix 9-B WFD Assessment [EN010154/APP/6.3]** |
| Environment Agency | Government guidance contained within the national planning practice guidance (water supply, wastewater and water quality – considerations for planning applications, paragraph 020) sets out a hierarchy of drainage options that must be considered in the following order: 1. Connection to the public sewer 2. Package sewage treatment plant (adopted in due course by the sewerage company or owned and operated under a new appointment or variation) 3. Septic Tank. | Noted. Refer to Appendix 9-D: **Framework Surface Water Drainage Strategy [EN010154/APP/6.3]** for full details of drainage arrangements and their development. | **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
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| Environment Agency | Paragraph 3.2.51 mentions that there would be 4 permanent staff members on site with up to 20 people on site at any one time. Our preferred option of those mentioned in paragraph 10.8.12 would be to connect foul drainage to the public main sewer, which would require co-ordination and discussions with Anglian Water. The other options may require an environmental permit (please refer to advice further below).<br><br>Whichever approach the developer undertakes, this should be explained in full in a foul drainage document. A foul drainage plan should be produced to accommodate any foul flows. | Noted. The latest proposals with regard to foul drainage as well as permits and consents likely to be required by the Proposed Development are described in this chapter. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |
| Environment Agency | There are a number of additional permits or consents that the applicant may require under the Environmental Permitting Regulations (EPR), or other legislation, to regulate matters such as flood risk, discharge of effluent / wastewater, water abstraction, watercourse impoundment and waste management. This is discussed below. | Noted. The consents and permits that are considered to be required in relation to the Water Environment are outlined in this chapter. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |
| Environment Agency | We would advise that the Battery Energy Storage Systems are located in areas of the site with the lowest risk of flooding, where possible (i.e. Flood Zone 1). | Noted, the FRA informs Battery Energy Storage System (BESS) locations in line with the sequential test. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** |
| Environment Agency | Paragraphs 3.2.2 and 3.2.44 - Temporary construction compounds should be positioned outside of the Witham Washland flood storage area, setback from flood defences and positioned outside of Flood Zones 2 and 3. We will require more information about the temporary roadways and their proximity to flood defences | Noted, and this has been taken into account during development of the design. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** |
| Environment Agency | Paragraph 3.2.37 - To ensure flood resilience it would be advisable to raise the 192 batteries which comprise the Battery | The BESS Compound (centralised BESS or distributed BESS) is located within Flood Zone 1 and at low risk | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
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| | Energy Storage System (BESS) above flood levels with the inclusion of freeboard. | from other sources of flooding, ensuring the infrastructure will remain operational in times of flood. | |
| Environment Agency | Paragraph 10.6.14 - We welcome reference to the Lincoln Flood Alleviation Scheme (aka the Witham Washland flood storage area) development should be setback from this area. | Noted, and this has been taken into account during development of the design. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** |
| Environment Agency | We note in Chapter 10: Water Environment the relevant Main Rivers have been identified, and it is confirmed that the Flood Risk Assessment (FRA) will form part of the technical appendix to the ES Report. All sources of flood risk have been identified in Chapter 10, however our focus is on fluvial and/or tidal flood risk. It is recommended that a sequential approach is taken to the proposed site layout, ensuring all development is located within Flood Zone 1, where possible. Should development be required within Flood Zones 2 or 3, then it should be demonstrated that the infrastructure will remain operational during a design flood plus appropriate climate change allowance, without increasing risk elsewhere. | Noted. **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** addresses flood risk and outlines appropriate assessment and mitigation where required. Flood risk and mitigation is also summarised within this chapter. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3].** |
| Environment Agency | Landscaping may change flood flow routes. We require more information about the changes in land level and how this may affect flood risk. | **Appendix 9-D: Framework Surface Water Drainage Strategy ]** and **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** consider any changes in land level. However, it is noted that the Proposed Development will not require significant land level alterations. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3],** **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3].** |
| Environment Agency | Paragraph 3.2.22 Vibration from horizontal directional drilling in close proximity to the flood defences should be considered. | Assessment of HDD is included in **Chapter 9: Water Environment [EN010154/APP/6.1]** with appropriate cross reference made to | **Chapter 9: Water Environment [EN010154/APP/6.1].** |

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| | | the assessments of ground conditions, noise and vibration. | |
| Environment Agency | Paragraph 3.2.26 Underground trenches/cables should be setback from the flood defences. Vibrations in close proximity to the flood defences from micro-tunnelling, boring, or horizontal directional drilling should be considered | Noted, and this is considered in the ES Assessment of cable installation is included in this chapter with appropriate cross reference made to the assessments of ground conditions, noise and vibration. | **Chapter 9: Water Environment [EN010154/APP/6.1].** |
| Environment Agency | If access routes are in close proximity to flood defences, we will need more information to consider whether the proposal is acceptable. We may require that the Applicant carry out a pre- and post-works assessment of the flood defences necessitating remediation of defects. There may need to be an assessment of vibration in relation to the increase in traffic (from circa 50 HGV per day or plant).Table 15-1<br>• Flood: Safe for its lifetime will require a demonstration for 75 years from the date<br>that construction is completed. Note that the development should not increase<br>flood risk elsewhere.<br>• Flood Defence Failure: We may require an assessment the flood defence<br>condition. | Noted, and this is considered in the ES. Assessment of access tracks is included in this chapter with appropriate cross reference made to the assessments of ground conditions, noise and vibration where necessary. Ensuring safe operation in times of flood has been taken into account in **Chapter 9: Water Environment [EN010154/APP/6.1]** and **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]**. The design life in operation of the Proposed Development is 60 years, and the assessment is based on a 60 year design life.<br>Flood Defence Failure has been discussed with the EA, the consultation with whom has informed the FRA. Consultation will continue through production of statements of common ground. | **Chapter 9: Water Environment [EN010154/APP/6.1]**<br>**Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3].** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
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| Environment Agency | The FRA should also consider flood risk impacts of decommissioning and the subsequent state of the floodplain. We note that the applicant intends to produce an outline Decommissioning Environmental Management Plan (DEMP), that should be informed by the flood risk assessment. We will require sight of the DEMP to enable us to consider the flood risk impacts and how the floodplain will be returned to its natural state thereafter, and we note it will take approximately 6-12 months to decommission the site and return the area back to its previous state. Early engagement on this issue would be advisable. | Noted. Reference is made in **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** to decommissioning and the Framework DEMP **[EN010154/APP/7.9]**. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3].** |
| Environment Agency | Paragraph 3.2.44 There should be no net loss of flood storage volume from the landscaping or construction of new access roads/tracks. The developer should consider alternatives to culverts as they may pose a flood risk (e.g., blockages, difficult to inspect, limited flow rate. The developer may need to utilise the 'Culvert, screen and outfall manual' (C786F). | Noted. Details of structures to be used across the site are included in this chapter, and their impact on the water environment assessed herein. No new culverts are required. Review of floodplain compensation, if appropriate, has been taken into account in **Chapter 9: Water Environment [EN010154/APP/6.1]** and **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3].** | **Chapter 9: Water Environment [EN010154/APP/6.1]**<br>**Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3].** |
| Environment Agency | Section 10.5.6 discussed the use of horizontal directional drilling (HDD) for the crossing of watercourses. This work could involve the use of drilling muds and their use may require risk assessment to ensure they do not pose a risk to controlled waters. The potential to use HDD techniques should therefore be included in the EIA. This is particularly important if it will be used in the Source Protection Zone (SPZ) 3. | Noted. This chapter includes assessment of the effects of the release of drilling fluids during HDD beneath watercourses, taking account of appropriate mitigation that will account for this (such as site-specific risk assessment and frac-out risk assessments). | **Chapter 9: Water Environment [EN010154/APP/6.1].** |

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| Environment Agency | If horizontal directional drilling (HDD) is used for the installation of cables this work could involve the use of drilling muds and their use may require risk assessment to ensure they do not pose a risk to controlled waters. The potential to use HDD techniques should therefore be included in the CEMP if it is likely to be an option. This is particularly important if it will be used in the SPZ 3. | Noted. This chapter includes assessment of the effects of the release of drilling fluids during HDD beneath watercourses, taking account of appropriate mitigation that will account for this (such as site-specific risk assessment and frac-out risk assessments). Appropriate mitigation measures for HDD are included in the **Framework CEMP [EN010154/APP/7.7].** | **Chapter 9: Water Environment [EN010154/APP/6.1] Framework CEMP [EN010154/APP/7.7].** |
| Environment Agency | Paragraph 3.2.40 and Table 3-1 We need clarity on where the minimum proximity will be measured from in the context of waterbodies or watercourses e.g., most landward extent of the flood defence. We would require more information about the exceptional cases i.e., access tracks, security fencing and/or connection routes. | Noted, buffer distances and points of measurements are outlined in this chapter. | **Chapter 9: Water Environment [EN010154/APP/6.1].** |
| Environment Agency | Paragraphs 10.5.5 and 10.5.6 We would require more information about the proposed open-cut excavation across watercourses. We require an understanding of how the HDD will be achieved without adversely affecting flood defences e.g., a consideration of proximity and vibration. The Applicant may need to assess the rate of erosion at the proposed sections of crossing. | Noted. Watercourse crossings using HDD are assessed in this chapter and mitigation outlined. There will be a minimum 16m buffer between HDD send or receive pits from the landward toe of flood defences. | **Chapter 9: Water Environment [EN010154/APP/6.1].** |
| Environment Agency | Paragraph 3.2.35 We will require clarity on the proposed access routes to be utilised, where there will be modifications or the addition of new access routes (e.g., six-metre-wide route for Heavy Goods Vehicles, 3.5-metre-wide route). It would be helpful | Noted. No ground raising is proposed in areas at risk of fluvial flooding. This has been taken into account in **Chapter 9: Water Environment [EN010154/APP/6.1]** and **Appendix** | **Chapter 9: Water Environment [EN010154/APP/6.1]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
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| | to understand how this may affect the topography and flood storage volume. | **9-C: Flood Risk Assessment [EN010154/APP/6.3]** | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3].** |
| Canal & Rivers Trust | Having reviewed the location of the project and the relationship of the Proposed Development and its associated infrastructure with our network, we do not believe that the proposals as shown would cross land owned or operated by the Trust or impact our interests. Our closest waterways are the River Trent approximately 6.5 km to the west and the Fossdyke Canal approximately 8 kilometres northeast of the site boundary. Should the scheme be amended to potentially affect these waterways we would welcome further consultation on the proposals, so that we can advise about any potential impact for our interests. | The Applicant confirms that the proposals as shown do not cross land owned or operated by the Canal and Rivers Trust or otherwise impact the Trust's interests. The Trust's closest waterways are the River Trent approximately 6.5 km to the west and the Fossdyke Canal approximately 8 km north-east of the DCO Site. Should the Proposed Development be amended to potentially affect these waterways, the Applicant would undertake further consultation on the proposals with the Trust. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |
| Lincolnshire County Council | Water Environment (Chapter 10) A FRA and Drainage Strategy is proposed to be submitted within the ES and nothing has been scoped out. This is acceptable and expected approach. | Noted. | **Chapter 9: Water Environment [EN010154/APP/6.1],** **Appendix 9-B: WFD Assessment**, **Appendix 9-C: Flood Risk Assessment** and **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
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| North Kesteven District Council | With reference to paragraph 10.3.9 and 10.4.2 the (AECOM) NKDC Strategic Flood Risk Assessment (SFRA) (www.n-kesteven.gov.uk/sites/default/files/2023-01/Strategic%20Flood%20Risk%20Assessment%20Report.pdf) should also be referred to in the consideration of local water resources/flood risk guidance. | Noted, all relevant SFRA and other planning documents have been reviewed. Refer to **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3].** | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** |
| North Kesteven District Council | With reference to the grid connection corridor options at 10.5.5, the applicant is reminded that an Anglian Water pipeline is currently under construction in the area through Harmston/Coleby/Navenby Heath. Underground cable connection options need to factor in the location and depth of the pipeline and early discussions with Anglian Water are recommended. | Noted. Consultations with Anglian Water are ongoing and have informed the ES and will continue to be reflected through Statements of Common Ground. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |
| North Kesteven District Council | With reference to paragraph 10.6.13 and 10.6.16, the Scoping Report notes that above ground infrastructure and solar PV panels in the Solar and Energy Storage Park will be located away from areas at risk of fluvial flooding where possible and that development of 'essential infrastructure' in flood zone 1 is acceptable. | Noted. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** |
| North Kesteven District Council | However, in the absence of any indicative layout plans and with reference to the site location plan, parts of the site are within both flood zones 2 and 3 (confirmed by Figure 10-3). Whilst there is in principle a compatibility between essential infrastructure and development in those flood zones, this still presumes that the flood risk sequential test has first been applied and passed. Chapter 10 does not acknowledge the need to apply the flood risk sequential test if any development is proposed in flood zones 2 and 3. | The FRA considers the sequential test and informs the development layout. See **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]**. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
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| North Kesteven District Council | The sequential test search area should align with the search area for 'alternatives' (see above). At present the 'alternatives' search area is potentially very extensive (District/County/Regional) reflective of there presumably being NG substation connections elsewhere. The grid connection strategy has yet to be confirmed for Fosse Green. We would therefore suggest that the scoping opinion cannot/should not specify anything other than an extensive flood risk sequential test alternatives/site selection zone at this stage. Consistent with advice offered initially for other NSIP solar schemes in North Kesteven District, as a minimum this should be set at county level reflective of grid substation connection possibilities elsewhere. | The FRA considers the sequential test and informs the development layout. See **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]**. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** |
| Witham First District Internal Drainage Board | While the supplied Environmental Impact Assessment Scoping Report states minimum offset distances for any proposed construction relative to varying landscape and ecological features in section 3.2.40 / Table 3.1 (Pg 23), it is worth noting that current Byelaws relating to IDB water courses state a minimum clear distance of 9 m should be maintained 'from the top of the watercourse bank' (rather than the watercourse centreline). | Noted, and this has been taken into account during development of the design in order to ensure an adequate buffer between potential construction and operational activity and watercourses across the site (including the Cable Corridor). This is reported in this chapter with a minimum 10m buffer from the top of bank or landward toe of any defence, other than where there are crossings or drainage outfalls. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |
| Witham First District Internal Drainage Board | Within the Board's district for Ordinary Watercourses under the terms of the Land Drainage Act. 1991 the prior written consent of the Board is required for any proposed temporary or permanent works or structures within any watercourse including infilling or a diversion. It is recommended that an access of appropriate width is left adjacent to all watercourse to allow for mechanical maintenance. | Noted. A buffer of 10m has been included around all watercourses, measured from the top of bank or landward toe of any defence, except where crossings are required or drainage outfalls. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| Witham First District Internal Drainage Board | Within Lincolnshire under the provisions of the Flood and Water Management Act 2010, and the Land Drainage Act. 1991, the prior written consent of the Lead Local Flood Authority (Lincolnshire County Council) is required for any proposed works or structures in any watercourse outside those designated Main Rivers and Internal Drainage Districts. Within the catchment draining to the Board's area (extended area) of Upper Witham and Witham First District Internal drainage Board acts as Agents for the Lead Local Flood Authority and as such any works, permanent or temporary, in any ditch, dyke or other such watercourse will require consent from the Board | Noted. The consents and permits that are considered to be required in relation to the Water Environment are included in this chapter. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |

**Table 9-2: Statutory Consultation Responses (Water Environment)**

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| Environment Agency | **A1 New Culverts**<br>**Issue**: There is a potential for new culverts to be constructed as part of the development to facilitate watercourse crossings.<br>**Impact**: Potential impact on flood flows and volumes, resulting in increased flood risk in areas both on and off site.<br>**Solution**: We would object to any new culverts on Main River watercourses. Any Main River crossing would need to be clear span. | There are no new culverts proposed. Existing crossings will be used where possible or otherwise open span bridges. | **Chapter 9: Water Environment [EN010154/APP/6.1]**<br>**Appendix 9-B: WFD Assessment [EN010154/APP/6.3].** |
| Environment Agency | • **A2: Watercourse buffer zone.**<br>• **Issue**: There is uncertainty as to the potential impacts on Main Rivers and associated flood defences. The 10m | As outlined in this chapter, the 10m buffer zone from watercourses is measured from the top of bank, or landward toe of a flood defence, as requested by the Environment Agency. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| | buffer zone should not be measured from the water's edge or channel.<br>• **Impact:** In the absence of a suitably defined buffer zone, there is a risk of structural impacts on flood defences, riverbanks, and habitat. Suitable buffer zones also maintain access to and along watercourses for maintenance purposes. There is a risk we may not be able to grant a flood risk activity permit if potential impacts on Main Rivers/flood defences are not clarified up front.<br>**Solution**: The proposed 10m width buffer zone is considered appropriate, but it should be measured from the top of bank, or the landward toe of a flood defence, rather than the water or channel. This point will vary depending on the presence and nature of any embankments or flood defences. | | **Appendix 9-B: WFD Assessment [EN010154/APP/6.3].** |
| Environment Agency | **A3 Grid Connection Cable and launch pits**<br>• **Issue:** The grid connection cable will be constructed beneath the River Brant and River Witham. It is likely that these will be 5m or greater below bed levels, and that launch pits will be set back 16m and 100m respectively. However, the potential impacts of on these Main Rivers/associated flood defences is unclear.<br>• **Impact:** There is potential impact on the bed and banks of the watercourses which should be minimised through detailed design of the construction works. These works may require a flood risk activity permit (FRAP). If we are unable to understand the potential impacts of the works on Main Rivers/flood defences, there is uncertainty as to whether there are any fundamental issues which would prevent us from granting a FRAP. | The depth of cable installation below each watercourse would be finalised at detailed design based on site specific risk assessment at each crossing location in order to minimise groundwater interactions where practicable. Information will be sought from the Environment Agency on the construction details of the flood defence embankments that may need to be crossed to inform the drilling approach.<br>Mitigation for trenchless crossings and launch pits is outlined in this chapter (Section 9.6). This includes a site-specific Hydraulic Fracture Risk Assessment, continuous monitoring of the water column above the drill path during drilling and send and receive pit excavations for | **Chapter 9: Water Environment [EN010154/APP/6.1]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| | **Solution:** Confirmation will be required of the design and construction methodology for the cable routes under Main Rivers/flood defences. | drilling/boring to be located at least 10m from the watercourse edge, as measured from the top of bank (or 16m from the landward toe of flood defences or 100m for the River Witham where the potential otter holt is located).<br>Once the cable is installed beneath the watercourse the pits and any cable trenches will be backfilled to the original ground level and seeded to reduce the risk of runoff and fine sediments entering the watercourse.<br>Consents and license requirements are also outlined in Section 9.6. | |
| Environment Agency | **A4 Development lifetime**<br>**Issue**: The site has a proposed lifetime of 60 years, however in accordance with relevant national Planning Practice Guidance (PPG), climate change should be assessed for a 75-year period. The Preliminary Flood Risk Assessment (FRA) refers to climate change uplifts to fluvial flows using the 2080's epoch. The results of this modelling has not been presented to provide sufficient consideration of climate change impacts<br>**Impact**: Climate change impacts have not been sufficiently assessed, which could impact the development and the requirement for any mitigation<br>**Solution**: Further work is required in order to show that sufficient allowance for climate change over the lifetime of the development has been assessed. Climate change allowances for fluvial flows using the 2080's epoch have been referred to later within the FRA, and these should give an appropriate assessment. The results of updated | Design life is confirmed in the draft DCO as 60 years. Climate Change is assessed for 100 years for fluvial and pluvial risk, so proposed FRA remains as it is for this assessment. The Environment Agency have been consulted on the approach. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| | modelling should be submitted for review and further comment | | |
| Environment Agency | **A5 Impact of solar panel infrastructure on flood extents**<br>**Issue:** No evidence is provided to qualify the statement that solar panel infrastructure in Flood Zone 3 and 2 is not envisaged to alter the existing flood extents in relation to fluvial flooding<br>**Impact:** Insufficient assessment of the development's impact on fluvial flood risk, which could impact the development or flood risk elsewhere, and any required mitigation.<br>**Solution:** With regards to the alteration of existing flood extents, evidence should be provided to qualify the statement that solar panel infrastructure will not influence flood extents. This could take the form of incorporating the solar panel infrastructure within a hydraulic model to demonstrate the impact or alternatively presenting a volumetric assessment of the volume lost to the design flood level because of solar panel supports | A calculation sheet is included in **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** to reflect the volume the panel legs occupy in the climate change flood extents. With tilting panels having three support legs, at 300mm typical flood depth, 1ha of panels results in approximately 1.5m$^3$ of floodplain loss. Previous NSIP FRAs have been assessed on this basis with it being accepted that 1.5m$^3$ is acceptable as not significant.<br><br>The potential volume loss would be considered to be inconsequential within a hydraulic model, with depth increases of less than 0.5mm across the floodplain – this would be will outside the typical tolerance of a model.<br><br>For this assessment, the 2015 Fluvial model has been applied, re-run with current climate change allowances, with the FRA being tested against the new extents. Extents do not impact the original conservative assessment used in the FRA to use the 1 in 1000 year extent to assess extreme sensitivity for flood risk. Using the current climate change allowance extents, the overall impact on panels is less than currently assessed. The Environment Agency have been consulted on this approach. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| Environment Agency | **A6 Tidal flood risk**<br>**Issue**: The FRA does not satisfactorily take tidal flood risk into account It is stated that the residual risk of tidal flooding is considered low as the River Witham and River Trent are protected up to a 300-year event with an allowance for climate change by the Grand Sluice tidal defence in Boston. The River Trent is not protected by this sluice, however<br>**Impact**: Inaccurate information with regards to the protection of tidal flooding by Grand Sluice for the River Trent. Therefore, the flood risks posed by the development have not been satisfactorily assessed<br>**Solution**: Please correct the text within the Preliminary Flood Risk Assessment which suggests the River Trent is protected by the Grand Sluice | The **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** has been updated to reflect tidal assessment. The further assessment does not impact FRA outcomes since the PEI Report at statutory consultation. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3].** |
| Environment Agency | **A7 Witham Washlands Flood Storage Area**<br>**Issue**: The flood risks posed by the development in relation to Witham Washlands Flood Storage Area (FSA), which is designated functional floodplain, has not been satisfactorily assessed. Whilst the main solar panel infrastructure part of the development is outside the Witham Washlands area, the grid connection cable area does fall within this area and has not been considered.<br>**Impact**: Flood depths within the Witham Washland FSA are likely to be significant during times of flooding. This could impact on construction activities associated with the cable route, which has not been considered. | Flood protection measures are included in the **Framework CEMP [EN010154/APP/7.7]**. No permanent above ground infrastructure is located in this area. | **Framework CEMP [EN010154/APP/7.7].** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| | **Solution**: Take into account the construction of the cable route within Witham Washlands FSA and demonstrate that this would not increase the risk of flooding on/off site | | |
| Environment Agency | **A8 West Brant Syke (Main River)**<br>**Issue**: The Main River, West Brant Syke, has not been identified as crossing the site boundary.<br>**Impact**: Flood risk could be underestimated, and the consideration of any works requiring flood risk activity permits could be overlooked.<br>**Solution**: Please consider and acknowledge the flood risk associated with all Main Rivers which cross the site, including West Brant Syke | The 2015 hydraulic model includes West Brant Syke and it is noted on the flood defences in the **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** and flood risk has been assessed for all modelled extents. However, the FRA has been amended to make it clearer the West Brant Syke is included in the assessment. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3].** |
| Environment Agency | **A9 Solar panel structures: impact on flood flows / flood storage**<br>**Issue**: Whilst the majority of solar panels and associated infrastructure will also be located within Flood Zone 1 (low probability of flooding), some solar panels will be within Flood Zone 3 (high probability of flooding) and Flood Zone 2 (medium probability of flooding).<br>**Impact**: Any development, including solar panels, within Flood Zones 2 and 3 may result in an impact on floodplain storage capacity and flood flows, therefore potentially impacting flood risk elsewhere<br>**Solution**: Solar panels are located within areas at risk of flooding over the lifetime of the development, an assessment of potential impact of infrastructure i.e. panel supports, on flood storage should be undertaken. Any loss of floodplain as a result of the development, will need to be compensated within the development site | A calculation sheet is included in **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** to reflect the volume the panel legs occupy in the climate change flood extents. With tilting panels having three support legs, at 300mm typical flood depth, 1ha of panels results in approximately 1.5m$^3$ of floodplain loss. Previous NSIP FRAs have been assessed on this basis with it being accepted that 1.5m$^3$ is acceptable as not significant.<br><br>For this assessment, the 2015 Fluvial model has been applied, re-run with current climate change allowances, with the FRA being tested against the new extents. Extents do not impact the original conservative assessment used in the FRA to use the 1 in 1000 year extent to assess | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3].** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| | | extreme sensitivity for flood risk. Using the current climate change allowance extents, the overall impact on panels is less than currently assessed. The Environment Agency have been consulted on this approach. | |
| Environment Agency | **A10 Fluvial flood risk: climate change allowances**<br>**Issue**: Incorrect climate chance allowances have been used. The impact of climate change on fluvial flood risk has therefore not been satisfactorily taken into account<br>**Impact**: Flood risk could be underestimated if the correct climate change allowances are not used. The use of incorrect climate change allowances could have implications for site design and layout.<br>**Solution**: The applicant should update the 2015 model to account for the latest climate change allowances for the Witham Management catchment for the 2080's epoch. As the development would be classed as 'essential infrastructure' both the higher central and upper climate change allowances should be used for the 2080s epoch. The higher central allowance would form the design scenario, and the upper allowance would act as a sensitivity test. This updated modelling and the outputs should be supplied to the Environment Agency for review, as soon as possible. | • Noted – The 2015 model has been re-run to include current climate change allowances. The FRA has been updated to assess flood risk with revised climate change extents. The outcomes are not altered – no additional mitigation is required.<br>•<br>A fluvial model update technical note has been prepared and is appended to the FRA and the Environment Agency have been consulted on the note during preparation of the **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3].** | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** |
| Environment Agency | **A11 Mill Dam Dyke: catchment details**<br>**Issue**: Catchment detail is missing; correct catchment outlet co-ordinates are not presented in the Preliminary FRA. Please see Additional explanation below. | • A technical note was prepared and issued to the EA and is appended to **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]**.<br>•<br>• Coordinates and a figure of the location are provided in technical note. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| | **Impact**: It is therefore difficult to appraise the flow estimation calculations provided and the hydrological calculations within the Preliminary FRA. As such, we cannot verify the conclusions made<br>**Solution**: Please include the grid reference to the catchment outlet in the FRA, so that appropriate checks on the calculated design flows can be undertaken. Please also include a map of the catchment | • <br>• | |
| Environment Agency | **A12 – Mill Dam Dyke: upstream analysis location**<br>**Issue**: It is unclear where the analysis location is upstream of Mill Dam Dyke regarding the runoff discharge rate to this catchment.<br>**Impact**: Whilst the calculated flows for Mill Dam Dyke presented in Table 9 of the Preliminary FRA appear conservative, it is difficult to fully appraise the hydrological calculations within the assessment.<br>**Solution**: Please provide a grid reference and map with the FRA for the analysis location, as it is not clear where this is. | • A technical note was prepared and issued to the EA and is appended to **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]**.<br>•<br>• Coordinates and a figure of the location are provided in technical note. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** |
| Environment Agency | **A13 Mill Dam Dyke: channel cross-section**<br>**Issue**: It is not clear where the cross-section of Mill Dam Dyke, as presented in Plate 11, has been taken from. It is therefore difficult to cross check the channel profile and the associated level calculations presented in Table 12 against the LiDAR data. Furthermore, no units of elevation or chainage information is provided for the cross-section in Plate 11. The channel profile looks very uniform and “trapezoidal” for a natural river channel. | • A technical note was prepared and issued to the EA and is appended to **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]**.<br>•<br>• The channel profile has been revised to the LiDAR assessed profile with most recent LiDAR data to provide a narrow base to the channel. Calculations have been revised for new profile within the technical note. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| | **Impact**: It is difficult to fully appraise the level calculations presented in Table 12 of the Preliminary FRA, as the cross-section location is not presented<br>**Solution**: Please provide the location of the cross section shown in Plate 11. Furthermore, please include units of chainage and elevation for Plate 11 within the FRA | | |
| Environment Agency | **A14 Field 61 (solar panel area)**<br>**Issue**: This section notes that there are no solar panels within Flood Zone 3b or Flood Zone 3a, however, the northwestern edge of Field 61 appears to encroach into Flood Zone 3a (Plate 15: 2015 Model Fluvial Flood Extents Field 57, 61, 62).<br>**Impact**: Flood risk to solar panels in Field 61 could be underestimated.<br>**Solution**: Please double check the statement in section 4.3.24 (page 50) of the Preliminary FRA. Please confirm if it is correct that all solar panel areas are outside of Flood Zone 3a, particularly considering Field 61 in Plate 15 appears to intersect Flood Zone 3a | Flood Zone areas have been checked and **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** updated accordingly. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** |
| Environment Agency | **A15 Estimated flood depths**<br>**Issue**: The analysis presented in Table 13 regarding estimated flood depths for the 0.1 % (1 in 1000) annual exceedance probability (AEP) flood is useful. However, this analysis should be cross checked against the updated hydraulic model runs, which include the 57% climate change scenario, to ensure the assessment of credible maximum flood depths is robust | • The levels in this area are almost exactly the same or less than the 1 in 1000 year extent. However, **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** has been updated to reflect the assessment with the current allowances, to confirm current and future flood risk as appropriately assessed. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3].** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| | **Impact**: Flood depths and therefore flood risk could be underestimated if climate change impacts are not adequately taken into account.<br>**Solution**: Please cross check the estimated flood depths presented in Table 13 (page 54) with the 1% (1 in 100) AEP 57% climate change scenario from updated hydraulic model runs once available | | |
| Environment Agency | **A16 Solar panel flood risk mitigation**<br>**Issue**: Solar panels are noted to be set 800mm above ground level across the site. The exception to this is at Field 55, where flood depths are greater, and an additional 250mm freeboard has be applied to raise the panels at this location<br>**Impact:** This is considered appropriate mitigation where panels are located within areas at risk of flooding, however this will need to be checked once updated climate change flood scenarios have been modelled<br>**Solution**: Updated data and confirmation of mitigation measures should be provided in an updated FRA | Noted and agreed. **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** has been updated for this section and there is no difference to the proposed mitigation for minimum panel height in this area. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3].** |
| Environment Agency | **A17 – Flood defence assets: assessment of construction activities**<br>**Issue**: The FRA identifies flood defences along the River Witham and River Brant and notes the defence type and standard of protection. This is presented in the context of potential breach and likely flood impact. Further detail should be provided for relevant flood defence assets in order to assess potential impacts from construction activities. | This chapter and **Framework CEMP [EN010154/APP/7.7]** include appropriate mitigation measures for trenchless crossings of the River Witham and River Brant, the send and receive pit excavations for drilling/boring will be located at least 16m from the landward toe of flood defences (or 100m for the River Witham where the potential otter holt is located).<br><br>The FRA has not considered the likelihood of a defence failure along with the construction | **Chapter 9: Water Environment [EN010154/APP/6.1]**<br>**Framework CEMP [EN010154/APP/7.7]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| | **Impact**: Construction activities, proposed cable routes, and horizontal drilling under watercourses has potential to impact the structural integrity of existing flood defences and the banks and bed of watercourses.<br>**Solution:** The FRA should provide further detail on the types of flood defence impacted by the development, including details of construction and current condition. This will allow assessment of potential impacts to defences from construction activities, particularly proposed cable routes and horizontal drilling under watercourses. | details, other than they are assumed to be well maintained defences. We consider the failure a residual risk for flood risk (in an extreme event they will be overtopped anyway, the 2015 model corroborates this). As only cable routes will cross beneath defences, the **Framework CEMP** includes detail of crossings and mitigation. | |
| Environment Agency | **A18 Anglian River Basin District: sea level rise**<br>**Issue**: In relation to the sea level rise estimates, the predicted climate change water levels are based on the 1% (1 in 100) AEP tidal scenario rather than the 0.5% (1 in 200) AEP tidal scenario.<br>**Impact**: The calculations seem reasonable, however as the incorrect starting scenario has been used, tidal flood risk could be underestimated.<br>**Solution**: This section notes that a sea level rise of 1026.4mm would provide a predicted peak flood level of 7.07 metres above Ordnance Datum (mAOD). Within Annex A it appears that coastal node 3994 has been used. This node is located at the outfall of the Boston Barrier in the Wash. The confidence interval 2 “C2” level appears to have been used for the 1% (1 in 100) AEP scenario. Technically, as we are considering tidal flood risk here the 0.5% (1 in 200) AEP tide should be considered. For the C2 scenario this is 6.28mAOD. | Noted. 1 in 100 year was used due to scheme design life and development type and location; however, **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** has been updated to reflect correct catchments for the Boston barrier and the River Trent sea level rise impacts. Use of the 1 in 200 year level of 6.28m results in 200mm increase in panel mitigation in field 55 (i.e. minimum height of panels set to 8.30m AOD); no other mitigation is required. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| Environment Agency | **A19 Humber River Basin District: sea level rise**<br>**Issue**: In relation to the sea level rise estimates, the predicted climate change water levels are based on the 1% (1 in 100) AEP tidal scenario rather than the 0.5% (1 in 200) AEP tidal scenario.<br>**Impact**: Whilst this suggests tidal flood risk could be underestimated, the impact of this on the Mill Dam Dyke catchment is likely to be minimal, given how the land raises towards the development site. However, incorrect information affects the validity of this part of the FRA.<br>**Solution**: For completeness the calculations should be updated to reference the 0.5% (1 in 200) tidal scenario. However, we consider the impacts will not be significant for the development site, but this is for the FRA to adequately demonstrate. | As per response to **A18** – however no additional mitigation required for fields in this catchment. Refer to **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** for further details. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** |
| Environment Agency | **D1 Watercourse reinstatement**<br>• **Issue**: Watercourses to be reinstated as found.<br>• **Impact**: In the letter of the legislation, the Water Framework Directive (WFD) covers all surface waterbodies. Biodiversity net gain (BNG), when it becomes mandatory for National Significant Infrastructure Projects (NSIPs), will require a minimum of 10% up-lift in condition. Watercourses may be in poor condition to start with and reinstating to previous condition may impact intention to up-lift status of waterbodies.<br>**Solution**: Enhancing the condition of the waterbodies following crossing operations will be beneficial to the watercourse and may also facilitate on-site opportunities for uplift. | Where intrusive works may be required (e.g. open-cut cable installations) the watercourse will be reinstated and opportunities taken to enhance the quality of each affected length of waterbody. A WFD Mitigation and Enhancement Strategy will be produced post consent, which will outline potential opportunities for the affected lengths with reference to a Pre-Works Riparian and Hydromorphological Survey. Further details are given in this chapter and **Appendix 9-B: WFD Assessment [EN010154/APP/6.3].** | **Chapter 9: Water Environment [EN010154/APP/6.1]**<br>**Appendix 9-B: WFD Assessment [EN010154/APP/6.3]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| Environment Agency | **E1 Source Protection Zone 3**<br>**Issue**: The cable route passes through a Groundwater Source Protection Zone 3, but this is not mentioned in the list of Existing Conditions. The Source Protection Zone (SPZ) 3 has not been listed as a receptor.<br>**Impact**: If sensitivity of the site is based on this list, then the SPZ might be missed, and insufficient controls be put in place to protect this receptor.<br>While the embedded mitigation for the Principal bedrock aquifer would also be sufficient to manage impacts to the SPZ, the SPZ is an important receptor in its own right and should be acknowledged separately to avoid being missed in future reports.<br>**Solution**: Include the SPZ3 as a receptor in its own right in all such lists in future reports and mitigation plans. | The SPZ3 is mapped in Figure 9-2 and has been separated out as an individual receptor within this chapter. | **Chapter 9: Water Environment [EN010154/APP/6.1]**<br>**Figure 9-2 Groundwater Features and Attributes [EN010154/APP/6.2]** |
| Environment Agency | **E3 Inconsistencies / inaccuracies: geological setting descriptions**<br>**Issue**: Various inconsistencies and inaccuracies with the descriptions of the geological setting.<br>**Impact**: If the site setting has not been correctly characterised, details, receptors, and potential impacts may be missed. The designs may not be suitable for the ground conditions.<br>**Solution**: Review geological maps and update this information in future documents and plans | Noted. The geological setting has been revised within this chapter where relevant based on the detailed EA comments. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |
| Environment Agency | **E4 Consideration of groundwater levels**<br>**Issue**: Chapter 9 (Water Environment) - Groundwater levels in the region are discussed, along with SPZs within the site and nearby, but no conclusions are made. | Noted. An assessment of potential impacts to SPZ3 has been included within this chapter. It is confirmed that groundwater levels will be considered further at the detailed design stage | **Chapter 9: Water Environment [EN010154/APP/6.1]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| | **Impact**: The impact of the development on groundwater and SPZs is unclear, as the information has not been adequately considered. Groundwater levels may affect design and placement of infrastructure. Shallow groundwater and shallow aquifers may be more susceptible to infiltration of contaminants, so additional protection may be required.<br>**Solution**: Groundwater levels to be considered further at the design stage. We recommend that groundwater level monitoring and chemical characterisation is included in the proposed intrusive ground investigation works (Appendix 14-B 15.1.2). | and groundwater level monitoring and chemical characterisation will be included in the scope of works for the ground investigation. Good practice measures for management of potential impacts to groundwater are also outlined in the **Framework CEMP [EN010154/APP/7.7]**. | |
| Environment Agency | **E5 Underground cabling / components left in situ**<br>**Issue**: It is proposed that Grid Connection and Onsite cabling might be left in situ indefinitely at decommissioning.<br>**Impact**: Cables and components are expected to break down over longer periods of time (that is, beyond the operational design life). Potentially contaminative compounds within cables and cable housing may leach into soils and groundwater over decades after decommissioning. This is a particular concern in SPZs and Principal aquifer designations.<br>**Solution**: Our preference is for all cables and subsurface infrastructure to be removed where they are within SPZs or Principal aquifer. Where cables are left in situ, we recommend that cable ends and junctions are sealed to reduce the impact of deterioration and interaction with groundwater over time. Guidance should be sought prior to | As recommended by the Environment Agency, guidance will be sought prior to commencement of decommissioning to identify the good practice recommendations at that time. There is a commitment to removing any cables within SPZs or Principal Aquifer as outlined within this chapter. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| | commencement of decommissioning to identify the best practice recommendations at that time. | | |
| Environment Agency | **E6 Proposed limited intrusive ground investigation**<br>**Issue**: There is a lack of clarity and detail regarding the proposed limited intrusive ground investigation.<br>**Impact**: The resulting ground investigation may be inadequate and therefore fail to satisfactorily demonstrate that the risks of pollution to controlled waters have been understood or provide adequate mitigation for these risks.<br>**Solution**: Satisfactory information should be provided to demonstrate that the risk to controlled waters has been fully understood and can be addressed through appropriate measures. | It is confirmed that groundwater levels will be considered further at the detailed design stage and groundwater level monitoring and chemical characterisation will be included in the scope of works for the ground investigation. This is secured via the **Framework CEMP [EN010154/APP/7.7]**. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |
| Environment Agency | **E9 Mitigation: groundwater**<br>**Issue**: Framework CEMP - Mitigation to protect controlled waters includes no works within 10 metres of watercourses. This does not protect groundwater or mitigate against infiltration to groundwater bodies, as this can happen anywhere with permeable soils.<br>**Impact**: Site workers may not consider or understand the risks to groundwater when working away from watercourses.<br>**Solution**: The good practice guidance referred to in this section may be sufficient to mitigate against the risks. We recommend no fuel storage, refuelling, or vehicle washing in SPZ3 or Principal aquifer unless essential. If fuel storage and similar is necessary in these locations, ensure it is fully bunded. | The recommendations regarding no fuel storage, refuelling, or vehicle washing in SPZ3 or Principal aquifer unless essential, and fully bunding fuel storage in these locations are included in **Framework CEMP [EN010154/APP/7.7]**. | **Framework CEMP [EN010154/APP/7.7]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| Environment Agency | **F1 Water supply**<br>**Issue**: Water supply has potentially been scoped out prematurely from the environmental impact assessment. This is based on the assumption that Anglian Water are able to supply all construction and operational supply needs.<br>**Impact**: Anglian Water may not be able to supply non-potable and non-domestic uses of water. Other sources of water may need to be explored, which have different impacts on the environment and have different implications for construction and operational design and processes.<br>**Solution**: We recommend that a basic water supply strategy is produced as part of the Environmental statement which includes all demands for water identified by the project. It should provide estimates of quantities likely to be required. In the event of Anglian Water being unable to supply such quantities, this assessment should also provide an options appraisal of alternative sources of supply. This will provide an opportunity to anticipate any obstacles to water supply such as potential licence restrictions affecting availability and will help to expedite the permitting process later on. | A Water Resources Assessment was submitted to Anglian Water outlining water requirements for the Proposed Development. Further details of water supply requirements for the construction and operational phases are outlined within this chapter. Anglian Water confirmed on 28 May 2025 that they are able to meet all of the Proposed Development's requirements (both domestic and non-domestic) during construction and during operation. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |
| Environment Agency | **F2 Consumptive uses of water**<br>**Issue**: Not all consumptive uses of water have been evaluated fully in consideration for water demands and supply options.<br>**Impact**: Dust suppression and bentonite clay mixing for Horizontal Directional Drilling (HDD) have not been evaluated as requiring a source of supply but are known | A Water Resources Assessment was submitted to Anglian Water outlining water requirements for the Proposed Development. Further details of water supply requirements for the construction and operational phases are outlined within this chapter. Anglian Water confirmed on 28 May 2025 that they are able to meet all of the Proposed Development's requirements (both | **Chapter 9: Water Environment [EN010154/APP/6.1]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| | often to require significant volumes and in some cases incur high losses to the environment.<br>**Solution**: We recommend that a basic water supply strategy is produced as part of the Environmental Statement which includes all demands for water identified by the project. It should provide estimates of quantities likely to be required. In the event of Anglian Water being unable to supply such quantities, this assessment should also provide an options appraisal of alternative sources of supply. This will provide an opportunity to anticipate any obstacles to water supply such as potential licence restrictions affecting availability and will help to expedite the permitting process. | domestic and non-domestic) during construction and during operation. | |
| Anglian Water | AWS disagrees that water supply can be scoped out (page 9-9).<br>9.4.17. The demand for 1,500m$^3$ of potable water for construction plus 500m$^3$ for wheel washers and 25,000m$^3$ for concrete production would require the submission of a WRA to AWS and the inclusion of the WRA in the ES. The project should consider whether the GHG emissions from transporting the water by tanker and indeed off-site concrete production would be less than the provision of a mains supply and the associated on site works to build a concrete batching plant, for example. | A Water Resources Assessment was submitted to Anglian Water outlining water requirements for the Proposed Development. Further details of water supply requirements for the construction and operational phases are outlined within this chapter. Anglian Water confirmed on 28 May 2025 that they are able to meet all of the Proposed Development's requirements (both domestic and non-domestic) during construction and during operation. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |
| Anglian Water | 9.4.18. Potable water supplies for the operational stage for welfare/ domestic use would appear to not be significant. If a mains water supply is required, then the staff accommodation should be located near to an existing water connection to reduce the environment impact of a new connection. | During the operational phase, the Proposed Development will be serviced by a nominal number of staff (up to four permanent staff per day). A new mains connection is required adjacent to the Warehouse storage building and | **Chapter 9: Water Environment [EN010154/APP/6.1]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| | | Control building, which is alongside existing Anglian Water mains supply. | |
| Anglian Water | 9.4.19. A 200m$^3$ supply of water for cleaning purposes, whether from a connection on site or at an existing non-domestic supply point should be assessed using a WRA in the EIA. | A Water Resources Assessment was submitted to Anglian Water outlining water requirements for the Proposed Development. Anglian Water confirmed on 28 May 2025 that they are able to meet all of the Proposed Development's requirements (both domestic and non-domestic) during construction and during operation. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |
| Anglian Water | 9.4.20. On the face of the statement, although this conflicts with other information in the consultation, the Fosse Green project does not plan to seek an operational water supply and connection for the sites. If all water is to be brought to the site, then the WRA will need to completed which identifies the offsite source if that supply is one which is or will be provided by AWS. | A Water Resources Assessment was submitted to Anglian Water outlining water requirements for the Proposed Development. Anglian Water confirmed on 28 May 2025 that they are able to meet all of the Proposed Development's requirements (both domestic and non-domestic) during construction and during operation. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |
| Anglian Water | 9.4.21. AWS welcomes confirmation that there will be no connection to the public sewer network for either construction or operational stages. AWS will require the provision for such connections to be removed from the draft DCO. | Noted, the undertaker proposes to deal with this through the negotiation of the protective provisions with AWS. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |
| Anglian Water | 9.4.22 On the basis that construction stage activities such as concrete production has no requirement for an on-site wastewater connection, AWS is content that Foul Water can be scoped out of the EIA. This would also then require the removal from the draft DCO of the right to connect to the public sewer network. Should the project's identification and assessment of the impact on the existing sewer network | Noted, and foul water remains scoped out of the assessment presented in this chapter. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| | result in the need for pipe relocation and protection then Foul Water would need to be scoped in. | | |
| Anglian Water | 9.4.25 onwards. We note that the potential impact of pollution to watercourses from construction activities breaking sewer pipes has not been explicitly considered. | The **Framework CEMP [EN010154/APP/7.7]** ensures that good construction practice will be followed, and utilities searches and surveys will be undertaken to mitigate this risk. | **Framework CEMP [EN010154/APP/7.7]**<br>**Chapter 9: Water Environment [EN010154/APP/6.1]** |
| Anglian Water | 9.6.11 The statement at f. contradicts the previous assertion that no public sewer connection is required by the project. | This statement has been amended to remove the public sewer connection and thus remove the contradiction. | **Chapter 9: Water Environment [EN010154/APP/6.1]** |
| Anglian Water | Entry 13 refers to the Anglian Water pipeline from Lincoln to Grantham. AWS considers that the two projects would not have significant cumulative impacts as the AWS pipeline construction will be completed in or about September 2026, before the Fosse Green project could receive consent. AWS considers the AWS Swinderby WRC should be listed in the Fosse Green projects list of foreseeable projects for assessment by Fosse Green.<br>A further 17 AWS investment projects planned for 2025 to 2030 (AMP8) are within or near to the Fosse Green project sites. | Noted, and the list of cumulative impacts has been updated within this ES. Refer to **Chapter 15: Cumulative Effects and Interactions [EN010154/APP/6.1]** for details of the long list and shortlisting process. The cumulative effects assessment is included in Section 9.10 of this chapter. | **Chapter 15: Cumulative Effects and Interactions [EN010154/APP/6.1]** |
| Lincolnshire County Council | LCC notes that the majority of the proposed site lies within flood zone 1, although areas of flood zone 2 and 3 associated with the River Witham floodplain, Mill Dam Dyke and the River Brant floodplain are within the proposed red line boundary. LCC considers that flood risk has been adequately addressed within Chapter 9 of the PEIR. | Noted. Refer to **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** for an updated version of the FRA. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| Lincolnshire County Council | LCC notes that the water environment has been adequately considered and welcomes the embedded mitigation measures proposed. LCC notes the Preliminary Flood Risk Assessment (Appendix 9-C) and the Preliminary Surface Water Drainage Strategy (Appendix 9-D) prepared as part of the PEIR documentation and welcomes further engagement on the design and of the project relating to flood risk and drainage design. | Noted. Refer to **Chapter 9: Water Environment [EN010154/APP/6.1],** **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** and **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]** for an updated version of the proposed mitigation, FRA and drainage. | **Chapter 9: Water Environment [EN010154/APP/6.1]** **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]** |
| North Kesteven District Council | The Preliminary Flood Risk Assessment (FRA), at paragraph 6.1.2 concludes that the sequential and exception tests have been carried out to fulfil the requirements of EN-1 and the NPPF.<br>Paragraphs 2.2.42-50 describe the requirements of the sequential and exception tests but do not apply them. Indeed, paragraph 2.2.50 states that the sequential approach in selecting the location of the site for the Proposed Development will be set out in the ES and the planning Statement, to be submitted as part of the DCO application.<br>Paragraph 6.1.10, at the end of the section on The Sequential Test and Exception Test concludes with the same conclusion set out in paragraph 2.2.50. There appears to be an inherent contradiction between paragraph 6.1.2 and the conclusions in paragraphs 2.2.50 and 6.1.10. | Noted. Refer to **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** for the updated version of the FRA. Further explanation regarding the sequential and exception tests are given within Appendix 9-C. | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| North Kesteven District | Paragraph 6.1.4 explains that the site selection process took account of wider planning and environmental matters but does not mention the Sequential Test. Paragraph 6.1.6 explains that a sequential 'approach' has been applied to the layout and design of the Principal Site whereby the on-site substation, BESS and the majority of the solar PV arrays located in areas with the lowest risk of flooding from any source. Paragraph 6.1.7 explains that there would be ecological benefits which would meet the exception test. None of these paragraphs can purport to demonstrate compliance with the requirements of EN-1 and the NPPF in respect of the sequential test.<br>As a result, it appears that neither the Sequential Test nor the Exception Test for flood risk has been carried out in order to inform the site selection process.<br>Paragraph 5.8.10 of EN-1 states that 'the Exception Test is only appropriate for use where the Sequential Test alone cannot deliver an acceptable site. It would only be appropriate to move onto the Exception Test when the<br>Sequential Test has identified reasonably available, lower risk sites appropriate for the proposed development where, accounting for wider sustainable development objectives, application of relevant policies would provide a clear reason for refusing development in any alternative locations identified'.<br>Paragraph 5.8.11 of EN-1 then confirms that both elements of the Exception Test will have to be satisfied for development to be consented. To pass the Exception Test it should be demonstrated that: | Noted. Refer to **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** for the updated version of the FRA. Further explanation regarding the sequential and exception tests are given within Appendix 9-C.<br>Flood risk figures are provided in **Figures 9-3 and 9-4 [EN010154/APP/6.2**], as well as those embedded within the **FRA.** | **Appendix 9-C: Flood Risk Assessment [EN010154/APP/6.3]** |

| Consultee | Summary of comment | How matter has been addressed | Location of response |
|---|---|---|---|
| | • the project would provide wider sustainability benefits to the community that<br>outweigh flood risk; and<br>• the project will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible will reduce flood risk overall.<br>Whilst footnote 216 references the inherent benefit of renewable energy schemes in the context of applying the Exception Test, the PEIR does not draw together benefits in a coherent way. The applicant is encouraged to further develop and highlight the 'benefits to the community' (that can be delivered through the DCO itself) in the ES and DCO application.<br>In addition, we recommend that a figure is produced with overlays the areas of solar arrays, solar stations, BESS and onsite substation across the flood risk information to better appreciate how the scheme design has sought to avoid areas of high flood risk. | | |

9.3.3 Additional engagement has been undertaken with key stakeholders including the Environment Agency, Anglian Water, and Upper Witham Internal Drainage Board (IDB) and Trent Valley IDB. The matters discussed included the assessment methodology, the scope of the baseline surveys presented in the PEI Report, the PEI Report outcomes and statutory consultation feedback.

9.3.4 A summary of these additional engagement events is presented in **Table 9-3**.

**Table 9-3: Additional Engagement Events (Water Environment)**

| Consultee | Date / Method | Summary of Consultation |
|---|---|---|
| Upper Witham IDB, Trent Valley IDB | 26/11/24 Online meeting | A meeting to discuss the outcomes of the PEI Report and next steps. Topics included mitigation to protect IDB watercourses, drainage, flood risk and protection of land drains. Outcomes have been incorporated into this chapter where appropriate. |
| Environment Agency | 02/10/24 Online meeting | A meeting to discuss flood risk, particularly the fluvial model approach for the PEI Report, and methodology and requirements for the FRA at ES stage. There was also discussion regarding the Mill Dam Dyke fluvial assessment, sea level rise. Outcomes have been incorporated in **Appendix 9-C: FRA [EN010154/APP/6.3]** where appropriate. |
| Environment Agency | 28/02/25 Online meeting | A meeting to discuss statutory consultation responses relating to flood risk. Topics discussed included the Proposed Development design life, fluvial model updates, discussion regarding panel supports and their impact on flood risk and Mill Dam Dyke. Outcomes have been incorporated in **Appendix 9-C: FRA [EN010154/APP/6.3]** where appropriate. |
| Environment Agency | 06/03/25 Online meeting | A meeting to discuss statutory consultation responses relating to waste, aquatic ecology, biodiversity and water environment. Water environment topics discussed included watercourse crossing requirements and mitigation, watercourse buffer zones, construction methodologies for cable routes, groundwater protection and water resources, including the need for a water supply assessment. |

| | | | |
|---|---|---|---|
| Anglian Water | 29/04/25 | Online meeting | A meeting to discuss the Water Resource Assessment requirements, which at the time of the meeting were being considered by the pre-planning team. Further checks to be undertaken to identify any conflict between Anglian Water utilities and infrastructure and the Proposed Development. Also discussed that foul water connection not required; new mains connection required at the Maintenance and Welfare Building and the **Framework Surface Water Drainage Strategy (Appendix 9-D, [EN010154/APP/6.3])** development. |

9.3.5 A freedom of information request was issued to the Environment Agency on 18 April 2023 to receive baseline information and data relating to water resources, water quality, flood risk and WFD classification and investigations. A response was received on 17 May 2023 (Reference RFI/2022/275414). This data has been used to inform the baseline conditions presented in **Section 6.5**.

9.3.6 North Kesteven District Council was contacted to provide details of Private Water Supplies (PWS) within the Study Area. A response was received on 20 August 2024 and has been used to inform the baseline in **Section 6.5**.

## 9.4 Assessment Methodology

9.4.1 This section sets out the scope and methodology for the assessment of the impacts of the Proposed Development on the Water Environment.

### Study Area

9.4.2 For the purposes of this assessment, a general Study Area of 1km around the Site has been considered in order to identify water bodies that are hydrologically connected to the Proposed Development and have the potential to be directly impacted by the activities associated with the Proposed Development. This Study Area is shown in **Figure 9-1: Surface Water Features and their Attributes [EN010154/APP/6.2]**.

9.4.3 Watercourses flow and so water quality and flood risk impacts may propagate downstream. As such, water environment impact assessments will sometimes consider a wider Study Area extending to as far downstream as a potential impact may influence the quality or quantity of the water body or water dependent designated nature conservation site. In this case, watercourses across the Study Area drain towards the River Witham and the Fleet, and so these are considered the final receiving water bodies that could conceivably be affected (and which are within 1km of the DCO Site). As such, a 1km buffer around the DCO Site is considered appropriate for the Study Area.

## Methodology

9.4.4 This section describes the methodology used for the assessment of effects of the Proposed Development on the water environment, including the criteria for the determination of the importance of the receptor and the magnitude of change from the baseline conditions. Potential impacts of the Proposed Development on the water environment will be assessed by:

a. Considering the existing (baseline) status of the water environment within the Proposed Development and relevant surrounds with respect to flood risk, surface water, groundwater and drainage, following the source-pathway-receptor approach;

b. Identifying potential impacts of the Proposed Development on the water environment during the construction and operational phases including maintenance, as well as cumulative effects. Potential impacts from the decommissioning of the Proposed Development are considered to be similar in nature to those during construction, as some groundwork would be required to remove infrastructure installed (potentially including cables, although the option of cables remaining in-situ is also a possibility). As such, decommissioning impacts are considered the same as construction as a worst case, given implementation of a detailed Decommissioning Environmental Management Plan (DEMP). A **Framework DEMP [EN010154/APP/7.9]** has been prepared and submitted with the DCO application;

c. Proposing suitable mitigation measures to be incorporated into the development design, construction, operation and decommissioning to avoid, prevent, minimise or offset any adverse impacts (i.e. embedded and additional mitigation); and

d. Reviewing any residual impacts.

## Sources of Information

9.4.5 The following sources of information have been used to inform the baseline and assessment presented within this chapter:

a. Online Ordnance Survey (OS) maps viewed to identify any surface water bodies within 1km of the DCO Site (Ref 9-35);

b. Online aerial photography (Ref 9-36);

c. Anglian River Basin District RBMP (Ref 9-31);

d. Environment Agency Catchment Data Explorer website (Ref 9-37);

e. Environment Agency Public Registers website – Environmental Permitting Regulations – Discharges to Water and Groundwater (Ref 9-38);

f. National Soil Resources Institute Soilscapes website (Ref 9-39);

g. Defra's Multi Agency Geographical Information for the Countryside (MAGIC) map website; (Ref 9-40);

h. National River Flow Archive (NRFA) website (Ref 9-41);

i. Natural England website for designated sites (Ref 9-42);
j. British Geological Survey (BGS) Geoindex website (Ref 9-44);
k. Met Office website (Ref 9-45);
l. BGS Borehole and Geology Mapping (Ref 9-46); and
m. Environment Agency Online Interactive Maps (Ref 9-47):
    i. Flood map for planning (rivers and sea);
    ii. Risk of flooding from surface water;
    iii. Risk of flooding from reservoirs; and
    iv. Flood warning areas and risk.
n. Environment Agency information on water resources (e.g. water activity permits, abstraction licenses and pollution incidents).
o. Local Authority information on private water supplies.

9.4.6 **Appendix 9-C: FRA [EN010154/APP/6.3]** provides further details of relevant catchment and flood risk data, and flood risk desktop survey information.

## Scope of the Assessment

9.4.7 The following potential impacts have been agreed to be considered as part of the EIA for the Proposed Development for which an assessment is provided Section 6.7 of this chapter.

9.4.8 During the construction phase the following impacts may occur and will be assessed:

a. Pollution of surface water or groundwater (and any designated ecology sites that are water dependent) due to deposition or spillage of soils, sediments, oils, fuels, or other construction chemicals, or through uncontrolled site run-off including dewatering of excavations or piling;
b. Temporary impacts on the hydromorphology of watercourses (e.g. from open-cut watercourse crossings and temporary vehicle access crossings as may be required). Temporary access from vehicles has been assessed as part of the overall construction activities taking place;
c. The need for a supply of water for construction activities;
d. Potential impacts on groundwater resources and local water supplies (licenced and unlicenced (private) abstractions);
e. Potential impact to baseflow to watercourses from temporary dewatering of excavations or changes in hydrology; and
f. Temporary changes in flood risk from changes in surface water runoff (e.g. disruption of stream flows during any potential watercourse crossing construction works), and exacerbation of localised flooding, due to deposition of silt, sediment in drains, ditches; and construction of the Solar PV Panels, Battery Energy Storage System (BESS) and associated infrastructure.

9.4.9 During decommissioning activities, potential impacts from the decommissioning of the Principal Site are similar in nature to those during construction, as some ground works would be required to remove infrastructure installed. Buried cables would either be removed by pulling the cables and ducting back through or left in situ, in accordance with recommended good practice at that point in time. However, all cables in areas of Source Protection Zone (SPZ) or Principal Aquifer would be removed.

9.4.10 The **Framework DEMP [EN010154/APP/7.9]** will be developed into a final DEMP prior to decommissioning to identify required measures to prevent pollution and flooding during this phase of the development.

9.4.11 As a result, it is considered the decommissioning impacts and effects would mirror those of the construction phase.

9.4.12 During operation the following impacts may occur and will be assessed:

a. Impacts on water quality in surface water features from diffuse pollution: run-off and the potential for accidental spillages from new permanent hardstanding and maintenance activities (predominantly consisting of panel cleaning), assuming surface water run-off does ultimately drain to a surface watercourse rather than simply to ground;

b. Potential for impact on groundwater or surface water from firewater runoff in the event of a fire in the BESS area(s);

c. Potential impacts on hydrology as a result of the Proposed Development. This may also have a subsequent effect on aquatic habitats and water-dependent nature conservation sites;

d. Potential for permanent physical impacts to watercourses if crossings are required for access and depending on the design of the structure used;

e. Potential impacts on groundwater resources, i.e., quality, flow and level;

f. Potential impact on fluvial flood risk from changes in the rate and volume of run-off entering local watercourses;

g. Generation of a new source of foul wastewater from on-site welfare facilities that will need to be adequately managed and disposed of;

h. The need for a supply of water for operation, and in particular solar panel cleaning;

i. The current arable fields are likely a source of diffuse agricultural pollutants (e.g. organic/inorganic fertiliser and pesticides). During the life of the project the use of such fertilisers and other chemicals will be ceased, which could lead to beneficial impacts on the water environment; and

j. Potential reduction in local surface and groundwater abstraction due to reduced agricultural irrigation requirements.

9.4.13 Water dependent habitats and designated sites are considered in as far as they inform the determination of water body importance. However, refer to **Chapter 8: Ecology and Nature Conservation [EN010154/APP/6.1]** for assessment of the effects of the Proposed Development on these sites. For

assessment of potential effects to ponds, also refer to **Chapter 8: Ecology and Nature Conservation [EN010154/APP/6.1].**

### Matters Scoped Out of the Assessment

*Foul Water*

9.4.14 There will be welfare facilities associated with the Proposed Development for up to four permanent full-time members of staff during operation, with up to 20 members of staff being in attendance for certain periods as described above. Given the low daily occupancy only small volumes of foul drainage will be generated. As the site compound is more than 30m from a public sewer and due to the low flows anticipated, the foul water flows will be dealt with via a sealed cesspit, i.e. with no overflow to ground pipe system. This would be regularly emptied under contract with a registered recycling and waste management contractor.

9.4.15 As there would be no discharge of foul water to a watercourse, and no discharge to the public foul sewer is anticipated, the assessment of foul water drainage has been scoped out.

*Nutrient Neutrality*

9.4.16 North Kesteven District Council is not a Local Planning Authority currently affected by nutrient pollution (nutrient enrichment from elevated nitrogen and phosphorus levels) whereby reduced water quality is leading to adverse nutrient impacts on some designated habitats sites. It has been concluded therefore that in line with Natural England advice, nutrient neutrality assessment can be scoped out of the assessment.

## Surveys

9.4.17 A site walkover survey was undertaken by a water scientist and hydromorphologist on 3 October 2023 in dry and overcast conditions to assess watercourse connectivity, quality and condition. This survey covered the DCO Site as described at the time of survey and while minor design changes have been made since the EIA Scoping Report, the survey covered the waterbodies that might be affected by the Proposed Development and has since been supported by further observations undertaken as part of the development of **Appendix 8-C: Aquatic Ecology [EN010154/APP/6.3]**, thus ensuring that survey findings remain valid.

9.4.18 Water quality surveying has not been undertaken given that the water features associated with the Proposed Development are generally minor. It is considered that the nature of the Proposed Development, having a relatively light footprint and limited ground works, does not warrant a water quality monitoring programme. Water quality of the more significant water features in the Study Area has been determined with reference to background water quality data from routine Environment Agency monitoring.

9.4.19 Further water quality monitoring is not considered necessary given the Environment Agency data that is publicly available, and because importance of water features will be determined from a holistic review of water body

features and so does not solely rely on water quality due to the principle that by law no controlled water may be polluted (i.e. no matter what the baseline water quality is there should be no pollution from the Proposed Development). Water quality impacts have been assessed based on a risk assessment that does not require input of raw background water quality data (described further below). Furthermore, pre-construction monitoring of potentially affected watercourses would be required and is detailed later in this chapter.

## Impact Assessment Methodology

### Source-Pathway-Receptor Approach

9.4.20 Based on professional judgement and experience of other similar Solar DCO schemes, a qualitative assessment of the likely significant effects on surface water quality and water resources has been undertaken.

9.4.21 The predominantly qualitative assessment of likely significant effects has considered the construction, operation, and decommissioning phases, as well as cumulative effects with other developments. It is based on a source-pathway-receptor approach. For an impact on the water environment to exist the following is required:

a. An impact source (such as the release of polluting chemicals, particulate matter, or biological materials that cause harm or discomfort to humans or other living organisms, or the loss or damage to all or part of a water body, or the change to water volume or flow rate within a watercourse);

b. A receptor that is sensitive to that impact (i.e. waterbodies and the services they support); and

c. A pathway by which the two are linked.

9.4.22 The first stage in applying the source-pathway-receptor approach is to identify the causes or 'sources' of potential impact from a development. The sources have been identified through a review of the details of the Proposed Development, including the size and nature of the proposed development, anticipated construction methodologies, and timescales.

9.4.23 The next step in the approach is to undertake a review of the potential receptors, that is, the water environment receptors themselves that have the potential to be affected. Waterbodies, including their attributes, have been identified through desk study and site surveys.

9.4.24 The last stage of the approach is, therefore, to determine if there is a viable exposure pathway or a 'mechanism' linking the source to the receptor. This has been undertaken in the context of local conditions relevant to water receptors within the Study Area, such as topography, geology, climatic conditions and the nature of the impact (e.g. the mobility of a liquid pollutant or the proximity to works that may physically impact a water body).

### Assessment of Surface Water Runoff for the Operational Phase

9.4.25 Surface water runoff from the additional areas of hardstanding (primarily the BESS and Onsite Substation areas) may contain pollutants derived from

impermeable surfaces (e.g. inert particulates, litter, hydrocarbons, metals, nutrients and de-icing salts). This mixture of pollutants is collectively known as 'urban diffuse pollutants', and although each pollutant may itself not be present in harmful concentrations, the combined effects over the long term can cause chronic adverse impacts to surface water or groundwater. An assessment is therefore undertaken to determine the potential risk to the receiving waterbodies and to inform the development of suitable mitigation and treatment measures.

9.4.26 The appropriateness of the surface water drainage measures in terms of providing adequate treatment of diffuse pollutants has been assessed with reference to the Simple Index Assessment method described in the SuDS Manual (Ref 9-27). The Simple Index Approach follows three steps:

a. Step 1 – Determine suitable pollution hazard indices for the land use(s);

b. Step 2 – Select SuDS with a total pollution mitigation index that equals or exceeds the pollution hazard index (for three key types of pollutants - total suspended solids, heavy metals and hydrocarbons). Only 50% efficiency should be applied to second, third etc. treatment train components; and

c. Step 3 – If the discharge is to a water body protected for drinking water, consider a more precautionary approach.

9.4.27 The SuDS Manual (Ref 9-27) only provides a limited number of land use types and so those selected will be the most suitable for the components of the Proposed Development, based on professional judgement. Where more than one pollution hazard category applies to a component of the Proposed Development, the worst pollution hazard will be selected.

9.4.28 Further to the Simple Index Approach assessment, the risk to water features from firefighting water and internal fire suppression water has also been covered qualitatively.

**Hydromorphology**

9.4.29 Potential hydromorphological impacts have been qualitatively appraised based on a desk study, a site walkover and a review of the Proposed Development components that may affect the physical form of water bodies. Morphological effects are described within this chapter according to the method for determining effect significance as described later in this section.

9.4.30 Consideration has been given to how the Proposed Development is likely to impact upon the WFD objectives for the relevant watercourses within **Appendix 9-B: WFD Assessment [EN010154/APP/6.3]**.

**Surface Water Drainage Strategy**

9.4.31 The design of drainage systems aims to ensure that there will be no significant increases in flood risk downstream, during storms up to and including the 1 in 100 (1%) annual probability design flood, with an allowance for climate change.

9.4.32 A **Framework Surface Water Drainage Strategy (Appendix 9-D [EN010154/APP/6.3])** has been developed to ensure the risk of surface water flooding is not increased as a result of the Proposed Development and any increased land take for foundations and any access roads.

9.4.33 Careful consideration of the SuDS features, in-keeping with local planning policy and through liaison with the LLFA, the IDB, and Environment Agency, has been undertaken to ensure that the Surface Water Drainage Strategy adequately attenuates and treats runoff from the Proposed Development, whilst not increasing flood risk to the site and surrounding areas.

9.4.34 In accordance with planning policy and general good practice, mitigation will be provided by restricting surface water discharge rates and providing on-site attenuation, primarily via SuDS.

9.4.35 A water quality risk assessment of all above ground installations has been undertaken using the Simple Index Approach described in the SuDS Manual (2nd edition) (Ref 9-27) and summarised above. This has informed the determination of suitability of proposed treatment measures to manage the risk from diffuse urban runoff to watercourses and ground.

**Flood Risk Assessment**

9.4.36 An FRA **(Appendix 9-C [EN010154/APP/6.3]**) has been prepared as a technical appendix to this chapter to review the current and future flood risk to the Study Area from all sources (including surface water, groundwater, tidal, fluvial and artificial sources), in-keeping primarily with the NPS (NPS EN-1 (Ref 9-16), EN-3 (Ref 9-17) and EN-5 (Ref 9-18) and also in accordance with NPPF guidance (Ref 9-19). It has also considered consultation with the Environment Agency, LLFA, and IDBs.

9.4.37 The FRA includes a review of the current and future flood risk to the Proposed Development from all sources (including fluvial, tidal, surface water, groundwater, sewer and artificial sources) to inform the design and set out proposed mitigation requirements including reference to the **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]**.

9.4.38 Any impacts identified during the operational phase through the FRA (**Appendix 9-C [EN010154/APP/6.3]**) have been evaluated for the impact assessment presented in this chapter and an effect significance value attributed to each impact in accordance with the methodology outlined in this chapter. The impact assessment only considers the potential impact of the Proposed Development on flood risk, not the suitability of the Proposed Development in the context of flood risk of the Site. The FRA considers the flood risk to the Proposed Development.

**Water Framework Directive Assessment**

9.4.39 Proposed developments having the potential to impact on current or predicted WFD status are required to assess their compliance against the objectives defined for potentially affected water bodies. As part of its role, the

Environment Agency must consider whether proposals for new developments have the potential to:

a. Cause a deterioration of a water body from its current status or potential; and/or

b. Prevent future attainment of Good status (or potential where not already achieved).

9.4.40 The following guidance on how to undertake WFD assessments has been used to inform the assessment presented in **Appendix 9-B: WFD Assessment [EN010154/APP/6.3]**:

a. The Planning Inspectorate Advice Note - Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive (Ref 9-103); and

b. Environment Agency Advice Note – Water Framework Directive Risk Assessment: How to assess the risk of your activity (Ref 9-101).

9.4.41 WFD assessment is undertaken in three stages. The first stage is 'screening', the aim of which is to identify the Proposed Development components that could affect WFD status and 'screen out' aspects of the Proposed Development that do not require any further consideration. The second stage is 'scoping', whereby WFD receptors that are potentially at risk are identified and it is determined how the risk will be assessed. Finally, and if required, the third stage involves a full impact assessment, including consideration of the criteria for derogation (if one is expected to be required) as outlined in Regulation 19 of The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (Ref 9-8).

9.4.42 **Appendix 9-B: WFD Assessment [EN010154/APP/6.3]** presents the WFD Assessment for the Proposed Development.

**Determining the Significance of Effect**

9.4.43 The significance of effects has been determined using the principles of the guidance and criteria set out in the Design Manual for Roads and Bridges (DMRB) LA113 Road Drainage and the Water Environment (Ref 9-49) and LA 104 Environmental Assessment and Monitoring (Ref 9-50) adapted for this assessment to take account of hydromorphology. Although these assessment criteria were developed for road infrastructure projects, the criteria are largely generic and suitable for use on any development project. They provide a robust and well tested method for predicting the significance of effects and have been used to assess the impact of numerous solar Nationally Significant Infrastructure Projects (NSIPs) on the water environment.

9.4.44 In a change to the standard methodology set out in **Chapter 5: EIA Methodology [EN010154/APP/6.1]**, whilst other disciplines may consider 'receptor sensitivity', 'receptor importance' is considered when determining the significance of effects on the water environment. This is because when considering the water environment, the availability of dilution means that there can be a difference in the sensitivity and importance of a water feature. For

example, a small drainage ditch of low conservation value and biodiversity with limited other socio-economic attributes is very sensitive to impacts, whereas an important regional scale watercourse, that may have conservation interest of international and national significance and support a wider range of important socio-economic uses, is less sensitive by virtue of its ability to assimilate discharges and physical effects. Irrespective of importance, all controlled waters in England are protected by law from being polluted.

9.4.45 In accordance with the stages of the methodology, there are three stages to the assessment of effects on the water environment, which are as follows:

a. A level of importance (low to very high) is assigned to the water resource receptor based on a combination of attributes (such as the size of the watercourses, WFD designation, water supply and other uses, biodiversity, and recreation etc.) and on receptors to flood risk based on the vulnerability of the receptor to flooding, see **Table 9-4;**

b. The magnitude of potential and residual impact (classed as negligible, minor, moderate or major adverse / beneficial) is determined based on the criteria listed in **Table 9-5**and the assessor's professional judgement. Embedded or standard mitigation measures are considered in the initial assessment, but any other mitigation is not considered until the assessment of residual effects; and

c. A comparison of the importance of the resource and magnitude of the impact (for both potential and residual impacts) results in an assessment of the overall significance of the effect on the receptor using the matrix presented in **Table 9-4**. The significance of each identified effect (both potential and residual) is classed as very large, large, moderate, slight or neutral and either beneficial or adverse.

## Table 9-4: Criteria to Determine Receptor Importance

| Importance | General Criteria | Surface Water[1] | Groundwater | Hydromorphology[2] | Flood Risk |
|---|---|---|---|---|---|
| Very High | The receptor has little or no ability to absorb change without fundamentally altering its present character, is of very high environmental value, or of international importance. | Watercourse having a WFD classification as shown in a River Basin Management Plan (RBMP) and Q95[3] ≥ 1.0m$^3$/s; site protected / designated under international or UK habitat legislation (Special Area of Conservation (SAC), Special Protection Area (SPA), Site of Special Scientific Interest (SSSI), Water Protection Zone (WPZ), Ramsar site. Critical social or economic uses (e.g. public water supply and navigation). | Source Protection Zone (SPZ) 1; Principal aquifer providing a regionally important resource and/or supporting a site protected under EC and UK legislation; Groundwater locally supports Groundwater Dependent Terrestrial Ecosystems (GWDTE); Water abstraction: >1,000m$^3$/day | Unmodified, near to or pristine conditions, with well-developed and diverse geomorphic forms and processes characteristic of river and lake type. | Essential Infrastructure or highly vulnerable development. |
| High | The receptor has low ability to absorb change without fundamentally altering its present character, is of high environmental value, or of national importance. | Watercourse having a WFD classification as shown in a River Basin Management Plan (RBMP) and Q95 < 1.0m$^3$/s; Major Cyprinid Fishery; Species protected under international or UK habitat legislation. Critical social or economic uses (e.g. water supply and navigation). Important social or economic uses such as | Principal Aquifer providing locally important source supporting rover ecosystem; SPZ2; Groundwater supports GWDTE; Water abstraction: 500–1,000m$^3$/day. | Conforms closely to natural, unaltered state and will often exhibit well-developed and diverse geomorphic forms and processes characteristic of river and lake type. Deviates from natural conditions due to direct and/or indirect channel, floodplain, bank modifications and/or catchment development pressures. | More vulnerable development. |

| Importance | General Criteria | Surface Water[1] | Groundwater | Hydromorphology[2] | Flood Risk |
|---|---|---|---|---|---|
| | | water supply, navigation or mineral extraction. | | | |
| Medium | The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value or is of regional importance. | Watercourse detailed in the Digital River Network but not having a WFD classification as shown in a RBMP. Q95 >0.001m$^3$/s. May be designated as a Local Wildlife Site (LWS) and support a small / limited population of protected species. Limited social or economic uses. | Secondary Aquifer providing water for agricultural or industrial use with limited connection to surface water; SPZ 3; Water abstraction: 50–499m$^3$/day. | Shows signs of previous alteration and/or minor flow / water level regulation but still retains some natural features or may be recovering towards conditions indicative of the higher category. | Less vulnerable development. |
| Low | The receptor is tolerant of change without detriment to its character, is low environmental value, or local importance. | Surface water sewer, agricultural drainage ditch; non-aquifer WFD Class 'Poor' or undesignated in its own right. Q95 ≤0.001m$^3$/s. Low aquatic fauna and flora biodiversity and no protected species. Minimal economic or social uses. | Generally Unproductive strata. Water abstraction: <50m$^3$/day | Substantially modified by past land use, previous engineering works or flow / water level regulation. Watercourses likely to possess an artificial cross-section (e.g. trapezoidal) and will probably be deficient in bedforms and bankside vegetation. Watercourses may also be realigned or channelised with hard bank protection, or culverted and enclosed. May be significantly impounded or abstracted for water resources use. Could be impacted by navigation, with associated high degree of flow regulation and bank protection, and probable strategic need for maintenance dredging. | Water compatible development. |

| Importance | General Criteria | Surface Water[1] | Groundwater | Hydromorphology[2] | Flood Risk |
|---|---|---|---|---|---|
| | | | | Artificial and minor drains and ditches will fall into this category | |
| Negligible | The receptor is resistant to change and is of little environmental value. | Not applicable. | Not applicable. | Not applicable. | Not applicable. |

*Adapted from DMRB LA113 (Ref 9-49)*

Note 1: Professional judgement is applied when assigning an importance category to all water features. The WFD status of a watercourse is not an overriding factor and, in many instances, it may be appropriate to upgrade a watercourse which is currently at poor or moderate status to a category of higher importance to reflect its overall value in terms of other attributes and WFD targets for the watercourse. Likewise, a watercourse may be below Good Ecological Status, this does not mean that a poorer quality discharge can be emitted. All controlled waters are protected from pollution under the Environmental Permitting (England and Wales) Regulations 2016 (Ref 9-10) and the Water Resources Act 1991 (Ref 9-6) (each as amended), and future WFD targets also need to be considered.

Note 2: Based on the water body 'Reach Conservation Status' presently being adopted for another major infrastructure project (and developed originally by Atkins) and developed from the Environment Agency conservation status guidance (Environment Agency, 1998a; 1998b (Ref 9-51) as LA113 (Ref 9-53) does not provide any criteria for morphology.

Note 3: Q95 flow is the flow rate that is exceeded 95% of the time.

9.4.46 The magnitude of impact will be determined based on the criteria in **Table 9-5,** taking into account the likelihood of the effect occurring. The likelihood of an effect occurring is based on a scale of certain, likely or unlikely. Likelihood has been considered in the case of the assessment of potential impacts to water bodies only, as likelihood is inherently included within the flood risk.

**Table 9-5: Magnitude of Impact Criteria**

| Magnitude | Magnitude criteria |
|---|---|
| Major Adverse | Results in a loss of attribute and/ or quality and integrity of the attribute. |
| Moderate Adverse | Results in impact on integrity of attribute, or loss of part of attribute. |
| Minor Adverse | Results in some measurable change in attribute's quality or vulnerability. |
| Negligible | Results in impact on attribute, but of insufficient magnitude to affect the use or integrity. |
| Minor Beneficial | Results in some beneficial impact on attribute or a reduced risk of negative impact occurring. |
| Moderate beneficial | Results in moderate improvement of attribute quality. |
| Major beneficial | Results in major improvement of attribute quality |
| No change | |

*Adapted from DMRB LA113 (Ref 9-49)*

9.4.47 The following significance categories have been used for both potential and residual effects:

a. Negligible: An imperceptible effect or no effect to a water resource receptor;

b. Beneficial: A beneficial/positive effect on the quality of a water resource receptor; or

c. Adverse: A detrimental/negative effect on the quality of a water resource receptor.

9.4.48 At a spatial level, 'local' effects are those affecting the DCO Site and neighbouring receptors, while effects upon receptors beyond the vicinity of the DCO Site are considered to be at a 'regional' level. Effects which affect different parts of the country, or England as a whole, are considered being at a 'national' level.

9.4.49 The importance of the receptor (**Table 9-4**) and the magnitude of impact (**Table 9-5**) are determined independently from each other and are then used to determine the overall significance of effects (**Table 9-6**). Options for mitigation will be considered and secured where practicable to avoid, minimise and reduce adverse impacts, particularly where significant effects may have

otherwise occurred. The residual effects of the Proposed Development with identified mitigation in place will then be reported. Effects of moderate or greater magnitude are considered significant in planning terms (i.e. shaded cells in **Table 9-6**). Where there is a range of potential effect (e.g. Large or Very Large) in **Table 9-6**, professional judgement is exercised to determine the most suitable effect.

**Table 9-6: Matrix for Assessment of Significance**

| Importance of Receptor | Magnitude of Change | | | | |
|---|---|---|---|---|---|
| | Major | Moderate | Minor | Negligible | No change |
| Very High | Very Large | Large or Very Large | Moderate or Large | Slight | Neutral |
| High | Large or Very Large | Moderate or Large | Slight or Moderate | Slight | Neutral |
| Medium | Moderate or Large | Moderate | Slight | Neutral or Slight | Neutral |
| Low | Slight or Moderate | Slight | Neutral or Slight | Neutral or Slight | Neutral |
| Negligible | Slight | Neutral or Slight | Neutral or Slight | Neutral | Neutral |

*Adapted from DMRB LA113 (Ref 9-49)*

## Assessment Assumptions and Limitations

9.4.50 This assessment has been undertaken based on baseline data and design information at the time of the submission of the DCO application, and as described in **Chapter 3: The Proposed Development [EN010154/APP/6.1]**.

9.4.51 Where there is uncertainty in the design, reasonable assumptions have been made and these are described at relevant points within this assessment.

9.4.52 A request for water resources and WFD information was issued to the Environment Agency to inform the baseline study in April 2023. A full response had been received in May 2023 and has therefore been taken into account in this assessment. It is considered that sufficient baseline information has been gathered from the desk study to enable this impact assessment to be undertaken.

9.4.53 Flood risk receptors considered in this assessment will include existing infrastructure assets, residential buildings, commercial buildings, agricultural land, and property potentially affected by the Proposed Development.

9.4.54 Temporary works will not be assessed unless they are of a potentially significant scale and have the potential to adversely affect flood risk or impact the quality or form of water bodies. The temporary works where such risks are considered significant (for example, excavations for the cable route), have been identified and assessed where there is sufficient detail to do so at this

stage. Operational maintenance activities are generally considered of insufficient scale to require assessment.

9.4.55 The specific locations and methodologies of construction and installation of the cables within the Principal Site and the Cable Corridor remain subject to detailed design, and so reasonable worst-case assumptions have been assessed. It has been confirmed that the River Witham and the River Brant will be crossed using non-intrusive, underground techniques (e.g. horizontal directional drilling (HDD)) that would not disturb the watercourse, as set out in the **Framework CEMP [EN010154/APP/7.7]**. The depth of the cable below the bed will be a minimum of 5m so as not to disturb the channel or risk being exposed by future bed scour. The launch and receiving pits will be set back from the bank top of the watercourse to protect riparian habitats. Where the Interconnecting Cable Corridor is proposed to cross the River Witham, this setback will be extended to a minimum of 100m in recognition of the presence of a potential Otter holt. Maximum parameters considered for the launch and receiving pits as a worst case are dimensions of 8m length x 4m width x 1m depth.

9.4.56 As set out in **Chapter 3: The Proposed Development** of this ES **[EN010154/APP/6.1]** and the **Framework CEMP [EN010154/APP/7.7]**, a minimum depth crossing of 2m below minor/ordinary watercourses (except where minor/ordinary watercourses have minimal or no water flow and water management is easily managed), will be also implemented. In order to maintain a worst-case assessment, cable crossings of all minor/ordinary watercourses are assumed to require open-cut installation techniques, with a maximum width of 5m per crossing being affected as a worst case. For these crossings, water flow would be maintained by damming, fluming, and/or over pumping. Several of the ditches within the DCO Site are ephemeral and if works could be carried out in the drier months this would reduce the risk of pollution propagating downstream, although this cannot be guaranteed and thus no weight has been attributed to this. It will be a requirement that the watercourses are reinstated as found and enhanced where opportunities are available. Water quality monitoring will be undertaken prior to, during, and following on from the construction activity and the scope of this is discussed in Section 6.8. These parameters are secured through the **Framework CEMP [EN010154/APP/7.7]**.

9.4.57 Indicative crossing of watercourses for access tracks are shown in **Figure 9-1: Surface Water Features and their Attributes [EN010154/APP/6.2]**. Where watercourses/ditches are crossed for access (either temporarily during construction or permanently during operation), new crossings will be clear span and wide/high enough to avoid the loss of in-channel and riparian habitats. However, existing crossings are to be used where practicable, in order to reduce the number of new crossings required. Where these exiting structures require replacement due to structural capacity or condition opportunities will be sought to replace them using an open span crossing.

9.4.58 The Proposed Development infrastructure will be set back from all water features by at least 10m to create a buffer zone. The point of measurement

will be from the top of bank or landward toe of any flood defence as agreed with the Environment Agency and IDB. There will also be a 16m buffer for infrastructure from the landward toe of flood defences, where present. These parameters are secured through the **Framework CEMP [EN010154/APP/7.7]**.

9.4.59 This buffer from water features will ensure all construction activities for the installation of solar PV panels, Onsite Substation, solar stations and BESS and other associated development would be offset from surface watercourses, other than where there is a need for crossing of a watercourse (such as for cabling installation or temporary vehicle access for construction) or connection for surface water drainage (that may be for temporary works or from the operational Proposed Development). Any works to enhance watercourses would also require direct works to the channel and banks, although given the aim of these works, their small-scale and 'soft-engineering' nature, construction impacts would be expected to be minimal. Overall, the inclusion of this buffer reduces the risk of pollutants entering the watercourse directly, whilst also providing space for mitigation measures (e.g. fabric silt fences) where they are required and maintaining access (e.g. for the IDBs).

9.4.60 The risk from surface water runoff to surface or groundwater features has been assessed on the basis of **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]**. The delivery of the detailed Drainage Strategy and implementation of the measures it contains is secured through Requirement 10 at Schedule 2 of the **Draft DCO [EN010154/APP/3.1]**.

9.4.61 In the UK climate, solar PV panels are largely self-cleaning and deterioration in PV system output due to dust or dirt is generally low. The pollution risk from runoff across the Principal Site is generally minimal as solar PV panels do not contain any liquid (hazardous or not) that could contaminate rainwater. They will be cleaned every two years as a worst case (although the period between cleaning can be much longer). As the use of cleaning products (chemicals) can damage panels and void manufacturer's warranties no cleaning products would be used, only water. It is assumed at this stage that clean water will be delivered to the site for use in specially adapted tractors and this will not lead to any significant pollution risk. It is estimated that the total volume of water required per cleaning cycle would be 1,545$m^3$.

9.4.62 The BESS will have built-in fire detection and will be fitted with an automatically operated internal fire extinguisher system. Emergency fire water would be stored within onsite water tanks with appropriate allowance for fire water storage provided. A **Framework Battery Safety Management Plan (FBSMP) [EN010154/APP/7.17]** has been prepared to support the DCO application. This sets out the parameters for the management of fire risk associated with the BESS. This management plan forms the basis for the preparation of a fully detailed fire safety management plan at a later stage to ensure the delivery of a robust fire safety strategy in relation to the BESS and is secured as a Requirement of the DCO.

9.4.63 Provision of fire water containment (impermeable water capture to prevent used firewater reaching ground/the surrounding environment) is required. It is currently proposed to contain the external fire water runoff within lined swales surrounding the BESS areas, where it can be held and tested before either being released into the surrounding watercourses or to ground (if found to have no contaminants present, or contaminants that are within acceptable legal limits) or taken off site by a tanker for treatment elsewhere. The swale will then be cleaned of all contaminants. This is secured through the **Framework Surface Water Drainage Strategy (Appendix 9-D [EN010154/APP/6.3])**.

9.4.64 Land use change relating to ceasing productive arable agriculture within the Principal Site to accommodate the Proposed Development will reduce water quality risk to watercourses associated with diffuse agricultural chemicals and possibly reduce soil erosion and need for local abstractions for irrigation, thereby providing a beneficial impact. However, there is limited data on the existing conditions and activities, and therefore no further consideration has been given to this potential benefit at this stage.

9.4.65 There will be welfare facilities associated with the Proposed Development for up to four permanent full time members of staff, with up to 20 being in attendance for periods of maintenance, cleaning or solar infrastructure replacement. Given the low daily occupancy only small volumes of foul drainage will be generated. This will be managed using a self-contained foul drainage system to a sealed cesspit. These tanks would be regularly emptied under contract with a registered recycling and waste management contractor.

## 9.5 Baseline Conditions

9.5.1 This section describes the baseline environment within the Study Area with specific reference to surface water, groundwater and flood risk. It identifies any sensitive receptors, considers their attributes and defines their individual importance.

### Existing Baseline

**Topography, Land Use, Climate**

*Principal Site*

9.5.2 The topography of the Proposed Development and its Study Area is relatively flat, with existing ground levels generally under 20m Above Ordnance Datum (AOD) according to online Ordnance Survey mapping (Ref 9-35) with gentle undulations around the larger watercourses. There are flood plains associated with:

a. The River Witham (Main River) which flows through the Study Area;

b. The River Brant (Main River), which is a tributary of the River Witham which flows through the Study Area and meets the Witham to the south of South Hykeham; and

c. The South Hykeham Catchment, a Main River located to the northeast of the Study Area.

9.5.3 These watercourses are shown in **Figure 9-1: Surface Water Features and their Attributes [EN010154/APP/6.2]**. In addition, there are numerous other Ordinary Watercourses within the Study Area that fall under the jurisdiction of the LLFA (Lincolnshire County Council) or IDB (Upper Witham Internal Drainage Board and Trent Valley Internal Drainage Board areas both cross into the Study Area), as shown in **Figure 9-1: Surface Water Features and their Attributes [EN010154/APP/6.2]**). These watercourses drain surface water from the surrounding agricultural areas.

9.5.4 The area is currently used mainly for agriculture, with a mosaic of agricultural fields. There are several small villages, hamlets, and farms throughout the Study Area. The villages include Bassingham, Norton Disney, Witham St Hughs and Thorpe on the Hill.

9.5.5 Based on the Meteorological Office website (Ref 9-54), the nearest weather station is located in Waddington (NGR SK 98952 65231), approximately 3.5km north of the Study Area. Using data from this weather station, for the period 1991-2020, it is estimated that the Study Area experiences approximately 614mm of rainfall per year, with it raining more than 1mm on approximately 116 days per year, which are both low in the UK context (**Plate 9-1**). This is relevant to the whole Study Area.

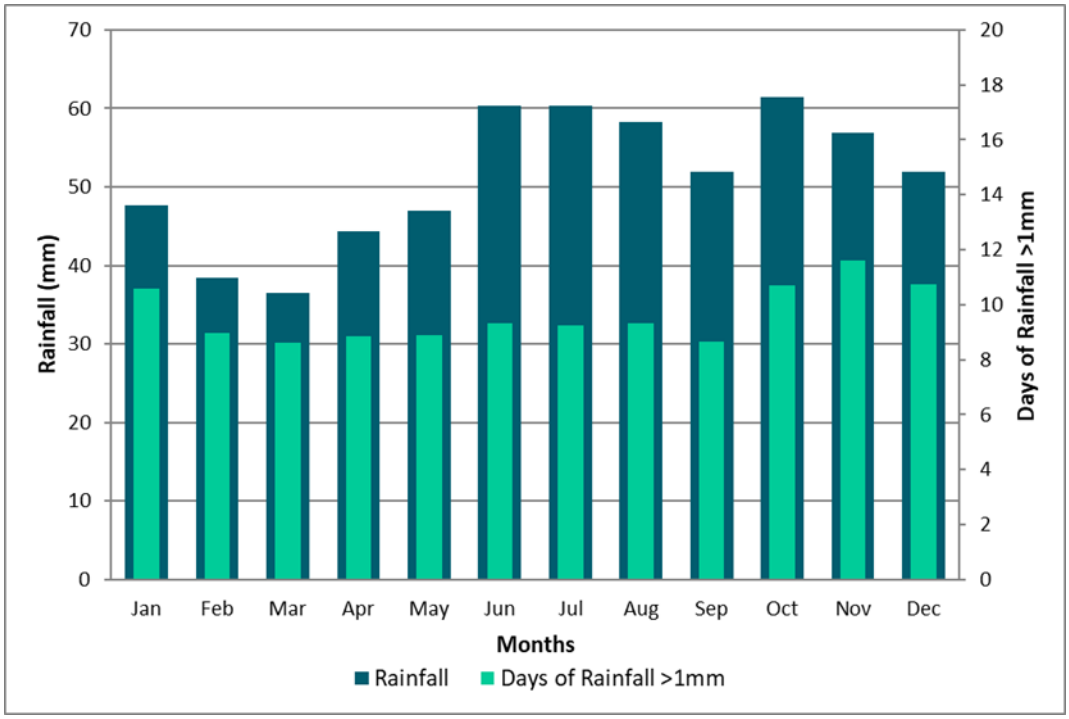


**Plate 9-1: Waddington weather station: monthly rainfall and days of rainfall greater than 1mm between 1991–2020**

*Source: Met Office (Ref 9-54)*

*Cable Corridor*

9.5.6 The topography of the Cable Corridor (and the surrounding 1km which constitutes the Study Area) generally rises east of the River Brant (at less than 10m AOD) forming an escarpment at around 80m AOD at Navenby. The land gently recedes in elevation beyond Navenby, falling to around 40m AOD to the east of the Study Area of Scopwick Heath. Land use is generally agricultural, but with the villages of Coleby, Navenby, Boothby Graffoe and Wellingore all falling within the Study Area.

9.5.7 Rainfall for the Cable Corridor is the same as described for the Principal Site above.

## Surface Water Features

9.5.8 The Proposed Development is located within the Anglian River Basin District, with a small area of the Principal Site around Morton Hall falling under the Humber River Basin District. It extends across two management catchments, namely Witham (Anglian) (Ref 9-55) and Trent Lower and Erewash (Humber) (Ref 9-56).

9.5.9 The Principal Site falls under the Witham Upper Operational Catchment and Trent and Trib Operational Catchment.

9.5.10 The Cable Corridor falls under the Witham Upper Operational Catchment to the west of the A607 (Grantham Road) and the Witham Lower Operational Catchment to the east of the A607. All watercourses in the Study Area ultimately drain to the River Witham (confluence of the Brant to confluence of Catchwater Drain).

9.5.11 The River Witham flows north east from the south west of the Study Area and passes through the Principal Site to the west of Aubourn, with the River Brant flowing into the River Witham just north of the Study Area, roughly 2.8km east of Aubourn. The River Brant also passes through the Cable Corridor close to Broughton Lane. The Study Area includes the catchments of seven surface water WFD water bodies, within three operational catchments as listed below. WFD water bodies in the Study Area are describe further in **Table 9-7**. The seven surface water WFD water bodies are:

a. Witham Upper Operational Catchment / Brant Lower Water Body from Brant Upper Water Body to River Witham Water Body (GB105030056770);

b. Witham Upper Operational Catchment / Witham from Cringle Brook to Brant Lower Water Body GB105030056780);

c. Witham Upper Operational Catchment / Boultham Catchwater Drain Water Body (GB105030062380);

d. Witham Upper Operational Catchment / South Hykeham Catchwater Water Body (GB105030062460);

e. Witham Lower Operational Catchment / Metheringham Beck Water Body (GB105030056210);

f. Witham Lower Operational Catchment / Dunston Beck Water Body (GB105030056230); and

g. Trent and Trib Operational Catchment / The Fleet Lower Catchment (tributary of Trent) Water Body (GB104028058250).

## Table 9-7: WFD Surface Water Features on Site

| Waterbody | Ecological Status / Potential (2022) | Chemical Status | Overall Target Objective | Hydromorphological Designation | Designated Reach | Reasons for Not Achieving Good Status |
|---|---|---|---|---|---|---|
| **Brant Lower Water Body** from Brant Upper Water Body to River Witham Water Body (GB105030056770) | Moderate Ecological Potential (note that both Biological Status and Physico-chemical status are moderate) | 2022 – Does Not Require Assessment<br><br>2019 – Fail (due to Mercury and its compounds PFOS, PBDE and benzo(g-h-i) perylene) | Good (2027) | Heavily modified | The watercourse designation extends from the town of Brant Broughton (approximately 5.3km south of Fosse Green Energy as the crow flies) from where it flows predominantly north-north east for 12.05km to Waddington where the waterbody is then designated as the Witham – Brant to Catchwater Drain waterbody. The catchment has an area of 88.9km$^2$ | Physical modifications relating to agriculture, continuous sewage discharges, diffuse agricultural pollution, poor nutrient and livestock management in the catchment, transport drainage, surface water abstraction and riparian/in-channel activities (including bank erosion) |
| **Relation to Proposed Development:** The River Brant crosses the Cable Corridor near Broughton Lane and will have the Grid Connection Cable laid beneath it using a trenchless approach. Several tributaries of the River Brant (generally agricultural ditches) are also located within the Cable Corridor or wider Study Area.<br><br>**Site Observations**: When observed on site close to the potential Cable Corridor crossing location near to Sand Syke Pumping Station, the River Brant had a bank top to bank top width of roughly 10m and an estimated bankfull depth of 5m. The channel appeared heavily modified and straightened at the point of observation, possessing very little variation or diversity. There were also steep embankments along both banks that will have limited any lateral connectivity. The channel margins had abundant emergent and floating macrophytes and the bed was smothered by fine sediment. Adjacent tributaries consisted of agricultural drainage channels, being trapezoidal and heavily modified in nature with little flow and densely vegetated. | | | | | | |
| **Witham from Cringle Brook to confluence with Brant Water Body** (GB105030056780) | Moderate Ecological Potential (on the basis of Moderate physico-chemical quality elements, notably phosphates | 2022 – Does Not Require Assessment<br><br>2019 – Fail (due to | Moderate (2015) | Heavily Modified | The watercourse designation has a large catchment area of 156.7km$^2$ which starts at Great Ponton to the south of the Proposed Development and terminates close to South | Physical modifications relating to agriculture, continuous sewage discharges, diffuse agricultural pollution, poor nutrient and |

| Waterbody | Ecological Status / Potential (2022) | Chemical Status | Overall Target Objective | Hydromorphological Designation | Designated Reach | Reasons for Not Achieving Good Status |
|---|---|---|---|---|---|---|
| | which have a poor status) | Mercury and its compounds PFOS and PBDE) | | | Hykeham. The watercourse catchment includes a relatively large part of the south westerly portion of the Proposed Development and the River Witham flows through the DCO Site (west of Aubourn) and has a length of 56.9km. | livestock management in the catchment. |

**Relation to Proposed Development:** This water body underlies a large portion of the Proposed Development's area and would cross the Principal Site, with a cable crossing required by trenchless techniques.

**Site Observations**: The River Witham is a Main River with a bank top to bank top width of approximately 8m. The channel when visited on the site walkover was embanked at the point of observation which will have limited lateral connectivity, yet the channel still exhibited a degree of flow variation and geomorphological process. The Aubourn fish pass is located close to Aubourn and consists of a rock ramp (boulders and carefully placed smaller stones form bars across the channel) built in 2016 to open up the upstream reaches of the channel to fish and eels following removal of the Aubourn weir. On the day of the site visit the water was turbid and the channel bed smothered with fine sediment.

**Existing Improvement Schemes:** The Environment Agency are undertaking partnership projects with East Mercia Rivers Trust and the Wild Trout Trust to deliver river restoration and floodplain and wetland creation within the River Witham. This has been on-going for several years and there are future projects to be delivered. These are generally upstream of Belton and so are upstream of the Study Area.

| | | | | | | |
|---|---|---|---|---|---|---|
| **Boultham Catchwater Drain Water Body** (GB105030062380) | Moderate Ecological Potential (on the basis of Poor status for macrophytes, and moderate for phosphate). | 2022 – Does Not Require Assessment<br><br>2019 - Fail (due to Mercury and its compounds PFOS, PBDE and benzo(g-h-i)perylene) | Good (2027) | Heavily Modified | This water body catchment area overlaps with a northern portion of the Proposed Development near Thorpe on the Hill (north west proportion of the Site). With the watercourse itself being further to the north between Skellingthorpe Big Wood and St Catherines in Lincoln. It has a catchment area of 43.8km$^2$ and a river length of 7.3km. | Diffuse and point source pollution from urban and transport processes and physical modification relating to land drainage. |

| Waterbody | Ecological Status / Potential (2022) | Chemical Status | Overall Target Objective | Hydromorphological Designation | Designated Reach | Reasons for Not Achieving Good Status |
|---|---|---|---|---|---|---|
| **Relation to Proposed Development:** A significant proportion of the Principal Site and its Study Area west of between Thorpe on the Hill and A46 is within the wider catchment of this water body. Nonetheless the water body itself is over 3.5km northeast as the crow flies and so would not be directly impacted but there may be hydrological connectivity through tributaries that extend into the DCO Site.<br><br>**Site Observations**: Given that the water body itself is over 1km from the Proposed Development and would not be directly impacted, it was not visited during the site walkover. | | | | | | |
| **South Hykeham Catchwater Water Body** (GB105030062460) | Moderate Ecological Status (on the basis of dissolved oxygen and phosphate which is at Moderate status) | 2022 – Does Not Require Assessment<br><br>2019 - Fail (due to Mercury and its compounds, PBDE and benzo(g-h-i)perylene) | Moderate (2015) | Heavily Modified | The watercourse flows west to east to the north of South Hykeham, from Danker Wood to the River Witham. It has a length of 3.1km and drains a total area of 4.8km$^2$. | Physical modifications for land drainage, sewage discharge pollution (continuous discharges and Private Sewage Treatment), trade/industry discharge, and poor livestock and nutrient management in the catchment. |
| **Relation to Proposed Development:** South Hykeham Catchwater is not within the Study Area (it is located to the east), but its wider catchment and associated tributaries do extend across the northeastern extent of the Principal Site and there is therefore hydrological connectivity to the water body.<br><br>**Site Observations**: Given that the water body itself is not within the Study Area and would not be directly impacted, it was not visited during the site walkover. | | | | | | |
| **Metheringham Beck Water Body** (GB105030056210) | Moderate Ecological Potential (on the basis of phosphate which is at poor status) | 2022 – Does Not Require Assessment<br><br>2019 - Fail (due to Mercury and | Moderate (2015) | Heavily Modified | The designated watercourse flows in a northeasterly direction from the south of Metheringham towards Car Dyke South and Delph System. However, this is designated watercourse is approximately 6 km east of the Study Area as the crow flies. Nonetheless, the wider | Physical modification for agriculture and rural land management, and continuous sewage discharge pollution. |

| Waterbody | Ecological Status / Potential (2022) | Chemical Status | Overall Target Objective | Hydromorphological Designation | Designated Reach | Reasons for Not Achieving Good Status |
|---|---|---|---|---|---|---|
| | | its compounds and PBDE) | | | catchment overlaps with a small portion of the Study Area east on Navenby. The water body has a catchment area of 35.5km$^2$ and a river length of 2.7km. | |
| **Relation to Proposed Development:** The wider WFD catchment overlaps with a small portion of the Study Area east of Navenby although mapping suggests there are few watercourses in this part of the Study Area (see **Figure 9-1 Surface Water Features and their Attributes [EN010154/APP/6.2]**). | | | | | | |
| **Site Observations**: Given that the water body itself is not within the Study Area and would not be directly impacted, it was not visited during the site walkover. | | | | | | |
| **Dunston Beck Water Body (GB 105030056230)** | Moderate Ecological Potential (note that Biological Status is bad due to a bad classification for fish and moderate for invertebrates) | 2022 – Does Not Require Assessment<br><br>2019 - Fail (due to Mercury and its compounds and PBDE) | Good (2021) | Heavily Modified | The designated waterbody rises approximately 3.6km east of the Study Area at Dunston Heath and flows easterly towards Car Dyke South and Delph System. It is 6.3km in length and drains a catchment area of 40.1km$^2$. The Study Area east of Navenby falls within this catchment. | Physical modifications relating to agriculture, agricultural pollution, poor soil management and surface water abstraction |
| **Relation to Proposed Development:** The wider WFD catchment overlaps with a small portion of the Study Area east of Navenby although mapping suggests there are few watercourses in this part of the Study Area (see **Figure 9-1 Surface Water Features and their Attributes [EN010154/APP/6.2]**). | | | | | | |
| **Site Observations**: Given that the water body itself is not within the Study Area and would not be directly impacted, it was not visited during the site walkover. | | | | | | |
| **Existing Improvement Schemes:** The Environment Agency are undertaking partnership projects with East Mercia Rivers Trust and the Wild Trout Trust to deliver river restoration and floodplain and wetland creation within the Dunston Beck Water Body. This has been on-going for several years and there are future projects to be delivered. No further details were provided by the Environment Agency. | | | | | | |
| **The Fleet Lower Catchment (tributary of the Trent) Water Body (GB104028058250)** | Poor Ecological Status (note that Biological Status is poor due to a poor classification for | 2022 – Does Not Require Assessment | Moderate (2015) | Not designated artificial or heavily modified | The designated waterbody rises approximately 1.2km west of the Study Area north of Eagle Hall Wood and flows west to meet the River Trent. It is 6.4km in length | Physical modifications relating to flood defence structures, drought and poor soil management. |

| Waterbody | Ecological Status / Potential (2022) | Chemical Status | Overall Target Objective | Hydromorphological Designation | Designated Reach | Reasons for Not Achieving Good Status |
|---|---|---|---|---|---|---|
| | Macrophytes and Phytobenthos sub element and for dissolved oxygen. Invertebrates and phosphate are at moderate status. | 2019 - Fail (due to Mercury and its compounds and PBDE) | | | and drains a catchment of 30.8km$^2$. The western extent of the Study Area overlaps with the wider WFD catchment to the east of Morton Hall. | |

**Relation to Scheme:** The wider WFD catchment overlaps with a small portion of the Principal Site east of Moreton Hall, with some of the tributaries of the Fleet Lower Catchment water body extending into the DCO Site.

**Site Observations**: Given that the water body itself is not within the Study Area and would not be directly impacted, it was not visited during the site walkover.

9.5.12 There are various other water features within the Study Area, which do not have WFD classifications in their own right, but which would all ultimately drain to the River Witham or The Fleet (and these are covered by their WFD designations). The key water features are all outlined below.

a. **West Brant Syke** watercourse rises at Broughton Clays and flows in a north and northeasterly direction for approximately 8.5km to meet the River Brant east of Bassingham. If flows within the Study Area for a total length of approximately 2km and borders the Principal Site along Fen Lane immediately upstream of its confluence with the River Brant. Based on site observations the channel was judged to be heavily modified, straightened and of an artificial character for much of its length. Bank top to bank top width was estimated to be 10m, with a bankfull depth of 5m. On the day of observation, there was only a minimal amount of water within the watercourse, which was flowing very slowly eastwards towards the River Brant.

b. **Pike Drain** rises in the north of the Study Area near Thorpe on the Hill and flows in a northeast direction through Whisby Nature Park and on through North Hykeham where it reaches its confluence with the River Witham at Bracebridge. It has a total length of approximately 9.4km. Two tributaries of Pike Drain extend into the Principal Site at its northernmost extent.

c. **Mill Dam Dyke** rises in the western extent of the Principal Site, immediately west of Morton Lane. It flows northwest out of the Study Area towards North Scarle and ultimately drains into the Fleet near Girton. It has a total length of approximately 6.5km.

d. There are several large **sand and gravel pit lakes** to the north of the Study Area near Thorpe on the Hill including several within Whisby Nature Park. These appear to be important sites for recreation with fishing and sailing usage.

e. There are a collection of large lakes immediately south of Witham St Hughs within the Study Area. These are located immediately west of the Principal Site. Given the fall of the land here is sloping gently west to east, and decreasing towards the DCO Site, there would not be anticipated to be any potential impacts on these waterbodies and they will not be considered any further (i.e. they are upslope of the Principal Site).

f. There are two small reservoirs roughly 800m west of Carlton le-Moorland, at NGR SK 89687 58156 and SK 89511 58226, one of which partly falls within the Study Area. There is no direct hydrological connectivity to these water features and so they will also not be considered any further.

g. Various small agricultural ponds are situated throughout the Study Area. See **Chapter 8: Ecology and Nature Conservation [EN010154/APP/6.1]** for further details.

## Hydrology

9.5.13 The nearest gauging station for the River Witham on the National River Flow Archive (Ref 9-41) is located 1.6km downstream from the confluence of

the River Witham and River Brant at North Hykeham, Lincolnshire (Station U3001, Witham at North Hykeham). The daily mean flow across the period 1998-2025 is 2.89m³/s.

9.5.14 The nearest gauging station with available records of Q95 flow (flow exceeded 95% of the time) is 11km upstream from the Study Area. The Q95 at this monitoring station (Station ID 30001, Witham at Claypole Mill) between 1959-2021 is 0.385m$^3$/s. The mean flow recorded at this station is 1.899m$^3$/s.

9.5.15 The nearest gauging station to the River Brant in the Study Area is located at Brant Boughton (Station ID 30033, Ref 9-41). This is located approximately 2.3 km upstream of the DCO Site, to the east of the Brant Broughton area. The annual mean flow is 0.26m³/s with a Q95 flow of 0.007m³/s and mean flow of 0.256m$^3$/s, with data recorded between the period 1990-2021.

## Water Quality

9.5.16 Water quality data for the River Witham (at Aubourn Bridge), River Brant (at Blackmore Bridge), South Hykeham Catchwater (at South Hykeham headwaters), Dunston Beck (at Dunston Beck Spring), Pike Drain (off Rochester Road) and Metheringham Beck (at Metheringham downstream of sewage treatment works) has been interrogated from the Environment Agency's Water Quality Archive website (Ref 9-64). Data has been compared to WFD Environmental Quality Standards (EQS) (Ref 9-42) and is expanded upon in **Table 9-8**.

9.5.17 The water quality within the Witham at Aubourn Bridge is slightly alkaline in nature with an average pH of 8.14 but falls within the threshold for WFD high classification based on data sampled here from 2019 to 2025. A 10th percentile dissolved oxygen saturation of 80.13% falls within the high WFD classification (with 70% being high). Electrical conductivity is moderate (mean 844.50 µS/cm). Ammonia (90$^{th}$ percentile of 0.00094mg/l) would fall under the WFD high classification.

9.5.18 Water quality within the River Brant at Blackmore Bridge is circum-neutral with an average pH of 7.91 but falls within the WFD high classification based on data sampled here from 2020 to 2025. A 10th percentile dissolved oxygen saturation of 58.4% falls within the Moderate WFD classification. A 90th percentile of 2.52mg/l and 0.00203mg/l for Biological Oxygen Demand (BOD) and ammonia respectively, fall under the high WFD classifications. Electrical conductivity is moderate (mean 890.11 µS/cm).

9.5.19 Water quality within the South Hykeham Catchwater at South Hykeham is circum-neutral with an average pH of 7.74 and falls within the WFD high classification based on data sampled here from 2019 to 2025. A 10th percentile dissolved oxygen saturation of 50.84% is within the poor WFD classification (with 45-54% being poor). A 90th percentile for BOD of 5.28mg/l falls within the moderate WFD classification (with >5mg/l being the threshold to moderate). A 90th percentile for ammonia of 0.0115mg/l falls within the high WFD classification. Electrical conductivity is moderate (mean 1043.04 µS/cm).

9.5.20 Water quality within the Dunston Beck WFD water body at Dunston Beck Spring is circum-neutral with a pH of 7.75, falling within the WFD high classification based on data sampled here from 2020 to 2025. A 10th percentile dissolved oxygen saturation of 90.5% falls within the WFD high classification. There has been no monitoring of BOD at this site. Electrical conductivity is moderate (mean 857.30 µS/cm).

9.5.21 Water quality within Metheringham Beck at Metheringham Ds Stw is circum-neutral with an average pH of 7.60 but falls within the WFD high classification based on data sampled here from 2019 to 2023. A 10th percentile dissolved oxygen saturation of 76.74% is within the good WFD classification. A 90th percentile for BOD of 5.64mg/l falls within the moderate classification and 0.003mg/l for ammonia both fall within the high WFD classifications. Electrical conductivity is moderate (mean 869.07 µS/cm).

9.5.22 Pike Drain is circum-neutral with a pH of 7.96. It has moderate electrical conductivity (680 µS/cm), but fewer determinants have been monitored at this site (which is not a WFD water body).

9.5.23 Nitrate and orthophosphate values are somewhat elevated for all monitored sites and indicates probable pressure from the surrounding agricultural land uses through use of fertilisers and other products which may runoff to the watercourses.

## Table 9-8: Summary Environment Agency water quality monitoring data

| | | Pike Drain (2018-2024; 9 samples) | | | | | River Witham, Aubourn Bridge (2019-2025; 60 samples) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Determinant** | **Units** | **Mean** | **Max** | **Min** | **90th %tile** | **10th %tile** | **Mean** | **Max** | **Min** | **90th %tile** | **10th %tile** |
| pH | pH Units | 7.96 | 8.67 | 7.62 | 8.26 | 7.74 | 8.14 | 8.93 | 7.60 | 8.39 | 7.84 |
| Temperature of Water | °C | - | - | - | - | - | 11.52 | 20.80 | 3.30 | 18.50 | 5.08 |
| Conductivity at 25 C | µs/cm | - | 680 | 680 | - | - | 884.50 | 1076.00 | 562.00 | 982.50 | 760.00 |
| BOD: 5 Day ATU | mg/l | | | | | | 1.52 | 3.20 | 1.00 | 1.96 | 1.10 |
| Ammoniacal Nitrogen as N | mg/l | - | - | - | - | - | 0.06 | 0.15 | 0.03 | 0.11 | 0.03 |
| Nitrogen, Total Oxidised as N | mg/l | - | - | - | - | - | 9.10 | 15.00 | 2.00 | 13.00 | 5.86 |
| Nitrate as N | mg/l | - | - | - | - | - | 9.06 | 14.90 | 1.97 | 12.90 | 5.84 |
| Nitrite as N | mg/l | - | - | - | - | - | 0.04 | 0.13 | 0.01 | 0.08 | 0.02 |
| Ammonia un-ionised as N | mg/l | - | - | - | - | - | 0.00089 | 0.00304 | 0.00038 | 0.00137 | 0.00046 |
| Alkalinity to pH 4.5 as CaCO3 | mg/l | - | - | - | - | - | 208.15 | 240.00 | 124.00 | 221.00 | 189.00 |
| Orthophosphate, reactive as P | mg/l | - | - | - | - | - | 0.21 | 0.57 | 0.05 | 0.36 | 0.10 |
| Calcium, Dissolved | mg/l | 91.29 | 120.00 | 33.00 | 113.60 | 68.68 | - | - | - | - | - |
| Carbon, Organic, Dissolved as C :- {DOC} | mg/l | 5.98 | 7.00 | 4.70 | 6.91 | 5.24 | - | - | - | - | - |
| Nickel, Dissolved | µg/l | 1.44 | 1.81 | 1.10 | 1.72 | 1.12 | - | - | - | - | - |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nickel : BLM Bioavailable | µg/l | 0.57 | 1.60 | 0.33 | 0.76 | 0.35 | - | - | - | - | - |
| Oxygen, Dissolved, % Saturation | % | - | - | - | - | - | 94.44 | 143.20 | 66.30 | 104.31 | 80.13 |
| Oxygen, Dissolved as O2 | mg/l | - | - | - | - | - | 10.38 | 13.20 | 7.08 | 12.72 | 7.98 |

| | | River Brant Blackmore Bridge (2020-2025; 38 samples) | | | | | South Hykeham (2019-2025; 48 samples) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Determinant** | **Units** | **Mean** | **Max** | **Min** | **90th %tile** | **10th %tile** | **Mean** | **Max** | **Min** | **90th %tile** | **10th %tile** |
| pH | pH Units | 7.91 | 8.47 | 7.06 | 8.36 | 7.46 | 7.74 | 8.81 | 7.18 | 7.96 | 7.48 |
| Temperature of Water | °C | 11.11 | 19.30 | 2.10 | 17.13 | 3.82 | 10.55 | 20.20 | 2.20 | 16.98 | 4.31 |
| Conductivity at 25 C | µs/cm | 890.11 | 1111.00 | 528.00 | 1036.90 | 717.70 | 1043.04 | 1535.00 | 498.00 | 1310.80 | 715.20 |
| BOD: 5 Day ATU | mg/l | 2.07 | 5.20 | 1.30 | 2.52 | 1.40 | 2.72 | 8.30 | 1.10 | 5.28 | 1.30 |
| Ammoniacal Nitrogen as N | mg/l | 0.10 | 0.48 | 0.03 | 0.25 | 0.04 | 0.37 | 2.10 | 0.03 | 0.78 | 0.05 |
| Nitrogen, Total Oxidised as N | mg/l | 10.26 | 21.00 | 2.10 | 17.50 | 3.90 | 5.06 | 28.00 | 0.25 | 11.80 | 0.51 |
| Nitrate as N | mg/l | 10.19 | 20.90 | 1.88 | 17.40 | 3.83 | 4.85 | 27.90 | 0.01 | 11.62 | 0.29 |
| Nitrite as N | mg/l | 0.06 | 0.22 | 0.02 | 0.10 | 0.03 | 0.11 | 1.10 | 0.01 | 0.19 | 0.02 |
| Ammonia un-ionised as N | mg/l | 0.00110 | 0.00366 | 0.00026 | 0.00203 | 0.00038 | 0.0046 | 0.0423 | 0.0002 | 0.0115 | 0.0005 |
| Alkalinity to pH 4.5 as CaCO3 | mg/l | 212.89 | 260.00 | 140.00 | 240.00 | 177.00 | 211.06 | 300.00 | 79.00 | 250.00 | 160.00 |
| Orthophosphate, reactive as P | mg/l | 0.26 | 1.30 | 0.03 | 0.64 | 0.05 | 0.12 | 0.47 | 0.02 | 0.22 | 0.03 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Oxygen, Dissolved, % Saturation | % | 89.57 | 169.20 | 8.10 | 120.70 | 58.04 | 79.77 | 167.80 | 38.70 | 98.60 | 50.84 |
| Oxygen, Dissolved as O2 | mg/l | 9.94 | 15.70 | 0.79 | 12.90 | 5.98 | 9.02 | 18.70 | 3.70 | 11.36 | 5.92 |

| | | Metheringham Beck Headwaters (2019-2023; 30 samples) | | | | | Dunston Beck (2022-2025) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Determinant** | **Units** | **Mean** | **Max** | **Min** | **90th %tile** | **10th %tile** | **Mean** | **Max** | **Min** | **90th %tile** | **10th %tile** |
| pH | pH Units | 7.60 | 7.93 | 7.31 | 7.73 | 7.47 | 7.75 | 8.00 | 7.55 | 7.95 | 7.57 |
| Temperature of Water | °C | 11.34 | 13.70 | 8.40 | 13.01 | 9.66 | 10.93 | 12.60 | 9.40 | 12.51 | 9.76 |
| Conductivity at 25 C | µs/cm | 869.07 | 1048.00 | 253.00 | 922.70 | 855.70 | 857.30 | 886.00 | 816.00 | 884.20 | 833.10 |
| BOD: 5 Day ATU | mg/l | 2.60 | 8.60 | 1.00 | 5.64 | 1.04 | - | - | - | - | - |
| Ammoniacal Nitrogen as N | mg/l | 0.12 | 0.34 | 0.03 | 0.26 | 0.03 | - | - | - | - | - |
| Nitrogen, Total Oxidised as N | mg/l | 9.86 | 12.00 | 1.50 | 11.10 | 8.88 | 16.60 | 20.00 | 13.00 | 19.10 | 14.80 |
| Nitrate as N | mg/l | 9.85 | 12.00 | 1.48 | 11.10 | 8.84 | 16.60 | 20.00 | 13.00 | 19.10 | 14.80 |
| Nitrite as N | mg/l | 0.01 | 0.04 | 0.01 | 0.01 | 0.01 | 0.0063 | 0.0063 | 0.0063 | 0.0063 | 0.0063 |
| Ammonia un-ionised as N | mg/l | 0.00145 | 0.00471 | 0.00020 | 0.00349 | 0.00021 | - | - | - | - | - |
| Alkalinity to pH 4.5 as CaCO3 | mg/l | 239.63 | 260.00 | 79.00 | 251.00 | 239.00 | 250.00 | 260.00 | 240.00 | 260.00 | 240.00 |
| Orthophosphate, reactive as P | mg/l | 0.04 | 0.12 | 0.01 | 0.08 | 0.01 | 0.0048 | 0.0110 | 0.0021 | 0.0082 | 0.0023 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Calcium, Dissolved | mg/l | - | - | - | - | - | 150.00 | 150.00 | 150.00 | 150.00 | 150.00 |
| Oxygen, Dissolved, % Saturation | % | 83.41 | 94.10 | 74.30 | 88.66 | 76.74 | 95.78 | 99.30 | 89.60 | 98.76 | 90.50 |
| Oxygen, Dissolved as O2 | mg/l | 9.12 | 10.40 | 7.90 | 9.67 | 8.48 | 10.55 | 11.30 | 9.50 | 11.12 | 9.95 |

## Aquatic Ecology

9.5.24 The aquatic ecology desk study described in **Appendix 8-C: Aquatic Ecology [EN010154/APP/6.3]** provides an overview of any protected, notable or invasive species of aquatic macroinvertebrates, macrophytes and fish within the Study Area based on desk study and site survey. A summary is provided below.

### Fish

9.5.25 The desk study identified ten records of the protected species European Eel *Anguilla anguilla* within 2km of the Study Area within the last 20 years, with the closest record being 600m downstream of the Site on the River Witham. This species is afforded protection under the Eels (England and Wales) Regulations 2009 (Ref 9-84), which places a requirement upon developers and abstracters to ensure continued eel passage and to prevent eel entrainment.

9.5.26 Bullhead *Cottus gobio* was also identified at the same Environmental Agency monitoring station with the most recent record in 2017. This species is a Habitats Directive Annex II species (Ref 9-85) and UK Biodiversity Action Plan (UK BAP) Priority Species (Ref 9-87).

9.5.27 The most recent record of Brown Trout *Salmo trutta* identified during the desk study was in 1997, 1.7km upstream of the DCO Site on the River Witham. Brown Trout is listed as a Section 41 species of principal importance (Ref 9-65).

9.5.28 The desk study also revealed that Barbel *Barbus barbus* was found 600m downstream of the DCO Site on the River Witham, with the latest record in 2005. This species is a Habitats Directive Annex V species (Ref 9-86).

9.5.29 In addition, Spined Loach *Cobitis taenia* was recorded in a section of the River Brant within the DCO Site, with the most recent record in 2011. This species is listed in Annex II of the Habitats Directive (Ref 9-86) and it is a Section 41 species of principal importance (Ref 9-65). It is restricted to central and eastern England.

9.5.30 Due to the presence of the above notable fish species in connected waterbodies, there is the potential that they may occur within the watercourses and ditches to be impacted within the Site. European Eel for example may utilise all connected watercourses and ditches in a catchment and may cross land between them. Therefore, consideration will need to be given to maintaining passage along watercourses and ditches for transitory fish species and avoiding impacts to them during construction.

9.5.31 No suitable spawning habitat for fish was identified in any of the surveyed waterbodies, and therefore there are no seasonal constraints due to the presence of spawning fish.

### Aquatic Macroinvertebrates

9.5.32 No aquatic macroinvertebrate species were recorded that receive specific legal protection via Schedule 8 of the Wildlife and Countryside Act (WCA) 1981 (Ref 9-65), or that are listed in Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 Act (Ref 9-66) as being of principal importance for nature conservation in England. However, there were two Regionally Notable macroinvertebrate species found in the Site: a water beetle *Hydraena testacea* and a dragonfly *Sympetrum vulgatum* (larva found) in drain WC3 (see **Figure 9-1 [EN010154/APP/6.2]** for drain locations). Four Locally Notable species were also found across the Site: a freshwater snail, Leach's Bithynia (*Bithynia leachii*), three water beetle species, two water scavenger beetles, *Laccobius colon* and *Anacaena bipustulata* and a diving beetle *Ilybius quadriguttatus*.

9.5.33 Macroinvertebrate communities were typical of watercourses subject to significant human modification and man-made drainage ditches in lowland Lincolnshire, with most ditch communities including freshwater snails, water beetles, and Odonata (dragonflies and damselflies).

9.5.34 Aquatic macroinvertebrate surveys undertaken for the Proposed Development revealed that watercourses within the Principal Site are all subject to habitat diversity and water quality pressures throughout. Current Average Score Per Taxon (WHPT) scores suggest that the majority of surveyed water bodies suffer from Poor, Polluted or Impacted water quality (see **Figure 9-1 [EN010154/APP/6.2]** for drain locations). There are some exceptions where Moderate, Moderately impacted water quality and Good, Clean water quality is recorded (refer to **Appendix 8-C: Aquatic Ecology [EN010154/APP/6.3]**). The macroinvertebrate communities in all surveyed water bodies were indicative of environments with high levels of siltation. In line with these results, the aquatic macroinvertebrate community of all surveyed watercourses had either a Low or Moderate conservation value.

### Aquatic Macrophytes

9.5.35 A single notable plant species, Opposite-leaved Pondweed *Groenlandia densa*, was present in drains BL5 and BL6 only. This threatened species has a Vulnerable status on the England Red List of vascular plants (Ref 9-88) but does not receive specific legal protection. Online mapping indicates that this species has a patchy distribution across Lincolnshire, where it is mostly found in smaller water bodies such as streams, canals, ditches and ponds. As such, it is considered of Local conservation value. Water body BL6 supports a total of 12 qualifying freshwater macrophyte species listed in the Local Wildlife Site Guidelines for Greater Lincolnshire (Ref 9-89). This water body therefore meets the criteria for selection of LWS and is of County conservation value.

9.5.36 Most of the water bodies do not support a notably diverse aquatic plant assemblage, with the majority being fairly species poor. Although some (WC8, BL8 and Bl5) do support a moderate number of aquatic plant species (>15), these are comprised of common species typical of drainage ditches and / or slow flowing water bodies. It is highly likely that similar aquatic plants

communities occur within suitable habitats across the wider landscape, and as such these plant species and assemblages are judged to be of Site conservation value.

**Mammals**

9.5.37 **Chapter 8: Ecology and Nature Conservation [EN010154/APP/6.1]** indicates the presence of Otter *Lutra lutra* along the River Brant and River Witham, including a potential Otter holt within the DCO Site on the River Witham within woodland east of the watercourse. Otter is protected under various legislation in the UK and the presence of a potential holt within the DCO Site and activity levels along the River Witham means the Principal Site is likely to support an Otter population of District Importance.

9.5.38 **Chapter 8: Ecology and Nature Conservation [EN010154/APP/6.1]** also indicates the presence of Water Vole *Arvicola amphibius* along the eastern end of the Principal Site on the River Witham. Water Vole are protected under Schedule 5 of the Wildlife and Countryside Act, 1981 (Ref 9-66). The limited number of records of Water Vole, suitable habitat and absence of Mink, which predate Water Vole, means the Proposed Development Site is likely to support a population of District importance, in consideration of this species' declining status in a national and county context.

**Aquatic Invasive Non-Native Species**

9.5.39 The presence of the non-native but non-invasive New Zealand Mud Snail and freshwater amphipod shrimp, either *Crangonyx pseudogracillis* or *Crangonyx floridanus*, constituted the only notable macroinvertebrate records. As these species are widespread and not currently listed in UK legislation, there are no statutory constraints to the spread of either species.

9.5.40 Two submerged plants, Canadian Waterweed *Elodea canadensis* and Nuttall's Waterweed *Elodea nuttallii*, are listed on Schedule 9 of the WCA (Ref 9-65) and the latter also listed on the Invasive Alien Species (Enforcement and Permitting) Order (Ref 9-70). As such it is an offence to cause either species grow in the wild and in the case of Nuttall's Waterweed, there should be a plan for dealing with this species as under the (Enforcement and Permitting) Order. To this end, a Biosecurity Management Plan would be produced to ensure that neither species was spread outside the DCO Site during construction, operation, and decommissioning. Nuttall's waterweed was recorded in water bodies WC8 and WC9; Canadian pondweed was recorded in water bodies BL4 and BL5 (see **Figure 9-1 [EN010154/APP/6.2]** for coded locations). The Biosecurity Management Plan would be produced post consent and is secured through the **Framework CEMP [EN010154/APP/7.7]** and **Framework OEMP [EN010154/APP/7.8].**

## Nature Conservation Sites

9.5.41 Statutory sites designated for nature conservation were identified through a review of Defra's MAGIC map (Ref 9-40). The following are located within the Study Area, or within a few kilometres downstream (considered in order of nearest to the Proposed Development):

a. Tunman Wood (Local Nature Reserve (LNR) – Located immediately north of the Principal Site, east of Sinderby. This is not a water dependent site and so is not considered further herein.

b. Whisby Nature Park (Local Nature Reserve (LNR)) – Located approximately 340m north of the Principal Site, the LNR consists of flooded gravel pits, wetlands, scrub woodland and some grassland. The LNR supports various species such as water voles, bats and various species of bird. There are no known hydrological connections between watercourses flowing through the Study Area to the waterbodies at Whisby Nature Park on the basis of Ordnance Survey mapping and it is not considered further.

c. Swanholme Lakes (Site of Special Scientific Interest (SSSI)) – The SSSI is located approximately 4.2km northeast of the Principal Site. The site is designated for the diversity of ecology resulting from unpolluted water and range of physical and chemical conditions. The area supports several uncommon species of submerged plants and an outstanding community of breeding dragonflies, as well as various other fauna. There are no known hydrological connections between watercourses flowing through the Study Area to Swanholme lakes on the basis of Ordnance Survey mapping and on this basis, it is not considered further.

## Geology and Soils

9.5.42 The BGS GeoIndex online mapping (Ref 9-44) has been reviewed to identify bedrock and superficial geology underlying the Proposed Development. Information on soils has been obtained from Cranfield Soilscapes website (Ref 9-39).

**Principal Site**

9.5.43 The soils underlying the Principal Site are predominantly described on the Cranfield Soilscapes website (Ref 9-39) as *"Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils"* with impeded drainage. There is a section to the south of Aubourn which is described as "*Naturally wet very acid sandy and loamy soils"* with naturally wet drainage. Soils closer to watercourses are described differently, as "*Loamy and clayey floodplain soils with naturally high groundwater*" and are naturally wet (Ref 9-39).

9.5.44 Superficial deposits are largely absent from the Principal Site however, isolated pockets of Balderton Sand and Gravel Member are mapped north of High Walks Farm, a larger area south of Aubourn and also along the western boundary of the Proposed Development. Alluvium, River Terrace Deposits and Fulbeck Sand and Gravel Member are mapped associated with the watercourses crossing the Proposed Development area.

9.5.45 The Principal Site is underlain by two bedrock formations. The majority of the Principal Site is underlain by Scunthorpe Mudstone Formation comprised of interbedded mudstone and limestone. The eastern part of the Principal Site, which includes the proposed substation and standalone BESS (under the centralised BESS arrangement), is underlain by the Charmouth Mudstone

Formation. The Charmouth Mudstone Formation is described as dark grey laminated shales, and dark, pale and bluish grey mudstones with local limestone beds.

**Cable Corridor**

9.5.46 Soils along the cable corridor are described on the Soilscapes website (Ref 9-39) as "*Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils*" with impeded drainage. Two areas of "*Naturally wet very acid sandy and loamy soils*" with naturally wet drainage are crossed by the cable corridor. Soils closer to watercourses are described differently, as "Loamy and sandy soils with naturally high groundwater and a peaty surface" and "*Loamy and clayey floodplain soils with naturally high groundwater*" and are naturally wet. Soils within the vicinity of, and to the east of, the A607 are described as "*Shallow lime-rich soils over chalk or limestone"* and are freely draining.

9.5.47 Superficial deposits are largely absent along the cable corridor, specifically, the section of the corridor to the east of Broughton Lane. Superficial deposits of Balderton Sand and Gravel Member are found between Aubourn and Bassingham and Alluvium, River Terrace deposits and Fulbeck Sand and Gravel Member are mapped associated with the watercourses. These deposits are comprised of silts, clays, sands of gravels.

9.5.48 The Cable Corridor Study Area is underlain by six bedrock formations. The boundaries between the formations are roughly north-south orientated and perpendicular to the cable corridor. The bedrock formations are outlined below from west to east.

9.5.49 A small section to the western extent of the Cable Corridor is underlain by the Scunthorpe Mudstone Formation (interbedded mudstone and limestone).

9.5.50 The bedrock formation east of the Scunthorpe Mudstone Group is the Charmouth Mudstone Formation, as described in section 9.5.45. The Charmouth Mudstone Formation underlies the majority of the Cable Corridor.

9.5.51 To the east of the Charmouth Mudstone formation is a narrow band of Whitby Mudstone Formation. The Whitby Mudstone Formation is comprised of interbedded mudstone, siltstone and calcareous sandstone beds. This narrow band runs north – south in between the Charmouth Mudstone Formation and the Grantham Formation and Northampton Sand Formation.

*9.5.52* To the east of the Whitby Formation is a very narrow band (approximately 45m at outcrop) of Grantham Formation and Northampton Sand Formation. This formation is comprised of sandstone and ironstone.

*9.5.53* To the east of Grantham Formation and Northampton Sand Formation outcrops the Lower Lincolnshire Limestone Member, part of the Lincolnshire Limestone Formation. This member outcrops in the vicinity of Boothby Graffoe and is dominated by peloidal wackestone and packstone.

9.5.54 The final bedrock formation crossed by the Cable Corridor is the Lincolnshire Limestone Formation comprised of typically calcilutites, and peloidal wackestones and packstones in the lower part ooidal and shell fragmental

grainstones in the upper part. The thickness of this formation can be up to 30m thick.

## Groundwater

### Hydrogeology

*Designations*

9.5.55 The superficial deposits are all classified by the Environment Agency as Secondary A Aquifers defined as '*Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers*.'

9.5.56 The Scunthorpe Mudstone Formation and Charmouth Mudstone Formation are a designated Secondary B Aquifers defined as '*predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering*'. The Whitby Formation and Grantham Formation and Northampton Sand Formation are not designated as an aquifer. The Lower Lincolnshire Limestone Member and the Lincolnshire Limestone Formation are designated as Principal Aquifers defined as '*rocks that provide significant quantities of water and can support water supply and/or baseflow to rivers, lakes and wetlands on a strategic scale*'. In summary, the Principal Site is underlain entirely by Secondary B bedrock aquifers and the Cable Corridor is predominantly underlain by Secondary B bedrock aquifers and Principal aquifers from Boothby Graffoe eastwards.

9.5.57 The Cable Corridor is partly located within a Source Protection Zone 3 (SPZ3, total catchment), in the area of Boothby Graffoe to Harmston. This SPZ3 is associated with a groundwater abstraction and SPZ1 located approximately 5.7km north-east of the Proposed Development. There is also an SPZ1 located approximately 4.1km east of the Proposed Development however, there are no SPZ2 or SPZ3 associated with is abstraction (Ref 9-40).

9.5.58 The Proposed Development lies within a Nitrate Vulnerable Zone, indicating an area at risk of agricultural nitrate pollution. The proposed development is not located within any Drinking Water Safeguard Zones for Groundwater.

*Groundwater levels and flow*

9.5.59 No site-specific ground investigation information is currently available at this stage, however a review of selected BGS borehole records available on the Geoindex website has been undertaken (Ref 9-44, Ref 9-75). Only five boreholes within the DCO Site recorded groundwater levels. These are described below.

9.5.60 Borehole data for BGS borehole record SK96SW4 and SK96SW38, located in the centre of Aubourn 660m northeast from the Cable Corridor, recorded groundwater levels 4.5m below ground level (bgl) in the Scunthorpe Mudstone Formation.

9.5.61 Borehole data for BGS borehole record SK86SE139, located in Tunman Wood approximately 100m from the northwestern extent of the Principal Site, recorded groundwater levels 2.5m bgl. This area is underlain by the Scunthorpe Mudstone Formation.

9.5.62 Borehole data for BGS borehole record SK95NE1/A and SK95NE1/B, located to the northwest of Navenby within the Cable Corridor recorded groundwater levels 11m bgl. This area is underlain by the Lincolnshire Limestone Formation.

9.5.63 The Environment Agency Hydrology Data Explorer has provided further data on groundwater levels at three stations in the area. These provide data on average groundwater levels (dipped only) since January 2020.

9.5.64 Thorpe on the Hill monitoring station, located north of the Principal Site, reported average groundwater levels of 12.37mAOD. The monitoring station is 14.2mAOD. Average groundwater levels are 1.8m bgl.

9.5.65 Norton Lane Thurlby monitoring station, located south of the Principal Site, reported average groundwater levels of 13.39mAOD. The monitoring station is 16.23mAOD. Average groundwater levels are 2.84m bgl.

9.5.66 Coleby monitoring station, located north of the Cable Corridor, reported average groundwater levels of 47.10mAOD. The monitoring station is 55.05mAOD. Average groundwater levels are 7.97m bgl.

9.5.67 Where present, groundwater flow within the superficial deposits is likely to be via intergranular flow towards local watercourses and drains. The groundwater flow will be influenced by the presence of lower permeability deposits such as silts and clays and also by the lateral extent of the deposits.

9.5.68 Groundwater flow in the bedrock is likely to be predominantly via fracture flow. Within the mudstone formations flow is likely to be restricted, however, flow can occur where interconnected fractures are present. Flow will be greater within the more permeable limestone bedrock with flow occurring through fractures, enlarged fissures and even karsts.

9.5.69 A Ground Investigation (GI) and groundwater monitoring will be undertaken to obtain groundwater level data and aquifer properties to inform the detailed design.

**WFD Groundwater Bodies**

9.5.70 The Proposed Development is mostly located within the Anglian (WFD groundwater) Management Catchment. However, the northernmost section of the Principal Site lies within the Humber (WFD groundwater) Management Catchment. The Study Area is underlain by three groundwater water bodies (see also **Figure 9-2 [EN010154/APP/6.2]**):

a. Witham Lias (WFD ID: GB40502G401400);

b. Witham Limestone Unit A (WFD ID: GB40501G444800); and

c. Trent Lower Erewash – Secondary Combined (WFD ID: GB40402G990300).

9.5.71 The Witham Lias (WFD ID: GB40502G401400) generally covers the area west of the A607 from Waddington to William St Hughs and Thorpe on the Hill. It has a surface area of 683km². The water body has an overall classification of Good (Cycle 3 classification), with an objective of maintaining Good status. The quantitative and chemical status were classified as Good.

9.5.72 The Witham Limestone Unit A (WFD ID: GB40501G444800) generally covers the area east of the A607 and Waddington and stretches towards the villages of Dunston and Metheringham, as shown on **Figure 9-2 [EN010154/APP/6.2]**. The surface area of this water body is 340.5km$^2$. The groundwater body has an overall classification of Poor (Cycle 3 classification) with both quantitative elements and chemical status being Poor. This Poor status is due to pollution from agriculture and rural land management and changes to natural flow and level of water from the water industry.

9.5.73 The Trent Lower Erewash – Secondary Combined (WFD ID: GB40402G990300) covers the area at the far west of the Study Area, around the village of Morton and generally west of the A46. The surface area of this water body is 1924.4km$^2$. It has an overall Cycle 3 classification of Good for 2019 for both Quantitative elements and Chemical Status, with an objective of maintaining Good status.

## Water Resources

### Protected Areas

9.5.74 Within the Study Area there is a Drinking Water Protected Area, which contains land to the east and west of the River Witham (see **Figure 9-1 [EN010154/APP/6.2])**. Drinking Water Protected Areas (Surface Water) are where raw water is abstracted from rivers and reservoirs and additional measures are required to protect the raw water supply to reduce the need for additional purification treatment (Ref 9-72). The Drinking Water Protected Area encompasses the majority of the Principal Site between Bassingham and the A46.

9.5.75 No areas of the Proposed Development are contained within a Drinking Water Safeguard Zone for surface water or groundwater. Drinking Water Safeguard Zones are established around public water supplies where additional pollution control measures are needed. (Ref 9-72).

9.5.76 The entirety of the Study Area is contained within the Lower Witham Nitrate Vulnerable Zone (NVZ) (Number S375) and The Fleet Lower Catchment (trib of Trent) NVZ (Number S338). NVZs are areas designated as being at risk from agricultural nitrate pollution. The designations are made in accordance with the Nitrate Pollution Prevention Regulations 2015 (Ref 9-73).

### Pollution Incidents

9.5.77 Information on pollution incidents for the period 2018-2023 has been obtained from the Environment Agency. There were 14 incidents in the Study Area in

this time period and these are listed in **Table 9-9** and shown in **Figure 9-1 [EN010154/APP/6.2]**. Pollution incidents to water are classified as Category 1 (serious impact) through to Category 4 (no impact). There were no Category 1 or 2 pollution incidents within the Study Area, all the incidents were split between Category 3 (minor) and 4 (no impact). The majority are related to illegal waste disposal.

**Water Activity Permits**

9.5.78 Information on water activity permits (i.e. discharge consents) has been obtained from the Environment Agency for the Study Area and are listed in **Table 9-10** and shown in **Figure 9-1 [EN010154/APP/6.2]**.

9.5.79 There are 17 water activity permits (i.e. consents for discharge) within the Study Area. The majority of these are related to sewage discharges some of which are for water companies while others are private (non-water company) discharges.

**Surface and Ground Water Abstractions**

9.5.80 There are three surface water and seven groundwater abstraction licenses located within the Study Area on the basis of data provided by the Environment Agency. These are displayed below in **Table 9-11** and shown in **Figure 9-1 [EN010154/APP/6.2]**.

9.5.81 None of these are located within the DCO Site. The surface water abstractions are used for trickle and spray irrigation and the groundwater abstractions are predominantly used for spray irrigation and in some cases mineral washing.

9.5.82 Details of PWS were requested from North Kesteven District Council, who confirmed that there are none within the Study Area.

## Table 9-9: Pollution Incidents in the Study Area (2018-2023)

| Fig 9-1 Reference Code | Notification Date | Location | National Grid Reference | Water - Incident Category | Cause of incident | Pollutant | X | Y |
|---|---|---|---|---|---|---|---|---|
| P1 | 14/04/2018 | South Farm | SK 90770 62103 | Category 4 (No Impact) | Fly-Tipping | Containers | 490770 | 362103 |
| P2 | 18/11/2020 | Foss Way (Roman Road) | SK 89626 62580 | Category 3 (Minor) | Illegal Waste Site | Hydrocarbons | 489626 | 362580 |
| P3 | 07/08/2020 | Scotwater Bridge | SK 88996 58981 | Category 4 (No Impact) | Other Authorised Activity | Other Atmospheric Pollutant or Effect | 488996 | 358981 |
| P4 | 27/05/2020 | Bassingham | SK 91464 59890 | Category 4 (No Impact) | Storage Tank or Container Failure (Unbunded) | Gas and Fuel Oils | 491464 | 359890 |
| P6 | 17/09/2020 | Coleby | SK 98091 60822 | Category 4 (No Impact) | Other Inadequate Control or Containment | Lubricating Oils | 498091 | 360822 |
| P7 | 18/11/2020 | Foss Way (Roman Road) | SK 89626 62580 | Category 3 (Minor) | Illegal Waste Site | Solvents | 489626 | 362580 |
| P8 | 16/05/2018 | Haddington | SK 91333 62611 | Category 3 (Minor) | Not Identified | Not Identified | 491333 | 362611 |
| P9 | 18/01/2019 | Norton Disney | SK 88910 59167 | Category 4 (No Impact) | Burning of Waste | Fumes | 488910 | 359167 |
| P10 | 21/12/2022 | Haddington | SK 91159 63955 | Category 4 (No Impact) | Other Unauthorised Activity | Unidentified Oil | 491159 | 363955 |
| P11 | 11/01/2023 | Foss Way (Roman Road) | SK 89341 62523 | Category 3 (Minor) | Pipe Failure above ground | Crude Sewage | 489341 | 362523 |
| P12 | 09/11/2020 | Scotwater Bridge | SK 89298 58726 | Category 3 (Minor) | Control System Failure | Petrol | 489298 | 358726 |
| P13 | 07/07/2020 | Norton Disney | SK 88703 59492 | Category 3 (Minor) | Fly-Tipping | Commercial Waste | 488703 | 359492 |
| P14 | 03/11/2018 | Middle lane, Thorpe on the Hill | SK 90970 65456 | Category 4 (No Impact) | Burning of Waste | Smoke | 490970 | 365456 |
| P15 | 17/08/2019 | Hykeham Grange | SK 92072 65251 | Category 4 (No Impact) | Other | Other Animal Matter | 492072 | 365251 |

## Table 9-10: Consented discharges (Water Activity Permits) in the Study Area

| Fig 9-1 Reference Code | Consent number | Long Name | National Grid Reference | Discharge type | X | Y |
|---|---|---|---|---|---|---|
| D1 | ANNNF10345 | BASSINGHAM WATER RECYCLING CENTRE | SK9045359920 | WwTW/Sewage Treatment Works (water company) | 490453 | 359920 |
| D2 | ANNNF10345 | BASSINGHAM WATER RECYCLING CENTRE | SK9045359920 | WwTW/Sewage Treatment Works (water company) | 490453 | 359920 |
| D3 | AW3NF802 | BOOTHBY GRAFFOE PS | SK9833059060 | Pumping Station on Sewerage Network (water company) | 498330 | 359060 |
| D4 | AW3NF824 | HALLWATH PUMPING STN | SK9090059940 | WwTW/Sewage Treatment Works (water company) | 490900 | 359940 |
| D5 | AW3NF827A | NORTON DISNEY PS | SK8918059040 | Pumping Station on Sewerage Network (water company) | 489180 | 359040 |
| D6 | ANNNF13397 | SWINDERBY(EXRAF) STW | SK9063061840 | WwTW/Sewage Treatment Works (water company) | 490630 | 361840 |
| D7 | EPRGB3097VL | GRANGE FARM COTTAGE | SK9235060027 | Domestic property (single) (incl farm house) | 492350 | 360027 |
| D10 | EPRJB3790NJ | SWINDERBY QUARRY | SK8844160953 | Waste Collection/Treatment/Disposal/Materials Recovery | 488441 | 360953 |
| D11 | AW3NFF706 | SPS HADDINGTON | SK9180062800 | Pumping Station on Sewerage Network (water company) | 491800 | 362800 |
| D12 | PR3NF908 | THORPE-ON-THE-HILL SERVICE AREA | SK9200065400 | Holiday Accomadation/Camp Site/Caravan Site/Hotel/Hostel | 492000 | 365400 |
| D13 | PR3NF907 | FILLING STATION AND RESTAURANT | SK9200065300 | Shop incl Garden Centre/Retail Trade(not Motor Vehicle) | 492000 | 365300 |
| D14 | AW3NFF702 | SPS THORPE ON THE HILL | SK9097466042 | Pumping Station on Sewerage Network (water company) | 490974 | 366042 |
| D15 | AW3NFF703 | SPS THORPE ON THE HILL | SK9081865133 | Pumping Station on Sewerage Network (water company) | 490818 | 365133 |
| D16 | EPRZP3224XR | HOUSHAM WOOD FARM | SK8943364453 | Domestic property (single) (incl farm house) | 489433 | 364453 |
| D18 | EPREB3894VF | UNITS 1,2 & 3 GREEN MAN FARM | TF0176059190 | Domestic property (multiple) (incl farm houses) | 501760 | 359190 |
| D19 | EPREB3494AX | GREENMAN CLUBHOUSE | TF0168659108 | Making of Machinery/Engine/Pump/Furnace/Tractor | 501686 | 359108 |
| D20 | T/69/07294/S | THE COTTAGES | SK8820063200 | WwTW (not water company) (not STP at a private premises) | 488200 | 363200 |

## Table 9-11: Abstraction Licenses in the Study Area

| Fig 9-1 Reference Code | License Number | Source Type | X | Y |
|---|---|---|---|---|
| A1 | 4/30/03/*S/0082 | Surface water | 493300 | 361600 |
| A3 | AN/030/0003/007 | Surface water | 489298 | 358720 |
| A4 | AN/030/0003/007 | Surface water | 491024 | 361105 |
| G4 | AN/030/0003/002 | Groundwater | 490520 | 366680 |
| G5 | 03/28/69/0296/1/R01 | Groundwater | 487400 | 365325 |
| G6 | 4/30/03/*G/0068 | Groundwater | 488450 | 365700 |
| G7 | 4/30/03/*G/0109/R01 | Groundwater | 489402 | 365964 |
| G8 | 4/30/03/*G/0109/R01 | Groundwater | 489746 | 365987 |
| G9 | 4/30/03/*G/0081 | Groundwater | 491900 | 365700 |
| G12 | 4/30/03/*G/0049 | Groundwater | 488490 | 361090 |

*G – Groundwater Abstraction, A – Surface Water Abstraction*

## Flood Risk from all sources

9.5.83 Existing flood risk from all sources for the Principal Site is summarised in **Table 9-12**. Refer to **Figure 9-3 [EN010154/APP/6.2]** for mapping of fluvial flood risk in relation to the Proposed Development, and **Figure 9-4 [EN010154/APP/6.2]** for mapping of surface water flood risk. Full details of flood risk are outlined in **Appendix 9-C: FRA [EN010154/APP/6.3]** with a brief summary provided in **Table 9-12**.

**Table 9-12: Flood Risk from all sources for the Site**

| Flood Risk Sources | Pre-Development Flood Risk | Comments |
|---|---|---|
| Fluvial | Low to High | **Main Rivers:**<br>The majority of the Principal Site and Cable Corridor are located within Flood Zone 1. However, there are significant areas designated as Flood Zone 2 and 3 associated with a flood storage area west of the River Witham (Witham Washlands Flood Storage Area), which the Proposed Development crosses, see **Figure 9-3 [EN010154/APP/6.2]**.<br>Land in Flood Zone 1 is assessed as having less than a 0.1% Annual Exceedance Probability (AEP) of fluvial or tidal flooding. The land in Flood Zone 2 is assessed as having between a 1% and 0.1% AEP of river flooding; or land having between a 0.5% and 0.1% AEP of tidal flooding. Flood Zone 3 is separated into 3a and 3b. The land in Flood Zone 3a is assessed as having a 1% or greater annual probability of fluvial flooding or a 0.5% or greater AEP of tidal flooding. The land in Flood Zone 3b is assessed as having a 3.3% or greater AEP of flooding.<br>There are flood defences along the River Witham and River Brant, which are operated and maintained by the Environment Agency to a high standard, such that the flood risk up to an including the return periods noted is considered a low residual risk.<br>**Ordinary Watercourses:**<br>Various Ordinary Watercourses and land drains located within the Principal Site extent are present. A small area of Flood Zone 3 is present in the northeast of the Principal Site associated with Mill Dam Dyke, see **Figure 9-3 [EN010154/APP/6.2]**. |
| Tidal | Low | The majority of the DCO Site east of the A46 is considered to be at a low residual risk of tidal flooding as the River Witham and Brant is protected for up to the 300 year event with an allowance for climate change by the Grand Sluice tidal defence in Boston, approximately 45km from the centre of the Principal Site. |

| Flood Risk Sources | Pre-Development Flood Risk | Comments |
|---|---|---|
| | | Mill Dam Dyke, an Ordinary Watercourse in the vicinity of the Proposed Development, located approximately 3.6km north west of the Principal Site Boundary (Morton Hall area) is subject to tidal influence, this may impose a tidal risk to the Principal Site Boundary as an Ordinary Watercourse that is a tributary to Mill Dam Dyke runs parallel with part of the Site Boundary. The Mill Dam Dyke discharges into the River Trent via tidal sluice; however, the Mill Dam Dyke can become tide locked impacting flood risk upstream. North Kesteven District Council's Strategic Flood Risk Assessment indicates that Environment Agency modelling suggests peak levels in the Mill Dam Dyke would reach approximately 7.74m AOD, before overtopping and flooding low lying areas. With lowest ground levels at the north west extent of the Principal Site boundary being approximately 14m AOD, tidal risk is considered low. |
| Surface Water | Low to High | The risk of surface water flooding within the Principal Site and Cable Corridor varies from very low to high (see **Figure 9-4 [EN010154/APP/6.2]**. The areas of high risk are likely associated with areas of low topography where surface water sits and pools rather than draining away or show areas at risk of flooding from smaller Ordinary Watercourses and/or local land drains. |
| Groundwater | Low | North Kesteven District Council's SFRA indicates the area the DCO Site is not deemed not to be at risk of groundwater flooding, with no recorded groundwater flood events.<br>No site-specific ground investigation information has been undertaken, however, a review of selected BGS borehole records available indicate shallow groundwater at depths of 2 to 3m below ground level (bgl) is likely to present in the river valleys and where the permeable superficial deposits are encountered. The depth to groundwater in the underlying bedrocks is currently unknown. |
| Sewers | Low | The Principal Site and Cable Corridor is located in a predominantly rural agricultural location. However, where the route crosses a highway or in proximity to a settlement there is potential for flooding from sewers, specifically nearer to sewerage treatment plants located to the south, adjacent to of the Principal Site Boundary. |

| Flood Risk Sources | Pre-Development Flood Risk | Comments |
|---|---|---|
| Reservoirs | Low | Environment Agency online mapping shows no artificial sources of flood risk associated within the DCO Site. Residual Risk is Low. |

9.5.84 Main Rivers are defined according to criteria set under the Water Resources Act 1991 (Ref 9-6) as usually larger rivers and streams with a potentially significant flood risk associated with them. There are two Main Rivers within the Study Area, for which the Environment Agency is the regulating authority. These are the River Brant and the River Witham. Other watercourses are Ordinary Watercourses and the LLFA (Lincolnshire County Council) is the regulating authority for these, other than those that are IDB drains.

## Future Baseline

9.5.85 The future baseline scenarios are set out in **Chapter 5: EIA Methodology [EN010154/APP/6.1]** and are described below.

**Surface Water**

9.5.86 Three WFD surface water body catchments identified within the Study Area (Brant Lower Water Body from Brant Upper Water Body to River Witham Water Body, Boultham Catchwater Drain Water Body, Dunston Beck Water Body) have a target of Good by 2024/2027, four (Witham from Cringle Brook to Brant Lower Water Body, South Hykeham Catchwater Water Body, Metheringham Beck Water Body, the Fleet Lower Catchment (tributary of the Trent) Water Body) with a target of Moderate (or maintaining Moderate status) by 2015.

9.5.87 It is likely that through the action of new legislative requirements and ever more stringent planning policy and regulation, that the health of the water environment will continue to improve post-2027. The Environment Act 2021 (Ref 9-1) and the Levelling-Up and Regeneration Act 2023 (Ref 9-19) include measures to tackle storm sewage discharges and set new requirements relating to nutrient (nitrogen and phosphorous) pollution standards, respectively (see Part 7 of the Act). There are, however, significant challenges such as adapting to a changing climate and pressures of population growth that could have a retarding impact. It is also difficult to forecast these changes with any certainty.

9.5.88 The current receptor importance criteria presented below in **Table 9-13** is largely based on the presence or absence of various attributes (e.g. Drinking Water Protected Area, designated nature conservation site or WFD designation) and flow (i.e. the size of the watercourse). The application of these criteria is therefore not sensitive to more subtle changes or improvements in water quality as may be experienced over time. Thus, no significant changes to current baseline conditions are predicted for the future baseline in the absence of the Proposed Development, as the principal

reasons for differences in water body importance are unlikely to change. For this reason, the impact assessment within this chapter is undertaken against existing baseline conditions.

**Groundwater**

9.5.89 The Study Area is underlain by three groundwater water bodies. The Lower Erewash – Secondary Combined WFD Groundwater body and the Witham Lias Trent WFD Groundwater body are both at their objectives of Good Status (2021), and Good Status (2015) respectively. The Witham Limestone Unit A WFD Groundwater body has an objective of Poor (2015), meaning that there should be no further deterioration from its current position. The importance level of the groundwater feature is based on SPZs, abstractions, and the Principal or other status of the aquifer. Thus, an increase in WFD designation from Poor to Good would not change the importance attributed to the groundwater feature at this stage.

9.5.90 No significant changes to current baseline conditions are predicted for the future baseline for the same reasons as outlined above for surface water. The impact assessment within this chapter is therefore undertaken against existing baseline conditions.

**Flood Risk**

9.5.91 Climate change is predicted to alter both future fluvial and pluvial flood risk with changing rainfall intensity, and thus it is important that this is taken into account by the FRA **(Appendix 9-C [EN010154/APP/6.3]**). Climate change resilience has been accounted for within the **Framework Surface Water Drainage Strategy (Appendix 9-D [EN010154/APP/6.3])** for the Proposed Development, accommodating current government climate change projections. Refer to the **FRA (Appendix 9-C) [EN010154/APP/6.3]** and **Framework Surface Water Drainage Strategy (Appendix 9-D) [EN010154/APP/6.3]** for further details.

**Future Baseline – approximately 2093**

9.5.92 It is considered that continued environmental improvements, tighter regulation at both national, regional and local scales, and environmental enhancements would lead to a gradual improvement over current baseline conditions in terms of water quality. However, as outlined above, the current receptor importance criteria presented in **Table 9-13** is largely based on the presence or not of various attributes. The application of these criteria is therefore not sensitive to more subtle changes or improvements in water quality as may be experienced over time. Thus, no significant changes to current baseline conditions are predicted for the future for surface water or groundwater.

9.5.93 Climate change has the potential to significantly impact on drainage and flood risk, for example through increased storm intensity and changes in future rainfall patterns. However, the design of the Proposed Development will incorporate the climate change projections required by the Environment Agency to ensure that potentially increased surface water flows are accounted for and managed across the lifetime of the Proposed Development. Therefore,

no significant adverse changes to current baseline conditions are predicted for the future baseline for decommissioning, assumed to be in 2093 (assumed to be the decommissioning date for the purposes of this assessment based on final commissioning in 2033 and a fixed lifespan of 60 years, as per **Chapter 3: The Proposed Development [EN010154/APP/6.1]**, and so the impact assessment within this chapter is undertaken against existing baseline conditions. It is noted that changes to the construction period altering the date of start of operation and hence the decommissioning date would not alter this outcome.

## Importance of Receptors

9.5.94 **Table 9-13** provides a summary of the water features that may be impacted by the Proposed Development (i.e. there is a source and a possible pathway), a description of their attributes, and states the importance of the water feature as used in this assessment. Importance is based on the criteria set out in **Table 9-13**. Separate importance classifications are provided for water quality and morphological aspects of waterbodies as it is not always appropriate to have the same rating (e.g. a waterbody may be heavily modified or even artificial and thus have a low morphology importance, but the water quality importance may be high by virtue of supporting protected species or other important potable or socio-economic and recreational uses).

### Table 9-13: Importance of identified receptors

| Waterbody | Importance |
|---|---|
| **River Brant Lower Water Body** | **High importance receptor for water quality** on the basis of being a WFD water body (Brant Lower, WFD ID: GB105030056770) with an estimated Q95 flow of less than 1.0$m^3$/s (recorded as 0.007$m^3$/s). Water quality monitoring data indicates that the watercourse is under pressure from agricultural pollution but it has recorded protected species (Spined Loach) in a section within the Study Area, although the most recent record was in 2011. Spined Loach is an Annex II species, and protected through the Conservation of Habitats and Species Regulations 2017. Otters are present and is a protected species.<br>**Low Importance for morphology** due to the heavily modified and straightened nature of the channel. |
| **River Witham** | **High importance receptor for water quality** on the basis of being a WFD water body (River Witham from Cringle Brook to confluence with Brant, WFD ID: GB105030056780) with an estimated Q95 flow of less than 1.0$m^3$/s (recorded as 0.383$m^3$/s). Water quality monitoring data indicates that the watercourse is under pressure from agricultural pollution but it has recorded protected species (European eel, bullhead, brown trout and barbel). The watercourse is also associated with a Drinking Water Protected Area. Otter and water vole are present and are protected species. |

| Waterbody | Importance |
|---|---|
| | **Medium Importance for morphology** due to the heavily modified nature of the channel but showing some signs of features indicative of more natural geomorphological processes. |
| **Boultham Catchwater Drain** | **High importance receptor for water quality** on the basis of being a WFD water body (Boultham Catchwater Drain, WFD ID: GB105030062380) with an estimated Q95 flow of less than 1.0$m^3$/s.<br>**Low Importance for morphology** due to the heavily modified nature of the channel. Nonetheless the channel itself is over 3km from the Study Area and so there are no morphological impacts to consider. |
| **South Hykeham Catchwater** | **High importance receptor for water quality** on the basis of being a WFD water body (South Hykeham Catchwater Water Body, WFD ID: GB105030062460) with an estimated Q95 flow of less than 1.0$m^3$/s.<br>**Low Importance for morphology** due to the heavily modified nature of the channel. Nonetheless the channel itself is not located within the Study Area and so there are no morphological impacts to consider. |
| **The Fleet** | **High importance receptor for water quality** on the basis of being a WFD water body (The Fleet, WFD ID: GB104028058256) but with an estimated Q95 flow of less than 1.0$m^3$/s.<br>**Low Importance for morphology** due to the heavily modified nature of the channel. Nonetheless the channel itself is not located within the Study Area and so there are no morphological impacts to consider. |
| **West Brant Syke, Pike Drain, Mill Dam Dyke** | As highly modified and often artificial agricultural watercourses and drains, these are **considered low importance water features for water quality**. Furthermore, no species with specific legal protections have been found within any of these watercourses during aquatic survey or desk study and nor are they designated. They are also considered **low importance for morphology** as they are generally straight, often dredged, grossly over-deepened trapezoidal ditches lacking hydraulic variation. |
| **Agricultural drains (Ordinary Watercourses / IDB watercourses)** | As highly modified and often artificial, frequently ephemeral agricultural drains and ditches, these are **considered low importance water features for water quality**. Furthermore, no species with specific legal protections have been found within any watercourse during aquatic survey or desk study. They are also considered **low importance for morphology** as they are generally straight, often dredged, grossly over-deepened trapezoidal ditches lacking hydraulic variation. |

| Waterbody | Importance |
|---|---|
| **Sand and Gravel Pit Lakes at Thorpe on the Hill** | **High importance for water quality** as they have recreational use for fishing and sailing and include Whisby Nature Park.<br>**Low importance for morphology** as artificial waterbodies derived from quarrying activity. |
| **Groundwater – bedrock aquifers** | Scunthorpe Mudstone Formation and Charmouth Mustone Formation are Secondary aquifers and do support groundwater abstractions and so are considered of **Medium importance**.<br>Lincolnshire Limestone Formation is Principal aquifer and so is considered to be of **High importance**. It is also associated with SPZ3 to the eastern extent of the Cable Corridor. |
| **Groundwater – superficial aquifers** | Superficial deposits of Balderton Sand and Gravel Member, Alluvium, River Terrace deposits and Fulbeck sand and gravel member Secondary aquifers and so considered to be of **Medium importance.** |
| **Source Protection Zone** | Source Protection Zone 3 is of **Medium importance.** |

### Floodplain Sensitivity for Impact Assessment

9.5.95 For the construction assessment, the key receptors in terms of all forms of flood risk are the construction workers present within the Site, who are considered to be of 'Very High' sensitivity.

9.5.96 For the operational assessment, the importance is based on understanding of the receptors present within areas at risk of flooding and the existing risk of flooding from all sources.

9.5.97 The majority of the Principal Site and Cable Corridor lies in Flood Zone 1 and the risk of fluvial or tidal flooding is low. However, there are areas of Flood Zone 2 and 3 present associated with the River Brant, River Witham and Mill Dam Dyke (see **Figure 9-3 [EN010154/APP/6.2]**). Within these areas, flood risk is considered to be high but flood defences are present which lower the residual risk. These areas at risk of flooding are predominantly agricultural land but also the western extent of Bassingham village.

9.5.98 The Proposed Development is classified as essential infrastructure and so is a Very High sensitivity receptor. Agricultural land uses surrounding the site are considered less vulnerable development and so are of 'Medium' sensitivity and surrounding villages and hamlets are more vulnerable development and so are 'High' sensitivity.

9.5.99 For the purpose of this impact assessment the sensitivity of non-fluvial forms of flood risk is as follows:

a. Flooding from surface water – generally very low risk (annual chance of flooding of less than 0.1% AEP) for most of the site, with areas of low

(chance of flooding between 0.1% and 1% AEP), medium (chance of flooding between 1% and 3.3% AEP) and high risk (chance of flooding of greater than 3.3% AEP) generally associated with flow pathways following topographic low points including drains and agricultural ditches.

b. Flooding from groundwater – North Kesteven District Council's Strategic Flood Risk Assessment indicates that the Proposed Development Site location is deemed not to be at risk of groundwater flooding, and so groundwater flood risk is Low.

c. Flooding from sewers – the Proposed Development is located in a predominantly rural location, however where the route crosses a highway or in proximity to a settlement there is potential for flooding from sewer sources. However, residual risk is Low.

d. Flooding from artificial sources – Environment Agency online mapping shows no artificial sources of flood risk associated within the Proposed Development boundary. Residual risk is Low.

9.5.100 Flood risk sensitivity is discussed further within **Appendix 9-C: FRA [EN010154/APP/6.3]**.

## 9.6 Embedded Mitigation Measures

9.6.1 Where practicable, mitigation measures have been incorporated into the Proposed Development design and/or the methodologies for how it shall be constructed. Through iterative assessment, potential impacts have been predicted and opportunities to mitigate them identified with the aim of preventing or reducing impacts as much as practicable. This approach provides the opportunity to prevent or reduce potential adverse impacts from the outset. This embedded mitigation/mitigation by design approach has been taken into account when evaluating the significance of the potential impacts within this assessment.

### Construction

**Framework Construction Environmental Management Plan**

9.6.2 The construction of the Proposed Development will take place in accordance with a CEMP. The **Framework CEMP [EN010154/APP/7.7]** submitted with this DCO application details the measures that would be undertaken during construction to mitigate the temporary effects on the water environment. It provides the framework for the detailed CEMP, which will be produced post-consent once a contractor is appointed and will be secured through a Requirement of the DCO.

9.6.3 The **Framework CEMP [EN010154/APP/7.7]** comprises good practice methods that are established and effective measures to which the development will be committed through the DCO. The measures within the **Framework CEMP [EN010154/APP/7.7]** focus on managing the risk of pollution to surface waters and the groundwater environment. It also considers the management of activities within floodplain areas (i.e. kept to a minimum

and with temporary land take required for construction to be located out of the floodplain as far as reasonably practicable).

9.6.4 The CEMP will be reviewed, revised and updated as the project progresses to ensure all potential impacts and residual effects are considered and addressed as far as practicable, in keeping with available good practice at that point in time. The principles of the mitigation measures set out below are the minimum standards that will be implemented. However, it is acknowledged that for some issues, there are multiple ways in which they may be addressed and methods of dealing with pollutant risk will be continually reviewed and adapted as construction works progress (e.g. the management of construction site runoff containing excessive levels of fine sediments).

9.6.5 The **Framework CEMP [EN010154/APP/7.7]** sets out standard procedure for the Proposed Development and describes the principles for the protection of the water environment during construction. The detailed CEMP(s) will be supported by a Water Management Plan (WMP), that will provide greater detail regarding the mitigation to be implemented to protect the water environment from adverse effects during construction. The potential for adverse impacts would be minimised by the adoption of the general mitigation measures outlined below, which will be described in the WMP and CEMP(s).

**Good Practice Guidance (GPP)**

9.6.6 The construction of the Proposed Development will be undertaken in accordance with good practice as detailed below. Where not disapplied through the DCO, temporary and relevant permanent consents/permits would be obtained where necessary, and these are outlined later in the chapter. The principal contractor will comply with any conditions imposed by any relevant permission.

9.6.7 The following relevant GPPs have been released to date on the NetRegs website (Ref 9-90) and are listed below. While these are not regulatory guidance in England where the UK government website outlines regulatory requirements (Ref 9-91), it remains a useful resource for good practice. They are documented in the **Framework CEMP [EN010154/APP/7.7]** and secured through the detailed CEMP:

a. GPP 1: Understanding your environmental responsibilities – good environmental practices;

b. GPP 2: Above ground oil storage;

c. GPP 3: Use and design of oil separators in surface water drainage systems;

d. GPP 4: Treatment and disposal of wastewater where there is no connection to the public foul sewer;

e. GPP 5: Works and maintenance in or near water;

f. GPP 6: Working on construction and demolition sites;

g. GPP 8: Safe storage and disposal of used oils;

h. GPP 13: Vehicle washing and cleaning;

i. GPP 19: Vehicles: Service and Repair;

j. GPP 20: Dewatering underground ducts and chambers;

k. GPP 21: Pollution Incident Response Plans;

l. GPP22: Dealing with spills;

m. GPP26: Safe storage – drums and intermediate bulk containers; and

n. GPP27: Installation, decommissioning and removal of underground storage tanks.

9.6.8 Where new GPPs are yet to be published, previous Pollution Prevention Guidance (PPGs) still provide useful advice on the management of construction to avoid, minimise and reduce environmental impacts, although they should not be relied upon to provide accurate details of the current legal and regulatory requirements and processes. Construction phase operations would be carried out in accordance with guidance contained within the following PPGs:

a. PPG7: Safe storage – the safe operation of refuelling facilities (Ref 9-92); and

b. PPG18: Managing fire water and major spillages (Ref 9-93).

9.6.9 Additional good practice guidance for mitigation to protect the water environment can be found in the following key Construction Industry Research and Information Association (CIRIA) documents and British Standards Institute documents:

a. British Standards Institute (2009) BS6031:2009 Code of Practice for Earth Works (Ref 9-79)

b. British Standards Institute (2013) BS8582 Code of Practice for Surface Water Management of Development Sites (Ref 9-79);

c. CIRIA (2015) C753 The SuDS Manual (second edition) (Ref 9-27);

d. CIRIA (2023) C811d Environmental good practice on site guide (fifth edition) (Ref 9-80);

e. C648 (2006) Control of water pollution from linear construction projects, technical guidance (Ref 9-81);

f. C609 (2004) Sustainable Drainage Systems, hydraulic, structural and water quality advice (Ref 9-82);

g. C532 (2001) Control of water pollution from construction sites – Guidance for consultants and contractors (Ref 9-83); and

h. C736F Containment systems for prevention of pollution (Ref 9-84).

**Management of Construction Site Runoff**

9.6.10 Mitigation measures are described in detail below, which are also included in the **Framework CEMP [EN010154/APP/7.7]** and would be adhered to during

the construction phase of the Proposed Development. These measures apply equally to all components of the Proposed Development.

9.6.11 The measures outlined below, will be required for the management of fine particulates in surface water runoff as a result of the Proposed Development construction activities:

a. All reasonably practicable measures will be taken to prevent the deposition of fine sediment or other material in, and the pollution by sediment of, any existing watercourse, arising from construction activities. The measures will accord with the principles set out in industry guidelines including the CIRIA report 'C532: Control of water pollution from construction sites' (Ref 9-83) and CIRIA report ‘C648 Control of water pollution from linear construction sites’ (Ref 9-81). Measures may include use and maintenance of temporary lagoons, tanks, bunds and fabric silt fences or silt screens as well as consideration of the type of plant used etc;

b. A temporary drainage system will be developed to prevent runoff contaminated with fine particulates from entering surface water drains without treatment. This will include identifying all land drains and water features in the DCO Site and ensuring that they are adequately protected using drain covers, sand bags, earth bunds, geotextile silt fences, straw bales, or proprietary treatment (e.g. lamella clarifiers). Any land drains damaged during the works would be reinstated as required;

c. Where practical, earthworks will be undertaken during the drier months of the year. When undertaking earth moving works periods of very wet weather will be avoided, where practical, to minimise the risk of generating runoff contaminated with fine particulates. However, it is likely that some working during wet weather periods will be unavoidable, in which case other mitigation measures (see below) will be implemented to control fine sediment laden runoff. Water may also be required to dampen earthworks during dry weather to reduce dust impacts, and any runoff generated will need to be appropriately managed by the Contractor in accordance with the pollution prevention principles described in this chapter;

d. To protect watercourses from fine sediment runoff, topsoil/subsoil will be stored a minimum of 20m from watercourses on flat lying land. Where this is not practicable, and it is to be stockpiled for longer than a two-week period, the material will either be covered with geotextile mats, seeded to promote vegetation growth, or runoff prevented from draining to a watercourse without prior treatment;

e. Appropriately sized runoff storage areas for the settlement of excessive fine particulates in runoff will be provided;

f. Construction site runoff will either be treated on site and discharged under a Water Discharge Activity Permit from the Environment Agency to Controlled Waters (potentially also including infiltration to ground) or removed from site for disposal at an appropriate and licensed waste facility;

g. Equipment and plant are to be washed out and cleaned in designated areas within the Proposed Development construction compound where runoff can be isolated for treatment before disposal as outlined above;

h. Mud deposits will be controlled at entry and exit points to the Site using wheel washing facilities and/or road sweepers operating during earthworks activities or other times as required. Potentially contaminated water from wheel washing facilities would be removed from site for disposal at an appropriate and licensed waste facility;

i. Debris and other material will be prevented from entering surface water drainage, through maintenance of a clean and tidy site, provision of clearly labelled waste receptacles, grid covers and the presence of site security fencing;

j. Should the use of herbicide or other spray chemical be required, a method statement, operating procedure or similar will be prepared prior to the work commencing. This will include measures to protect ground and surface water, including that such work would not be undertaken during or before rainfall and high winds where practicable. Such work will only be carried out by competent personnel using products approved for UK use with adherence to manufacturer's instructions; and

k. The WMP (which will be produced post consent) will include details of pre, during and post-construction water quality monitoring. This will be based on a combination of visual observations and sampling, and reviews of the Environment Agency's automatic water quality monitoring network.

**Management of Spillage Risk**

9.6.12 The measures outlined below will be implemented to manage the risk of accidental spillages within the Site and potential conveyance to nearby water features via surface runoff or land drains. These measures are secured in the **Framework CEMP [EN010154/APP/7.7]** and will be adopted during the construction works:

a. Fuel will be stored and used in accordance with the Control of Substances Hazardous to Health Regulations 2002 (Ref 9-13), and the Control of Pollution (Oil Storage) (England) Regulations 2001 (Ref 9-12). Particular care will be taken with the delivery and use of concrete and cement as it is highly corrosive and alkaline;

b. Fuel and other potentially polluting chemicals will either be in self-bunded leak proof containers or stored in a secure impermeable and bunded area (minimum capacity of 110% of the capacity of the containers, which includes 10% more capacity than is needed);

c. Any plant, machinery or vehicles will be inspected before every use and maintained to ensure they are in good working order and clean for use in a sensitive environment. This maintenance is to take place off site if practicable or, if on site, only at designated areas within the Proposed Development site compound. Only construction equipment and vehicles free of all oil/fuel leaks will be permitted on the Site. Drip trays will be placed below static mechanical plant;

d. All washing down of vehicles and equipment will take place in designated areas and wash water will be prevented from passing untreated into watercourses;

e. All refuelling, oiling and greasing of plant will take place above drip trays or plant nappies, or on an impermeable surface which provides protection to underground strata and watercourses, and away from drains as far as reasonably practicable. Vehicles will not be left unattended during refuelling;

f. As far as reasonably practicable, only biodegradable hydraulic oils will be used in equipment working in or over watercourses;

g. All fixed plant used on the DCO Site will be self-bunded;

h. Mobile plant is to be in good working order, kept clean, fitted with plant 'nappies' at all times and are to carry spill kits;

i. The WMP (which will be produced post consent) will include details for pollution prevention and will be prepared and included alongside the final CEMP. Spill kits and oil absorbent material will be carried by mobile plant and located at high-risk locations across the Site and regularly monitored and topped up. All construction workers will receive spill response training and tool box talks;

j. The DCO Site will be secure to prevent any vandalism that could lead to a pollution incident;

k. Construction waste/debris are to be prevented from entering any surface water drainage or water body;

l. Surface water drains on public roads trafficked by plant or within the construction compound will be identified and, where there is a risk that fine particulates or spillages could enter them, the drains will be protected (e.g. using covers or sand bags) or the road regularly cleaned by road sweeper;

m. Where practicable, concrete mixing and washing down of mixing plant is to be carried out by the suppliers and away from the DCO Site. Should on-site concrete washout be required, suitable facilities (e.g. geotextile wrapped sealed skip placed within a bunded area or specialist mobile concrete washout facility) will be provided to ensure that the high alkalinity wash water is adequately contained and prevented from entering surface or groundwater. Wash water will be removed from the Site for appropriate disposal at a suitably licenced waste facility. Concrete washout is prohibited within a minimum of 20m of any body of water, including ditches and ponds, or surface water drains, and within 5m of a foul drain. Where practical, this will increase to 50m; and

n. Water quality monitoring of potentially impacted watercourses will be undertaken to ensure that pollution events can be detected against baseline conditions and can be dealt with effectively. Full monitoring details would be outlined in the detailed CEMP.

### Management of Flood Risk

9.6.13 The **Framework CEMP [EN010154/APP/7.7]** incorporates measures to prevent an increase in flood risk or pollution during the construction works, in addition to the provision of temporary settlement and drainage measures as detailed above.

9.6.14 Construction works undertaken adjacent to, beneath and within watercourses will comply with relevant guidance, including Environment Agency and Defra guidance documents.

9.6.15 The detailed CEMP will incorporate measures aimed at preventing an increase in flood risk during the construction works. Examples of measures that could be implemented include:

a. Topsoil and other construction materials will be stored outside of the 1 in 100 year floodplain extent where feasible. If areas located within Flood Zone 2/3 are to be utilised for the storage of construction materials, this would be done in accordance with the applicable flood risk activity regulations, if required;

b. Connectivity will be maintained between the floodplain and the adjacent watercourses, with no changes in ground levels within the floodplain as far as practicable;

c. During the construction phase, the contractor will monitor weather forecasts on a monthly, weekly and daily basis, and plan works accordingly. For example, works in the channel of any watercourse will be avoided or halted were there to be a significant risk of high flows or flooding; and

d. The construction laydown area site office and supervisor will be notified of any potential flood occurring by use of the Floodline Warnings Direct or equivalent service.

9.6.16 The contractor will be required to produce an Emergency Response Plan following receipt of DCO consent and prior to construction, which will provide details of the response to an impending flood and include:

a. A 24-hour availability and ability to mobilise staff in the event of a flood warning;

b. The removal of all plant, machinery and material capable of being mobilised in a flood for the duration of any holiday close down period where there is a forecast risk that the site may be flooded;

c. Details of the evacuation and site close down procedures;

d. Arrangements for removing any potentially hazardous material and anything capable of becoming entrained in floodwaters, from the temporary works areas;

e. The contractor will sign up to Environment Agency flood warning alerts and describe in the Emergency Response Plan the actions it will take in the event of a flood event occurring. These actions will be hierarchical

meaning that as the risk increases the contractor will implement more stringent protection measures;

f. If water is encountered during below ground construction, suitable de-watering methods will be used. Any groundwater dewatering required in excess of the exemption thresholds will be undertaken in line with the requirements of the Environment Agency (under the Water Resources Act 1991 as amended) (Ref 9-6) and the Environmental Permitting Regulations (2016) (Ref 9-10); and

g. Safe egress and exits are to be maintained at all times when working in excavations. When working in excavations, a banksman is to be present at all times.

**Grid Connection Cable and Onsite Cables: Overview**

9.6.17 It is proposed that the electricity generated by the Proposed Development is exported via a 400kV connection between the Onsite Substation and the proposed National Grid substation near Navenby (subject to a separate Planning Application to be submitted by National Grid). The cabling will be installed underground. Further feasibility studies and options appraisals are to be undertaken to determine the exact routeing and installation method for the cable at detailed design, with this assessment undertaken following the principles of the Rochdale Envelope approach.

9.6.18 The Grid Connection Cable will be installed using an open trench method requiring a 30m to 40m working width, with trench widths approximately 3m wide and up to 3m deep.

9.6.19 Low voltage cabling between PV panels and the inverters (typically via 1.5/1.8kV cables) will typically be located above ground level (along a row of racks), fixed to the mounting structure, and then underground (between solar PV array tables and in the central inverters and or transformer input). Medium voltage cables (around 33kV) are required between the transformers, switchgear and the Onsite Substation. These buried interconnecting cables will be located within the Solar PV Array Areas and within the Interconnecting Cable Corridors between the Solar PV Array Areas. The trench will typically be up to 1m wide with a maximum depth of 1.2m and will be dependent on the method of installation, ground conditions and number of cables laid in parallel. A minimum backfill of 0.8m will be on top of the cable.

**Trenchless Crossings – River Witham and River Brant (Horizontal Directional Drill)**

9.6.20 It is proposed to install the Grid Connection Cable beneath the River Brant and a section of the onsite cabling beneath the River Witham using underground techniques such as horizontal directional drilling beneath the bed of the channel. Indicative locations at this stage are NGR SK 91183 62349 for the River Witham and NGR SK 94314 60111 for the River Brant.

9.6.21 The cable would be installed a minimum of 5m beneath the bed in each case. A maximum depth would be finalised based on site specific risk assessment at each crossing location in order to minimise groundwater interactions where

practicable. Information will be sought from the Environment Agency on the construction details of the flood defence embankments that may need to be crossed to inform the drilling approach for directional drilling beneath the Rivers Brant and Witham and associated flood defences. There will be a minimum 16m buffer between HDD send or receive pits from the landward toe of flood defences. Furthermore, in the case of the River Witham this distance is to be increased to 100m due to the presence of a potential Otter holt. These buffer distances are secured through the **Framework CEMP [EN010154/APP/7.7].**

9.6.22 In addition to the control and management measures for site runoff and spillage risk noted above, the methodology of the drilling, or other trenchless techniques, would include measures to minimise the risk to the environment. There are risks associated with the use of drilling muds and plant close to the surface water and groundwater bodies. For example, although rare, without due care there is a risk that drilling muds can 'break out' into water bodies leading to pollution (known as 'hydraulic fracture' or 'frac-out'). A site-specific Hydraulic Fracture Risk Assessment would be developed prior to construction following further investigation of specific ground conditions at the crossing locations, and appropriate mitigation developed in line with best construction practice.

9.6.23 There is also a need to manage drilling muds and wastewater so that this will not be spilt into the channel when working close to a groundwater body or watercourses. The requirement for a Hydraulic Fracture Risk Assessment is included in the **Framework CEMP [EN010154/APP/7.7]** and will be secured through a requirement of the DCO.

9.6.24 Directional drilling, or other trenchless techniques, would be undertaken by a specialist contractor and the water column above the drill path would be continuously monitored during drilling. It is acknowledged that drill fluid leakage into a watercourse is not a common problem, particularly given the proposed depths. However, where there is an increased perceived risk (i.e. lack of drilling mud returns) the drilling/boring operation would be suspended, remediation action implemented, and subsequently the methodology for that crossing re-evaluated.

9.6.25 The drill fluids used within the drilling machine would be water based, such as naturally occurring bentonite clay. The fluid component of the drilling mud would be mains water, obtained from a nearby supply and tankered to site when required. There would be some recycling of drilling muds by the drilling plant used.

9.6.26 The bentonite within the drilling fluid enables the fluid to have sufficient viscosity to carry the cutting chips back to the surface machine whilst lubricating and cooling the drilling bit. The drilling fluid that returns to the drilling rig would be recycled within that drilling rig. Any wastewater/drilling products that are not recycled will be stored and removed from the DCO Site by a suitable waste management contractor and disposed of at a licenced wastewater facility.

9.6.27 The sections of the cables that will be installed via trenchless approaches will require send and receive pits to be installed at each crossing point.

9.6.28 The send and receive pit excavations for drilling/boring will be located at least 10m from the watercourse edge, as measured from the top of bank (or 16m from the landward toe of flood defences or 100m for the River Witham where the potential otter holt is located). This may require survey work (prior to construction) in some locations to adequately define and agree the top of bank position with the Environment Agency.

9.6.29 The exact dimensions of the send and receive pits would be determined by site and ground conditions but will be kept to a safe minimum in terms of length, width and depth. Maximum parameters considered here as a worst case are dimensions of 8m length x 4m width x 1m depth. A shoring system appropriate to the ground conditions will be used as appropriate to minimise water ingress into the pits. The ingress of any groundwater will be carefully managed through design of the send or receive pit, shoring method, and a pumping and treatment system. Excessive ingress of water would make the pit unsafe and thus it is important that ingress is minimised and that a suitable system of managing that water is implemented.

9.6.30 Once the cable is installed beneath the watercourse the pits and any cable trenches will be backfilled to the original ground level and seeded to reduce the risk of runoff and fine sediments entering the watercourse.

**Grid Connection Cable, Interconnecting Cables and Onsite Cabling: Management of Risk to Morphology of Watercourses**

9.6.31 The Grid Connection Cable, Interconnecting Cable and Onsite Cabling would require a number of watercourse crossings. With the exception of the River Brant and River Witham (i.e. Main Rivers), all other crossings are assumed to use intrusive open-cut techniques for cable installation as a worst case scenario for assessment.

9.6.32 Based on the Cable Corridor boundary (for the Grid Connection Cable), there would be expected to be five watercourse crossings required. For the Onsite Cabling, three indicative locations for watercourse crossings have been identified at this stage. These are listed in **Table 9-14** and shown in **Figure 9-1 [EN010154/APP/6.2]**.

**Table 9-14: Indicative watercourse crossing locations for cables**

| Watercourse Crossing Points | Proposed Development Section | WFD Catchment | NGR |
|---|---|---|---|
| B3 – crossing of drainage ditch | Onsite Cabling (indicative) – Principal Site | Boultham Catchwater Drain Water Body | SK 90080 64934 |
| B4 - crossing of drainage ditch | Onsite Cabling (indicative) – Principal Site | Boultham Catchwater Drain Water Body | SK 89577 64481 |

| Watercourse Crossing Points | Proposed Development Section | WFD Catchment | NGR |
|---|---|---|---|
| WC1 – crossing of drainage ditch | Cable Corridor (indicative location) | Witham - conf Cringle Bk to conf Brant Water Body | SK 92114 61598 |
| WC12 – crossing of drainage ditch | Onsite Cabling (indicative) – Principal Site | Witham - conf Cringle Bk to conf Brant Water Body | SK 91107 62453 |
| BL5 – crossing of drainage ditch | Cable Corridor (indicative location) | Brant - Lower Water Body | SK 93905 60339 |
| BL6 – crossing of drainage ditch | Cable Corridor (indicative location) | Brant - Lower Water Body | SK 93557 60588 |
| BL7 – crossing of drainage ditch | Cable Corridor (indicative location) | Brant - Lower Water Body | SK 92780 60914 |
| BL8 – crossing of drainage ditch | Cable Corridor (indicative location) | Brant - Lower Water Body | SK 97488 59627 |

9.6.33 This will be subject to further refinement of the Proposed Development design post-consent and the number of crossings will be minimised where practicable. All of the potential crossings outlined in **Table 9-14** are agricultural drains and ditches, with many being ephemeral.

9.6.34 In each case, a Pre-works Riparian and Morphology Survey of the channel of the watercourse to be crossed will be undertaken prior to construction. The surveys would be within the area to be crossed as determined at detailed design and will be used to guide the most appropriate crossing location. The pre-works survey will also ensure that there is a formal record of the condition of each watercourse prior to commencement of works to install cables beneath the channel. The survey is a precautionary measure so that should there be any unforeseen adverse impacts there is a record against which any remedial action can be determined.

9.6.35 At this stage it is assumed that where open-cut crossings are required that a maximum channel length of 6m would be impacted. Water flow would be maintained by damming and over-pumping or fluming. Works will be carried out in the drier months where practicable as this would reduce the risk of pollution propagating downstream, particularly in the case of ephemeral watercourses. Once the watercourses are reinstated, silt fences, geotextile matting, or straw bales will be used initially to capture mobilised sediments until the watercourse has returned to a settled state. It will be a requirement that the watercourses are reinstated as found and where possible enhanced. Enhancement opportunities will be considered through development of a WFD Mitigation and Enhancement Strategy. This would be produced post consent

once locations are finalised and would be informed by the further survey at these locations.

9.6.36 Water quality monitoring will be undertaken prior to, during, and following on from the construction activity. If the watercourse itself is dry then monitoring should be undertaken once flow returns and should include the downstream receiving watercourse. Regular observations of the watercourses will also be required post-works during vegetation re-establishment of the banks, especially following wet weather, to ensure that no adverse impacts have occurred. These requirements will be secured in the WMP (via the **Framework CEMP [EN010154/APP/7.7]**).

**Access Track Crossings of Watercourses**

9.6.37 Access tracks will be constructed across the DCO Site. These would typically be 5m wide with passing bays provided as required. Initially at each of the main access points, access tracks would be required to be 6m wide on approach to the construction compounds to facilitate two-way Heavy Goods Vehicle (HGV) traffic. The internal access tracks will likely be constructed of compacted stone or gravel with excavation kept to a minimum, or for secondary tracks left as grass. Where drainage is required a ditch or a swale may be located downhill of the internal access track to control any potential for surface water run-off.

9.6.38 The access tracks will adhere to the appropriate 10m buffer from water features, except where crossings are required.

9.6.39 The Proposed Development layout has been designed to avoid new drainage ditches and watercourse crossings where practicable. **Table 9-15** lists the twelve crossings that are expected to be required. The indicative locations are also shown in **Figure 9-1 [EN010154/APP/6.2]**.

**Table 9-15: Indicative watercourse crossing locations for access tracks**

| Watercourse Crossing Points | WFD Catchment | NGR |
|---|---|---|
| B1 – drainage ditch | Boultham Catchwater Drain Water Body | SK 64503 90234 |
| B2 – drainage ditch | Boultham Catchwater Drain Water Body | SK 64675 90791 |
| B5 – drainage ditch | Boultham Catchwater Drain Water Body | SK 64953 90091 |
| WC2- drainage ditch | Witham - conf Cringle Bk to conf Brant Water Body | SK 61845 91672 |
| WC3 – drainage ditch | Witham - conf Cringle Bk to conf Brant Water Body | SK 61781 91566 |
| WC9 – drainage ditch | Witham - conf Cringle Bk to conf Brant Water Body | SK 61470 90029 |
| WC10 – drainage ditch | Witham - conf Cringle Bk to conf Brant Water Body | SK 62552 90463 |

| Watercourse Crossing Points | WFD Catchment | NGR |
|---|---|---|
| WC11 – drainage ditch | Witham - conf Cringle Bk to conf Brant Water Body | SK 90437 62706 |
| WC13 – drainage ditch | Witham - conf Cringle Bk to conf Brant Water Body | SK92106 61597 |
| BL7 – drainage ditch | Brant - Lower Water Body | SK 92623 60624 |
| BL9 – drainage ditch | Brant - Lower Water Body | SK 92141 60878 |
| BL10 – drainage ditch | Brant - Lower Water Body | SK 92362 61667 |

9.6.40 All crossings are intended to adopt existing crossings or an open span approach, and so no new culverts are required by the Proposed Development.

9.6.41 Where existing crossings are to be used, it is assumed as a worst case that some degree of strengthening or improvement of the structures may be required (which may require minor widening). Where such upgrades are required, they are assumed to be a maximum extension to the structure width of 2m as a worst case. Where a new drainage ditch crossing is required, an open span structure would be used. Bridge foundations would be set back from the edge of the channel.

9.6.42 Length-for-length watercourse enhancements are required wherever existing culverts may require extension for strengthening, in order to mitigate the impacts and to ensure compliance against WFD objectives (see **Appendix 9-B: WFD Assessment [EN010154/APP/6.3]**). This length-for-length watercourse enhancement will be outlined in the WFD Mitigation and Enhancement Strategy (to be produced post consent).

9.6.43 Depending on the design of any watercourse crossings, floodplain compensation may be required on a 'like for like' and 'level for level' basis. Alterations to surface water flow pathways will also need to be considered and, if necessary, mitigated. This will include consideration of the span and soffit height of any open span bridge works to ensure no increase in flood risk.

9.6.44 As with intrusive cable installation, it is assumed that during installation works flow would be maintained by damming and over pumping.

**Water Demand**

9.6.45 During construction it is envisaged that a temporary potable water supply will be provided. There would be a requirement for 23m$^3$ per day of clean water for approximately 600 staff. The average number of workers on site during construction is assumed to be 350, which would have a demand of an average 13m$^3$/day. This equates to an assumed maximum of 12,264m$^3$ over the 30 month construction period.

9.6.46 Other uses of water use include wheel washers (assumed to be 500m$^3$ in total), dust suppression (1,000 m$^3$) and water to support the preparation of concrete for use across the Site (assumed to be 25,000m$^3$ in total). Anglian Water have confirmed that this volume can be supplied for the Proposed Development.

## Operation (and Maintenance)

### Design

9.6.47 Detailed information on the Proposed Development design and infrastructure is provided in **Chapter 3: The Proposed Development [EN010154/APP/6.1]**.

9.6.48 All infrastructure will be offset from watercourses by a minimum of 10m buffer (except where crossings are required or connections for drainage). This would be measured from the top of bank as required by the Environment Agency and the IDBs. This will likely require survey which will be undertaken post-consent to reflect the detailed design.

9.6.49 Solar PV panel heights are to be a minimum 0.8m above ground so as to reduce risk of fluvial flooding.

9.6.50 Indicative foundation depths and types associated with the development include typical depths as follows:

a. **Solar PV foundations** will typically be galvanised steel piles driven or screwed into the ground. Indicative maximum depth of 2m for fixed south facing strings and indicative maximum depth of 4m for single axis tracker strings depending upon ground conditions and subject to archaeological and geotechnical surveys. In archaeologically sensitive areas solar PV panels may be mounted on concrete blocks, subject to further archaeological investigation and agreement with the relevant stakeholders.

b. **BESS**– foundations would consist of reinforced concrete footings with a maximum depth of 1m below existing ground level. Depending on ground conditions, a pile foundation may be required with a maximum depth of 3m.

c. **Onsite cabling** – maximum trench dimensions to be 0.8–1.2m depth, and 1.2–5m wide depending on the number of circuits within the trench. Greater depth would be required when drilled beneath the River Witham (>5m depth from the bed of the channel). The minimum depth beneath the A46 is dependent on the road makeup and will align with minimum depth required by the asset owner.

d. **Grid connection cable** - for open trench excavation, up to 3m below ground level subject to design and ground conditions, with a minimum cover of 0.9m for the cable and a trench width of up to 4.5m. For horizontal directional drilling, a minimum 5m depth under the River Brant would be required, with final depth subject to design and ground conditions. Jointing bays will be required up to 1,000m apart to join sections of cable together.

The dimensions of the jointing bay would be up to 21m in length by 3m in width by 2.5m in depth.

e. **Control building and office** – maximum foundation depth of 2m.

f. **Warehouse and storage building** - maximum foundation depth of 2m.

g. **Access tracks** - the internal access tracks will likely be constructed of compacted stone or gravel with excavation kept to a minimum, or for secondary tracks left as grass.

h. **Solar Station, Inverters, Transformers, Switchgear Enclosures** – these would be located on a concrete base or monolith plinth with a maximum depth of 1m. Depending on ground conditions, a pile foundation may be required with a maximum depth of 3m.

i. **Onsite Substation** – concrete foundation depth up to 3m.

**Surface Water Drainage Strategy**

9.6.51 A **Framework Surface Water Drainage Strategy** has been prepared and is included within **Appendix 9-D** of this ES **[EN010154/APP/6.3]**. This Framework Surface Water Drainage Strategy will provide attenuation of surface water runoff from the Proposed Development, whilst minimising flood risk to the Proposed Development and surrounding areas. In accordance with planning policy guidance (as outlined in **Appendix 9-A** of this ES **[EN010154/APP/6.3]**), runoff from the Proposed Development will be attenuated to ensure no increase in surface water discharge rates and to provide water quality treatment of runoff water.

9.6.52 Individual solar PV panels will be held above the ground surface on mounting structures (a minimum of 800mm above ground level). This prevents sealing the ground with an impermeable surface beneath the solar panels, allowing rainfall/runoff to infiltrate to ground throughout the Principal Site. As a result, it is considered that the impermeable area within solar PV panel areas will remain substantively consistent to its pre-development state.

9.6.53 Despite not contributing towards the impermeable areas, in order to limit the potential for channelisation from rainfall dripping off the end of the panels, the areas between, under and surrounding the solar PV panels will be planted with native grassland and wildflower mix (noting that planting types are described within the **Framework Landscape and Ecological Management Plan (LEMP) [EN010154/APP/7.15]**). This planting will intercept and absorb rainfall running off the panels, preventing it from concentrating and potentially forming channels in the ground.

9.6.54 New access roads will be permeable, in line with paragraph 2.10.85 from NPS EN-3 (Ref 9-17). Therefore, the Principal Site's access roads will not lead to an increase in impermeable area. The drainage regime of the access roads is therefore assumed to remain consistent with its pre-developed state.

9.6.55 The Indicative Site Layout Plans (included in **Figure 3-2A and 3-2B [EN010154/APP/6.2]**) show options for distributed and centralised BESS areas, with the distributed BESS arrangement comprising BESS to be co-

located with Solar Station Compounds spread across the Principal Site, and a single location BESS Compound under the centralised BESS arrangement and, like the Onsite Substation compound, are assumed to be 100% impermeable.

9.6.56 In order to drain surface water from these proposed impermeable areas, it is proposed to construct a swale around the Solar Station Compounds, the single BESS compound and Onsite Substation. The swales will collect and treat surface water before discharge. Paragraph 056 of the Planning Practice Guidance for Flood Risk and Coastal Change (Ref 9-21) states that the surface water should be discharged in the following hierarchy:

a. Into the ground (infiltration);

b. To a surface water body; and

c. To a surface water sewer, highway drain, or another drainage system; to a combined sewer.

9.6.57 Due to the current understanding of the ground conditions within the Principal Site, it is preferred to utilise surface water bodies to discharge runoff from the Solar Station Compounds / single BESS compound and Onsite Substation where possible. Therefore, surface water runoff from the Onsite Substation swales and the majority of the Solar Station Compound swales (where possible within the DCO Site) is proposed to be prioritised to local watercourses. The discharge to these watercourses will be maintained at existing greenfield runoff rates by restricting rates using a flow control (see **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]** for details of the greenfield runoff rates). The flow control will use a restriction on the outlet of the swale which will hold water back within the swale and release it at a controlled rate.

9.6.58 Swales around the BESS areas (for both distributed and centralised BESS arrangement options) and Onsite Substation area will be lined with an impermeable membrane or similar impermeable barrier to prevent any pollution from entering the ground.

9.6.59 In the north of the Principal Site, there are seven Solar PV fields (fields 14, 18, 19, 25, 29, 32 and 34 as shown in **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]** Annex C) where surface water bodies are not available in suitable locations to discharge runoff from the lined Solar Station Compound swales; it is, therefore, proposed to discharge flows from the lined swales to infiltration swales lining the boundaries of these seven fields. The swales are to be designed to attenuate flows for the 1 in 100 year + 40% climate change event and fire water runoff (if deemed to be clean) and slowly infiltrate to ground whilst also making use of evapotranspiration. Discharge of runoff will be controlled from the Solar Station Compounds by penstocks at each location which can isolate the runoff from the BESS prior to entering the infiltration swales.

9.6.60 As part of the non-statutory consultation for the Proposed Development, properties along The Avenue in Morton, adjacent to solar PV fields 25, 30 and

34, are known to experience surface water flooding from natural overland runoff from these fields. The online flood map for surface water (Ref 9-47) indicates a medium flood risk to these properties.

9.6.61 As a voluntary enhancement measure by the Applicant, edge swales will be provided to capture excess runoff from these PV fields to reduce existing surface water risk. Edge swales within Fields 25, 30, and 34 will be sized and located accordingly to capture as much excess overland surface water runoff that can be reasonably accommodated, providing betterment in this area by reducing the existing surface water flood risk to properties along The Avenue. This is secured within the **Design Approach Document (Appendix A: Design Commitments) [EN010154/APP/7.3])**. Also refer to **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]** for further detail on the proposed swales to reduce flood risk to The Avenue.

9.6.62 Transformers will be installed with suitable bunds to contain any oil spillage in the unlikely case of an oil-leakage event. Bunds will be designed to contain at least 110% of the volume of the oil to ensure there is some tolerance to prevent breaching of the bund. Under normal conditions any rainwater collected within the bund will be removed by use of pump, which automatically switches off if it detects the smallest presence of oil in the water. Pumps will be linked to control and monitoring equipment to raise alarms if oil is detected.

9.6.63 No drainage design is proposed for the Cable Corridor during operation, as the Cable Corridor is not deemed to contribute any additional runoff due to the cables being buried below ground.

9.6.64 It is important that there is a requirement for regular inspection and maintenance of the drainage systems, proposed SuDS and watercourse crossings. This will be carried out in accordance with good practice guidance. The drainage system will be designed in accordance with current guidance to ensure that the potential for siltation and blockages is minimised under normal operation. If there is any evidence of excessive erosion or sedimentation associated with new structures further actions will be considered to remedy that impact in as sustainable a way as practicable. The maintenance and monitoring requirement for the drainage system will be secured via **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]**.

**Drainage Outfalls**

9.6.65 Where practicable, surface water will drain from the Proposed Development's swale-based drainage system to local receiving watercourses (field ditches) via a new ditch, as this avoids the need to construct an engineered outfall. Alternatively, where piped sections are required, these would be shortened and the last 10m section of the outfall route will be open green ditch other than where this affects maintenance of the channel by the IDB. This will be secured as part of the **Framework Surface Water Drainage Strategy** (**Appendix 9-D** of this ES **[EN010154/APP/6.3]**)

9.6.66 Any engineered outfalls that may be required would be appropriately micro-sited to minimise loss of bank habitat, the need for bed scour or hard bank protection, and localised flow disturbance or disruption to sediment transport

processes. It will also avoid the creation of 'dead' spaces with sedimentation and vegetation blockage risks and to that effect it is not proposed that outfalls are recessed into the bank. Further site survey and micro-siting of outfalls would occur post consent.

**Fire Water Runoff**

9.6.67 The proposed BESS within the Solar Station Compounds (distributed BESS arrangement) and single BESS Compound (centralised BESS arrangement) areas require fire water tanks to supress a fire, should one break out. The BESS containers will contain an internal fire suppression system, with a sump to contain any water used in the event of an internal fire. This water will not be directed to the surrounding swales.

9.6.68 It is proposed to contain the external fire water runoff within the swale surrounding the Solar Station Compounds, where it can be held and tested before either being released into the environment (if found to have no contaminants present, or contaminants that are within acceptable legal limits) or taken off site by a tanker for treatment elsewhere. The swale will then be cleaned of all contaminants. A **Framework Battery Safety Management Plan (FBSMP) [EN010154/APP/7.17]** is included within the DCO application and outlines the fire management plan in more detail.

9.6.69 Each swale will be underlain with an impermeable liner to prevent any contaminants entering the ground. The swale will be controlled by a penstock valve that can be closed before a fire is put out. The penstock valves will be located to the west of the Solar Station Compounds and Onsite Substation wherever practicable to reduce the potential of their operation being affected by the prevailing wind conditions directing a potential fire towards the penstock.

9.6.70 National Fire Chiefs Council (NFCC) guidance ("Grid Scale Battery Energy Storage System planning – Guidance for Fire and Rescue Services", 2022, (Ref 9-94) has been used to determine the volume storage of fire water runoff. The NFCC guidance states firefighting supplies '*should be capable of delivering no less than 1,900 litres per minute for at least 2 hours*'. On top of this supply requirement, a 30% additional capacity has been applied for storage in the swale. This equates to approximately 300m$^3$. It should be noted that the 300m$^3$ storage is required for each group of BESS (i.e. 300m$^3$ will be required if there is one BESS container on its own or several BESS grouped together). This is based on the likely scenario that, in the unlikely event of a fire, only one BESS would be on fire at the any given time.

9.6.71 By using the swale for fire water storage as well as surface water storage, there is the potential that, in the event of a fire, the swale may already contain surface water and reduce the capacity for fire water storage. Therefore, the swale should be sized to serve both purposes. It is considered overly conservative to provide the required fire water storage on top of the 1 in 100 year + 40% storage already provided, as it is extremely unlikely a fire will occur at the same time as the 1 in 100 year event. Therefore, taking a pragmatic approach, an allowance has been made that a 1 in 2 year event could occur

at the same time as a fire. Therefore, the swale will need to contain the 1 in 2 year event plus the fire water storage runoff or the 1 in 100 year + 40% event on its own, whichever is greater (thereby providing for the worst-case scenario).

9.6.72 In order to determine the attenuation volume required, a storage estimate calculation was made for a single Solar Station Compound based on the 1 in 2 year event (see Annex A of **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]**), which gave a value of 15m$^3$. A comparison was then made between the 1 in 2 year plus fire water storage and the 1 in 100 year + 40% event. See Table 13 within **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]**, which highlights the worst-case storage required in the design for each Solar Station Compound configuration and the single BESS Compound.

9.6.73 Further detail on storage volumes are provided in the **Framework Surface Water Drainage Strategy** (**Appendix 9-D [EN010154/APP/6.3]**). The volume requirements for containment of fire water runoff within the swale and its configuration are subject to agreement with the Local Fire and Rescue Service.

**Water Demand including Operational Panel Cleaning**

9.6.74 The Proposed Development will contain solar PV technology with no residential usage of water required in the long term. Water would be stored on site for fire safety purposes. It is anticipated that there would be up to four permanent full time members of staff, with up to 20 being in attendance for periods of maintenance or solar infrastructure replacement. A new mains water supply connection is proposed adjacent to the Warehouse storage building and Control building, which is alongside existing Anglian Water mains supply. The water demand is estimated as 0.75m$^3$/d of clean water and 0.71m$^3$/d for foul water systems.

9.6.75 The cleaning requirements for the Proposed Development can only be accurately determined once operational, therefore, to present a reasonable worst case for the assessment, a two-year cleaning cycle is assumed.

9.6.76 It is assumed that a tractor mounted system (currently the system typically used on UK solar farms) will be used. A tractor mounted cleaning system uses a rotating ‘car-wash’ type brush. It is anticipated that water would be brought to site in 1m$^3$ (one tonne/1,000 litres (l)) IBCs. Individual IBCs would be mounted on the rear of the tractor to provide water supply during cleaning. It is estimated that the total volume of cleaning water per cleaning cycle would be 1,545m$^3$. As the use of cleaning products (chemicals) can damage panels and void manufacturer’s warranties no cleaning products would be used, only water. If required, a water softener would be added to prevent wash-residue forming on the panels, this would be biodegradable and would have no impact to the environment.

9.6.77 A Water Resources Assessment has been submitted to Anglian Water to determine whether the water demand can be accommodated. Anglian Water confirmed on 28 May 2025 that they are able to meet all of the Proposed

Development's requirements (both domestic and non-domestic) during construction and during operation.

**Weed Management**

9.6.78 With regard to weed management, the Applicant has identified options for the management of the grassland created within the solar farm. This includes management by grazing and/or by mowing/strimming.

9.6.79 Where mowing/strimming is required, as a worst case there may be localised use of herbicide or other spray chemical in small volumes. Should this be required, a method statement, operating procedure or similar will be prepared prior to the work commencing, this will include measures to protect ground and surface water, including working in dry weather and not in high winds, and maintaining appropriate buffers from watercourses. Application of chemicals would only be carried out by suitably competent personnel using products approved for UK use with adherence to manufacturer's instructions. This mitigation is secured through the **Framework Operational Environmental Management Plan (OEMP)** submitted as part of this DCO application **[EN010154/APP/7.8]**.

**Permits and Consents**

9.6.80 Various water-related permissions may be required where it is not agreed with the relevant regulating authority to disapply them through the DCO.

9.6.81 These permissions may include:

a. Land drainage consent(s) under section 23 of the Land Drainage Act 1991 (Ref 9-5) for works affecting the flow in Ordinary Watercourses;

b. Flood risk activity permit(s) from the Environment Agency under the Environmental Permitting Regulations (England and Wales) 2016 (Ref 9-10) in connection with watercourse crossings and drainage outfall installation. Matters relating to flood risk are to be agreed by way of protective permissions for the benefit of the Environment Agency;

c. Water activity permit(s) from the Environment Agency under the Environmental Permitting Regulations (England and Wales) 2016 (Ref 9-10) for temporary construction and permanent operational discharges;

d. Trade effluent consent under the Water Industry Act 1991 (Ref 9-95) for the purposes of discharging trade effluent from welfare facilities during construction;

e. Full or temporary water abstraction licence(s) under section 24 of the Water Resources Act 1991 (Ref 9-6) (if more than 20m$^3$/d is to be dewatered/over-pumped and exemptions do not apply) – see further detail below;

f. Temporary water impoundment licence under section 25 of the Water Resources Act 1991 (Ref 9-6) in connection with the laying of cables; and

g. Under IDB byelaws, prior written consent (outside of the planning process) is needed for certain works that may affect IDB watercourses such as any works within the channel or any drainage into an IDB watercourse.

9.6.82 There is the potential for the need for either full or temporary water abstraction licence(s) from the Environment Agency for the abstraction of water from the entry and exit pits associated with the underground watercourse crossings or other excavations where groundwater may be encountered, other than where exemptions apply. A full licence is required when more than 20m$^3$ per day of water may need to be abstracted for more than 28 days. A temporary licence is applicable where the abstraction is less than 28 days. Where less than 20m$^3$ per day of water needs to be abstracted, no licence is required. However, in all circumstances it may be necessary to obtain a water activity permit(s) from the Environment Agency to discharge the water to ground or a watercourse if the water is considered to be 'unclean'.

## Decommissioning

9.6.83 The design life of the Proposed Development is expected to be 60 years with decommissioning to start 60 years after commercial operation date; the operational life of the Proposed Development is currently anticipated to be 2033 to 2093. Decommissioning is expected to take between 12 and 24 months and would be undertaken in phases.

9.6.84 When the operational phase ends, the Principal Site will require decommissioning. All PV modules, mounting poles, inverters and transformers would be removed and recycled or disposed of in accordance with good practice and market conditions at the time. Buried medium voltage cables would either be removed or left in situ.

9.6.85 As per Environment Agency requirements, all cables and subsurface infrastructure will be removed where they are located within an SPZ or areas of Principal aquifer (i.e. to the eastern extent of the Grid Connection Cable, east of Boothby Graffoe).

9.6.86 The majority of the Principal Site would be returned to the landowner after decommissioning and will be available for its original use and any planting would be retained as far as practicable. Areas of landscape and biodiversity mitigation and enhancement, as well as permissive paths delivered as part of the Proposed Development, would remain up until the land is returned to the previous landowners. Following this, the landowners would choose how the land is to be used and managed.

9.6.87 The drainage of the land within the Principal Site will be checked after decommissioning. Should any agricultural drains be altered or removed, they will be restored such that agricultural activities could continue after decommissioning of the Proposed Development.

9.6.88 A **Framework Decommissioning Environmental Management Plan (DEMP) [EN010154/APP/7.9]** has been prepared and submitted with the DCO application. This sets out the general principles to be followed in the decommissioning of the Proposed Development. A detailed DEMP will be

prepared and agreed with the relevant authorities at that time of decommissioning, in advance of the commencement of decommissioning works, and would include timescales and transportation methods. Given the similarity of the mitigation measures to the **Framework CEMP [EN010154/APP/7.7]** they are not described in detail here. Refer to construction mitigation described above and to the **Framework DEMP [EN010154/APP/7.9]** for further details.

## 9.7 Assessment of Effects

9.7.1 Taking into account the embedded mitigation measures as detailed in **Section 9.6** above, the potential impacts and effects of the Proposed Development was assessed using the methodology as detailed in **Section 9.4** of this Chapter.

### Construction (estimated 2031 to 2033)

9.7.2 During construction the following adverse impacts on the water environment may occur:

a. Pollution of surface water or groundwater (and any designated ecology sites that are water dependent) due to deposition or spillage of soils, sediments, oils, fuels, or other construction chemicals, or through uncontrolled site run-off including dewatering of excavations or piling;

b. Temporary impacts on the hydromorphology of watercourses (e.g. from open-cut watercourse crossings and temporary vehicle access crossings as may be required). Temporary access from vehicles has been assessed as part of the overall construction activities taking place;

c. Potential impacts on groundwater resources and local water supplies (licenced and unlicenced (private) abstractions);

d. Potential impact to baseflow to watercourses from temporary dewatering of excavations or changes in hydrology; and

e. Temporary changes in flood risk from changes in surface water runoff (e.g. disruption of stream flows during any potential watercourse crossing construction works), and exacerbation of localised flooding, due to deposition of silt, sediment in drains, ditches; and construction of the Solar PV Panels, BESS and associated infrastructure.

**Surface Water Features – Water Quality**

9.7.3 The Principal Site is located within the catchments of the River Witham, Boultham Catchwater Drain, South Hykeham Catchwater and the Fleet (all of which are WFD water bodies). A crossing of the River Witham is required for the Onsite Cabling and the River Brant for the Grid Connection Cable. These cables would be installed using a trenchless approach. There would also be intrusive crossings of the various drains for Onsite Cabling, the Grid Connection Cable and for access tracks (as outlined in **Section 9.6**).

9.7.4 Construction activities such as earthworks, excavations, site preparation, levelling, and grading operations result in the disturbance of soils. Exposed

soil is more vulnerable to erosion during rainfall events due to loosening and removal of vegetation to bind it, compaction, and increased runoff rates. Surface runoff from such areas can contain excessive quantities of fine sediment, which may eventually be transported to watercourses where it can result in adverse impacts on water quality, flora and fauna.

9.7.5 Construction works within, along the banks of, and across watercourses can also be a direct source of fine sediment mobilisation. Other potential sources of fine sediment during construction works include water runoff from earth stockpiles, dewatering of excavations (surface and groundwater), mud deposited on site and local access roads, and that which is generated by the construction works themselves or from vehicle washing.

9.7.6 Generally, excessive fine sediment in runoff is chemically inert and affects the water environment through smothering riverbeds and plants, temporarily changing water quality (e.g. increased turbidity and reduced photosynthesis) and causing physical and physiological adverse impacts on aquatic organisms (such as abrasion or irritation).

9.7.7 During construction, fuel, hydraulic fluids, solvents, grouts, paints and detergents and other potentially polluting substances will be stored and/or used on site. Leaks and spillages of these substances could pollute the nearby surface watercourses if their use or removal is not carefully controlled, and spillages enter existing flow pathways or water features directly. Like excessive fine sediment in construction site runoff, the risk is greatest where works occur close to and within water features.

9.7.8 The majority of construction works across the Principal Site are set back from watercourses and on relatively flat topography. The Proposed Development design includes a 10m buffer around all watercourses and ponds, except where crossings are required. With the exception of watercourse cable crossings and possible existing culvert extensions (and potentially drainage outfalls) there will be no further requirement to work in immediate proximity to watercourses or ponds. As such, the water pollution risk to watercourses within the Study Area from general construction activities is considered to be low. The greater risks of adverse impacts are where direct works are required within a watercourse or works in very close proximity for specific activities (such as cable crossings).

9.7.9 As stated in the assumptions (**Section 9.4**), it is currently assumed that with the exception of the River Brant and River Witham that all watercourses that need to be crossed by cabling will be done so using open-cut, intrusive techniques. As outlined in **Section 9.6** these crossings are all of the ditches and drains, and there are eight locations in total. The final crossing approaches will be informed by site specific conditions. Where these crossings are required, there would be unavoidable works within the channel, with potential for adverse water quality impacts requirement mitigation.

*Trenchless Crossings for Cable Installation*

9.7.10 Where trenchless approaches (such as HDD) are to be used for the River Witham and River Brant cable crossings, the send and receiving pits would be

no closer than 10m from the top of bank (or 16m from the landward toe of flood defences where present or 100m for the River Witham where there is a potential Otter holt). Despite this buffer, there remains a risk of sediment mobilisation in runoff and for chemical spillages to occur that could enter the channel if not managed accordingly. These mitigation requirements will be outlined in a WMP that will be produced as part of the detailed CEMP after consent and prior to construction. Water quality monitoring will also be undertaken prior to, during, and following on from the construction activity to ensure any spillages or other pollution is identified, as outlined in **Section 9.6**.

9.7.11 There is also a chance of 'frac-out' events (i.e. hydraulic fluid break out) from drilling if not appropriately mitigated for site specific conditions. To manage this risk a site-specific Hydraulic Fracture Risk Assessment will be produced prior to commencing works to define the mitigation required based on specific local ground conditions.

9.7.12 Given the non-intrusive nature of the works and the mitigation that will be in place, the risk to water quality of the River Witham and River Brant is considered to be low and a short term, temporary negligible adverse impact is predicted. For these high importance receptors this would result in a **slight adverse impact (not significant)**.

*Intrusive Crossings for Cable Installation*

9.7.13 Eight intrusive open-cut crossings are currently assumed to be required for the Cable Corridor and Onsite Cabling (as outlined in **Table 9-14**). These watercourses will require unavoidable works within the channel, with potential for adverse water quality impacts. It is also assumed at this stage that a maximum channel length of 6m would be affected in each case. For intrusive cable installation, a dry working environment would be created thus creating a barrier for contamination of the watercourses, although it will also be necessary to maintain a flow downstream. This would be achieved by temporarily damming and over pumping. Works will be carried out in the drier months where practicable when flows are likely to be lower and easier to manage across the dry working area, thus reducing the risk of sediment mobilisation and pollution occurring. Silt fences, geotextile matting or straw bales or other similar method would be used initially once the channel is reinstated to filter the flow and capture mobilised sediments until the watercourse has returned to a settled state. Affected banks will be protected with suitable biodegradable matting to protect them from erosion until vegetation re-establishes. Water quality monitoring will be undertaken prior to, during, and following on from the construction activity. These requirements will be described in the WMP (which will form an appendix to the detailed CEMP).

9.7.14 There would be a risk of sediment disturbance when trenching through the channel, reinstating the channel bed, and when working on the adjacent banks. There also remains potential for construction runoff and spillages to enter the watercourse given the direct nature of the work. However, given implementation of good practice measures as outlined in the **Framework CEMP [EN010154/APP/7.7]** and the WMP (that will accompany the detailed CEMP), this would be a temporary and localised minor adverse impact in

terms of water quality. For the low importance watercourses affected (crossing of unnamed ditches at B3, B4, WC1, W12, BL5, BL6, BL7 and BL8 as shown in **Figure 9-1 [EN010154/APP/6.2]** this would result in a slight adverse effect (not significant).

*Access Track Crossings of Watercourses*

9.7.15 A total of twelve watercourse crossings for access tracks have been identified across the Proposed Development at this stage (see **Table 9-15** and locations on **Figure 9-1 [EN010154/APP/6.2]**. Existing crossings are being used where possible or otherwise new crossings will be of an open span design with abutments set back from the bank. Where upgrades to existing culverts might be required (to be determined at detailed design), they are assumed to be a maximum extension to the structure width of 2m. Any culvert extensions required would result in an unavoidable need to work directly within the watercourse channel in each case, and therefore raises a risk of mobilisation of sediment directly in the channel or for accidental spillages to occur. However, good practice mitigation measures as outlined in the **Framework CEMP [EN010154/APP/7.7]** and WMP (that will accompany the detailed CEMP) would be implemented.

9.7.16 The affected ditches for minor crossing upgrades are generally ephemeral. If the works occur within the channel when watercourses are flowing (as a worst case) there is potential for adverse water quality impacts from runoff containing fine sediments and chemical spillages relating to use of plant adjacent to and within the watercourses.

9.7.17 To mitigate this, works will be carried out in the drier months where practicable as this would reduce the risk of pollution propagating downstream, particularly for these ephemeral watercourses. However, this may not always be possible, thus as with intrusive cable crossings, a dry working area would be established by damming and over pumping around the structure modifications, with reconnection only made once the works are complete. Silt fences, geotextile matting or straw bales or other similar method would be used initially once the channel is reinstated to filter the flow and capture mobilised sediments until the watercourse has returned to a settled state. Affected banks will be protected with suitable biodegradable matting to protect them from erosion until vegetation re-establishes. It will be a requirement that the watercourses are reinstated as found around each cable or structure crossing and water quality monitoring will be undertaken prior to, during, and following on from the construction activity. These requirements will be defined in the WMP.

9.7.18 Given implementation of good practice measures as outlined in the **Framework CEMP [EN010154/APP/7.7]** and the WMP (that will accompany the detailed CEMP), this would be a temporary and localised minor adverse impact in terms of water quality from any culvert strengthening or extension works. Given that potentially impacted watercourses are of low importance for water quality, this minor impact would result in a temporary slight adverse effect (not significant) in both cases.

9.7.19 The remainder of crossings would be of an open span nature with abutments set back to retain a riparian margin. As such, there would be no direct works to the channel in these cases. While there may be some potential for runoff of sediments and/or spillages into the channel (given the close proximity of the works), the impact on water quality would be negligible given the mitigation measures outlined in the **Framework CEMP [EN010154/APP/7.7]** and the WMP. For these low importance receptors this results in a neutral effect (not significant) on water quality.

*Drainage Outfalls*

9.7.20 It is intended that surface water will drain to local receiving watercourses (field ditches) via a new ditch outfall, as this avoids the need to construct an engineered outfall on channel margins. Alternatively, where piped sections are required, these would be shortened and the last 10m section of the outfall route will be open green ditch. The only exceptions would be where the IDB require access to be maintained along channel margins, in which case the use of an engineered outfall cannot be ruled out. As the exact locations and/or need for engineered outfalls will be defined at detailed design and adopting a precautionary approach, it has been assumed as a worst case that engineered outfalls will be required.

9.7.21 It is assumed that construction of any outfalls would be within a dry working area, but that their construction would result in some temporary disturbance to the bed and banks and the risk of chemical spillages, especially if pre-cast headwalls cannot be used requiring pouring of wet concrete close to water.

9.7.22 Within the Principal Site, the River Witham is of high importance for water quality, with all other receptors being of low importance. Overall, a temporary, localised minor magnitude of impact would be anticipated to surface water quality in relation to outfall installation given implementation of good practice mitigation measures. This would result in a temporary slight adverse impact (not significant) in all cases, should engineered outfalls be required.

*Construction Compounds*

9.7.23 There is proposed to be one main construction compound and several secondary construction compounds for the Proposed Development. Their locations are described in **Chapter 3: The Proposed Development [EN010154/APP/6.1]** and shown in **Figure 3-1 [EN010154/APP/6.2].**

9.7.24 In addition to the main compound and the secondary compounds, smaller short-term use construction compounds will be located across the DCO Site including the Cable Corridor. The location of the temporary construction compounds for the Cable Corridor are shown in **Figure 3-1 [EN010154/APP/6.2]**.

9.7.25 Within these compounds there is intended to be materials storage, car parking, and potential for refuelling activities. Within the embedded mitigation measures there is a requirement for a 10m buffer from watercourses to ensure minimisation of risk to watercourses from any spills or leaks, together with ensuring any equipment or plant washing takes place in designated areas. It

is considered that with the proposed embedded mitigation in place (including a 10m buffer zone, standard construction measures and appropriate management of runoff) this would result in a negligible impact on the high importance River Witham and low importance drains and ditches within the Principal Site. This results in a slight adverse effect (not significant) for the River Witham and neutral effect (not significant) for the remainder of watercourses within the Principal Site.

**Surface Water Features – Morphology**

*Intrusive Crossings for Cable Installation*

9.7.26 The open-cut installation of Onsite Cables and Grid Connection Cables at eight locations (as indicated in **Figure 9-1 [EN010154/APP/6.2]** and **Table 9-14**) will require intrusive works across drains and ditches. The affected watercourses across the Principal Site and Cable Corridor are all considered low importance for morphology given that they are generally artificially straight, trapezoidal channels often lacking significant geomorphic and bedform features.

9.7.27 Where open-cut crossings are required, a Pre-works Riparian and Hydromorphological Survey will be undertaken at each crossing point prior to construction commencing (post consent). The cables will be buried at sufficient depth to prevent exposure (minimum 1.5m below the bed) and the flow over-pumped or flumed during the works to minimise the risk of water pollution. However, there will unavoidably be short term, temporary adverse impacts on the watercourse and riparian habitats, and the hydrological and sediment regimes during construction. These impacts would be very localised and short in duration, with the channels reinstated taking into account the pre-works morphological condition.

9.7.28 Despite the mitigation measures, a temporary moderate adverse magnitude of impact to morphology is considered appropriate as a worst-case scenario given the direct, intrusive nature of the works. Full recovery of the channel would be expected within around five years. For these low importance receptors (in terms of morphology) this results in a temporary slight adverse effect (not significant).

*Access Track Crossings of Watercourses*

9.7.29 Culvert extensions may be required to existing crossings in some locations (e.g. for strengthening purposes), with a maximum extension of 2m assumed. This would be determined at detailed design. The potentially affected watercourses across the Principal Site and Cable Corridor are all considered low importance for morphology given that they are generally artificially straight, trapezoidal channels often lacking significant geomorphic and bedform features.

9.7.30 Any culvert extension works will require intrusive works and physical impact to watercourses on a permanent basis. This is considered a worst case with replacement open span crossings being the preference where feasible. Should culverts require extension (as determined at detailed design), there

would be unavoidable direct loss of riparian, bank and bed habitats where they are replaced by culvert. However, if culvert extensions are progressed, then their design will aim to minimise changes in watercourse alignment and length as much as is feasible and be environmentally sensitive with a naturalised bed (see further details in **Section 9.6**). An equivalent length of watercourse enhancement will be delivered for every metre of watercourse directly impacted by culvert extensions (if required), with this enhancement to be defined within a WFD Mitigation and Enhancement Strategy (produced post consent) and which will be developed in consultation with the Environment Agency.

9.7.31 Given the mitigation approaches to softening the impacts of potential culvert extensions and the delivery of equivalent length watercourse enhancement, a minor adverse magnitude of impact to morphology is considered appropriate as a worst-case scenario at this stage. For these low importance (in terms of morphology) agricultural drains and ditches this results in a permanent slight adverse effect (not significant).

*Drainage Outfalls*

9.7.32 As outlined above, it is not known where future engineered surface water outfalls will be located, and there remains an opportunity for any SuDS or surface water drainage systems to connect to the existing waterways using ditches to avoid engineered outfalls entirely. However, as this will not be confirmed until the detailed design stage, and adopting a precautionary approach, it has been assumed that engineered outfalls will be provided.

9.7.33 Within the Principal Site the surface water receptors are all of low importance for morphology with the exception of the River Witham, which is of medium importance. A localised, temporary minor adverse impact is predicted should outfalls be required, which would result in a slight adverse effect (not significant) for any watercourse affected within the Site.

**Groundwater**

*Impact on Groundwater Level and Flow – Cable Trenches, Trenchless Watercourse Crossings, Intrusive Watercourse Crossings and Foundations*

9.7.34 A ground investigation and groundwater monitoring will be undertaken to inform the detailed design. In addition, groundwater monitoring will also be undertaken prior to, during, and following on from the construction activities.

9.7.35 As indicated in **Section 9.6** (and described in **Chapter 3: The Proposed Development [EN010154/APP/6.1]**), low voltage cabling between PV panels and the inverters (typically via 1.5/1.8kV cables) will typically be located above ground level (along a row of racks), fixed to the mounting structure, and then underground (between racks and in the central inverter's and or transformer input). Medium voltage cables (around 33kV) are required between the transformers, switchgear and the Onsite Substation. These buried interconnecting cables will be located within the Solar PV Array Areas and within the Interconnecting Cable Corridors between the Solar PV Array Areas. The trench will typically be up to 1m wide with a maximum depth of 1.2m

(except where trenchless crossings below watercourses are required whereby the cable would be a minimum of 5m below the channel bed).

9.7.36 The Grid Connection Cable will be installed using an open trench method requiring a 30m to 40m working width, with trench widths approximately 3m wide and up to 3m deep. As above, the exception is where trenchless crossings are required, with the cable installed a minimum of 5m below the channel bed.

9.7.37 Other structures within the subsurface include the Solar PV foundations (2m indicative maximum depth for fixed south facing strings and 4m indicative maximum depth for single axis tracker strings), BESS and associated battery containers (1m maximum depth on concrete base or monolith plinth), the control building, office, warehouse and storage building (maximum foundation depth of 2m) and Onsite Substation, Solar Station Compounds, Inverters, Transformers and Switchgear Enclosures (assumed maximum depth for all of 2m).

9.7.38 At present, there is relatively limited groundwater level data across the Site however, GI and groundwater monitoring will be undertaken to inform the detailed design. Based on available data, the shallowest groundwater levels recorded across the Study Area from a review of Environment Agency data (see Section 9.5) was 2.5m in Tunman Wood, approximately 100m from the north western DCO Site for the Principal Site, and a shallower level of 1.8m was recorded near Thorpe on the Hill and may suggest that groundwater within superficial deposits may be within 2m of the surface across parts of the Site at times. Therefore, groundwater in the superficial deposits may be encountered during construction.

9.7.39 Groundwater in the Lincolnshire Limestone Principal Aquifer (underlying the eastern extent of the Cable Corridor) is estimated to be at least 11m below ground level based on the available borehole data, and so is unlikely to be encountered by the construction works.

9.7.40 Groundwater in the superficial deposits may be encountered where deeper foundations are required across the Principal Site (e.g. solar PV foundations of up to 4m depth), although the spatial extent of these works would be very limited in the context of the wider aquifer. Where superficial deposits are underlain by Scunthorpe Mudstone Formation and Charmouth Mudstone Formation, it would not be expected to encounter significant quantities of groundwater due to the low permeability nature of the secondary aquifer. Where there is a requirement for trenchless crossings which would require deeper works below ground (at least 5m below the river bed), a site specific risk assessment would be undertaken for each crossing point, in order to inform a methodology that minimises groundwater interactions where practicable.

9.7.41 Overall, given that no continuous foundations are present in the design, the regularly spaced discrete solar PV panel foundations and infrastructure foundations across the Principal Site are considered to have negligible impact on groundwater level or flows. For the medium importance Scunthorpe

Mudstone Formation, Charmouth Mudstone Formation and superficial deposits this results in a neutral effect (not significant).

9.7.42 With regards to installation of the Grid Connection Cable over the high importance Lincolnshire Limestone Formation and the medium importance SPZ3, there is anticipated to be no change to groundwater levels, flow or quality due to the implementation of good practice and given the depth of identified groundwater in comparison to the relatively shallow excavations required for the Cable Corridor works. No change would also result in a neutral effect (not significant).

9.7.43 Where construction works to install cables beneath the River Brant for the Cable Corridor and River Witham within the Principal Site are required, the cable routes may be below the water table over part of their routes. The River Witham crossing is underlain by Scunthorpe Mudstone Formation and the River Brant crossing is underlain by Charmouth Mudstone Formation. The profile of the cable ducting is considered to be small compared to the spatial and vertical extent of the aquifers. Therefore, the works are considered to have a negligible impact on groundwater level or flow for the medium importance Scunthorpe Mudstone Formation and Charmouth Mudstone Formation, resulting in a neutral effect (not significant) in both cases.

9.7.44 The use of trenchless installation (HDD or similar) beneath the River Brant and River Witham would necessitate a temporary send and receive pit either side of the watercourse. As outlined above there may be potential for shallow groundwater in parts of the Principal Site, and so there is potential for groundwater ingress to the pits. This would be managed following standard construction techniques potentially including pumping, damming, or shoring up the pits with sheet piling. The pits would be backfilled with the original excavated material upon completion and would not affect groundwater flow in the longer term. Given the potential to encounter groundwater temporarily during construction, but that it would be appropriately managed in line with any required permit conditions and best industry practice as outlined in the **Framework CEMP [EN010154/APP/7.7]**, there is potential for a short term, temporary minor adverse impacts on groundwater flow. For the medium importance Scunthorpe Mudstone, Charmouth Mudstone and superficial aquifers this results in a neutral effect (not significant).

*Impact on Groundwater Resources*

9.7.45 In terms of water resources, no PWS or groundwater abstractions have been identified within the Site, although there are several groundwater abstractions in the wider Study Area (see **Figure 9-1 [EN010154/APP/6.2]**). There would be negligible impact to these abstractions given that no significant effects on groundwater level or flow have been identified. There is an area of SPZ 3 – Total Catchment, located at the eastern extent of the Cable Corridor. As no change is expected to occur to groundwater levels and flows in this area (which is underlain by Lincolnshire Limestone Formation) then it is not considered that there would be any groundwater quantity impact on the SPZ3. As such, the effect of the Proposed Development on groundwater resources (abstractions and the SPZ3) would be neutral (not significant).

*Impact on Groundwater Quality*

9.7.46 The Principal Site is not known to have a significant history of potentially contaminating land uses, although there is a former airfield on site (Swinderby Airfield). Further details are available in **Chapter 14: Other Environmental Topics [EN010154/APP/6.1]** and in the **Appendix 14-C: Phase 1 Preliminary Risk Assessment [EN010154/APP/6.3]**.

9.7.47 The installation of the discrete PV module structures to a maximum depth of 4m below ground, and other foundation depths as outlined above (maximum 2m depth for new infrastructure aside from cables beneath watercourses) are not considered at this stage to create a significant risk of mobilising contaminants, creating a contaminant pathway or risking infiltration to the water table.

9.7.48 Nonetheless, prior to construction works commencing, a targeted scheme of Ground Investigation and testing followed by a Quantitative Risk Assessment will be completed. This will be in accordance, ~~if and~~ where necessary, with BS10175:2026~~2011+ A2:2017~~ Investigation of Potentially Contaminated Sites: Code of Practice (Ref 9-98), BS 5930:2015+A1:2020 Code of Practice for Ground Investigations (Ref 9-99), and the Environment Agency's Land contamination risk management (LCRM) (Ref 9-97). Furthermore, a standalone, site specific Hydraulic Fracture Risk Assessment will be produced prior to drilling the cable crossings, as is standard practice, to mitigate any water quality deterioration from the drilling process, and similarly appropriate risk assessment would be undertaken for any piling requirements that are identified. This, along with standard measures for protection of groundwater quality, will be secured through the **Framework CEMP [EN010154/APP/7.7].**

9.7.49 Consequently, there would be negligible water quality impact to groundwater aquifers. For the high importance Lincolnshire Limestone aquifer this results in a slight adverse effect (not significant). For the medium importance SPZ3, Scunthorpe Mudstone, Charmouth Mudstone and superficial aquifers this results in a neutral effect (not significant).

**Water Demand**

9.7.50 During construction there would be a requirement for 30m$^3$ per day of clean water for approx. 600 staff, 23m$^3$ per day of clean water for approximately 600 staff. The average number of workers on site during construction is assumed to be 350, which would have a demand of an average 13m$^3$/day. This equates to an assumed maximum of 12,264m$^3$ over the 30 month construction period.

9.7.51 It is assumed that the peak volume of 21.3m$^3$ per day of foul water would be produced during construction equating to an assumed maximum of 11,610m$^3$ over the 30-month construction period

9.7.52 Other uses of water use include wheel washers (assumed to be 500m$^3$ in total), dust suppression (1,000m$^3$) and water to support the preparation of concrete for use across the Site (assumed to be 25,000m$^3$ in total).

9.7.53 A Water Resources Assessment was submitted to Anglian Water to determine whether the water demand can be accommodated. Anglian Water confirmed on 28 May 2025 that it is able to meet all of the Proposed Development's requirements (both domestic and non-domestic) during construction. Given that it has been confirmed through the Water Resources Assessment that the Proposed Development's supply requirements can be delivered without compromising water resources in the Anglian Water area, then it is considered that there would be a negligible impact on water resources (considered to be a high importance receptor), which results in a slight adverse effect (not significant).

**Flood Risk**

*Fluvial / Tidal Flood Risk*

9.7.54 The majority of the Principal Site and Cable Corridor Study Area is in Flood Zone 1 (see **Figure 9-3 [EN010154/APP/6.2]**) and considered to be at low risk from fluvial and tidal flooding. However, construction activity will involve work in areas of Flood Zone 2 and 3 associated with the River Witham, River Brant and Mill Dam Dyke. Should a fluvial flood event occur during construction, this could be a potential high risk to construction workers in the immediate vicinity (very high importance receptors). The baseline flood risk could be exacerbated during construction works by the temporary increase in the rate and volume of surface water runoff from an increase in impermeable areas caused by the compaction of soils and the presence of stockpiled materials. In addition, equipment may also be washed downstream where it may block the channel and lead to or increase the risk of flooding.

9.7.55 All temporary construction compounds proposed for the Principal Site are located within Flood Zone 1 with very low risk of fluvial flooding. The temporary construction compounds are expected to be in place for up to 30 months during the Construction Phase, being replaced gradually throughout the construction phase with solar PV panels, where located within the Principal Site.

9.7.56 As stated within **Section 9.6**, for the Cable Corridor, HDD will be used so that the cables will be installed under the River Witham and River Brant and adjacent flood defences. This will ensure there will be no impact on the banks and bed of the watercourses, and therefore no effect on the flow regime or flooding potential of these rivers. However, during construction there may be potential for flooding within the temporary launch and receive pits for the HDD work and this risk would need to be mitigated.

9.7.57 With the implementation of standard construction methods and mitigation as described in **Section 9.6**, fluvial flood risk in Flood Zone 2 and 3 can be effectively managed through a variety of measures, for example by monitoring weather forecasts and Environment Agency flood warnings, by undertaking works close to watercourses during periods of dry weather, by ensuring an adequate temporary drainage system is in place and maintained throughout the construction phase and avoiding stockpiling material on

floodplains. An Emergency Response Plan would also be in place and will be secured via the CEMP (see **Framework CEMP [EN010154/APP/7.7]**).

9.7.58 As such, the magnitude of flooding from these sources during construction, both on site and further downstream to off-site receptors, is considered to be negligible once the mitigation is taken into account. When considering the construction workers on site who are a very high importance receptor, this gives a slight adverse effect (not significant). When considering agricultural land uses surrounding the site (medium importance receptor) and surrounding villages and hamlets (high importance receptors) this results in a slight adverse effect (not significant).

*Surface Water (Pluvial Flood Risk)*

9.7.59 The Principal Site and Cable Corridor is in general at a very low risk of surface water flooding, although in some areas (mainly associated with watercourses and localised shallow patches) there are areas of low, medium and high risk as outlined in the baseline and shown in **Figure 9-4 [EN010154/APP/6.2]**.

9.7.60 During construction, the following adverse impacts may occur with regard to surface water flood risk:

a. Existing surface water flow paths may be disrupted and altered due to site clearance, earthworks, and excavation work. The exposure and compaction of bare ground and the construction of new embankments and impermeable surfaces may increase the rates and volume of runoff and increase the risk from surface water flooding;

b. Temporary changes in flood risk from changes in surface water runoff (e.g. exacerbation of localised flooding due to deposition of silt, sediment in drains, ditches); and

c. Changes in flood risk due to the construction of Principal Site, Cable Corridor and site compound and storage facilities, which alter the surface water runoff from the Site.

9.7.61 Construction activities will take place with the Final CEMP in place (building on the **Framework CEMP [EN010154/APP/7.7]**) to ensure no exacerbation of localised flooding from deposition of silt or sediment in drainage and ditches. A temporary drainage system will be in use where required (see **Section 9.6**).

9.7.62 Therefore, the impact during construction on surface water flooding and flood risk, to and from the Proposed Development and to other developments and receptors outside of the Proposed Development extents, is considered to be negligible. For the Very High importance construction workers this would be a slight adverse effect in EIA terms (not significant). When considering agricultural land uses surrounding the site (medium importance receptor) and surrounding villages and hamlets (high importance receptor) this results in a slight adverse effect (not significant).

*Groundwater Flood Risk*

9.7.63 North Kesteven District Council's Strategic Flood Risk Assessment indicates the Principal Site and Cable Corridor are deemed not to be at risk of groundwater flooding. However, where the Cable Corridor crosses the River Witham, groundwater may be elevated within the alluvial deposits. There is no risk mapping for groundwater in this area, but as soils are largely impermeable the risk is considered medium, as the bedrock geology would not support large amounts of water storage, such as an aquifer.

9.7.64 There may be potential for shallow groundwater levels and therefore groundwater ingress to excavations during construction in parts of the Site. This will be managed following standard construction techniques potentially including pumping, damming, or shoring up excavation pits with sheet piling.

9.7.65 It is considered that groundwater flood risk both to and from the site is unlikely to increase from the Principal Site and Cable Corridor during construction as the majority of works will be above the ground surface with relatively limited excavations as outlined in **Section 9.6**. Infiltration into the soil and underlying geology will remain largely as per existing conditions except for localised areas of hardstanding and temporary drainage systems will be used where necessary as per the **Framework CEMP [EN010154/APP/7.7]**.

9.7.66 Based on the above considerations, the impact during construction on groundwater flooding and flood risk, to and from the Proposed Development to other developments and receptors outside of the Proposed Development, is considered to be negligible. When considering the very high importance receptors, being the construction workers, this results in a slight adverse effect (not significant). When considering agricultural land uses surrounding the site (medium importance receptor) and surrounding villages and hamlets (high importance receptor) this results in a slight adverse effect (not significant).

*Flood Risk from Sewers and Artificial Sources*

9.7.67 The Principal Site and Cable Corridor Study Areas are considered to be at low risk of flooding from artificial sources and sewers.

9.7.68 It is not envisaged the flood risk from drainage infrastructure (e.g. sewers) will increase from the baseline situation with the construction of the Proposed Development. No new connections to foul water infrastructure are considered to be required for the Proposed Development.

9.7.69 There is not envisaged to be any impact on flood risk from artificial sources either on or off-site during construction (i.e., no change), and so no effect to on-or off-site receptors (e.g. ecological receptors). In terms of very high importance construction workers and off-site land uses (agricultural land, villages and hamlets) there is a neutral effect (not significant) from flood risk from drainage infrastructure and artificial sources.

## Operation (and maintenance) (estimated 2033 to 2093)

9.7.70 Impacts on water features during operation of the Proposed Development are likely to include:

a. Impacts on water quality in surface water features from diffuse pollution: run-off and the potential for accidental spillages from new permanent hardstanding and maintenance activities (predominantly consisting of panel cleaning), assuming surface water run-off does ultimately drain to a surface watercourse rather than simply to ground;

b. Potential for impact on groundwater or surface water from firewater runoff in the event of a fire in the battery energy storage system (BESS) area(s);

c. Potential impacts on hydrology as a result of the Proposed Development;

d. Potential for permanent physical impacts to watercourses if crossings are required for access and depending on the design of the structure used;

e. Potential impacts on groundwater resources: quality, flow and level;

f. Potential impact on fluvial flood risk from changes in the rate and volume of run-off entering local watercourses;

g. Generation of a new source of foul wastewater from on-site welfare facilities that will need to be adequately managed and disposed of;

h. The current arable fields are likely a source of diffuse agricultural pollutants (e.g. organic/inorganic fertiliser and pesticides). During the life of the project the use of such fertilisers and other chemicals will be ceased, which could lead to beneficial impacts on the water environment; and

i. Potential reduction in local surface and groundwater abstraction due to reduce agricultural irrigation requirements.

**Water Quality**

*Impacts from Operational Site Runoff and Accidental Spillages*

Overview of Provisional Drainage Arrangements

9.7.71 The drainage arrangements outlined in **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]** propose to attenuate surface water runoff and contain chemical spillages from the Site once operational, whilst minimising flood risk to the Site and surrounding areas (see Section 9.6). The operation of the Site will be managed in accordance with an Operational Environmental Management Plan (OEMP). A **Framework OEMP [EN010154/APP/7.8]** has been produced as part of the DCO application.

9.7.72 Surface water runoff would mainly be low risk roof or panel runoff as this will consist mainly of rainfall. In addition to permanent structures, there would be runoff from hardstanding areas such as the centralised BESS, Solar Station Compounds, Onsite Substation, switchgear enclosures, control building, office, warehouse and storage building and access tracks.

9.7.73 Within the area of Solar PV Panels, the impermeable area would remain largely consistent with its pre-development state as Solar PV Panels are elevated above ground (minimum of 800mm above ground level) and incident rainfall will run off them to ground as it does now.

9.7.74 In order to limit the potential for channelisation from rainfall dripping off the end of the Solar PV Panels, the areas between, under and surrounding the Solar PV Panels will be planted with native grassland and wildflower mix. This planting will intercept and absorb rainfall running off the Solar PV Panels, preventing it from concentrating and potentially forming channels in the ground. Planting types will be described within the **Framework Landscape and Ecological Management Plan [EN010154/APP/7.15]**.

9.7.75 New access roads will be permeable. Therefore, the Principal Site's access roads will not lead to an increase in impermeable area. The drainage regime of the access roads is therefore assumed to remain consistent with its pre-developed state.

9.7.76 The Indicative Site Layout Plans (included in **Figure 3-2A and 3-2B [EN010154/APP/6.2]**) show options for distributed and centralised BESS arrangements, with distributed BESS co-located with Solar Station compounds spread across the Principal Site, and a single location centralised BESS Compound. These are assumed to be 100% impermeable. In order to drain surface water from these proposed impermeable areas, it is proposed to construct a swale around the BESS (or groups of BESS) and substation areas. The swales will collect and treat surface water before discharge.

9.7.77 Due to the current understanding of the ground conditions within the Principal Site, it is preferred to utilise surface water bodies to discharge runoff from the Solar Station Compounds, BESS Compound and Onsite Substation where practicable. Therefore, surface water runoff from the Substation compound swales and the majority of the BESS swales (where practicable within the DCO Site) is proposed to be discharged to local watercourses. The discharge to these watercourses will be maintained at existing greenfield runoff rates by restricting rates using a flow control. The flow control will use a restriction on the outlet of the swale which will hold water back within the swale and release it at a controlled rate.

9.7.78 Swales around all of the BESS areas (for both centralised coupled and distributed arrangements) and Onsite Substation areas will be lined with an impermeable membrane or similar impermeable barrier to prevent any pollution associated with fire water runoff from entering the ground. Penstocks will also be used in the event of a fire to prevent any pollution associated with fire water runoff from entering the local watercourses without prior testing.

9.7.79 In the north of the Principal Site, there are seven Solar PV fields (fields 14, 18, 19, 25, 29, 32 and 34 as shown in Annex C of **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]**) where surface water bodies are not available in suitable locations to discharge runoff from the lined BESS swales; it is, therefore, proposed to discharge flows from the lined BESS swales to infiltration swales lining the boundaries of fields. These field swales are to be designed to attenuate flows for the 1 in 100 year + 40% climate change event and fire water runoff (if deemed to be clean) and slowly infiltrate surface water flows to ground whilst also making use of evapotranspiration. As set out above, discharge of runoff will be controlled

from BESS areas by penstocks at each location which can isolate the runoff from the BESS prior to entering the infiltration swales.

*Water Quality Risk Assessment*

9.7.80 To assess the risk to receiving watercourses, an assessment has been undertaken of the proposed surface water drainage system in accordance with the Simple Index Approach (SIA) as detailed within CIRIA C753 The SuDS Manual (Ref 9-27). This method determines the pollution hazard level (or index) of the land use proposed and then assesses the level of treatment the proposed drainage system will provide (mitigation index) to ensure it provides sufficient water quality mitigation.

9.7.81 The land use falls into the 'Low Pollution Hazard Level' categories of the SIA (Ref 9-27) as the solar PV panels and BESS/Substation area(s) are equivalent to commercial and industrial roofs, while the access tracks are equivalent to low traffic roads (less than 300 vehicle movements per day).

9.7.82 The assessment is presented in **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]** (Section 4.6).

9.7.83 The assessment indicates that sufficient water quality mitigation has been proposed through the use of swales for the areas of hardstanding across the Proposed Development site including for the access tracks (i.e. the mitigation index surpasses the pollution hazard index). For those seven fields discharging to ground via infiltration swales, the suitability of the sites for infiltration and sufficient attenuation will be further confirmed through ground investigation at the detailed design stage. The final drainage strategy, which will be secured as a DCO Requirement, will repeat the water quality assessment to ensure sufficient treatment is provided.

*Firewater Management*

9.7.84 Firefighting water, and its potential contaminants, is not included in the SIA assessment as there is no pathway to impact. The operational Proposed Development design will include both fire water tanks and associated fire water containment. Any fire water will be stored on Site in tanks. In the event of a fire, any fire water runoff will be stored in the lined swales surrounding the BESS Area. These swales will have an impermeable liner to prevent water quality impacts to the underlying groundwater receptor, and the outfall from the swale will be controlled via a penstock to allow the containment of all stored fire water if it becomes necessary to be used (refer to **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3])**. This means there would be no pathway whereby firewater could access surface water runoff and enter surface or ground water features. Any fire water that collects in the lined swales would be tested and if found to be contaminated, it would be pumped out by a suitable contractor for off-site disposal at a licenced waste facility. The swale will then be cleaned of all contaminants. If not contaminated, this would be released with agreement of the Environment Agency if a permit was required.

*Transformer and Fuel Storage Tanks*

9.7.85 Transformers and fuel storage tanks will be installed with suitable bunds to contain any oil spillage in case of an oil-leakage event. Bunds will be designed to contain at least 110% of the volume of the oil to ensure there is some tolerance to prevent breaching of the bund. Under normal conditions any rainwater collected within the bund will be removed by use of special pump, which automatically switches off if it detects the smallest presence of oil in the water. Pumps will be linked to control and monitoring equipment to raise alarms if oil is detected.

*Impact Assessment*

9.7.86 During operation, the Proposed Development would operate using good practice and comply with environmental legislation through the application of the OEMP (see **Framework OEMP [EN010154/APP/7.8]**), including appropriate maintenance of SuDS and other drainage infrastructure.

9.7.87 Overall, given the implementation of a Surface Water Drainage Strategy including SuDS provision, there would be negligible impact to the receiving surface waters or groundwater from operational surface water runoff.

9.7.88 For the high importance River Witham this negligible impact would result in a slight adverse effect (not significant), whereas for the low importance drains and ditches that might be affected this would result in a neutral effect (not significant).

9.7.89 As described above, there may be a requirement given distance from watercourses for part of the site to discharge surface water runoff to ground within the Principal Site where the Scunthorpe Mudstone Formation, Charmouth Mudstone Formation and superficial deposits are considered medium importance receptors (see **Section 9.5**). As such, the negligible impact would result in a slight adverse effect (not significant).

9.7.90 With regards to the Cable Corridor, once operational with the cable buried below ground, there would be no water quality impacts associated with this part of the Proposed Development.

9.7.91 As land within the Proposed Development is being taken out of agricultural usage, it is considered there would a decrease in surface water runoff of agricultural additives to the land (be those nutrients in the form of phosphates and nitrates, or from pesticides, herbicides or insecticides). Taking land out of arable production may also have other benefits by reducing the risk of soil erosion and the need for local water abstraction for crop irrigation. This effect is not formally assessed given that there is no data or information on the application of agri-chemicals to the existing land in the Proposed Development boundary, but nonetheless is worth noting as a potential water quality benefit associated with the Proposed Development.

**Change in Site Hydrology**

9.7.92 Once the Proposed Development is operational, there is the potential for a change in surface water runoff patterns from new areas of hardstanding, potentially leading to a change in hydrology of the watercourses around the

Principal Site. However, **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]** includes attenuation in the form of swales that have been incorporated to control any increase in the rate of flow towards the receiving watercourses. The rate of runoff from each location across the Principal Site will ensure nil detriment in terms of no increase in runoff rate from the Proposed Development to receiving watercourses.

9.7.93 On this basis there would be a negligible impact on site hydrology. For the River Witham as a high importance receptor for water quality, a negligible impact results in a slight adverse effect (not significant), while for all other drains and ditches which are of low importance for water quality there would be a neutral effect (not significant).

9.7.94 With regards to the Cable Corridor, once operational with the cable buried below ground, there would be no changes in hydrology associated with this part of the Proposed Development.

**Morphology: Outfalls**

9.7.95 Where practicable, surface water will drain from the Proposed Development's swale-based drainage system to local receiving watercourses via a new open green ditch. If a pipe system is required, the piped section will be shortened and the last 10m section of the outfall route will be open green ditch wherever possible, unless this affects maintenance of the watercourse by the IDB or Environment Agency or there are other circumstances that prevent this from being possible.

9.7.96 Locations will be determined at the detailed design following further development of the drainage strategy. The final location, position and orientation of any new outfall will be carefully determined and informed by a hydromorphological survey to minimise any adverse local impacts on river processes. If headwalls are required in certain locations, then appropriate micro-siting of the outfalls will minimise loss of bank habitat, the need for bed scour or hard bank protection, and localised flow disturbance or disruption to sediment transport processes.

9.7.97 As full details and locations are not yet available, it is assumed as a reasonable worst case that new engineered outfalls are required. This would cause a very localised minor adverse impact against morphology due to the loss of bank habitat. For both the medium importance (for morphology) River Witham and low importance (for morphology) drains and ditches this results in a neutral effect (not significant) in all cases.

**Groundwater Flow**

9.7.98 As outlined above, swales will collect runoff from the new areas of hardstanding and access tracks across the Principal Site. This runoff is generally expected to be conveyed to watercourses, although there are parts of the site where infiltration swales will be used as no watercourses are located within close proximity (fields 14, 18, 19, 25, 29, 32 and 34 as shown in Annex C of **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]**).

9.7.99 Construction of building foundations, plinths, and areas of new hardstanding will prevent recharge of rainfall directly under their footprint, with runoff again being managed appropriately using SuDS. These areas of hardstanding are very limited in size in the context of the wider site and therefore the majority of the Principal Site will remain permeable. As such, it is considered there would be no impact to infiltration of rainwater into the ground.

9.7.100 As such, there would be negligible localised changes in the spatial distribution and quantity of recharge of groundwater across the Principal Site. It is considered there would be a negligible impact on groundwater recharge, level and flow. For the medium importance superficial and bedrock groundwater aquifers (Scunthorpe Mudstone Formation, Charmouth Mudstone Formation) underlying the site, this results in a neutral effect (not significant). There will be no impact on groundwater abstractions as none are situated within the Principal Site and once built there would be negligible impact on groundwater flows or quality given implementation of the **Framework Surface Water Drainage Strategy (Appendix 9-D [EN010154/APP/6.3])**.

9.7.101 With regard to the Cable Corridor, once operational there would be very limited potential for impact on groundwater flows given the limited scale of the cable ducting in the context of the wider groundwater aquifers, and no impediment to groundwater flow is anticipated. The impact would be no change, which would result in a **neutral effect (not significant)** for the high importance Lincolnshire Limestone and for the medium importance SPZ3, Scunthorpe Mudstone, Charmouth Mudstone and superficial deposits. There would be no impact on river baseflow or groundwater abstractions anticipated in the Study Area.

**Water Demand**

9.7.102 It is anticipated that there would be up to four permanent full time members of staff, with up to 20 being in attendance for periods of maintenance or solar infrastructure replacement. The water demand is estimated as 0.75m$^3$/d of clean water and 0.71m$^3$/d for foul water systems. A new mains water supply is proposed adjacent to the Warehouse storage building and Control building, which is alongside existing Anglian Water mains supply.

9.7.103 For panel cleaning, a two-year cleaning cycle is assumed. It is estimated that the total volume of cleaning water per cleaning cycle would be 1,545m$^3$.

9.7.104 A Water Resources Assessment was submitted to Anglian Water to determine whether the water demand can be accommodated. Anglian Water confirmed on 28 May 2025 that they are able to meet all of the Proposed Development's requirements (both domestic and non-domestic) during operation. Given that it has been confirmed through the Water Resources Assessment that the Proposed Development's supply requirements can be delivered without compromising water resources in the Anglian Water area, then it is considered that there would be a negligible

impact on water resources (considered to be a high importance receptor), which results in a slight adverse effect (not significant).

**Flood Risk**

*Principal Site*

Fluvial Flood Risk

9.7.105 In general, the majority of the Principal Site is located within Flood Zone 1, with three areas of Flood Zone 2 and 3 extents located within proximity to the above ground infrastructure proposed to be located within PV panel fields (see **Figure 9.3 [EN010154/APP/6.2]** and **Appendix 9-C FRA [EN010154/APP/6.3]**).

9.7.106 In terms of potential risk resulting from the Proposed Development, the **Framework Surface Water Drainage Strategy (Appendix 9-D: [EN010154/APP/6.3]**) sets out the approach by which surface water runoff will be managed in order to mimic the pre-Proposed Development run-off conditions, mitigating any increases to peak river flow rates within the watercourses utilised for outfall locations within the Principal Site boundary. This strategy will result in no increase to fluvial flood risk levels within vicinity of the Principal Site throughout the design life of the Proposed Development.

9.7.107 With regard to potential flood risk to the Proposed Development, as assessment of floodplain compensation has been undertaken within **Appendix 9-C: FRA [EN010154/APP/6.3]**. The approach is described within the FRA, and results indicate a maximum flood depth in all scenarios of 500mm across the Principal Site within PV panel areas. As PV panels are set 800mm above the ground level, flood risk does not impact the panels.

9.7.108 Solar panel mounts do, however, sit within the River Witham and River Brant flood extents. Of the PV panel fields at risk of flooding, only three fields (Fields 45, 54 and 57) are within the Flood Zone 3 climate change extent (for the 1 in 100 year plus 57% Credible Maximum Scenario (CMS) flood extent or the 1 in 1000 year extent, whichever is greater, see **Appendix 9-C: FRA [EN010154/APP/6.3]**).

9.7.109 Volumetric floodplain compensation calculations indicate that total of 8.49m$^3$ of floodplain volume is lost as a result of the Solar PV Panel infrastructure within the CMS flood depth extents. Across an area of 3.18ha, this results in a maximum increase in the flood depth of approximately 1.57mm. A hydraulic model would not feasibly assess the floodplain loss at this scale within a tolerance less than +/- 10mm. As such, it is considered, with the estimated flood depth increase of 1.57mm, there will be no material increase in flood risk on the site or elsewhere. Floodplain compensation is not required for the Proposed Development.

9.7.110 In order to assess the fluvial flood risk to the solar PV fields in the vicinity of the fluvial flood risk area of the Mill Dam Dyke, a catchment runoff approach has been undertaken to estimate potential flood depths, including allowance for the 1 in 100 year + CC events. The flood depth when taking into

account both the Higher and Upper climate change allowances, does not reach the topographical height of the adjacent solar PV fields. Therefore no mitigation, such as raising panel mounting height is required in this area of the Proposed Development from the Mill Dam Dyke.

9.7.111 For the River Brant and Witham, the Environment Agency has undertaken detailed hydraulic modelling. This modelling has been updated for the Proposed Development to include climate change allowances of 32% and 57% to the 1 in 100 year event (**see Appendix 9-C: FRA [EN010154/APP/6.3]**).

9.7.112 Other than solar PV panels, the Proposed Development design does not propose any permanent above ground infrastructure within Flood Zone 2, 3a or 3b. With regard to the solar PV panels, modelling indicates that even those field partially within Flood Zone 3 (100 yr + 32% CC), do not see maximum flood depth exceeding 0.4m. As such, all panels within these fields will achieve a minimum freeboard depth of 300mm below the bottom of the panel. Therefore, for the design storm event including climate change, there is no mitigation required to raise solar PV panels above the floodplain to ensure a 300mm freeboard is maintained.

9.7.113 The modelling also assessed the CMS based on both the 1 in 100 year + 57% climate change scenario within the updated 2015 Upper Witham Lincoln hydraulic model and the 2015 modelled Flood Zone 2 extent (1 in 1000 year event). The maximum flood depth was assessed to be approximately 0.5m in Field 54. As solar PV panel heights are to be a minimum 0.8m above ground, all of the solar PV panels are not considered at risk of fluvial flooding, taking into account the CMS. The analysis therefore demonstrates the solar PV infrastructure will remain operational in times of flood.

9.7.114 The solar PV fields also benefit from flood defences along the River Witham and River Brant, either from natural high ground or embankments. Assessment within **Appendix 9-C: FRA [EN010154/APP/6.3]**) indicates that Fields 54 and 57 could, in theory, be impacted by an embankment breach. However, the maximum flood depth for the CMS is approximately 0.5m, whereas the solar PV panels are afforded at least 0.3m freeboard above this level, providing sufficient protection from a potential breach.

9.7.115 Given the lifetime of the Proposed Development is proposed to be 60 years, it is considered that a breach event within the Principal Site boundary is a low residual risk.

9.7.116 On the basis of the assessment undertaken with the FRA **(Appendix 9-C [EN010154/APP/6.3]),** it is considered that there would be negligible impact to flood risk on or off site. The Proposed Development is classified as essential infrastructure and so is a very high importance receptor for fluvial flood risk, thereby resulting in a slight adverse effect (not significant). When considering agricultural land uses surrounding the site (medium importance receptor) and surrounding villages and hamlets (high importance receptors) this also results in a slight adverse effect (not significant).

Tidal Flood Risk

9.7.117 Tidal flooding occurs when an exceptionally high tide, almost always accompanied by a storm tide surge, overtops and/or breaches the tidal defences along a coastline or tidal estuary. Although North Kesteven does not lie along a coastline or does not have a tidal river flowing through the District, a small area around North Scarle falls within the River Trent's tidal floodplain.

9.7.118 The Mill Dam Dyke, which runs through North Scarle is considered a significant tidal flood risk source. The Mill Dam Dyke (or Girton Fleet downstream of Baxter Bridge) flows through the village of North Scarle and discharges into the River Trent via a modern tidal outfall sluice. The watercourse can become tide locked impacting on water levels within the channel at North Scarle.

9.7.119 The village of North Scarle is approximately 3.6km from the Proposed Development boundary, at a level of between approximately 9m AOD and 10m AOD. The tidal influence is not considered to pose a risk to the Site Boundary with minimum ground levels of solar PV panel fields approximately 13m AOD.

9.7.120 The Mill Dam Dyke discharges into the River Trent via tidal sluice; however, the Mill Dam Dyke can become tide locked impacting flood risk upstream. This is discussed in the North Kesteven Strategic Flood Risk Assessment (SFRA). The North Kesteven District Council SFRA notes Environment Agency modelling suggests peak levels in the Mill Dam Dyke would reach approximately 7.74m AOD, before overtopping and flooding low lying areas. With lowest ground levels at the north west extent of the Principal Site boundary being approximately 14m AOD, tidal risk is considered low.

9.7.121 Another potential tidal influence within North Kesteven is determined by the ability of the River Witham to discharge via its tidal outfall at Boston (Grand Sluice). The River Witham's discharge can be restricted for significant periods of time when there is a high tide which has implications for fluvial flood risk as far upstream as North Kesteven.

9.7.122 Tidal flood risk to the Site generally is considered to be low. Nonetheless, given the nature of the Proposed Development, an assessment of future sea level rise has been undertaken**.** Full details are provided within the FRA (**Appendix 9-C** of this ES **[EN010154/APP/6.3]**) including the sea level rise allowances for both the Humber and Anglian River Basin Districts.

9.7.123 The assessment indicates that the flood risk to permanent above ground infrastructure (Principal Site) associated with sea level rise is considered a low residual risk, particularly given the protection afforded by the Boston Tidal Barrier (opened in 2020). The tidal barrier is designed to protect the River Witham catchment against tidal flooding for the 1 in 300 year event for the next 100 years, (up to the year 2120) which exceeds the design life for the Proposed Development. The FRA **(Appendix 9-C [EN010154/APP/6.3])** concludes that no further mitigation is required for the Proposed Development within the Humber and Anglian River Basin District areas.

9.7.124 In EIA terms, it is considered that there would be negligible impact to flood risk on or off site. The Proposed Development is classified as essential infrastructure and so is a very high importance receptor for tidal flood risk, thereby resulting in a slight adverse effect (not significant). When considering agricultural land uses surrounding the site (medium importance receptor) and surrounding villages and hamlets (high importance receptors) this also results in a slight adverse effect (not significant).

Surface Water Flood Risk

9.7.125 The **Framework Surface Water Drainage Strategy (Appendix 9-D [EN010154/APP/6.3]**) sets out how increases in surface water runoff as a result of the Proposed Development are proposed to be managed via SuDS techniques to ensure the existing surface water drainage regime is mimicked, mitigating the risk of increased surface run off from and to the Proposed Development.

9.7.126 The increases to impermeable areas are envisaged to be a result of localised runoff from; the Solar Station Compounds located across the PV panel fields (in the case of a distributed BESS option), the single BESS compound (in the case of a centralised BESS option) and the Onsite Substation. As previously described, the increase in surface water runoff from these areas is proposed to be managed via SuDS to temporarily attenuate the increased surface water flows before discharging to surrounding watercourses at restricted rates to mimic the pre-Proposed Development conditions for up to and including the 1 in 100 year + 40% climate change event.

9.7.127 It is considered that total impermeable areas where solar PV panels are proposed for the with-Proposed Development scenario will remain consistent to the pre-Proposed Development state. Therefore, the proposed PV panel areas are considered to not impact the post-Proposed Development surface water flood risk level in relation to PV panel areas adjacent to field drains (Ordinary Watercourses).

9.7.128 As part of the non-statutory consultation for the Proposed Development, properties along The Avenue in Morton, adjacent to solar PV fields 25, 30 and 34, are known to experience surface water flooding from natural overland runoff from these fields. The online flood map for surface water indicates a medium flood risk to these properties.

9.7.129 Edge swales are proposed within the **Framework Surface Water Drainage Strategy (Appendix 9-D [EN010154/APP/6.3]** to capture excess runoff from the PV fields. These edge swales will capture the peak runoff from Solar Station Compounds and runoff from the solar PV panel fields, reducing peak runoff rates during storm events, for up to and including the 1 in 100 year plus 40% climate change event (for the fields where new impermeable surfaces are introduced). Fields 25, 30 and 34 along The Avenue in Morton will be sized accordingly to capture overland surface water runoff; therefore, reducing the existing surface water flood risk to properties along The Avenue, providing betterment.

9.7.130 It is therefore envisaged that there will be no material increase to surface water flood risk on or surrounding the Principal Site for the with-Proposed Development scenario meaning surface water risk will therefore remain as existing.

9.7.131 In EIA terms, it is considered that there would be negligible impact to flood risk on or off site. The Proposed Development is classified as essential infrastructure and so is a very high importance receptor for surface water flood risk, thereby resulting in a slight adverse effect (not significant). When considering agricultural land uses surrounding the site (medium importance receptor) and surrounding villages and hamlets (high importance receptors) this also results in a slight adverse effect (not significant).

Groundwater Flood Risk

9.7.132 North Kesteven District Council's Strategic Flood Risk Assessment (SFRA) indicates the area the DCO Site are located within is deemed not to be at risk of groundwater flooding, with no recorded groundwater flood events.

9.7.133 The **FRA (Appendix 9-C [EN010154/APP/6.3])** indicates that groundwater flood risk is anticipated to remain effectively unchanged, as there are limited requirements for discharging surface water runoff via infiltration methods due to the underlying ground conditions not being suitable for such techniques across the majority of the site. The exception is those areas where discharge to a watercourse is unachievable (solar PV fields 14, 18, 19, 25, 29, 32 and 34 as shown **in Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3] Annex C**).

9.7.134 For these locations it is proposed to discharge flows from lined swales to infiltration swales around the boundaries of these seven fields. The swales are to be designed to attenuate flows for the 1 in 100 year + 40% climate change event and fire water runoff (if deemed to be clean) and slowly infiltrate to ground whilst also making use of evapotranspiration.

9.7.135 In the context of the wider Principal Site the attenuated drainage from these seven fields would have a negligible impact on groundwater flood risk. The Proposed Development is classified as essential infrastructure and so is a very high importance receptor, thereby resulting in a slight adverse effect (not significant). When considering agricultural land uses surrounding the site (medium importance receptor) and surrounding villages and hamlets (high importance receptors) this also results in a slight adverse effect (not significant).

Flood Risk from Sewers and Artificial Sources

9.7.136 The Proposed Development scenario does not propose to interact or alter any existing sewer infrastructure and therefore will result in no change to flood risk from such sources. Furthermore, there are no Artificial Sources of flood risk within the Principal Site; therefore, flood risk remains low from Artificial Sources.

9.7.137 No change would result in a neutral effect (not significant) to receptors both on and offsite in relation to flood risk from sewers and artificial sources.

*Cable Corridor*

9.7.138 Long term flood risk resulting from the Cable Corridor is considered to be as existing for the operational phase, as the infrastructure will be buried throughout the corridor with no permanent above ground-built development.

9.7.139 As such, there would be neutral effect (not significant) in terms of flood risk (from all sources) on and off site in relation to the Cable Corridor.

### Decommissioning (estimated 2093)

9.7.140 Potential impacts from the decommissioning of the Principal Site are similar in nature to those during construction, as some ground works would be required to remove infrastructure installed. A detailed Decommissioning Environmental Management Plan (DEMP) (based on the **Framework DEMP [EN010154/APP/7.9]**) will be prepared prior to decommissioning to identify required measures to prevent pollution and flooding during this phase of the development.

9.7.141 The mode of cable decommissioning for the Grid Connection Cables and Onsite Cabling will be dependent upon government policy and good practice at that time. Currently, the most environmentally acceptable option is considered to be leaving the cables in situ, as this avoids disturbance to overlying land and habitats and to neighbouring communities, this is likely to be the case for the majority of the cable route which is situated in Secondary B Aquifers. However, where cables are within the SPZ3 or a Principal aquifer, the cables will be removed to prevent potential leaching of contaminative compounds from the cables and cable housing. The cables can be removed by opening up the ground at regular intervals and pulling the cable through to the extraction point, avoiding the need to open up the entire length of the cable route. Where cables are left in-situ, the cable ends and junctions will be sealed to reduce the impact of deterioration and interaction with groundwater.

9.7.142 The pits would be sensitively located so as not to impact watercourses. Given that all cables will be a minimum of 5m below the bed of the River Brant and River Witham and 1.5m below the drains and ditches across the site, this is not anticipated to prevent natural geomorphic evolution or potential future restoration of affected areas. As a result, it is considered the decommissioning impacts and effects would be no greater than those of the construction phase and no additional impacts are anticipated.

## 9.8 Additional Mitigation and Enhancement

9.8.1 As no significant adverse effects have been identified, following the incorporation of the standard and embedded measures described in **Section 9.6**, no additional mitigation measures are required during construction, operation or decommissioning.

9.8.2 Nonetheless, as part of the non-statutory consultation for the Proposed Development, residents along The Avenue in Morton, indicated that their properties experience surface water flooding from natural overland runoff from adjacent fields within the Site. The FRA **(Appendix 9-C [EN010154/APP/6.3])** indicates a medium flood risk to these properties. As such, it has been agreed to provide edge swales to capture excess runoff from the neighbouring PV areas. These edge swales will capture the peak runoff from Solar Station Compounds and runoff from the solar PV areas, reducing peak runoff rates during storm events, for up to and including the 1 in 100 year plus 40% climate change event (for the where new impermeable surfaces are introduced). The existing surface water flood risk to properties along The Avenue will be reduced by the drainage proposals, thereby providing betterment for this area. Refer to the **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]** for further details.

9.8.3 As land across the Principal Site is being taken out of agricultural usage, it is considered there would be a decrease in surface water runoff of agricultural additives to land (i.e. nutrients in the form of phosphates or nitrates or from pesticides, herbicides or insecticides). However, it is considered this would not be a great enough change to result in an effect on the individual water features.

9.8.4 The WMP (to be produced post-consent) will set out details of water quality monitoring to be undertaken during construction. Due to the low level of risk posed by the construction works, this monitoring will consist of visual and olfactory observations as well as in-situ testing using hand-held water quality meters. This requirement is included within the **Framework CEMP [EN010154/APP/7.7]**.

9.8.5 It is important that during the operation of the Proposed Development there is regular inspection and maintenance of the drainage systems, proposed SuDS and watercourse crossings. This will be carried out in accordance with good practice guidance. The drainage system will be designed in accordance with current guidance to ensure that the potential for siltation and blockages is minimised under normal operation. If there is any evidence of excessive erosion or sedimentation associated with new structures further actions will be considered to remedy that impact in as sustainable a way as practicable. This requirement is included within the **Framework OEMP [EN010154/APP/7.8]**.

9.8.6 Provision of watercourse enhancements are required on a length-for-length basis to mitigate any unavoidable intrusive impact to watercourses associated with access tracks (e.g. culvert extensions). The details of this will be developed post consent through the WFD Mitigation and Enhancement Strategy, which is a requirement of the **Framework CEMP [EN010154/APP/7.7]**. Furthermore, SuDS will be developed for amenity and biodiversity value where appropriate.

## 9.9 Residual Effects and Conclusions

9.9.1 **Table 9-16** and Table 9-17:~~Table 9-17:~~~~Table 9-17:~~ summarise the residual significant effects of the Proposed Development on the Water Environment.

9.9.2 Following the implementation of standard and embedded mitigation as outlined in **Section 9.6**, there are no likely significant effects resulting from the construction, operation or decommissioning of this Proposed Development. As no likely significant effects have been identified, no additional mitigation has been outlined at this stage.

9.9.3 There are limited maintenance activities of the scale requiring assessment. However, potential for impacts from activities such as panel cleaning and spillages from vehicles have been considered within the assessments where appropriate. As no likely significant effects have been identified, no additional mitigation has been outlined at this stage.

9.9.4 Effects for decommissioning are considered to be similar to those identified for construction, as described in **Section 9.6**.

## Table 9-16: Summary of Residual Effects (Construction)

| Receptor | Importance (value) | Description of impact | Embedded mitigation | Magnitude of impact after embedded and standard mitigation | Residual effect after embedded mitigation |
|---|---|---|---|---|---|
| River Witham | High | Water quality impacts to surface water features during construction and decommissioning (i.e. runoff containing fine sediments, accidental spillages) and in particular from proposed trenchless crossing for Onsite Cabling (River Witham) and Cable Corridor (River Brant) | Application of measures outlined in the **Framework CEMP [EN010154/APP/7.7]** (including water quality monitoring) and **Framework DEMP [EN010154/APP/7.9]**. Appropriate trenchless crossing methodology including site specific Hydraulic Fracture Risk Assessment. | Negligible | Slight adverse (not significant) |
| River Brant | High | | | Negligible | Slight adverse (not significant) |
| Agricultural Drains, Ditches – where direct works are required (e.g. open-cut cable crossings, outfall installation and possible culvert extension works for access tracks) | Low | Water quality impacts to surface water features during construction and decommissioning (i.e. runoff containing fine sediments, accidental spillages), in particular from installation of open-cut cable crossings, drainage outfalls and access track structures | Application of measures outlined in the **Framework CEMP [EN010154/APP/7.7]** (including water quality monitoring) and **Framework DEMP [EN010154/APP/7.9]**. Appropriate Open-Cut Crossing Construction Methodology and Outfall and | Minor adverse | Slight adverse (not significant) |

| Receptor | Importance (value) | Description of impact | Embedded mitigation | Magnitude of impact after embedded and standard mitigation | Residual effect after embedded mitigation |
|---|---|---|---|---|---|
| | | | Structure Installation Methodology where required. | | |
| Agricultural Drains, Ditches – where no direct works are required (including open span access track crossings) | Low | Water quality impacts to surface water features during construction and decommissioning - where they are not directly impacted but could be indirectly impacted (e.g. by runoff) | Application of measures outlined in the **Framework CEMP [EN010154/APP/7.7]** (including water quality monitoring) and **Framework DEMP [EN010154/APP/7.9]**. | Minor adverse | Slight adverse (not significant) |
| River Witham | High | Water quality impacts to surface water features during construction and decommissioning (i.e. runoff containing fine sediments, accidental spillages) in relation to activities at construction compounds (including satellite compounds) | Application of measures outlined in the **Framework CEMP [EN010154/APP/7.7]** (including water quality monitoring). | Negligible | Slight adverse (not significant) |
| Agricultural Drains, Ditches | Low | | | Negligible | Neutral (not significant) |
| River Witham | Medium (for morphology) | Impacts to channel morphology during construction from watercourse crossings (trenchless crossing for Onsite Cabling) | Cable to be installed at least 5m below bed (minimum), with 10m buffer between HDD launch or exit pits from the top of bank, or 16m from | No change | Neutral (not significant) |

| Receptor | Importance (value) | Description of impact | Embedded mitigation | Magnitude of impact after embedded and standard mitigation | Residual effect after embedded mitigation |
|---|---|---|---|---|---|
| | | | the landward toe of flood defences where present. | | |
| River Brant | Low (for morphology) | Impacts to channel morphology during construction from watercourse crossings (trenchless crossing for Cable Corridor) | Cable to be installed at least 5m below bed (minimum), with 10m buffer between HDD launch or exit pits from the top of bank, or 16m from the landward toe of flood defences where present. | No change | Neutral (not significant) |
| Agricultural Drains, Ditches | Low (for morphology) | Impacts to channel morphology during construction from intrusive watercourse crossings for cabling, culver extensions for access tracks and/or outfall installation | Pre-works Riparian and Hydromorphological Survey and reinstatement as found as well as aftercare to ensure vegetation re-establishes. Working in dry weather where practicable.<br>Appropriate Open-Cut Crossing Construction Methodology.<br>Environmentally sensitive culvert extension design. Length-for-length equivalent | Moderate adverse | Slight adverse (not significant) |

| Receptor | Importance (value) | Description of impact | Embedded mitigation | Magnitude of impact after embedded and standard mitigation | Residual effect after embedded mitigation |
|---|---|---|---|---|---|
| | | | watercourse enhancements are required for each new culvert extension (to be determined in a WFD Mitigation and Enhancement Plan).<br>These measures are secured via the **Framework CEMP [EN010154/APP/7.7].** | | |
| Groundwater – Superficial deposits | Medium | Impacts on groundwater flow (and potentially local abstractions, and river baseflow) | Application of measures outlined in the **Framework CEMP [EN010154/APP/7.7]**. | Negligible | Neutral (not significant) |
| Groundwater – Secondary bedrock aquifer (Charmouth Mudstone and Scunthorpe Mudstone) | Medium | Impacts on groundwater flow (and potentially local abstractions, and river baseflow) | Application of measures outlined in the **Framework CEMP [EN010154/APP/7.7]**. | Negligible | Neutral (not significant) |
| Groundwater – Principal bedrock aquifer (Lincolnshire Limestone Formation) | High | Impacts on groundwater flow (and potentially local abstractions, and river baseflow) | Application of measures outlined in the **Framework CEMP [EN010154/APP/7.7]**. | No change | Neutral (not significant) |

| Receptor | Importance (value) | Description of impact | Embedded mitigation | Magnitude of impact after embedded and standard mitigation | Residual effect after embedded mitigation |
|---|---|---|---|---|---|
| Source Protection Zone 3 | Medium | Impacts on groundwater flow (and potentially local abstractions, and river baseflow) | Application of measures outlined in the **Framework CEMP [EN010154/APP/7.7]**. | No change | Neutral (not significant) |
| Groundwater – Superficial deposits | Medium | Impacts on groundwater quality | Application of measures outlined in the **Framework CEMP [EN010154/APP/7.7]**. Targeted scheme of Ground Investigation and testing followed by a Quantitative Risk Assessment. | Negligible | Neutral (not significant) |
| Groundwater – Secondary bedrock aquifer (Charmouth Mudstone and Scunthorpe Mudstone) | Medium | Impacts on groundwater quality | Application of measures outlined in the **Framework CEMP [EN010154/APP/7.7]**. Targeted scheme of Ground Investigation and testing followed by a Quantitative Risk Assessment. | Negligible | Neutral (not significant) |
| Groundwater – Principal bedrock aquifer (Lincolnshire Limestone Formation) | High | Impacts on groundwater quality | Application of measures outlined in the **Framework CEMP [EN010154/APP/7.7]**. Targeted scheme of Ground | No change | Slight adverse (not significant) |

| Receptor | Importance (value) | Description of impact | Embedded mitigation | Magnitude of impact after embedded and standard mitigation | Residual effect after embedded mitigation |
|---|---|---|---|---|---|
| | | | Investigation and testing followed by a Quantitative Risk Assessment. | | |
| Source Protection Zone 3 | Medium | Impacts on groundwater quality | Application of measures outlined in the **Framework CEMP [EN010154/APP/7.7]**. Targeted scheme of Ground Investigation and testing followed by a Quantitative Risk Assessment. | No change | Slight adverse (not significant) |
| Flood Risk (from tidal, fluvial, pluvial, drainage and artificial sources and sewers) – construction workers | Very High (construction workers) | Potential for increase of flooding from the site, or to the site as a result of construction | Application of measures outlined in the **Framework CEMP [EN010154/APP/7.7]** (including water quality monitoring) and Emergency Response Plan. | Negligible | Slight adverse (not significant) |
| Flood Risk (from tidal, fluvial, pluvial, drainage and artificial sources and sewers) – construction workers | High (residential receptors); Medium | Potential for increase of flooding from the site, or to the site as a result of construction | Application of measures outlined in the **Framework CEMP [EN010154/APP/7.7]** (including water quality | Negligible | Slight adverse (not significant) |

| Receptor | Importance (value) | Description of impact | Embedded mitigation | Magnitude of impact after embedded and standard mitigation | Residual effect after embedded mitigation |
|---|---|---|---|---|---|
| | (agricultural receptors) | | monitoring) and Emergency Response Plan. | | |

**Table 9-17: Summary of Residual Effects (Operation)**

| Receptor | Importance (value) | Description of impact | Embedded mitigation | Magnitude of impact after embedded mitigation | Residual effect after embedded mitigation |
|---|---|---|---|---|---|
| River Witham | High | Water quality impacts from operational runoff (diffuse pollution) from the Principal Site | Implementation of **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]**. | Negligible | Slight adverse (not significant) |
| Agricultural Drains, Ditches | Low | Water quality impacts from operational runoff (diffuse pollution) from the Principal Site | Implementation of **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]**. | Negligible | Neutral (not significant) |
| River Witham | High | Change in hydrology from Proposed | Implementation of **Appendix 9-D: Framework Surface Water** | Negligible | Slight adverse (not significant) |

| Receptor | Importance (value) | Description of impact | Embedded mitigation | Magnitude of impact after embedded mitigation | Residual effect after embedded mitigation |
|---|---|---|---|---|---|
| | | Development runoff from the Principal Site | **Drainage Strategy [EN010154/APP/6.3]**. | | |
| Agricultural Drains, Ditches | Low | Change in hydrology from Proposed Development runoff from the Principal Site | Implementation of **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]**. | Negligible | Neutral (not significant) |
| River Witham | Medium (for morphology) | Impacts to channel morphology due to potential outfall installation | Environmentally sensitive outfall design if required, although outfalls are mainly expected to use ditches. | Minor adverse | Neutral (not significant) |
| Agricultural Drains, Ditches | Low (for morphology) | Impacts to channel morphology due to potential outfall installation | Environmentally sensitive outfall design if required, although outfalls are mainly expected to use ditches. | Minor adverse | Neutral (not significant) |
| Agricultural Drains, Ditches | Low (for morphology) | Impacts to channel morphology due to potential culvert extension (if required) | Environmentally sensitive design where culvert extensions are required. | Moderate adverse | Slight adverse (not significant) |
| Groundwater – Superficial deposits | Medium | Impacts on groundwater flow (and thereby local | Implementation of **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]**. | Negligible | Neutral (not significant) |

| Receptor | Importance (value) | Description of impact | Embedded mitigation | Magnitude of impact after embedded mitigation | Residual effect after embedded mitigation |
|---|---|---|---|---|---|
| | | abstractions and river baseflow) and quality | | | |
| Groundwater – Secondary bedrock aquifer (Charmouth Mudstone and Scunthorpe Mudstone) | Medium | Impacts on groundwater flow (and thereby local abstractions and river baseflow) and quality | Implementation of **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]**. | Negligible | Neutral (not significant) |
| Groundwater – Principal bedrock aquifer (Lincolnshire Limestone Formation) | High | Impacts on groundwater flow (and thereby local abstractions and river baseflow) and quality | Implementation of **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]**. | No change | Neutral (not significant) |
| Source Protection Zone 3 | Medium | Impacts on groundwater flow (and thereby local abstractions and river baseflow) and quality | Implementation of **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]**. | No change | Neutral (not significant) |
| Flood Risk (from tidal, fluvial, surface water, groundwater and artificial sources and sewers) – on site | High-Low | Potential for increase of flooding from the site, or to the site as a result of operation | Implementation of **Appendix 9-D: Framework Surface Water Drainage Strategy [EN010154/APP/6.3]**. | Negligible (for all sources of flooding) | Slight adverse (not significant) to Neutral (not significant) – |

| Receptor | Importance (value) | Description of impact | Embedded mitigation | Magnitude of impact after embedded mitigation | Residual effect after embedded mitigation |
|---|---|---|---|---|---|
| Essential Infrastructure and offsite agricultural land / villages | | | Panels and field stations raised appropriate level above ground level in Flood Zone 2 and 3. | | for all sources of flooding |

## 9.10 Cumulative Assessment

9.10.1 This section presents an assessment of the potential for cumulative effects to arise between the Proposed Development and other proposed and committed plans and projects including other developments (referred to as 'Cumulative Schemes') within the surrounding area.

9.10.2 This assessment has been made with reference to the methodology and guidance set out in **Chapter 15: Cumulative Effects and Interactions [EN010154/APP/6.1]** and shortlist of cumulative schemes identified also identified in **Chapter 15: Cumulative Effects and Interactions [EN010154/APP/6.1]**.

9.10.3 Of the shortlisted developments listed in **Chapter 15: Cumulative Effects and Interactions [EN010154/APP/6.1]**, 20 developments are considered to have the potential for cumulative effects with regards to the Water Environment. This is due to being located within the Proposed Development's 1km Zone of Influence for the Water Environment (or up to 2km where a water feature may potentially be impacted by both the Proposed Development and the Cumulative Scheme).

9.10.4 This cumulative effect assessment identified for each receptor those areas where the predicted effects of the Proposed Development could interact with effects arising from other plans and, or projects on the same receptor based on a spatial and/or temporal basis.

### Construction and Decommissioning

9.10.5 There is potential for overlap between construction of the Proposed Development and impacts from adjacent schemes. Thus, there is the potential for short term, temporary construction related pollutants generated from both the Proposed Development and the Cumulative Schemes to impact on watercourses in the Study Area.

9.10.6 The **Framework CEMP [EN010154/APP/7.7]** details the measures that would be undertaken during construction to mitigate the temporary effects on the water environment by the Proposed Development. Provided that standard and good practice mitigation is implemented on the Cumulative Scheme construction sites through their respective CEMPs, which would be considered to follow similar good practice measures, and as per the conditions of the relevant planning permissions, environmental permits and licences which are assumed to be required, then cumulative effects risk can be effectively managed and there would not be a significant increase in the risks to any relevant waterbodies. As such, there are not expected to be any significant cumulative effects during construction.

9.10.7 Potential impacts from the decommissioning of the Proposed Development are considered similar in nature to those during construction, as some ground disturbance and excavation will be required to remove

infrastructure installed. These impacts would be controlled by a DEMP (see the **Framework DEMP [EN010154/APP/7.9])**.

9.10.8 The short listed Cumulative developments identified in **Chapter 15: Cumulative and Effect Interactions [EN010154/APP/6.1]** have been screened for spatial and temporal overlaps with the Proposed Development. Where potential and, or temporal overlap of water environment receptors was thought to occur, the specific water environment receptors that fall within any area of overlap were identified. If the water environment receptors identified were considered to be sensitive, the overlapping development was taken forward for cumulative assessment.

9.10.9 From the short list of developments, the remaining developments have been scoped out of further assessment due to the Cumulative Developments existing outside of the 1km Zone of Influence for the Water Environment (or not having a common receptor up to 2km from the DCO Site) and were therefore deemed unlikely to have a combined impact due to there being no hydrological pathway for cumulative effects to occur (via surface water or groundwater pathways).

9.10.10 The 20 Cumulative Schemes in **Table 9-18** were given consideration owing to their proximity to the Proposed Development or potential for impacts on the same water environment receptors as the Proposed Development. The construction phase impact assessment and significance of effects is presented in **Table 9-18**. Similar cumulative effects would be anticipated during decommissioning.

## Table 9-18: Assessment of Cumulative Effects during Construction

| ID | Application reference | Cumulative Scheme description | Distance from the Proposed Development (m) | Summary of cumulative effect (construction) |
|---|---|---|---|---|
| 5 | 15/1347/OUT<br>Associated applications:<br>24/0456/RESM / 22/0174/RESM / 21/0276/RESM | Erection of up to 1,100 dwellings and 150 care/retirement units (C2/C3), the formation of a roundabout to Camp Road, A46 junction improvement works, public open spaces and associated service infrastructure (outline with means of access) | 123 | This development is located in the Fleet Lower (trib of Trent) WFD catchment. There is potential for cumulative potential pollution to local watercourses and/or groundwater from construction site runoff containing pollutants and fine sediment; chemical spillages; increased flood risk during construction.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements, and therefore appropriately mitigate these effects, it is considered there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 8 | 18/0760/OUT / 21/1045/RESM | Residential development of up to 144 dwellings and associated works (outline with means of access) / Reserved matters application for the erection of 144 no. dwellings and associated works with details of internal access road layout, appearance, landscaping, layout & scale pursuant to outline permission 18/0760/OUT | 1006 | This development is located in the South Hykeham Catchwater WFD catchment. There is potential for cumulative potential pollution to local watercourses and/or groundwater from construction site runoff containing pollutants and fine sediment; chemical spillages; increased flood risk during construction.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements, and therefore appropriately mitigate these effects, it is considered there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 13 | 18/1560/EIASCO | Development of a 55km potable water pipeline from Lincoln to Grantham with associated infrastructure including partially buried 20 million litre bulk potable water storage tank, 3km connecting | 0 | This development is located in the Dunston Beck WFD catchment. It will cross the Cable Corridor north of Navenby but does not appear to be in close proximity to any watercourses at this crossing point which reduces the risk. Nonetheless, there is some potential for cumulative |

| ID | Application reference | Cumulative Scheme description | Distance from the Proposed Development (m) | Summary of cumulative effect (construction) |
|---|---|---|---|---|
| | | pipeline to Anglian Water (AWS) site at Bracebridge Heath (Bracebridge Spur), connecting sections of pipeline to the existing Central Lincs Trunk Main, partially buried 3million litre break tank and the erection of 3 pumping stations (the Grantham Resilience Pipeline Project). | | potential pollution to occur to more distant watercourses via runoff containing pollutants and fine sediment, chemical spillages, or to groundwater. There could also be increased flood risk during construction.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements, and therefore appropriately mitigate these effects, it is considered there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 33 | 20/1523/FUL | Hybrid planning application consisting of full planning permission for Phase 4 - the erection of four units comprising uses E, B2 and B8 with associated access, car parking and landscaping and outline permission with all matters reserved for phases 5 to 7 consisting of the proposed erection of commercial units comprising use classes E, B2 and B8 | 615 | This development is located in the Witham (confluence of Cringle Brook to confluence with the Brant) WFD catchment. There is potential for cumulative potential pollution to local watercourses and/or groundwater from construction site runoff containing pollutants and fine sediment; chemical spillages; increased flood risk during construction.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements, and therefore appropriately mitigate these effects, it is considered there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 34 | 20/1736/RESM | Residential development of 70 no. affordable dwellings (Cell 2B). Reserved Matters application comprising details of appearance, landscaping, layout and scale pursuant to outline planning permission 15/1347/OUT - Erection of up to 1,100 dwellings and 150 | 257 | This development is located in the Witham (confluence of Cringle Brook to confluence with the Brant) WFD catchment. There is potential for cumulative potential pollution to local watercourses and/or groundwater from construction site runoff containing pollutants and fine sediment; chemical spillages; increased flood risk during construction. |

| ID | Application reference | Cumulative Scheme description | Distance from the Proposed Development (m) | Summary of cumulative effect (construction) |
|---|---|---|---|---|
| | | care/retirement units (C2/C3), the formation of a roundabout to Camp Road, A46 junction improvement works, public open spaces and associated service infrastructure (outline with means of access) | | Assuming the Cumulative Scheme would follow all legislative and regulatory requirements, and therefore appropriately mitigate these effects, it is considered there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 37 | 21/1245/FUL | Installation of a 100.3kW ground mounted solar PV installation comprising of 264 solar panels. | 942 | This development is located in the Dunston Beck WFD catchment. There is potential for cumulative potential pollution to local watercourses and/or groundwater from construction site runoff containing pollutants and fine sediment; chemical spillages; increased flood risk during construction.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements, and therefore appropriately mitigate these effects, it is considered there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 49 | 22/0520/FUL | Installation of a ground based solar PV array (approximately 6KW) | 364 | This development is located in the Witham (confluence of Cringle Brook to confluence with the Brant) WFD catchment. There is potential for cumulative potential pollution to local watercourses and/or groundwater from construction site runoff containing pollutants and fine sediment; chemical spillages; increased flood risk during construction.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements, and therefore appropriately mitigate these effects, it is considered there |

| ID | Application reference | Cumulative Scheme description | Distance from the Proposed Development (m) | Summary of cumulative effect (construction) |
|---|---|---|---|---|
| | | | | would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 54 | 22/1376/FUL | Erection of 148 dwellings with associated outbuildings/garages and landscaping/open space and affordable housing and including conversion of existing (retained) building to shop and offices | 1314 | This development is located in the Fleet Lower (trib of Trent) WFD catchment. There is potential for cumulative potential pollution to local watercourses and/or groundwater from construction site runoff containing pollutants and fine sediment; chemical spillages; increased flood risk during construction.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements, and therefore appropriately mitigate these effects, it is considered there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 58 | 22/1785/FUL | Erection of 18 no. affordable houses with associated infrastructure | 528 | This development is located in the Witham (confluence of Cringle Brook to confluence with the Brant) WFD catchment. The potential for cumulative potential pollution to local watercourses and/or groundwater from construction site runoff containing pollutants and fine sediment; chemical spillages; increased flood risk during construction.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements, and therefore appropriately mitigate these effects, it is considered there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 63 | EN010149 | Springwell Solar Farm is a proposed new solar farm with battery storage and supporting grid connection infrastructure in North Kesteven, Lincs | 0 | This cumulative development partially overlaps with the Proposed Development at its eastern extent for the Cable Corridor. The remainder of the development is located to the south and east of the Proposed Development, with two |

| ID | Application reference | Cumulative Scheme description | Distance from the Proposed Development (m) | Summary of cumulative effect (construction) |
|---|---|---|---|---|
| | | | | overlapping WFD catchments common to both schemes (Metheringham Beck and Dunston Beck WFD catchments). However, there are no watercourses in close proximity to the area of overlap between the two schemes. Nonetheless, there may be potential for cumulative pollution to groundwater from construction site runoff containing pollutants, for example from chemical spillages. Even so, assuming the Cumulative Scheme would follow all legislative and regulatory requirements, and therefore appropriately mitigate these effects, it is considered there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 86 | 25/0491/FUL | Erection of 400MW Battery Storage Development incorporating 324no. Containerised Battery Storage Units, 54no. transformer/inverter blocks and 8 back up auxiliary transformers, 4no. storage containers for spare parts etc, substation comprising 4-6no. switchgear units, a control room and a HV compound with 2 Step-up Transformers, associated access tracks, inverter, switchgear substations, boundary treatments and CCTV - Request for Scoping Opinion | 0 | This development is located within the Proposed Development boundary. There is potential for cumulative potential pollution to local watercourses and/or groundwater from construction site runoff containing pollutants and fine sediment; chemical spillages; increased flood risk during construction.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements, and therefore appropriately mitigate these effects, it is considered there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 89 | PL/0055/23 | To install a solar PV array development and associated infrastructure to generate electricity for the operation of Swinderby Quarry plant machinery and site offices. | 500 | This development appears to be located at the watershed between two WFD water bodies that also have the potential to be impacted by the Proposed Development and is located west of Witham St Hughs in the wider Study Area. These are the Fleet Lower Catchment (tributary of Trent) |

| ID | Application reference | Cumulative Scheme description | Distance from the Proposed Development (m) | Summary of cumulative effect (construction) |
|---|---|---|---|---|
| | | | | and Witham (confluence of Cringle Brook to confluence with the Brant) WFD catchments. There is potential for cumulative potential pollution to local watercourses and/or groundwater from construction site runoff containing pollutants and fine sediment; chemical spillages; increased flood risk during construction.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements, and therefore appropriately mitigate these effects, it is considered there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 90 | 23/0628/OUT | Residential development of up to 120 no. dwellings (outline with all matters reserved) | 1,839 | This development is located on a patch of land that is just south of Apex Lake. It is currently unknown if a hydrological pathway connects the Proposed Development to Apex Lake, though it was noted that Pike Drain flows parallel to the lake. The potential for cumulative potential pollution to local watercourses and/or groundwater from construction site runoff containing pollutants and fine sediment; chemical spillages; increased flood risk during construction. Due to the early stage of this development, information on the plans are scarce however, assuming the Cumulative Scheme would follow all legislative and regulatory requirements, and therefore appropriately mitigate these effects, it is considered there would be **no change from the**<br>**residual effects assessed for the Proposed Development (not significant).** |

| ID | Application reference | Cumulative Scheme description | Distance from the Proposed Development (m) | Summary of cumulative effect (construction) |
|---|---|---|---|---|
| 95 | PL/0087/23 | For construction of the North Hykeham Relief Road (NHRR) between the A46 Hykeham Roundabout and the A15 Sleaford Road Roundabout at the end of the Lincoln Eastern Bypass, with junctions at South Hykeham Road, Brant Road and Grantham Road. The Proposed Scheme will comprise 8km of dual all-purpose carriageway with a 70mph speed limit (120kph design speed) and associated structures, earthworks, drainage, street lighting, traffic signals, utility diversions and installations, pipeline diversion, temporary materials processing, landscaping, and highway features | 0 | The southern extent of the North Hykeham Relief Road (NHRR) would be located within the South Hykeham Catchwater WFD water body, approximately 750m east of the Proposed Development.<br>There is potential for cumulative potential pollution to local watercourses and/or groundwater from construction site runoff containing pollutants and fine sediment; chemical spillages; increased flood risk during construction.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements, and therefore appropriately mitigate these effects, it is considered there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 98 | EIA/02/04 | For variation of conditions 2, 28 and 29 under planning permission 14/0385/CCC - to enable a proposed revision of the restoration scheme and a change to the silt management arrangements approved at Whisby Quarry | 599 | Whisby Quarry is in close proximity to Pike Drain. There may be some potential for cumulative pollution to local watercourses and/or groundwater from construction site runoff containing pollutants and fine sediment; chemical spillages; increased flood risk during construction. However, the cumulative development is a restoration scheme and any adverse effects would be expected to be short term and in relation to the construction phase. Assuming the Cumulative Scheme would follow all legislative and regulatory requirements, and therefore appropriately mitigate these effects, it is considered there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |

| ID | Application reference | Cumulative Scheme description | Distance from the Proposed Development (m) | Summary of cumulative effect (construction) |
|---|---|---|---|---|
| 99 | EIA/03/24 | For the installation of floating Solar PV arrays plus terrestrial based ancillary infrastructure and equipment, cable route and access | 499 | This development is located in the Boultham Catchwater Drain WFD catchment. The potential for cumulative potential pollution to local watercourses and/or groundwater from construction site runoff containing pollutants and fine sediment; chemical spillages; increased flood risk during construction.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements, and therefore appropriately mitigate these effects, it is considered there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 101 | 24/0075/EIASCR | Erection of 240MW Battery Storage Development incorporating approximately 75no. inverter skids, approximately 75 no. battery skids, approximately 4no. switchrooms, DNO equipment compound, CCTV Security Cameras, internal access road and DNO access road Request for Screening Opinion | 840 | This development is located in the Metheringham Beck WFD catchment. There do not appear to be any watercourses that intersect both schemes. However, there remains potential for cumulative impact to groundwater from runoff or spillages.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements, and therefore appropriately mitigate these effects, it is considered there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 103 | EN0110016 | Leoda Solar - Ground-mounted solar electricity generating station with a targeted gross output of 500 to 600 Megawatts (MW) and associated grid connection infrastructure. | 0 | The development is located across the Brant Lower, Metheringham Beck and Dunston Beck WFD catchments. There is some potential for cumulative potential pollution to local watercourses and/or groundwater from construction site runoff containing pollutants and fine sediment; chemical spillages; increased flood risk during construction. |

| ID | Application reference | Cumulative Scheme description | Distance from the Proposed Development (m) | Summary of cumulative effect (construction) |
|---|---|---|---|---|
| | | | | Assuming the Cumulative Scheme would follow all legislative and regulatory requirements, and therefore appropriately mitigate these effects, it is considered there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 105 | 24/1080/EIASCR | Erection of new 400kv Air Insulated Switchgear (AIS) substation and associated development – proposed National Grid substation near Navenby | 0 | This development is located in the Dunston Beck WFD catchment. There is some potential for cumulative potential pollution to local watercourses and/or groundwater from construction site runoff containing pollutants and fine sediment; chemical spillages; increased flood risk during construction. However, Dunston Beck itself is over 4km to the northeast and so the risk to the WFD watercourse can be considered low.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements, and therefore appropriately mitigate these effects, it is considered there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 108 | N/A | Brant Energy Storage Scheme<br>1GW Battery Energy Storage System located west of Coleby and east of Broughton Lane. Broadly similar Grid Connection Corridor anticipated as for the Proposed Development | 0 | This project is at the pre-application stage and does not yet have an application reference and so details are limited. However, assuming a similar cable corridor as for the Proposed Development, there is potential for cumulative impacts to the Brant Lower, Metheringham Beck and Dunston Beck WFD catchments. There is some potential for cumulative potential pollution to local watercourses and/or groundwater from construction site runoff containing pollutants and fine sediment; chemical spillages; increased flood risk during construction. |

| ID | Application reference | Cumulative Scheme description | Distance from the Proposed Development (m) | Summary of cumulative effect (construction) |
|---|---|---|---|---|
| | | | | Assuming the Cumulative Scheme would follow all legislative and regulatory requirements, and therefore appropriately mitigate these effects, it is considered there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |

## Operation and Maintenance

9.10.11 Drainage strategies for all cumulative developments would be produced with reference to the relevant policies and guidance documents outlined in **Section 9.2**. For those Cumulative Schemes under development, it is assumed that flood risk assessments and appropriate drainage strategies are to be developed in line with good practice.

9.10.12 The Cumulative Schemes assessed in this chapter will similarly be designed to ensure no long-term deterioration in water quality or increase in flooding. Attenuation and treatment will be provided for runoff from each scheme prior to discharge to waterbodies or ground. As such, provided that all the mitigation measures are implemented for all Cumulative Schemes, then the cumulative impacts from the Proposed Development and any cumulative developments would not be anticipated to produce any significant effects during operation.

9.10.13 The operation phase impact assessment and significance of effects is presented in **Table 9-19**.

## Table 9-19: Assessment of Cumulative Effects during Operation

| ID | Application reference | Cumulative Scheme description | Distance from the Proposed Development (m) | Summary of cumulative effect (operation) |
|---|---|---|---|---|
| 5 | 15/1347/OUT<br>Associated applications:<br>24/0456/RESM / 22/0174/RESM / 21/0276/RESM | Erection of up to 1,100 dwellings and 150 care/retirement units (C2/C3), the formation of a roundabout to Camp Road, A46 junction improvement works, public open spaces and associated service infrastructure (outline with means of access) | 123 | Potential pollution of surface or groundwater bodies from diffuse urban runoff from the development; increased flood risk from increased impervious area in the catchment. Potential hydromorphological impacts to surface watercourses from watercourse crossings and road outfalls, if required. A Flood Risk Assessment (including Drainage Strategy) was submitted with planning for the development, which recognises the increase in impermeable areas and proposes to introduce a series of SuDS to control runoff rates. Existing outfalls will be used and surface water runoff will be limited to greenfield runoff. Excess storm water will be attenuated on site by a series of balancing ponds. Outfall to the west eventually discharges to River Trent.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements during operation, it is considered that suitable mitigation would be in place and that there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 8 | 18/0760/OUT / 21/1045/RESM | Residential development of up to 144 dwellings and associated works (outline with means of access) / Reserved matters application for the erection of 144 no. dwellings and associated works with details of internal access road layout, appearance, landscaping, layout & scale | 1006 | Potential pollution of surface or groundwater bodies from diffuse urban runoff from the development; increased flood risk from increased impervious area in the catchment. Potential hydromorphological impacts to surface watercourses from watercourse crossings and road outfalls, if required. A Flood Risk Assessment (including |

| ID | Application reference | Cumulative Scheme description | Distance from the Proposed Development (m) | Summary of cumulative effect (operation) |
|---|---|---|---|---|
| | | pursuant to outline permission 18/0760/OUT | | Drainage Strategy) was submitted with planning for the development incorporating SuDS to control runoff rate.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements during operation, it is considered that suitable mitigation would be in place and that there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 13 | 18/1560/EIASCO | Development of a 55km potable water pipeline from Lincoln to Grantham with associated infrastructure including partially buried 20million litre bulk potable water storage tank, 3km connecting pipeline to Anglian Water (AWS) site at Bracebridge Heath (Bracebridge Spur), connecting sections of pipeline to the existing Central Lincs Trunk Main, partially buried 3million litre break tank and the erection of 3 pumping stations (the Grantham Resilience Pipeline Project). | 0 | Limited potential for adverse effects during operation given the sub-surface nature of the development.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements during operation, and therefore appropriately mitigate these effects, it is considered there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 33 | 20/1523/FUL | Hybrid planning application consisting of full planning permission for Phase 4 - the erection of four units comprising uses E, B2 and B8 with associated access, car parking and landscaping and outline permission with all matters reserved for phases 5 to 7 consisting of the proposed | 615 | Potential pollution of surface or groundwater bodies from diffuse urban runoff from the development; increased flood risk from increased impervious area in the catchment. Potential hydromorphological impacts to surface watercourses from watercourse crossings and road outfalls, if required. A Flood Risk Assessment (including Drainage Strategy) was submitted with planning for the |

| ID | Application reference | Cumulative Scheme description | Distance from the Proposed Development (m) | Summary of cumulative effect (operation) |
|---|---|---|---|---|
| | | erection of commercial units comprising use classes E, B2 and B8 | | development incorporating SuDS and oil separators to control runoff rate and potential impacts on water quality.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements during operation, it is considered that suitable mitigation would be in place and that there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 34 | 20/1736/RESM | Residential development of 70 no. affordable dwellings (Cell 2B). Reserved Matters application comprising details of appearance, landscaping, layout and scale pursuant to outline planning permission 15/1347/OUT - Erection of up to 1,100 dwellings and 150 care/retirement units (C2/C3), the formation of a roundabout to Camp Road, A46 junction improvement works, public open spaces and associated service infrastructure (outline with means of access) | 257 | Potential pollution of surface or groundwater bodies from diffuse urban runoff from the development; increased flood risk from increased impervious area in the catchment. Potential hydromorphological impacts to surface watercourses from watercourse crossings and road outfalls, if required. Application is associated with 15/1347/OUT which provided a Flood Risk Assessment (including Drainage Strategy) with planning for the development. The FRA proposes to introduce a series of SuDS to control runoff rates. Existing outfalls will be used and surface water runoff will be limited to greenfield runoff. Excess storm water will be attenuated on site by a series of balancing ponds. Outfall to the west eventually discharges to River Trent.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements during operation, it is considered that suitable mitigation would be in place and that there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |

| ID | Application reference | Cumulative Scheme description | Distance from the Proposed Development (m) | Summary of cumulative effect (operation) |
|---|---|---|---|---|
| 37 | 21/1245/FUL | Installation of a 100.3kW ground mounted solar PV installation comprising of 264 solar panels. | 942 | Limited potential for adverse effects during operation given the small-scale nature of the Cumulative Scheme and positioning away from any significant watercourse.<br><br>This planning application has been approved although an FRA and Drainage Strategy was not provided. Assuming the Cumulative Scheme would follow all legislative and regulatory requirements during operation, and therefore appropriately mitigate these effects, it is considered there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 49 | 22/0520/FUL | Installation of a ground based solar PV array (approximately 6KW) | 364 | Limited potential for adverse effects during operation given the small-scale nature of the Cumulative Scheme and positioning away from any significant watercourse.<br><br>This planning application has been approved although an FRA and Drainage Strategy was not provided. Assuming the Cumulative Scheme would follow all legislative and regulatory requirements during operation, and therefore appropriately mitigate these effects, it is considered there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 54 | 22/1376/FUL | Erection of 148 dwellings with associated outbuildings/garages and landscaping/open space and affordable housing and including conversion of existing (retained) building to shop and offices | 1314 | Potential pollution of surface or groundwater bodies from diffuse urban runoff from the development; increased flood risk from increased impervious area in the catchment. Potential hydromorphological impacts to surface watercourses from watercourse crossingsand road outfalls, if required. A Flood Risk Assessment (including Drainage |

| ID | Application reference | Cumulative Scheme description | Distance from the Proposed Development (m) | Summary of cumulative effect (operation) |
|---|---|---|---|---|
| | | | | Strategy) was submitted with planning for the development incorporating SuDS to control runoff rate.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements during operation, it is considered that suitable mitigation would be in place and that there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 58 | 22/1785/FUL | Erection of 18 no. affordable houses with associated infrastructure | 528 | Potential pollution of surface or groundwater bodies from diffuse urban runoff from the development; increased flood risk from increased impervious area in the catchment. Potential hydromorphological impacts to surface watercourses from watercourse crossings and road outfalls, if required. A Flood Risk Assessment (including Drainage Strategy) was submitted with planning for the development incorporating SuDS.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements during operation, it is considered that suitable mitigation would be in place and that there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 86 | 25/0491/FUL | Erection of 400MW Battery Storage Development incorporating 324no. Containerised Battery Storage Units, 54no. transformer/inverter blocks and 8 back up auxiliary transformers, 4no. storage containers for spare parts etc, | 0 | Potential pollution of surface or groundwater bodies from diffuse urban runoff from the development; increased flood risk from increased impervious area in the catchment. Potential hydromorphological impacts to surface watercourses from watercourse crossings and road outfalls, if required. However, it should be noted that there |

| ID | Application reference | Cumulative Scheme description | Distance from the Proposed Development (m) | Summary of cumulative effect (operation) |
|---|---|---|---|---|
| | | substation comprising 4-6no. switchgear units, a control room and a HV compound with 2 Step-up Transformers, associated access tracks, inverter, switchgear substations, boundary treatments and CCTV - Request for Scoping Opinion | | should be limited impacts from the operational Scheme given the nature of the development.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements during operation, it is considered that suitable mitigation would be in place and that there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 89 | PL/0055/23 | To install a solar PV array development and associated infrastructure to generate electricity for the operation of Swinderby Quarry plant machinery and site offices. | 500 | It is expected that a Drainage Strategy and Flood Risk Assessment will be submitted with the ES for the development, incorporating SuDS to control runoff rate and provide treatment of pollutants. Appropriate design of structures is to be included.<br>This planning application has been approved although FRA or Drainage Strategy not provided Assuming the Cumulative Scheme would follow all legislative and regulatory requirements during operation, it is considered that suitable mitigation would be in place and that there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 90 | 23/0628/OUT | Residential development of up to 120 no. dwellings (outline with all matters reserved) | 1,839 | Potential pollution of surface or groundwater bodies from diffuse urban runoff from the development; increased<br>flood risk from increased impervious area in the catchment. Potential hydromorphological impacts to surface watercourses from watercourse crossings and road outfalls, if required. A Flood Risk Assessment (including Drainage Strategy) was submitted with planning for the development incorporating SuDS. |

| ID | Application reference | Cumulative Scheme description | Distance from the Proposed Development (m) | Summary of cumulative effect (operation) |
|---|---|---|---|---|
| | | | | Assuming the Cumulative Scheme would follow all legislative and regulatory requirements during operation, it is considered that suitable mitigation would be in place and that there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 95 | PL/0087/23 | For construction of the North Hykeham Relief Road (NHRR) between the A46 Hykeham Roundabout and the A15 Sleaford Road Roundabout at the end of the Lincoln Eastern Bypass, with junctions at South Hykeham Road, Brant Road and Grantham Road. The Proposed Scheme will comprise 8km of dual all-purpose carriageway with a 70mph speed limit (120kph design speed) and associated structures, earthworks, drainage, street lighting, traffic signals, utility diversions and installations, pipeline diversion, temporary materials processing, landscaping, and highway features | 0 | Potential pollution of the surface or groundwater bodies from diffuse urban runoff from the development; increased flood risk from increased impervious area in the catchment. Potential hydromorphological impacts to surface watercourses from watercourse crossings or road outfalls.<br>This planning application has been approved and includes appropriate mitigation for flood risk and drainage impacts where required.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements during operation, it is considered that suitable mitigation would be in place and that there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 98 | EIA/02/04 | For variation of conditions 2, 28 and 29 under planning permission 14/0385/CCC - to enable a proposed revision of the restoration scheme and a change to the silt management arrangements approved at Whisby Quarry | 599 | Assuming the Cumulative Scheme would follow all legislative and regulatory requirements during operation, it is considered that suitable mitigation would be in place and that there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |

| ID | Application reference | Cumulative Scheme description | Distance from the Proposed Development (m) | Summary of cumulative effect (operation) |
|---|---|---|---|---|
| 99 | EIA/03/24 | For the installation of floating Solar PV arrays plus terrestrial based ancillary infrastructure and equipment, cable route and access | 499 | Assuming the Cumulative Scheme would follow all legislative and regulatory requirements during operation, it is considered that suitable mitigation would be in place and that there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 101 | 24/0075/EIASCR | Erection of 240MW Battery Storage Development incorporating approximately 75no. inverter skids, approximately 75 no. battery skids, approximately 4no. switchrooms, DNO equipment compound, CCTV Security Cameras, internal access road and DNO access road Request for Screening Opinion | 840 | Potential pollution of surface or groundwater bodies from diffuse urban runoff from the development; increased flood risk from increased impervious area in the catchment. Potential hydromorphological impacts to surface watercourses from watercourse crossings and road outfalls, if required. However, it should be noted that there should be limited impacts from the operational Scheme given the nature of the development.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements during operation, it is considered that suitable mitigation would be in place and that there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 103 | EN0110016 | Leoda Solar - Ground-mounted solar electricity generating station with a targeted gross output of 500 to 600Megawatts (MW) and associated grid connection infrastructure. | 0 | It is expected that a Drainage Strategy and Flood Risk Assessment will be submitted with the ES for the development, as well as appropriate design of structures where relevant. However, there would be limited<br>potential for operational effects.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements during operation, it is considered that suitable mitigation would be in place and |

| ID | Application reference | Cumulative Scheme description | Distance from the Proposed Development (m) | Summary of cumulative effect (operation) |
|---|---|---|---|---|
| | | | | that there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 105 | 24/1080/EIASCR | Erection of new 400kv Air Insulated Switchgear (AIS) substation and associated development – proposed National Grid substation near Navenby | 0 | It is expected that a Drainage Strategy and Flood Risk Assessment will be submitted with the ES for the development, as well as appropriate design of structures where relevant.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements during operation, it is considered that suitable mitigation would be in place and that there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |
| 108 | N/A | Brant Energy Storage Scheme<br>1GW Battery Energy Storage System located west of Coleby and east of Broughton Lane. Broadly similar Grid Connection Corridor anticipated as for the Proposed Development | 0 | Potential pollution of surface or groundwater bodies from diffuse urban runoff from the development; increased flood risk from increased impervious area in the catchment. Potential hydromorphological impacts to surface watercourses from watercourse crossings and road outfalls, if required.<br>Assuming the Cumulative Scheme would follow all legislative and regulatory requirements during operation, it is considered that suitable mitigation would be in place and that there would be **no change from the residual effects assessed for the Proposed Development (not significant).** |

## 9.11 References

Ref 9-1 The Environment Act 2021. Available at: https://www.legislation.gov.uk/ukpga/2021/30/contents

Ref 9-2 Water Act 2014. Available at: https://www.legislation.gov.uk/ukpga/2014/21/contents

Ref 9-3 Flood and Water Management Act 2010. Available at: https://www.legislation.gov.uk/ukpga/2010/29/

Ref 9-4 Environmental Protection Act 1990. Available at: https://www.legislation.gov.uk/ukpga/1990/43/contents

Ref 9-5 Land Drainage Act 1991. Available at: https://www.legislation.gov.uk/ukpga/1991/59/section

Ref 9-6 Water Resources Act 1991. Available at: https://www.legislation.gov.uk/ukpga/1991/57

Ref 9-7 Salmon and Freshwater Fisheries Act 1975. Available at: https://www.legislation.gov.uk/ukpga/1975/51

Ref 9-8 The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. Available at: https://www.legislation.gov.uk/uksi/2017/407

Ref 9-9 The Environmental Damage (Prevention and Remediation) (England) (Amendment) Regulations 2017. Available at: https://www.legislation.gov.uk/uksi/2017/1177/contents

Ref 9-10 The Environmental Permitting (England and Wales) Regulations 2016 Available at: https://www.legislation.gov.uk/uksi/2016/1154/contents

Ref 9-11 Eels (England and Wales) Regulation 2009. Available at: https://www.legislation.gov.uk/uksi/2009/3344/

Ref 9-12 Control of Pollution (Oil Storage) (England) Regulations 2001. https://www.legislation.gov.uk/uksi/2001/2954/contents

Ref 9-13 The Control of Substances Hazardous to Health (Amendment) Regulations 2004. https://www.legislation.gov.uk/uksi/2004/3386/contents

Ref 9-14 The Anti-Pollution Works Regulations 1999. https://www.legislation.gov.uk/uksi/1999/1006/introduction/made

Ref 9-15 The Water Framework Directive (Standards and Classification) Directions 2015. https://www.legislation.gov.uk/uksi/2003/3242/pdfs/uksiod_20033242_en_002.pdf

Ref 9-16 Department for Energy Security & Net Zero (2023). Overarching National Policy Statement for Energy (EN-1), November 2023. Available at:

https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1

Ref 9-17 Department for Energy Security & Net Zero (2023). National Policy Statement for Renewable Energy Infrastructure (EN-3), November 2023. Available at: https://www.gov.uk/government/publications/national-policy-statement-for-renewable-energy-infrastructure-en-3

Ref 9-18 Department for Energy Security & Net Zero (2023). National Policy Statement for Electricity Networks Infrastructure (EN-5), November 2023. Available at: https://www.gov.uk/government/publications/national-policy-statement-for-electricity-networks-infrastructure-en-5

Ref 9-19 Department for Levelling Up, Housing and Communities and Local Government (2023) National Planning Policy Framework (NPPF), Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1182995/NPPF_Sept_23.pdf [Accessed 19 September 2023].

Ref 9-20 Department of Communities and Local Government (2023). National Planning Practice Guidance (NPPG). Available at: https://www.gov.uk/government/collections/planning-practice-guidance

Ref 9-21 Department of Communities and Local Government (2022). National Planning Practice Guidance: Flood Risk and Coastal Change.

Ref 9-22 Environment Improvement Plan 2023 (2023) Available at: https://www.gov.uk/government/publications/environmental-improvement-plan

Ref 9-23 A Green Future: Our 25 Year Plan to Improve the Environment. Available at: https://www.gov.uk/government/publications/25-year-environment-plan

Ref 9-24 Plan for Water: our integrated plan for delivering clean and plentiful water (2023) Available ay: https://www.gov.uk/government/publications/plan-for-water-our-integrated-plan-for-delivering-clean-and-plentiful-water

Ref 9-25 Future Water: The government's water strategy for England. https://www.gov.uk/government/publications/future-water-the-government-s-water-strategy-for-england.

Ref 9-26 Defra (2015) Non-statutory technical standards for sustainable drainage systems. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/415773/sustainable-drainage-technical-standards.pdf.

Ref 9-27 CIRIA (2015) The SuDS Manual (C753F).

Ref 9-28 The Building Regulations 2010 Drainage and waste disposal. BR_PDF_AD_H_2015.pdf (publishing.service.gov.uk).

Ref 9-29 The BRE Digest 365: Soakaway Design and Sewerage Sector Guidance 2022, Appendix C Design and Construction Guidance.

Ref 9-30 Water sector guidance (2022) Available at: https://www.water.org.uk/water-sector-guidance-approved-documents/

Ref 9-31 Environment Agency (2022) Anglian River Basin Management Plan Available at: https://www.gov.uk/guidance/anglian-river-basin-district-river-basin-management-plan-updated-2022

Ref 9-32 Environment Agency (2022) Humber River Basin Management Plan. Available at: https://www.gov.uk/guidance/humber-river-basin-district-river-management-plan-updated-2022

Ref 9-33 Lincolnshire County Council. (2017). Central Lincolnshire Local Plan 2012-2036. Lincolnshire County Council, Lincoln.

Ref 9-34 Lincolnshire County Council. (2018). Sustainable Drainage Design and Evaluation Guide. Lincolnshire County Council, Lincoln.

Ref 9-35 Ordnance Survey (2018); Open Data.

Ref 9-36 Bing (2019); Maps.

Ref 9-37 Environment Agency (2019); Catchment Data Explorer Tool. Available at: https://environment.data.gov.uk/catchment-planning/

Ref 9-38 Environment Agency Public Registers website – Environmental Permitting Regulations – Discharges to Water and Groundwater. Available at: https://environment.data.gov.uk/public-register/view/search-water-discharge-consents

Ref 9-39 Cranfield Soil and Agrifood Institute Soilscapes viewer, available at: http://www.landis.org.uk/soilscapes/

Ref 9-40 Multi Agency Geographic Information for Countryside (MAGIC). Available at: MAGIC (defra.gov.uk)

Ref 9-41 National River Flow Archive (NRFA) website. Available at: https://nrfa.ceh.ac.uk/data/search

Ref 9-42 HMSO. (2015). The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015. Available at: https://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksiod_20151623_en_auto.pdf

Ref 9-43 Natural England. (n.d.). Natural England Website for Designated Sites. Available at: https://designatedsites.naturalengland.org.uk/

Ref 9-44 British Geological Survey. Onshore GeoIndex. Available at: https://mapapps2.bgs.ac.uk/geoindex/home.html

Ref 9-45 Met Office (2023): Waddington Climate. Available at: https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gcrws0hwg

Ref 9-46 British Geology Survey (2019); Geology of Britain viewer. Available at: http://mapapps.bgs.ac.uk/geologyofbritain/home.html

Ref 9-47 Environment Agency (2019); Flood map for planning. Available at: https://flood-map-forplanning.service.gov.uk/

Ref 9-48 The Water Framework Directive (Standards and Classification) Directions 2015. https://www.legislation.gov.uk/uksi/2003/3242/pdfs/uksiod_20033242_en_002.pdf

Ref 9-49 Highways England. (2020). Design Manual for Roads and Bridges (DMRB) LA113 Road Drainage and the Water Environment. Available at: https://www.standardsforhighways.co.uk/tses/attachments/d6388f5f-2694-4986-ac46-b17b62c21727

Ref 9-50 Highways England. (2020). LA 104 Environmental Assessment and Monitoring. Available at: https://www.standardsforhighways.co.uk/tses/attachments/0f6e0b6a-d08e-4673-8691-cab564d4a60a

Ref 9-51 Environment Agency (1998a) River Geomorphology: a practical guide.

Ref 9-52 Environment Agency. (1998b). Geomorphological approaches to river management. Project record W5A/i661/1, prepared by Thorne, C., Downs, P.W., Newson, M.D., Clarke, M.J., and Sear, D.A., EA, Bristol.

Ref 9-53 Highways England. (2020). LA113 Road drainage and the water environment. Available at: https://www.standardsforhighways.co.uk/tses/attachments/d6388f5f-2694-4986-ac46-b17b62c21727

Ref 9-54 Met Office (2023): Waddington Climate. Available at: https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gcrws0hwg

Ref 9-55 Environment Agency (2019a); Catchment Data Explorer Tool. Available at; https://environment.data.gov.uk/catchment-planning/ManagementCatchment/3116

Ref 9-56 Environment Agency (2019b); Catchment Data Explorer Tool. Available at; https://environment.data.gov.uk/catchment-planning/ManagementCatchment/3052

Ref 9-57 National River Flow Archive (n.d.). Station 30001 - Witham at Claypole Mill. Available at: https://nrfa.ceh.ac.uk/data/station/info/30001

Ref 9-58 Environment Agency (2019c); Catchment Data Explorer Tool. Available at; https://environment.data.gov.uk/catchment-planning/WaterBody/GB105030056780

Ref 9-59 Environment Agency (2019d); Catchment Data Explorer Tool. Available at; https://environment.data.gov.uk/catchment-planning/WaterBody/GB105030062370

Ref 9-60 National River Flow Archive (n.d.). Station 30033 - Brant at Brant Broughton. Available at: https://nrfa.ceh.ac.uk/data/station/info/30033

Ref 9-61 Environment Agency (2019e); Catchment Data Explorer Tool. Available at; https://environment.data.gov.uk/catchment-planning/WaterBody/GB105030062460

Ref 9-62 Environment Agency (2019f); Catchment Data Explorer Tool. Available at; https://environment.data.gov.uk/catchment-planning/WaterBody/GB105030056230

Ref 9-63 Environment Agency (2019g); Catchment Data Explorer Tool. Available at; https://environment.data.gov.uk/catchment-planning/WaterBody/GB105030056210

Ref 9-64 Environment Agency (n.d.) Water quality data archive. Available at: https://environment.data.gov.uk/water-quality/view/landing

Ref 9-65 HMSO (1981). Wildlife & Countryside Act 1981 (as amended). HMSO, London. Available at: https://www.legislation.gov.uk/ukpga/1981/69

Ref 9-66 HMSO (2006). Natural Environment and Rural Communities Act 2006. HMSO, London. Available at: https://www.legislation.gov.uk/ukpga/2006/16/contents

Ref 9-67 Shirt, D.B. (1987). British Red Data Books 2: Insects. Nature Conservancy Council: Peterborough.

Ref 9-68 JNCC (2023). UK Biodiversity Framework 2024. Available at https://data.jncc.gov.uk/data/19a729f6-440e-4ac6-8894-cc72e84cc3bb/uk-biodiversity-framework.pdf

Ref 9-69 European Council (EC) (1992). Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. EC, Brussels.

Ref 9-70 HMSO (2019). The Invasive Alien Species (Enforcement and Permitting) Order 2019. HMSO, London. Available at: https://www.legislation.gov.uk/uksi/2019/527/contents/made

Ref 9-71 National Biodiversity Network Trust (NBN) (2021). National Biodiversity Network Atlas. Available at: https://nbnatlas.org/

Ref 9-72 Environment Agency Check for Drinking Water Safeguard Zones and NVZs website. Available at: https://environment.data.gov.uk/farmers/ [Accessed 21 April 2023]

Ref 9-73 Nitrate Pollution Prevention Regulations 2015

Ref 9-74 British Geological Survey. Onshore GeoIndex. Available at: https://webapps.bgs.ac.uk/lexicon/lexicon.cfm?pub=CHAM

Ref 9-75 British Geological Survey. (n.d.) Borehole Record BG ID 16105054 BGS Ref SK95NE42. Available at; http://scans.bgs.ac.uk/sobi_scans/boreholes/16105054/images/15169311.html

Ref 9-76 British Geological Survey. (n.d.) Onshore GeoIndex. Available at: https://www2.bgs.ac.uk/groundwater/shaleGas/aquifersAndShales/maps/aquifers/CarboniferousLimestone.html. [Accessed 09 September 2024]

Ref 9-77 Environment Agency. Check for Drinking Water Safeguard Zones and NVZs. Available at: https://environment.data.gov.uk/farmers/

Ref 9-78 Planning Practice Guidance: Natural Environment (Landscapes) (2019). Available at: https://www.gov.uk/guidance/natural-environment

Ref 9-79 British Standards Institute (2009) BS6031:2009 Code of Practice for Earth Works

Ref 9-80 CIRIA C811D. (2023). Environmental good practice on site guide (fifth edition).

Ref 9-81 CIRIA C648. (2006). Control of water pollution from linear construction projects, technical guidance.

Ref 9-82 CIRIA C609. (2004). Sustainable Drainage Systems, hydraulic, structural and water quality advice.

Ref 9-83 CIRIA C532. (2001). Control of water pollution from construction sites – Guidance for consultants and contractors.

Ref 9-84 CIRIA C736F. (2014). Containment systems for prevention of pollution.

Ref 9-85 HMSO (2009) The Eels (England and Wales) Regulations 2009 (SI 2009/3344). HMSO, London. Available at: https://www.legislation.gov.uk/uksi/2009/3344/made

Ref 9-86 European Council (EC) (1992). Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. EC, Brussels.

Ref 9-87 HMSO (1994) Biodiversity: the UK Action Plan. HMSO, London. Available at: https://www.gov.uk/government/publications/biodiversity-the-uk-action-

Ref 9-88 Stroh, P.A., Leach, S.J., August, T.A., Walker, K.J., Pearman, D.A., Rumsey, F.J., Harrower, C.A., Fay, M.F., Martin, J.P., Pankhurst, T., Preston, C.D. and Taylor, I. (2014). A Vascular Plant Red List for England. Botanical Society of Britain and Ireland (BSBI), Bristol.

Ref 9-89 Greater Lincolnshire Nature Partnership (GLNP) (2013). Local Wildlife Site Guidelines for Greater Lincolnshire (3rd edition). GLNP, Lincolnshire.

Ref 9-90 NetRegs. NetRegs – Environmental guidance for your business in Northern Ireland and Scotland.

Ref 9-91 UK Government Guidance [2023] Pollution Prevention for Business. Available at https://www.gov.uk/guidance/pollution-prevention-for businesses

Ref 9-92 Environment Agency (2011). Pollution Prevention Guidance. Safe storage – the safe operation of refuelling: PPG7. Available at: https://www.netregs.org.uk/media/1673/ppg-7.pdf

Ref 9-93 Environment Agency. Pollution Prevention Guidance. Managing fire water and major spillages: PPG18. Available at: https://www.netregs.org.uk/media/1674/ppg-18.pdf

Ref 9-94 National Fire Chiefs Council (2022) Grid Scale Battery Energy Storage System planning – Guidance for FRS. Available at: https://nfcc.org.uk/wp-content/uploads/2023/10/Grid-Scale-Battery-Energy-Storage-System-planning-Guidance-for-FRS.pdf

Ref 9-95 HMSO (1991) Water Industry Act 1991. HMSO, London.

Ref 9-96 Environment Agency (2023). Temporary dewatering from excavations to surface water: RPS 261. Available at: https://www.gov.uk/government/publications/temporary-dewatering-from-excavations-to-surface-water/temporary-dewatering-from-excavations-to-surface-water

Ref 9-97 Environment Agency (2020) Land contamination risk management (LCRM). Available at: https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm

Ref 9-98 British Standards Institute (~~2013b~~2026) BS10175:~~2011+ A2:2017~~2026 Investigation of Potentially Contaminated Sites: Code of Practice.

Ref 9-99 British Standards Institute (2015) BS 5930:2015+A1:2020 Code of Practice for Ground Investigations.

Ref 9-100 Environment Agency (2010) GPLC1 – Guiding principles for land contamination. Available at: https://www.claire.co.uk/index.php?option=com_content&view=article&id=192&catid=41&Itemid=256

Ref 9-101 The Planning Inspectorate Advice Note 18: The Water Framework Directive.

Ref 9-102 The Planning Inspectorate Advice Note - Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive. Available at: https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-the-water-framework-directive#:~:text=Guidance-

,Nationally%20Significant%20Infrastructure%20Projects%3A%20Advice%20on%20the%20Water%20Framework%20Directive,Infrastructure%20Project%20(NSIP)%20applications

Ref 9-103 Environment Agency Advice Note – Water Framework Directive Risk Assessment: How to assess the risk of your activity. Available at: https://assets.publishing.service.gov.uk/media/5a819cd7ed915d74e33ff25a/LIT_10445.pdf

Ref 9-104 British Standards Institute (2013) BS8582 Code of Practice for Surface Water Management of Development Sites.