

Springwell Solar Farm

Preliminary Environmental Information Report

Volume 1
Chapter 13: Water

Phase 2 consultation
Springwell Energyfarm Ltd



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13. Water

13.1. Introduction

- 13.1.1. This chapter presents the preliminary environmental information and a preliminary assessment of the likely significant environmental effects arising from the construction, operation (including maintenance) and decommissioning of the Proposed Development upon water (flood risk, hydrology and drainage).
- 13.1.2. This chapter is intended to be read as part of the wider Preliminary Environmental Information Report (PEIR) with particular reference to **Chapter 6: Biodiversity** and **Chapter 10: Land, Soils and Groundwater**.

13.2. Consultation, scope and study area

Consultation undertaken to date

- 13.2.1. An EIA Scoping Report, as provided in **Appendix 4.1**, setting out the proposed water assessment scope and methodology for the Proposed Development, was submitted to the Planning Inspectorate in March 2023. A Scoping Opinion, as provided in **Appendix 4.2**, was issued by the Planning Inspectorate on behalf of the Secretary of State in May 2023. **Appendix 4.3** provides responses to comments relating to water in the Scoping Opinion and details how these have been addressed in this preliminary assessment.
- 13.2.2. **Table 13.1** provides a summary of the consultation activities undertaken in support of the preparation of this preliminary assessment, in addition to the EIA Scoping process.

Table 13.1 Summary of consultation undertaken

Consultee	Key Matters Raised	Actions in response to consultee comments
Environment Agency	Online meeting (23 June 2023) between the Applicant and the Environment Agency to introduce the Proposed Development and discuss the project principles and work undertaken to date.	The Applicant requested further information on ongoing local projects such as 'Project Groundwater' and 'Bringing back the Limestone Becks' project to understand if these could be aligned with the outcomes of the Proposed Development. An email response from the Environment Agency following the meeting (12 th July 2023) outlined further details of 'Project Groundwater', this was described by the Environment Agency as ' <i>a new project aimed at better understanding flood risk and is led by</i>

Consultee	Key Matters Raised	Actions in response to consultee comments
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Lincolnshire County Council. Scopwick is listed as one of the current priorities, where the project will look to investigate, model and mitigate the causes of groundwater flooding impacting sewage infrastructure and properties in Scopwick.'

The 'Bringing the Limestone Becks Back to Life' project is described by the Environment Agency as 'a successful collaboration between East Mercia Rivers Trust, the Environment Agency, and the Wild Trout Trust and aims to improve and protect Lincolnshire's limestone becks from deterioration.'

Additionally in the email response, the Environment Agency provided the following response with regards to flood risk, 'Most of the site boundary sits within flood zone 1. There are some elements of the site which have small parts of flood zone 2 and 3. The scoping report shows the essential infrastructure will sit in flood zone 1. There are no proposed river crossings or interaction with embankments or assets - if there are this is not clear in the scoping report. We would require permitting advice to be sought from us if river crossings were proposed in future.' The requirement of river/ditch crossings is yet to be determined and if required, permitting advice will be sought.

13.2.3. Consultation and engagement with consultees and relevant stakeholders is still ongoing, and will continue to inform the design and EIA process.

Scope of the assessment

13.2.4. This section updates the scope of assessment and confirms, and where necessary updates, the evidence base for scoping out receptors/matters following further iterative assessment and consideration of the Scoping Opinion.

Receptors/matters scoped out of further assessment

13.2.5. **Table 13.2** presents the receptors/matters that are scoped out of further assessment, together with appropriate justification. Where a change has occurred to the approach proposed within the EIA Scoping Report, this is clearly stated and justified.

Table 13.2 Receptor/matters scoped out of further assessment

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Flood risk	Construction and operation	Given the nature of the Site and the Proposed Development, and subject to ensuring no increase in flood risk and agreeing design and mitigation measures with the Environment Agency, Lincolnshire County Council (the Lead Local Flood Authority) and the Witham First Internal Drainage Board, PINS agreed to scope this matter out of the ES. However, a stand-alone Flood Risk Assessment will be submitted in support of the DCO application.	No change – this matter was proposed to be scoped out of further assessment within the EIA Scoping Report and the Scoping Opinion has agreed with this approach.

Receptors/matters scoped into further assessment

13.2.6. **Table 13.3** presents the receptors/matters that are scoped into further assessment, together with appropriate justification. Where a change has occurred to the approach proposed within the EIA Scoping Report, this is clearly stated and justified.

13.2.7. It should be noted that groundwater has been considered as a sensitive receptor as part **Chapter 10: Land, Soils and Groundwater** and so has not been scoped into the water assessment.

Table 13.3 Receptor/matters scoped into further assessment

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Water quality	Construction and decommissioning	Within the Scoping Opinion, PINS made note that not enough evidence regarding the design and control measures had been provided within the EIA Scoping Report to scope impacts to water quality out during construction or decommissioning.	Change – this matter was proposed to be scoped out of further assessment within the EIA Scoping Report but the Scoping Opinion has requested it be scoped in. Following further consideration, the Applicant agrees with this opinion for the purposes of this preliminary assessment.
Water resources	Construction and operation	Within the Scoping Opinion, PINS has requested this matter to be considered due to the area being classified as water stressed.	Change - this matter was not considered within the EIA Scoping Report, but the Scoping Opinion has requested it to be considered. Following further consideration, the Applicant agrees with this opinion for the purposes of this preliminary assessment.
Water Framework Directive (WFD)	Construction and operation	The EIA Scoping Report identified the potential for contamination of surface water and groundwater bodies and given the location of the Proposed Development relative to surrounding WFD classified waterbodies, PINS has requested (via the Scoping Opinion) that	Change - this matter was not considered within the EIA Scoping Report, but the Scoping Opinion has requested it be considered. Following further consideration, the Applicant agrees with this opinion for the purposes of this

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
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this matter considered.	be preliminary assessment.
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Extent of the study area

13.2.8. For the purposes of this preliminary assessment, the Site and a 1km buffer have been considered with regard to identifying hydrological feature related receptors that could be impacted by the construction, operation and/or decommissioning of the Proposed Development. In the absence of any specific guidance relating to solar developments and in accordance with Design Manual for Roads and Bridges LA 113 (2020)¹, a 1km buffer is considered appropriate for water environment assessments. A 1km buffer is a sufficient distance to enable the deposition of silts in overland flows and dilution of any concentrated pollutants so that waterbodies at a greater distance than the buffer would not be at risk of being affected.

13.3. Legislative framework, planning policy and guidance

Relevant legislation

13.3.1. The Water Framework Directive Regulations 2017 (WFD) came into effect in April 2017 and originate from the European Union (EU) Water Framework Directive (2000). The WFD continues to form part of UK law post Britain leaving the EU. All new activities in or potentially affecting the water environment need to consider the WFD. The relevant Environmental Objectives set out in the WFD are listed below:

- Prevent deterioration in the status of aquatic ecosystems, protect them and improve the ecological condition of waters;
- Aim to achieve at least good status for all water bodies by 2015. Where this is not practicable and subject to the criteria set out in the WFD, aim to achieve good status by 2021 or 2027;
- Meet the requirements of the WFD;
- Promote sustainable use of water as a natural resource;
- Conserve habitats and species that depend directly on water;

¹ Design Manual for Roads and Bridges LA 113, Road drainage and the water environment, Sustainability & Environment Appraisal (March 2020). Available online: LA 113 - Road drainage and the water environment (standardsforhighways.co.uk)

- Progressively reduce or phase out the release of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment; and
- contribute to mitigating the effects of floods and droughts.

13.3.2. The Flood and Water Management Act 2010 provides more comprehensive management of flood risk for people, homes and businesses, helps safeguard community groups from unaffordable rises in surface water drainage charges, and protects water supplies to the consumer. The activities required under this Act aim to reduce the flood risk associated with extreme weather.

Relevant planning policy

13.3.3. Planning policy relevant to water comprises the following:

- Overarching National Policy Statement for Energy (NPS EN-1) (2011)² - Section 5.8 outlines the planning policy for flood risk, including guidance on undertaking a flood risk assessment and resilience to the effects of climate change. This section also states that a flood risk assessment needs to accompany a proposed development within flood zone 2 or 3.
- Draft Overarching National Policy Statement for Energy (NPS EN-1) (2023)³ - Section 5.8 outlines the planning policy for flood risk, including guidance on undertaking a flood risk assessment and resilience to the effects of climate change. This section also states that a flood risk assessment needs to accompany a proposed development within flood zone 2 or 3.
- National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2011)⁴ - Section 2, though not to solar development, outlines increased risk of flooding as a result of climate change should be considered for proposals.
- Draft National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2023)⁵ - Section 3.10 gives specific consideration to solar development including direction relating to the consideration and assessment of flood risk.

² Overarching National Policy Statement for Energy (EN-1) (2011). Available online:

<https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure>

³ Draft National Policy Statement for Energy (EN-1) (2023). Available online:

<https://www.gov.uk/government/consultations/planning-for-new-energy-infrastructure-revisions-to-national-policy-statements>

⁴ National Policy Statement for Renewable Energy (EN-3) (2011). Available online:

<https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure>

⁵ Draft National Policy Statement for Renewable Energy (EN-3) (2023). Available online:

<https://www.gov.uk/government/consultations/planning-for-new-energy-infrastructure-revisions-to-national-policy-statements>

- National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2011)⁶ - Section 2.4 gives consideration to climate change and the increased risks to resilience as a result; the section identifies that future increases in risk of flooding should be covered in any flood risk assessment.
- Draft National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2023)⁷ - Section 2.3 gives consideration to climate change and the increased risks to resilience as a result; the section identifies that future increases in risk of flooding should be covered in any flood risk assessment.
- National Planning Policy Framework (NPPF) (September 2023)⁸ sets out the criteria for development and flood risk by stating that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere.
- Planning Practice Guidance - Flood Risk and Coastal Change⁹, Communities and Local Government (2022) - Provides additional guidance to ensure the effective implementation of the planning policy set out in the NPPF on development in areas of flood risk.
- Joint Lincolnshire Flood Risk and Water Management Strategy 2019-2050¹⁰ - The strategy outlines aims for effective management of water and flood risk. Promoting a greater mix of measures including water retention and attenuation and natural flood risk management methods is identified as a way of covering water management with flood risk.

⁶ National Policy Statement for Renewable Energy (EN-5) (2011). Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47858/1942-national-policy-statement-electricity-networks.pdf

⁷ Draft National Policy Statement for Renewable Energy (EN-5) (2023). Available online: <https://www.gov.uk/government/consultations/planning-for-new-energy-infrastructure-revisions-to-national-policy-statements>

⁸ Department for Levelling Up, Housing and Communities, 'National Planning Policy Framework', published 27 March 2012, updated 5 September 2023. Available online: [National Planning Policy Framework - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/47858/1942-national-policy-statement-electricity-networks.pdf)

⁹ Planning Practice Guidance - Flood Risk and Coastal Change, Communities and Local Government, published March 2014 and last updated August 2022.

¹⁰ Joint Lincolnshire Flood Risk and Water Management Strategy 2019 – 2050. Available online: [Lincolnshire Joint Flood Risk and Drainage Management Strategy - Implementing the Strategy in Partnership](https://www.lincolnshire.gov.uk/media/1000000/lincolnshire-joint-flood-risk-and-drainage-management-strategy-implementing-the-strategy-in-partnership.pdf)

Applicable guidance

13.3.4. The following guidance documents have been used during the preparation of this preliminary assessment:

- The Construction Industry Research and Information Association (CIRIA), The Sustainable Drainage System (SuDS) Manual (2015)¹¹
- CIRIA, Environmental Good Practice on Site (C741) (2015)¹²
- The State of Environmental Impact Assessment Practice in the UK, Institute of Environmental Management and Assessment, (IEMA) (2011)¹³.

13.4. Methodology

Data sources to inform baseline characterisation

13.4.1. An initial desk-based hydrology study has been undertaken as part of the assessment which has included a review of existing watercourses, water quality, drainage and areas prone to fluvial flooding as identified on the flood map for planning¹⁴. The watercourses and flood zones from the flood map for planning are shown in **Figure 2.1**.

13.4.2. Initial baseline information on the physical environment has been collected from the following sources:

- Defra MAGIC Map¹⁵;
- Environment Agency and the relevant local authorities, on abstractions and discharges to watercourses and water quality records;
- Hydrogeological maps;
- Groundwater vulnerability maps;
- Soil survey maps including The British Geological Survey (BGS) Geology Map¹⁶;
- Internal Drainage Boards Map¹⁷; and

¹¹ The Construction Industry Research and Information Association (CIRIA), The Sustainable Drainage System (SuDS) Manual (2015). Available online: [Update to the SuDS Manual - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/428222/Update_to_the_SuDS_Manual_-_GOV.UK.pdf)

¹² The Construction Industry Research and Information Association (CIRIA), Environmental Good Practice on Site (C741) (2015). Available online: [Environmental good practice on site \(ciria.org\)](https://www.ciria.org/publications/environmental-good-practice-on-site)

¹³ Institute of Environmental Management and Assessment, "The State of Environmental Impact Assessment Practice in the UK," IEMA, 2011.

¹⁴ Environment Agency. Flood Map for Planning. Available online: [Flood map for planning - GOV.UK \(flood-map-for-planning.service.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/428222/Flood_map_for_planning_-_GOV.UK.pdf)

¹⁵ Department for Environment, Food & Rural Affairs. MAGIC Map (2023). Available online: [MAGIC \(defra.gov.uk\)](https://www.defra.gov.uk/magic/)

¹⁶ The British Geological Survey (BGS) Geology Viewer. Available online: [BGS Geology Viewer - British Geological Survey](https://www.bgs.gov.uk/geology-viewer/)

¹⁷ Witham Internal Drainage Board Map (2023). Available online: [Maps – Witham & Humber Drainage Boards \(witham3idb.gov.uk\)](https://www.witham3idb.gov.uk/maps/)

- Local Authority private water supply records.

Surveys to inform baseline characterisation

13.4.3. No surveys or site visits have been undertaken to inform this preliminary assessment.

Design assumptions

13.4.4. **Chapter 2: Description of the Proposed Development** details the preliminary design principles of the Proposed Development components as they are currently known. Preliminary parameter plans, which define the broad extents within which development can take place, are presented in the following figures within **Volume 2**:

- **Figure 2.3** – Zonal Masterplan;
- **Figure 2.4** – Indicative Height Parameters Plan;
- **Figure 2.5** – Indicative Green Infrastructure Parameters Plan; and
- **Figure 2.6** – Indicative Operational Access & Movement Parameters Plan.

13.4.5. **Chapter 4: Approach to EIA** sets out those elements of the Proposed Development for which optionality is present within the current design and sets out the scenario assessed for the purpose of this preliminary assessment.

Embedded mitigation measures

13.4.6. This preliminary assessment has been based on the principle that measures have been ‘embedded’ into the design of the Proposed Development to remove potential significant effects as far as practicable, for example by the considered placement of infrastructure. Embedded (primary) environmental mitigation measures that are considered to be an inherent part of the Proposed Development are detailed within **Table 4.4** of **Chapter 4: Approach to EIA**.

13.4.7. Those embedded mitigation measures relevant to this preliminary water assessment comprise:

- Offsets of at least 10m will be provided either side from main rivers and 6m from ditches.
- Boundary fencing will not be constructed through existing hedgerows or across ditches.
- The Solar PV modules will be separated by a rainwater gap to allow rainwater to drain freely to the ground between the panels helping to replicate greenfield runoff conditions.
- A detailed operational drainage design will be carried out pre-construction to account for the areas of hardstanding at the Springwell Substation and Battery Energy Storage System (BESS) compound.

- To ensure potentially contaminated runoff does not enter the wider hydrological network, a system would be installed to isolate and contain any firewater runoff in the event of an emergency. The potentially contaminated runoff would then be contained within an underground attenuation tank prior to being collected and tankered offsite to be suitably tested and disposed of.

Assessment methodology

- 13.4.8. For this preliminary assessment, the likely significant effects on identified receptors are reported based on the information available at the time of writing. The final assessment of likely significant effects will be reported in the ES.
- 13.4.9. A desk-based study has been undertaken to identify the existing hydrological features and assess any potential effects caused by the Proposed Development during the construction, operation and decommissioning phases. The hydrology has been assessed in terms of the natural drainage patterns and water quality.
- 13.4.10. In order to inform this preliminary assessment, additional information has been obtained from Environment Agency sources, such as fluvial flood mapping and information on nationalised modelling of surface water flow paths available from online government meta data¹⁸.
- 13.4.11. Where necessary, additional mitigation has been identified following best practice guidelines including the (now revoked) Environment Agency Pollution Prevention Guidelines (PPGs). PPGs contained a mix of regulatory requirements and good practice advice; however, the Environment Agency does not provide 'good practice' guidance and withdrew the PPGs from use¹⁹.
- 13.4.12. Online guidance provided by the Environment Agency for water abstraction and impound licensing applications has been used for the assessment of water resources²⁰ magnitude of impact criteria. The guidance notes that water abstraction that is less than 20 cubic metres of water a day does not require a license. Therefore, water usage that is less than 20 cubic metres of water a day is not considered significant and would be a negligible magnitude of impact.

¹⁸ 'Risk of Flooding from Surface Water Speed: 1 percent annual chance', Environment Agency, accessed 19th September 2023. Available at: <https://www.data.gov.uk/dataset/592d6b5f-8ca3-4713-bf04-b6d77422d7e2/risk-of-flooding-from-surface-water-speed-1-percent-annual-chance>

¹⁹ Pollution prevention guidance (PPG), Environment Agency, 2 July 2014, accessed 02 October 2023, available online: <https://www.gov.uk/government/collections/pollution-prevention-guidance-ppg>

²⁰ Apply for a water abstraction or impounding licence, published 8 May 2014, last updated 1 June 2023, Environment Agency, accessed 19 September 2023, available online: <https://www.gov.uk/guidance/water-management-apply-for-a-water-abstraction-or-impoundment-licence>

13.4.13. The preliminary assessment of likely significant effects has taken into account the sensitivity of the receptor and the magnitude of the impact on that receptor. Criteria for determining the sensitivity of the receptor, based on professional judgement, are presented in **Table 13.4** below.

Table 13.4 Receptor sensitivity criteria

Sensitivity	Criteria Guide
High	<p>The receptor has low ability to absorb change without fundamentally altering its present character, is of high environmental value, or of national importance. In terms of hydrological receptors, this relates to;</p> <ul style="list-style-type: none"> • A watercourse of National importance; • Areas of Flood Zone 3 or at high risk of surface water [or other forms of] flood risk; • WFD recorded watercourse achieving 'Good' or targeted as 'Good' status (including immediately downstream watercourses); • Regional sewer or water supply networks; • A flood plain or defence protecting between 1 and 100 residential properties or industrial premises from flooding; • Protected or designated areas, e.g., Sites of Special Scientific Interest (SSSI), Ramsar sites, Special Protected Areas (SPAs), Special Areas of Conservation (SACs), which are highly sensitive to disruption; • Supports industrial or agricultural abstraction of >500 m³/day or supports a public potable water supply to a large community.
Medium	<p>The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value, or is of regional importance. In terms of hydrological receptors this relates to;</p> <ul style="list-style-type: none"> • A watercourse of Countywide importance; • Areas of Flood Zone 2 or medium surface water flood risk; • WFD recorded watercourse achieving 'Moderate' or targeted as 'Moderate' status (including immediately downstream watercourses); • Local sewer or water supply networks; • Supports industrial or agricultural abstraction of 50 - 500 m³/day or supports a Private Water Supply of potable water to a small community
Low	<p>The receptor is tolerant of change without detriment to its character, is of low environmental value, or local importance. In terms of hydrological receptors this relates to;</p> <ul style="list-style-type: none"> • A watercourse of Local to District importance; • Areas of Flood Zone 1 or low surface water flood risk;

Sensitivity	Criteria Guide
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- WFD recorded watercourse achieving ‘Poor’ or targeted as ‘Poor’ status (including immediately downstream watercourses);
- On-site sewer or water supply networks;
- Supports an abstraction for agricultural or industrial use of <math><50\text{m}^3/\text{day}</math>.

13.4.14. The criteria used to assess the magnitude of impact are outlined in **Table 13.5**. The allocation of the level of magnitude is identified through the consideration, and application, of professional judgement and the assessment of the supporting evidence.

Table 13.5 Magnitude of impact criteria

Magnitude of impact	Criteria Guide
High	Total loss or major alteration to key elements or features of the baseline conditions to the extent that post-development character or composition of baseline conditions will be fundamentally changed. (E.g. large increase or decrease in peak flood level, significant deterioration or improvement of water quality)
Medium	Loss or alteration to one or more key elements or features of the baseline conditions to the extent that post-development character or composition of the baseline conditions will be materially changed. (E.g. moderate increase or decrease in peak flood level, moderate deterioration or improvement of water quality)
Low	Minor shift away from baseline conditions. Changes arising will be detectable but not material; the underlying character or composition of the baseline conditions will be similar to the pre-development situation. (E.g. slight increase or decrease in peak flood level, slight deterioration or improvement of water quality)
Negligible	Very little change from baseline conditions. Change is barely distinguishable, approximating to a ‘no change’ situation. (E.g. no discernible effects on hydrological elements (neither beneficial nor adverse))

13.4.15. The determination of the significance of effect is achieved using the matrix presented in **Table 13.6**.

Table 13.6 Significance of effect

Magnitude of impact	Sensitivity		
	High	Medium	Low
High	Major beneficial or adverse effect	Major or Moderate beneficial or adverse effect	Moderate or Minor beneficial or adverse effect
Medium	Major or Moderate beneficial or adverse effect	Moderate beneficial or adverse effect	Minor beneficial or adverse effect
Low	Moderate or Minor beneficial or adverse effect	Minor beneficial or adverse effect	Minor beneficial or adverse effect or negligible effect
Negligible	Negligible effect	Negligible effect	Negligible effect

13.4.16. The terms used within **Table 13.6** are defined as follows:

- Major adverse/beneficial effect: where the development will cause significant improvement (or deterioration) to the existing environment.
- Moderate adverse/beneficial effect: where the development will cause noticeable improvement (or deterioration) to the existing environment.
- Minor adverse/beneficial effect: where the development will cause perceptible improvement (or deterioration) to the existing environment.
- Negligible: no discernible improvement or deterioration to the existing environment.

13.4.17. For the purposes of this preliminary assessment, moderate or major beneficial/adverse effects are deemed to be significant. Minor beneficial/adverse or negligible effects are deemed to be not significant.

13.5. Summary of baseline conditions

Flooding

13.5.1. The Environment Agency flood map for planning²¹ was used for the assessment of fluvial flood risk to the Site. Spatial data available

²¹ Environment Agency, Flood Map for Planning (2023). Available online: [Flood map for planning - GOV.UK \(flood-map-for-planning.service.gov.uk\)](https://www.gov.uk/flood-map-for-planning.service.gov.uk)

online for flood zone 2²² and flood zone 3²³ have been reviewed and outlined on the Environmental Features Plan provided in **Figure 2.1**.

- 13.5.2. According to the Environment Agency flood map for planning, the Site is predominantly located within flood zone 1 (land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%), though areas of flood zones 2²⁴ and flood zone 3²⁵ do extend into some of the fields, particularly in the north east of the Site within Springwell East and alongside the east of Springwell West, as detailed in **Figure 2.1**. Similarly, the Site is typically at a low or very low risk of surface water flooding, though some fields within Springwell East do have a greater extent of areas of low to high surface water flood risk.

Waterbodies

- 13.5.3. The Site is shown on topographic mapping to be undulating with ground levels between approximately 30mAOD and 10mAOD across the Site. Lower site levels are typically towards the eastern boundaries of the Site. Many of the fields within the Site boundary are delineated by small field boundary drains/drainage ditches. The majority of these watercourses are unnamed. The ditches are not WFD classified and therefore considered low sensitivity receptors.
- 13.5.4. The Environment Agency is responsible for the maintenance, improvement or construction work on waterbodies classified as 'main rivers'. Main rivers are usually larger rivers or streams, though the Environment Agency decide on the designation of the waterbody as such. From the Environment Agency's main river mapping service²⁶, there are several main rivers within 2km of the Site.
- 13.5.5. The closest main river is Springwell Brook/Digby Beck, located outside of the Site boundary approximately 1.55km east from field reference Bcd111 (as shown on the Zonal Masterplan in **Figure 2.3**) and is shown as extending from Bloxholm in an easterly direction until it reaches Dorrington Dike (a larger Main River).
- 13.5.6. An upstream tributary of Dorrington Dike is classified as a main river, which is located outside of the Site boundary and is approximately 1.6km south from field reference Lf11 (as shown on

²² Environment Agency, Flood Map for Planning (Rivers and Sea) – Flood Zone 2. Available online: [Flood Map for Planning \(Rivers and Sea\) - Flood Zone 2 - data.gov.uk](#)

²³ Environment Agency, Flood Map for Planning (Rivers and Sea) – Flood Zone 3. Available online: [Flood Map for Planning \(Rivers and Sea\) - Flood Zone 3 - data.gov.uk](#)

²⁴ flood zone 2 - land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%)

²⁵ flood zone 3 - land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%)

²⁶ Environment Agency, Statutory Main River Map. Available online: Statutory Main River Map ([Account Login - ArcGIS Online](#))

the Zonal Masterplan in **Figure 2.3**). The watercourse flows south-east away from the Site.

- 13.5.7. Metheringham Beck is located outside of the Site boundary and is approximately 2km north east from field reference By05 (as shown on the Zonal Masterplan in **Figure 2.3**). The watercourse flows east away from the Site.
- 13.5.8. The Beck/Ruskington Brook is located outside of the Site Boundary and is approximately 2.5km south-east from field reference E1a (as shown on the Zonal Masterplan in **Figure 2.3**). The watercourse flows south-east away from the Site.
- 13.5.9. The remaining ditches and watercourses within the Site boundary would be under the jurisdiction of the Lincolnshire County Council (the Lead Local Flood Authority) as they are classified as ordinary watercourses.
- 13.5.10. Some watercourses are additionally within internal drainage districts and are also under the jurisdiction of Witham First Internal Drainage Board. The district broadly encompasses the eastern boundary of the Site namely fields east of By24 and field Bcd110 (as shown on the Zonal Masterplan in **Figure 2.3**).

Water Framework Directive designations

- 13.5.11. A section of Metheringham Beck (upstream of the main river section and classified as an ordinary watercourse) is located outside of the Site boundary, approximately 100m north from field By01. The watercourse is designated with a moderate ecological status under the Water Framework Directive/River Basin Management Plan (Cycle 3 – 2022).
- 13.5.12. Dorrington Dike (a main river) as described above is designated with a poor ecological status under the Water Framework Directive/River Basin Management Plan (Cycle 3 – 2022).
- 13.5.13. Ruskington Beck (The Beck) (a main river) as described above is designated with a moderate ecological status under the Water Framework Directive/River Basin Management Plan (Cycle 3 – 2022).
- 13.5.14. A Groundwater Source Protection Zone 1 is located within the Site boundary and is centred to the west of Scopwick (shown in **Figure 2.1**).
- 13.5.15. A Groundwater Source Protection Zone 3 is located within the Site boundary, within Springwell West, broadly at the south-westernmost boundary and to the north west of Blankney and to the south of Bloxham (shown in **Figure 2.1**).

Land use and designations

- 13.5.16. The Site is not within an area classified as a Drinking Water Safeguard Zone for surface or ground water, nor is it located at a Drinking Water Protected Area.

13.5.17. The Site is currently in agricultural use and therefore comprises permeable surfaces, such that surface water run-off generally infiltrates into the ground or is routed to the various ditches/drains that bisect the Site.

Sensitive receptors

13.5.18. The Water Stress Map²⁷, produced by the Environment Agency and published 1 July 2021²⁸, identifies the Site within an area deemed seriously water stressed, where water resources are being or are likely to be exploited to a degree which may result in pressure on the environment or water supplies both now and in future. The Site is shown on the map as within Area 2 – Anglian Water, with a 'serious' classification.

13.5.19. There are to be 24 permanent staff members working at the Proposed Development during operation. Assuming the water usage per staff member is 145 litres per day (based on typical usage guidance²⁹) then it is assumed water usage could reach 3480 litres per day, or 3.48 cubic metres of water. In line with **Table 13.4**, this would identify the Site as a low sensitivity receptor as water usage is >50 cubic meters per day and is for commercial use.

13.5.20. During the construction phase there will be an increased, but temporary, demand on water resources for construction activities such as groundworks (drilling etc), potable water for site cabins, and equipment cleaning (tools, wheel washing etc). Concrete is to be pre-mixed and brought to Site, therefore reducing demand on water resources on Site. Though total water usage for the construction phase is still to be determined, the activities would not be expected to exceed 50 cubic metres per day. Therefore, during the construction phase, this would identify the Site as a **low** sensitivity receptor.

13.5.21. The proximity of WFD classified water bodies in the Witham Lower Operational Catchment have been assessed against the location of the Site boundary and the extent of the study area.

13.5.22. There is one WFD classified waterbody which is within the study area, located approximately 100m north outside of the northern Site boundary. This is identified as Metheringham Beck waterbody.

13.5.23. The pathways from the Site to the receptor waterbody can be demonstrated through surface water flood extents which are available from the Environment Agency nationalised risk from

²⁷ Figure 1: map showing results of water stress classification, Water stressed areas – final classification 2021 Version 1.0, Environment Agency, 1 July 2021. Available online: <https://www.gov.uk/government/publications/water-stressed-areas-2021-classification>

²⁸ Water stressed areas – final classification 2021 Version 1.0, Environment Agency, 1 July 2021, accessed 02 October 2023 available at: <https://www.gov.uk/government/publications/water-stressed-areas-2021-classification>

²⁹ How much water do you use?, accessed 19 September 2023 at: <https://www.ccw.org.uk/save-money-and-water/averagewateruse/>

surface water flood mapping³⁰. The mapping of the surface water flood extents provides an indicative analysis of the expected overland flow pathways which are produced by flood modelling and considers the land topography which is a dominant factor in the directional flow of overland flows.

13.5.24. Baseline conditions of Metheringham Beck waterbody are outlined in **Table 13.7** below as per the classification item status. The baseline conditions are obtained from the Environment Agency Catchment Data Explorer resource which is available online at <https://environment.data.gov.uk/catchment-planning/> (accessed 13 September 2023).

13.5.25. Reasons For Not Achieving Good status (RNAG) for Metheringham Beck waterbody are outlined in **Table 13.8** below.

13.5.26. As Metheringham Beck is given a moderate ecological status, the watercourse is classed as being of **medium** sensitivity.

Table 13.7 Metheringham Beck waterbody classification status

Classification Item	2016	2019	2022
Ecological	Moderate	Moderate	Moderate
Physio-chemical quality elements	N/A	Moderate	Moderate
Ammonia (Phys-Chem)	N/A	High	High
Biochemical Oxygen Demand (BOD)	N/A	High	High
Dissolved oxygen	N/A	Good	High
Phosphate	N/A	Poor	Poor
Temperature	N/A	n/a	High
pH	N/A	High	High
Hydromorphological Supporting Elements	Supports Good	Supports Good	Supports Good
Hydrological Regime	Supports Good	Supports Good	Supports Good
Supporting elements (Surface Water)	Moderate	Moderate	Moderate
Mitigation Measures Assessment	Moderate or Less	Moderate or Less	Moderate or Less

³⁰ Environment Agency. Long term flood risk: surface water mapping. Available online: [Check the long term flood risk for an area in England - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/614242/Check_the_long_term_flood_risk_for_an_area_in_England_-_GOV.UK.pdf)

Table 13.8 Reasons for not achieving good status at Metheringham Beck waterbody

Significant Water Management Issue	Activity	Category	Classification Element
Point source	Sewage discharge (continuous)	Water Industry	Phosphate
Physical modification	Other	Agriculture and rural land management	Mitigation Measures Assessment
Physical modification	Other	Local and Central Government	Mitigation Measures Assessment
Measures delivered to address reason, awaiting recovery	Not applicable	No sector responsible	Mercury and Its Compounds
Measures delivered to address reason, awaiting recovery	Not applicable	No sector responsible	Polybrominated diphenyl ethers (PBDE)

Public Water Supplies

13.5.27. Consultation will be undertaken with Anglian Water to identify public water abstractions and the potential for the use of the public water supplies as part of the ongoing assessment. The responses will inform the evolving design and will be reported in the ES.

Private Water Supplies

13.5.28. Consultation will be undertaken to identify private water supplies within the Site as part of the ongoing assessment. The response will inform the evolving design and will be reported in the ES.

Abstractions and Discharge Consents

13.5.29. The environmental database reports provided in the appendices of the Preliminary Risk Assessment report³¹ (see **Appendix 10.1**) have been analysed to determine the number of abstraction and discharge consents in the study area. From the data available, there

³¹ Springwell Solar Farm, Preliminary Risk Assessment, 1922604 R01 (00), RSK Environment Ltd, November 2022

are approximately 41 active³² discharge and abstraction consents within the study area, comprising 13 discharge consents and 28 abstraction consents. Of these, eight of the consents are within the Site boundary, comprising eight abstraction consents, two are abstraction from surface water and six are for abstraction from groundwater.

Future baseline

- 13.5.30. There is unlikely to be any change to the baseline position with respect to the hydrological regime or waterbodies within the study area as there is no known reasoning for works to be undertaken on the watercourses or changes in point source pollution in the future. These features are unlikely to change significantly by natural processes.
- 13.5.31. The Metheringham Beck waterbody does not currently achieve a good status due to the presence of the sewer discharge from the nearby sewer treatment works. There are no known reasons why the sewer discharge from the sewer treatment works will change.

13.6. Likely effects, additional mitigation and residual effects

Construction phase

Table 13.9 Assessment of likely effects, additional mitigation and residual effects during construction

Receptor/ Matter	Likely Effects/Additional Mitigation/Residual Effects	(Secondary and Tertiary)
Metheringham Beck	Likely effects	Construction activities including top soil stripping and stockpiling of material, establishment of construction compounds and access tracks, reprofiling and vegetation clearance will have the potential to result in silt laden runoff arising from on-site construction activities, resulting in the sedimentation and pollution of watercourses, which could significantly degrade the receiving WFD classified waterbody.
	Additional (secondary and tertiary) mitigation	Measures to control silt/soil laden runoff produced during construction activities will be documented within and secured by the Outline Construction Environmental Management Plan and through the provision of an Outline Surface Water Drainage Strategy. Such measures will ultimately prevent silt laden runoff that may arise from the

³² Where a revocation date has not been supplied for the consent, it has assumed the consent is still active.

Receptor/ Matter	Likely Mitigation/Residual	Effects/Additional (Secondary and Tertiary) Effects
		<p>construction phase from reaching the receptor waterbody via overland flow pathways. Such measures would potentially include collecting surface water run-off from hard standing area in a sump, geotextile silt-fences around excavations and exposed ground, stockpiles to prevent the uncontrolled release of sediments from the Site, and installation of sediment traps on all surface water drains within the Site boundary.</p> <p>Likely residual effects</p> <p>The sensitivity of Metheringham Beck is considered to be medium based on the moderate ecological status, and with the mitigation in place in line with the Outline Construction Environmental Management Plan, the magnitude of impact would be negligible. Therefore, the significance of effect is considered to be negligible and not significant.</p>
Water resources	Likely effects	<p>During construction, the Proposed Development will increase the demand on water resources compared to the existing scenario as potable water will be required for the staff on site and raw water required for construction activities.</p> <p>Water supplied from private abstraction from the ground would be considered a worst case scenario given the Environment Agency has identified the Site as within a water stressed area.</p> <p>Environment Agency guidance states water abstraction from the ground for over 20 cubic metres of water per day will require a licence. The volumes of water usage and the sources of water supply are to be determined and will be considered in the design.</p> <p>Additional (secondary and tertiary) mitigation</p> <p>If it is expected that water abstraction would exceed 20 cubic meters of water per day during the construction period then additional water would be brought in by bowser to provide sufficient supply for construction activities.</p> <p>Likely residual effects</p> <p>The sensitivity of the local water resource is considered to be low. Confirmation of the water usage requirements of the Proposed</p>

Receptor/ Matter	Likely Mitigation/Residual	Effects/Additional Effects	(Secondary and Tertiary)
			Development will need to be determined; however, it is likely with mitigation in place to reduce reliance on water abstraction such as bringing in water from a bowser to reduce water usage to less than 20 cubic meters per day, the magnitude of impact would be negligible . Therefore, the significance of effect is considered to be negligible and not significant .

Operational phase

Table 13.10 Assessment of likely effects, additional mitigation and residual effects during operation

Receptor/ Matter	Likely Mitigation/Residual	Effects/Additional Effects	(Secondary and Tertiary)
Water resources	Likely effects		During the operational phase of the Proposed Development, there is likely to be an increase on the demand on water resources compared to the existing scenario as potable water will be required for operational staff. It is anticipated that this would be minimal based on approximately 24 permanent staff present during the operational phase. It is calculated 24 staff may use up to 3.48 cubic meters of water a day based on typical usage of water per individual. A worst case scenario assumes that this water will be provided from a private supply using water abstraction.
	Additional (secondary and tertiary) mitigation		Additional mitigation to reduce the water usage during the operational phase will be documented within and secured by the Outline Operational Environmental Management Plan. This would include dual flush systems on toilet facilities to reduce the demand on potable water supplies for staff and best practice measures to reduce water usage.
	Likely effects	residual	The sensitivity of the local water resource is considered to be low and assuming 3.48 cubic meters of water a day is required for staff, this is considered to be a negligible magnitude of impact on water resources. Therefore, the significance of effect is considered negligible and not significant . If Anglian Water will be

Receptor/ Matter	Likely Mitigation/Residual	Effects/Additional Effects	(Secondary and Tertiary)
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responsible for the supply of water, the effects would be anticipated to be lesser still.

Decommissioning phase

Table 13.11 Assessment of likely effects, additional mitigation and residual effects during decommissioning

Receptor/ Matter	Likely Mitigation/Residual	Effects/Additional Effects	(Secondary and Tertiary)
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Metheringham Beck	Likely effects	Decommissioning activities could increase the potential for soil erosion where there will be vehicle movements. This will have the potential to result in silt laden runoff arising from on-site activities, resulting in the sedimentation and pollution of watercourses, which could significantly degrade water quality of the receiving WFD classified waterbody.	
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	Additional (secondary and tertiary) mitigation	Measures to control silt/soil laden runoff produced during decommissioning activities will be documented within and secured by the Outline Decommissioning Environmental Management Plan, which would avoid, minimise or mitigate effects on the water environment. This would include best practice procedures to mitigate against erosion and manage the timing and conditions of the decommissioning activities.	
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	Likely residual effects	The sensitivity of the local water resource is considered to be medium . With mitigation in place in line with the Outline Decommissioning Environmental Management Plan, the magnitude of impact would be negligible . Therefore, the significance of effect is considered to be negligible and not significant .	
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Assessment against future baseline

13.6.1. Climate change may result in more frequent and severe storms in the UK with high intensity rainfall events. This is not anticipated to impact on water resources or water quality, however, this will be considered as part of the Flood Risk Assessment and Outline Surface Water Drainage Strategy which will be submitted in support of the DCO application. Climate change factors for increases in rainfall will be taken into account for surface water drainage calculations and Flood Risk Assessment.

13.7. Opportunities for environmental enhancement

- 13.7.1. The cessation of agricultural activity at the Site could lead to the stabilisation of soils and may reduce soil laden runoff into non-designated watercourses on Site. A reduction in the application of herbicides, pesticides or fertilizers as a result of changes in land management from agricultural producer to solar farm will result in a reduction of surface water runoff from the Site polluted with herbicides, pesticides or fertilizers.

13.8. Intra-project combined effects

- 13.8.1. It is recognised that there is potential for the interaction and combination of different environmental residual effects from within the Proposed Development to affect certain receptors discussed in this preliminary water assessment. For example, this could include impacts on water receptors due to mobilisation of the soils during construction. The intra-project combined effects will be presented within the ES once relevant assessments are further progressed.
- 13.8.2. Inter-project effects are assessed and presented in **Chapter 15: Cumulative Effects**.

13.9. Difficulties and uncertainties

- 13.9.1. The information provided in this PEIR is preliminary and is based on the information available at the time of writing. The final assessment of likely significant effects will be reported in the ES.
- 13.9.2. The ability for Anglian Water to provide a potable water mains supply to the Site for staff welfare facilities is currently unknown.

13.10. Further work to inform the ES

- 13.10.1. Consultation is ongoing with Anglian Water to confirm the provision of a potable water mains supply to the Site for staff welfare facilities.
- 13.10.2. A Flood Risk Assessment will be undertaken, which will inform the ongoing design. The Flood Risk Assessment will be submitted in support of the DCO application, and in parallel with the preparation of the ES.
- 13.10.3. The Flood Risk Assessment will be based on desktop studies of flood risk in line with the principles outlined by the Environment Agency and Department for Environment, Food and Rural Affairs (Defra) guidance for preparing a flood risk assessment¹⁷ and will be made using the data available for the fluvial and the surface water flood risk and establishing which areas of the Proposed Development are at risk from these flood risk sources. The assessment will consider the vulnerability of those using the Site, including arrangements for safe access and escape.
- 13.10.4. A quantitative assessment will be made whether the Proposed Development will cause an increase in flood risk elsewhere either as a result of modifications to the flood plain or changes in ground

permeability which can alter the surface water runoff from the Site. The assessment will be made by calculating greenfield runoff rates from the Site and ensuring surface water runoff rates from proposed areas of impermeability as a result of construction do not exceed existing greenfield runoff rates. The quantitative assessment into runoff rates will also consider the requirements for SuDS to mitigate against any potential increases in runoff rates from impermeable constructed areas.

- 13.10.5. Through the implementation of the Outline Surface Water Drainage Strategy, the Flood Risk Assessment will, if practicable, identify and secure opportunities to reduce the causes and impacts of flooding overall, making as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management.



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