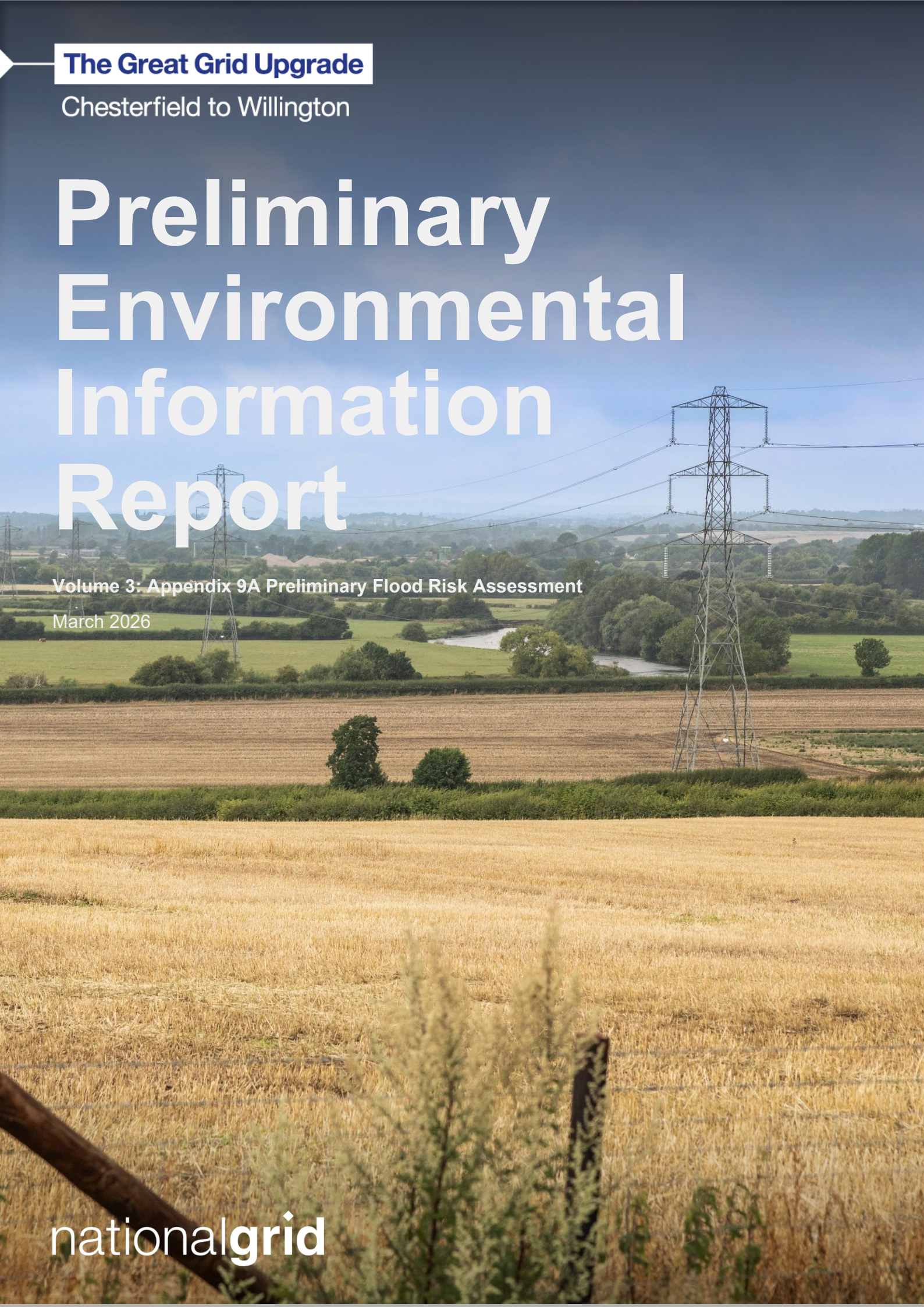
The Great Grid Upgrade

Chesterfield to Willington

Preliminary Environmental Information Report

Volume 3: Appendix 9A Preliminary Flood Risk Assessment

March 2026



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9A. Preliminary Flood Risk Assessment

9A.1 Introduction

Overview

9A.1.1 This preliminary Flood Risk Assessment (pFRA) has been prepared by WSP on behalf of National Grid Electricity Transmission plc (National Grid) and is intended to give consultees an understanding of the potential flood risk in relation to the Chesterfield to Willington Project (the 'Project').

9A.1.2 This pFRA forms Preliminary Environmental Information Report (PEIR) **Appendix 9A Preliminary Flood Risk Assessment** of **Chapter 9 Hydrology and Land Drainage** and is to be read in conjunction with the following chapters:

- Chapter 1 Introduction;
- Chapter 4 Description of the Project; and
- Chapter 9 Hydrology and Land Drainage.

9A.1.3 A description of the Study Area adopted for the purposes of this assessment is provided in section 9A.7 of this report.

9A.1.4 A description of the Project and the associated proposed new permanent infrastructure is in section 9A.7 of this report, with further details provided in **Chapter 4 Description of the Project**.

9A.1.5 This pFRA has been prepared on a route-wide basis and considers the Project, referring to specific locations and sub-sections where necessary.

9A.1.6 Further details on the assessment of the preliminary likely significant effects associated with the Project on hydrology and land drainage are provided in **Chapter 9 Hydrology and Land Drainage**.

9A.2 Scope and Methodology

Scope

9A.2.1 This pFRA comprises a qualitative preliminary assessment of the risk of flooding within the Study Area posed to, and arising from, the Project during the construction and operational phases for the present-day and future (with climate change) scenarios.

9A.2.2 It considers all of the primary sources of flooding (specifically fluvial and tidal, surface water, reservoir, artificial source and groundwater flooding) based on existing available and online data sources. The assessment does not include hydraulic modelling, manipulation of existing hydraulic models or other quantitative analysis at this stage (excluding a sample of flood depths in key areas that have been extracted from existing Environment Agency (EA) hydraulic models).

9A.2.3 Consultation with the EA and Lead Local Flood Authority (LLFA) (Derbyshire County Council) has been undertaken to gain provisional approval of the proposed methodology, understand any additional assessment requirements, secure agreement in principle of mitigation measures and understand requirements for future work at the full FRA stage.

9A.2.4 The assessment will be further developed in line with emerging design information, ongoing surveys and stakeholder consultation to form a full FRA which is to be submitted as part of an Environmental Statement (ES) in support of the Development Consent Order (DCO) application.

9A.2.5 High-level mitigation measures are also summarised in this report, including recommended design principles for inclusion in the proposed design and operation of the Project. **Chapter 4 Description of the Project** and **Appendix 4A Draft Outline Code of Construction Practice** should be referred to for further details on the construction phase.

9A.2.6 The National Policy Statement (NPS) for Electricity Networks Infrastructure (EN-5) (Ref 9A.2) states that nationally significant electricity networks such as the Project, are likely to have an ongoing function that will be subject to maintenance and reinforcement works prior to replacement at the end of their lifespan. There are currently no specific plans to decommission the Project. It is expected that the transmission of electricity would continue for as long as there is a business case for doing so and that any decommissioning activity would occur decades into the future. For the purposes of this assessment, it has been assumed that the Project would have a design life of at least 80 years, given the life expectancy of the materials required for the Project is up to approximately 80 years.

9A.2.7 An assessment of the decommissioning phase of the Project has therefore not been undertaken as part of this pFRA as it was scoped out of the assessment as referenced in the Scoping Report (Ref 9A.3) and Scoping Opinion (Ref 9A.4).

Methodology

9A.2.8 The pFRA follows a source-pathway-receptor-led approach to the assessment of flood risk. The terms below are defined in the following ways for the purpose of this pFRA:

- **sources**: defined as the potential source of flood risk to be assessed, such as direct rainfall, watercourses, the sea, groundwater or infrastructure;
- **pathways**: defined as the means by which the source of flood risk can impact potential receptors;
- **flood mechanism**: defined as a specific combination of sources and pathways such as extreme rainfall events and overtopping of riverbanks or flood defences; and
- **receptors**: defined as those persons or assets that could be vulnerable to the flood mechanisms identified.

9A.2.9 The source-pathway-receptor-led approach included establishing the Study Area as the extent of the draft Order Limits plus a 500 m buffer around this boundary.

9A.2.10 With the Study Area established, an assessment of flood risk from all sources posed to, and arising from the Project was undertaken. This pFRA identifies sources that require further assessment and suggests preliminary flood risk mitigation measures.

9A.2.11 With due consideration of the temporary nature of many of the elements of the Project, which are only required during the construction phase, and the outline nature of design work currently undertaken, the approach taken in the pFRA is considered to be proportionate to the risk and appropriate to the scale, nature and location of the Project.

9A.3 Sources of Information

9A.3.1 The following sources of data have been used to inform this preliminary assessment of flood risk, including the 2025 versions of the EA's flood maps:

- EA Flood Map for Planning – Fluvial and Tidal Flood Risk (Ref 9A.8);
- EA Risk of Flooding from Rivers and Sea (Ref 9A.9);
- EA Long Term Flood Risk Mapping (Ref 9A.10);
- EA Risk of Flooding from Surface Water mapping (Ref 9A.11);
- EA Reservoir Flood Risk mapping (Ref 9A.12);
- EA Statutory Main River Map (Ref 9A.13);
- EA Asset Information Management Systems (AIMS) Spatial Flood Defences mapping (Ref 9A.14);
- EA Recorded Flood Outline mapping (Ref 9A.15);
- British Geological Survey Mapping (Ref 9A.16);
- Department for Environment, Food and Rural Affairs Multi-Agency Geographic Information for the Countryside (MAGIC) mapping (Ref 9A.17); and
- Photos from a Member of Parliament (MP)-led engagement event (2025).

9A.4 Terminology

9A.4.1 This pFRA expresses the probability associated with a given flood event in terms of annual probability, which is the inverse of the annual return period. For example, a flood event with a return period of 1 in 100 years can be expressed as having a one per cent annual probability (i.e. a flood event that has a one per cent chance of occurring in any given year) as detailed in paragraph 002 of the Flood Risk and Coastal Change Planning Practice Guidance (Ref 9A.7).

9A.4.2 **Table 9A.1** summarises the annual probabilities associated with the flood events used to define each Flood Zone as given by the EA's Flood Map for Planning (Ref 9A.8) and detailed in Paragraph 078 of the Flood Risk and Coastal Change Planning Practice Guidance.

Table 9A.1: Flood zone definitions

Flood Zone	Probability of Flooding	Definition
Flood Zone 1	Low	Land having a less than 1 in 1,000-year annual probability of river or sea flooding.
Flood Zone 2	Medium	Land having between a 1 in 100-year and 1 in 1,000-year annual probability of river flooding; or land having between a 1 in 200-year and 1 in 1,000-year annual probability of sea flooding.
Flood Zone 3a	High	Land having a 1 in 100-year or greater annual probability of river flooding; or land having a 1 in 200-year or greater annual probability of sea flooding.
Flood Zone 3b	Functional floodplain	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters.

9A.4.3 **Table 9A.2** summarises the annual probabilities associated with the flood events used to define the risk of flooding as given by the EA's Risk of Flooding from Rivers and Sea (Ref 9A.9) and Risk of Flooding from Surface Water mapping (Ref 9A.11).

Table 9A.2: Long-term flood risk mapping definitions

Probability of Flooding	Definition
Very Low	Land having a less than 1 in 1,000-year annual probability of flooding.
Low	Land having between a 1 in 1,000-year and 1 in 100-year annual probability of flooding.
Medium	Land having between a 1 in 100-year and 1 in 30-year annual probability of flooding.
High	Land having a 1 in 30-year or greater annual probability of flooding.

9A.5 Structure

9A.5.1 This pFRA is structured as follows:

- section 9A.6 (Legislation, Policy Framework and Consultation) establishes the legislation and planning policy context for the pFRA and the subsequent FRA and offers a summary of the consultation that has been undertaken at the time of writing;

- section 9A.7 (Study Area and Project Description) provides an overview of the Study Area and a description of the Project;
- section 9A.8 (Flood Risk Screening) considers the potential risk from all sources of flooding prevailing across the Study Area and identifies those that require further assessment;
- section 9A.9 (Preliminary Flood Risk Assessment) presents a preliminary assessment of the risk of flooding posed to, and arising from, the Project within the Study Area associated with those risks identified in section 9A.8 as requiring further assessment. In addition, it details proposed hydraulic modelling work;
- section 9A.10 (Flood Risk Management) presents a preliminary identification of the mitigation measures that are expected to be required to manage the risks of flooding assessed in section 9A.9;
- section 9A.11 (Planning Requirements) discusses the requirements of the Sequential Test and the Exception Test in relation to the Project; and
- section 9A.12 (Conclusion) summarises the key findings and conclusions arising from this pFRA.

9A.6 Legislation, Policy Framework and Consultation

Introduction

9A.6.1 The following section sets out the relevant regulatory and planning policy context for the Project with respect to flood risk. It is structured in hierarchical order, from national policy to local guidance, and is to be read in conjunction with **Chapter 2 Legislation, Regulatory and Planning Policy Context**.

9A.6.2 The following Policy, Legislation and Guidance have also been considered throughout this assessment:

- Planning Act 2008 (PA 2008) (Ref 9A.1);
- Flood and Water Management Act 2010 (Ref 9A.18);
- Land Drainage Act 1991 (Ref 9A.19);
- The Environmental Permitting (England and Wales) Regulations 2016 (Ref 9A.20);
- National Policy Statement for Electricity Networks Infrastructure (EN-5) (Ref 9A.2);
- Overarching National Policy Statement for Energy (EN-1) (Ref 9A.5);
- National Planning Policy Framework (NPPF) (Ref 9A.6);
- Flood Risk and Coastal Change Planning Practice Guidance (Ref 9A.7);
- Amber Valley Borough Local Plan (adopted 2006) (Ref 9A.40);
- Amber Valley Borough Local Plan - Local Plan Submission (July 2024) (Ref 9A.21);
- Local Plan for Bolsover District (Ref 9A.22);

- Chesterfield Borough Local Plan (Ref 9A.23);
- Erewash Core Strategy (Ref 9A.24);
- North East Derbyshire Local Plan 2014 – 2034 (Ref 9A.25);
- South Derbyshire District Council Local Plan (Ref 9A.26);
- Derbyshire County Council's Local Flood Risk Management Strategy (Ref 9A.27);
- National Grid Technical Specification 2.10.13: Technical Specifications - Flood Defences for Electricity Substations (Ref 9A.28);
- Engineering Technical Report 138 Issue 3 2018: Resilience to Flooding of Grid and Primary Substations (Ref 9A.29);
- EA Climate Change Guidance (Ref 9A.30);
- Flood Estimation handbook (FEH) (Ref 9A.31);
- The Sustainable Drainage System (SuDS) Manual (C753F) (Ref 9A.32);
- Non-Statutory Technical Standards for Sustainable Drainage Systems (Ref 9A.33);
- Chesterfield to Willington Corridor Preliminary Routeing and Siting Study (Ref 9A.34);
- Chesterfield to Willington Strategic Options Report (Ref 9A.35); and
- Derbyshire County Council and Derby City Council's Strategic Flood Risk Assessment (Part 1) (Ref 9A.39).

National Planning Policy and Guidance

National Policy Statements

Introduction

9A.6.3 Section 104 of PA 2008 (Ref 9A.1) identifies the role that NPSs play in the decision-making process when considering applications for development consent. Section 104(2) states that:

'In deciding the application, the Secretary of State must have regard to –

a) any national policy statement which has effect in relation to development of the description to which the application relates (a "relevant national policy statement"),

[…]

d) any other matters which the Secretary of State thinks are both important and relevant to the Secretary of State's decision.'

9A.6.4 The pFRA has therefore been prepared in accordance with the requirements of PA 2008 (Ref 9A.1) and the following NPSs[1]:

[1] The updated NPSs came into force on 6 January 2026; however, this post-dated the drafting and assessment work within this appendix and so are not reflected within the relevant policy descriptions in this appendix, which are instead based on the 2023 versions of the NPSs that were in force at the time of preparing the appendix. These sections will be updated as part of the Application.

- Overarching National Policy Statement for Energy (EN-1) (NPS EN-1) (Adopted 2024) (Ref 9A.5); and
- National Policy Statement for Electricity Networks Infrastructure (EN-5) (NPS EN-5) (Adopted 2024) (Ref 9A.2).

9A.6.5 NPS EN-1 sets out national planning policy for Nationally Significant Infrastructure Projects (NSIPs) in the energy sector, with NPS EN-5 providing technology-specific policy for electricity transmission and distribution. Where the respective NPSs do not provide sufficient detail to inform the pFRA, reference is made to the NPPF (Ref 9A.6) and the Flood Risk and Coastal Change Planning Practice Guidance (PPG) (Ref 9A.7) as set out in the respective sections below.

9A.6.6 Section 5.8 of NPS EN-1 (Ref 9A.5) considers the generic flood risk impacts that arise from the development of all types of infrastructure covered by the energy NPSs. Section 4.10 details how the effects of climate change should be considered to ensure that new energy infrastructure is sufficiently resilient to the anticipated impacts of climate change.

9A.6.7 Section 2.3 of NPS EN-5 (Ref 9A.2) details how electricity network infrastructure should consider climate change adaptation and resilience within the design of new schemes. Section 2.3 details that applicants should set out to what extent a project is expected to be vulnerable and how it has been designed to be resilient to flooding.

9A.6.8 The summary of the key minimum requirements for the assessment of flood risk in relation to the Project given by NPS EN-1 and EN-5 are summarised in **Table 9A.3** below.

9A.6.9 Draft updates were published in April 2025 to both NPS EN-1 and EN-5. For EN-1, there are some changes to the draft's 'Flood Risk' section, namely paragraph 5.8.3 being replaced and text added to paragraph 5.8.36, although these changes are not significant to the outcome of this assessment.

Table 9A.3: Minimum FRA requirements

Category	Source	Requirement
Application	NPS EN-1 (5.8.13)	The application should be supported by an appropriate FRA.
Assessment	NPS EN-1 (5.8.14 and 5.8.15)	This assessment should identify and assess the risks of all forms of flooding to and from the Project and demonstrate how these flood risks will be managed, taking climate change into account.
		The FRA should be proportionate to the risk and appropriate to the scale, nature and location of the Project.
		The FRA should be undertaken by competent people, as early as possible in the process of preparing the proposal.
		The FRA should be supported by appropriate data and information, including historical information on previous events.
		The FRA must consider the vulnerability of those using the site, including arrangements for safe access and escape.

Category	Source	Requirement
		The FRA should consider and quantify the different types of flooding (whether from natural and human sources and including joint and cumulative effects) and include information on flood likelihood, speed-of-onset, depth, velocity, hazard and duration.
		The FRA must include the assessment of the remaining (known as 'residual') risk after risk reduction measures have been taken into account and demonstrate that these risks can be safely managed, ensuring people will not be exposed to hazardous flooding.
		The FRA must detail those measures that will be included to ensure the development will be safe and remain operational during a flooding event throughout the development's lifetime, without increasing flood risk elsewhere.
		The FRA should consider the effects of a range of flooding events, including extreme events, on people, property, the natural and historic environment, as well as river and coastal processes.
Policy	NPS EN-1 (5.8.36)	The Project should be in line with any relevant national and local flood risk management strategy.
Climate Change	NPS EN-1 (5.8.15)	The FRA should take the impacts of climate change into account, across a range of climate scenarios, clearly stating the development lifetime over which the assessment has been made.
	NPS EN-5 (2.3.2)	The applicant should set out to what extent the Project is expected to be vulnerable to climate change and the measures incorporated to ensure that it will be resilient to flooding, particularly for substations that are vital to the network; and especially in light of changes to groundwater levels resulting from climate change.
The Sequential Test and Exception Test	NPS EN-1 (5.8.36 and 5.8.21)	The Sequential Test must be applied and satisfied as part of site selection, taking all sources of flood risk and climate change into account.
	NPS EN-1 (5.8.9, 5.8.10 and 5.8.11)	If, following application of the Sequential Test, it is not possible for the Project to be located in areas of lower flood risk, the Exception Test can be applied as defined in the Flood Risk and Coastal Change PPG (Ref 9A.7). Both elements of the Exception Test should be satisfied for the Project to be consented.
On-site Flood Risk	NPS EN-1 (5.8.15 and 5.8.36)	The Project should be designed and constructed to remain safe and operational during its lifetime, with appropriate mitigation and management measures detailed in the FRA.
		The FRA should consider the vulnerability of those using the Project, including arrangements for safe access and escape. Safe access and escape routes must be identified where required, as part of an agreed emergency plan, and any residual risk must be safely managed over the lifetime of the Project.

Category	Source	Requirement
	NPS EN-1 (5.8.29 and 5.8.36)	The sequential approach should be applied at the site level to minimise risk by directing the most vulnerable uses to areas of lowest flood risk. Vulnerable aspects of the Project should be located on parts of the Project at lower risk and residual risk of flooding.
	NPS EN-1 (5.8.36)	Land that is likely to be needed for present or future flood risk management infrastructure should be appropriately safeguarded from development to the extent that development will not prevent or hinder its construction, operation or maintenance.
Off-site Flood Risk	NPS EN-1 (5.8.15, 5.8.36 and 5.8.42)	The FRA must consider the risk of flooding arising from the Project in addition to the risk of flooding to the Project. The Project must be designed and constructed to remain safe and operational without increasing flood risk elsewhere over its intended design life. Exceptionally, where an increase in flood risk elsewhere cannot be avoided or wholly mitigated, the Secretary of State may grant consent subject to present and future flood risk being mitigated to an acceptable extent.
	NPS EN-1 (5.8.41)	If the Project has to be located in Flood Zone 3b for operational reasons, it should not result in a net loss of floodplain storage or impede water flows.
	NPS EN-1 (5.8.30 and 5.8.31)	If the Project could result in an increase in flood risk elsewhere through the loss of flood storage, on-site level-for-level compensatory storage, accounting for the predicted impacts of climate change over the lifetime of the development, should be provided. Where it is not possible to provide compensatory storage on site, it may be acceptable to provide it off-site if it is hydraulically and hydrologically linked. If the Project may cause the deflection or constriction of flood flow routes, these will need to be safely managed within the site.
Opportunities	NPS EN-1 (5.8.15)	The FRA should 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. The FRA should also identify and secure opportunities to reduce the causes and impacts of flooding overall during the construction phase.
	NPS EN-1 (5.8.29)	Applicants for development consent should seek opportunities to use open space for multiple purposes such as amenity, wildlife habitat and flood storage uses. Opportunities should be taken to lower flood risk by reducing the built footprint of previously developed sites and using SuDS.
Residual Risk	NPS EN-1 (5.8.15)	The FRA should include assessment of the residual risk after appropriate measures have been considered and demonstrate that these risks can be safely managed.
		The FRA should consider both the potential adverse and beneficial effects of flood risk management infrastructure, including raised

Category	Source	Requirement
		defences, flow channels, flood storage areas and other artificial features, together with the consequences of their failure and exceedance.
Surface Water Drainage	NPS EN-1 (5.8.15)	The FRA must consider how the ability of water to soak into the ground may change with development, along with details of how the proposed layout of the Project may affect drainage systems.
	NPS EN-1 (5.8.36)	SuDS must be used unless there is clear evidence that their use would be inappropriate.
	NPS EN-1 (5.8.26)	Site layout and surface water drainage systems should cope with events that exceed the design capacity of the system, so that excess water can be safely stored on or conveyed from the site without adverse impacts.
	NPS EN-1 (5.8.27)	The surface water drainage arrangements for the Project should, accounting for the predicted impacts of climate change throughout the lifetime of the Project, be such that the volumes and peak flow rates of surface water leaving the site are no greater than the rates prior to the Project, unless specific off-site arrangements are made and result in the same net effect.
	NPS EN-1 (5.8.37)	Approval for the Project's drainage system, including during the construction period, will form part of the development consent issued by the Secretary of State and must comply with any National Standards published by Ministers under paragraph 5(1) of Schedule 3 to the Flood and Water Management Act 2010 (Ref 9A.18).
	NPS EN-1 (5.8.38)	Provision for appropriate operation and maintenance of any SuDS throughout the Project's lifetime must be made. Where this is secured through the adoption of any SuDS features, any necessary access rights to property will need to be granted.

National Planning Policy Framework

9A.6.10 The NPPF (Ref 9A.6) acts as guidance for local planning authorities (LPAs) and decision makers when drawing up local development plans and determining individual planning applications.

9A.6.11 Although the NPPF and the associated Flood Risk and Coastal Change PPG (Ref 9A.7) are not directly applicable to NSIPs, they provide relevant additional guidance on a range of issues in relation to flood risk and both documents are referenced in paragraph 5.8.16 of the NPS EN-1 (Ref 9A.5). The NPPF and Flood Risk and Coastal Change PPG provide the definition of flood zones, flood risk vulnerability classifications, flood risk compatibility, the requirements for FRAs, the application of the Sequential Test and the Exception Test as well as appropriate allowances for the anticipated effects of climate change.

9A.6.12 Paragraph 078 of the Flood Risk and Coastal Change PPG defines the flood zones given by the EA's Flood Map for Planning as presented in **Table 9A.1**. Annex 3 of the NPPF details the classification of flood risk vulnerability by development type, with Paragraph 079 of the Flood Risk and Coastal Change PPG summarising flood zone incompatibility and flood risk vulnerability. Further information on the classification of flood risk vulnerability and flood zone compatibility in relation to the various elements of the Project, is provided in section 9A.7 of this pFRA.

9A.6.13 Paragraph 175 of the NPPF states that:

'The sequential test should be used in areas known to be at risk now or in the future from any form of flooding, except in situations where a site-specific flood risk assessment demonstrates that no built development within the site boundary, including access or escape routes, land raising or other potentially vulnerable elements, would be located on an area that would be at risk of flooding from any source, now and in the future (having regard to potential changes in flood risk).'

9A.6.14 Paragraph 177 of the NPPF states that:

'Having applied the sequential test, if it is not possible for development to be located in areas with a lower risk of flooding (taking into account wider sustainable development objectives), the exception test may have to be applied. The need for the exception test will depend on the potential vulnerability of the site and of the development proposed'.

Paragraph 178 of the NPPF states that:

'To pass the exception test it should be demonstrated that:

a) the development would provide wider sustainability benefits to the community that outweigh the flood risk; and

b) the development 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.'

9A.6.15 Paragraph 181 of the NPPF requires that new development should not increase flood risk elsewhere, and that opportunities should be sought to reduce flood risk, where possible. It states that:

'Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;

b) the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;

c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;

d) any residual risk can be safely managed; and

e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.'

9A.6.16 Paragraph 049 of the Flood Risk and Coastal Change PPG (Ref 9A.7) states that:

'Where flood storage from any source of flooding is to be lost as a result of development, on-site level-for-level compensatory storage, accounting for the predicted impacts of climate change over the lifetime of the development, should be provided.'

9A.6.17 Paragraph 049 also states that:

'The loss of floodplain storage is less likely to be a concern in areas benefitting from appropriate flood risk management infrastructure or where the source of flood risk is solely tidal.'

9A.6.18 There is a presumption for the use of SuDS within any development, except in rare instances that it can be demonstrated that SuDS principles cannot be feasibly incorporated within a development, as agreed with the planning authority.

9A.6.19 Paragraph 182 of the NPPF states that:

'Applications which could affect drainage on or around the site should incorporate sustainable drainage systems to control flow rates and reduce volumes of runoff, and which are proportionate to the nature and scale of the proposal. These should provide multifunctional benefits wherever possible, through facilitating improvements in water quality and biodiversity, as well as benefits for amenity. Sustainable drainage systems provided as part of proposals for major development should:

a) take account of advice from the Lead Local Flood Authority;

b) have appropriate proposed minimum operational standards; and

c) have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development.'

9A.6.20 Paragraph 056 of the Flood Risk and Coastal Change PPG (Ref 9A.7) states that:

'Where possible, preference should be given to multi-functional sustainable drainage systems, and to solutions that allow surface water to be discharged according to the following hierarchy of drainage options:

1) into the ground (infiltration);

2) to a surface water body;

3) to a surface water sewer, highway drain, or another drainage system;

4) to a combined sewer.'

Local Planning Policy and Guidance

Local planning authorities

9A.6.21 As an NSIP, the application for development consent in respect of the Project will be determined by the Secretary of State rather than the LPA. However, the LPA is a statutory consultee in the DCO process.

9A.6.22 For the purpose of this assessment, the local plans and the relevant local planning policies of the District and Borough Councils that lie within Derbyshire County Council's authority have been used to inform the Local Planning Policy Summary in **Table 9A.4:** below. These are considered to be in general accordance with the national policies set out in this section.

Table 9A.4: Local planning policy summary

Local Plan	Content
Amber Valley Borough Council Local Plan (2006) (Ref 9A.40) and Local Plan 2022-2040 Submission (Ref 9A.21)	Amber Valley Borough Council's Local Plan was formally adopted in 2006. Policies EN14 and EN15 within the Local Plan offer details regarding flood risk management including, but not limited to: requiring development not to have an adverse impact on flood risk management; appropriate application of the sequential test; and the use of sustainable drainage techniques, where possible. In addition, the Council submitted the Amber Valley Borough Local Plan 2022-2040 Local Plan to the Secretary of State in July 2024. At the time of writing, this is thought to be the most recent version of the Local Plan, but it should be noted that some of the policies could be subject to change. Local Plan Objective 12 is: '*To ensure that new development is directed away from areas at highest risk of flooding, and to maintain, enhance and where necessary remediate the quality of surface and groundwater resources.*' Policy EN1: Climate Change and EN11: Derelict, Unstable and Contaminated Land both pertain to developments being suitably located and future-proofed against future impacts from climate change, including from a flood risk perspective.
Local Plan for Bolsover District (Ref 9A.22)	The Local Plan for Bolsover District was formally adopted in March 2020. Among the policies included in the Plan regarding sustainable development and the protection of infrastructure from future impacts of climate change, Policy SC7: Flood Risk states requirements for new developments with a primary focus on fluvial and surface water flood risk and the effective implementation of SuDS.
Chesterfield Borough Council Local Plan (Ref 9A.23)	The Chesterfield Borough Local Plan was formally adopted in July 2020. The Plan contains policies to ensure the protection of infrastructure within the borough, particularly from the impacts of flooding. A key policy within the Plan is CLP13: Managing the Water Cycle. The policy aims to direct new developments to the areas at lowest risk of flooding, including considerations of climate change. This aims to ensure the safe operation of new developments through their lifecycle and to ensure flooding to adjacent areas is minimised as much as possible. Improvements to the drainage network are also included as a policy, as is the protection of the water environment.
Erewash Core Strategy (Ref 9A.24)	Erewash Borough Council Local Plan was not readily available online at the time of writing this assessment. A review of Erewash Borough Council's website suggests that the Erewash Core Strategy, adopted in 2014, is the council's most up to date planning policy document, running up to 2028. Work is underway to replace this document. The Strategy contains 20 key strategic policies for the area, including Policy 1: Climate Change. This offers specific advice on guiding new developments to areas at lower risk of flooding. Given the pending expiry of this document, however, a more detailed review of subsequent submissions will be undertaken at the full FRA stage if further information is available.

Local Plan	Content
North-East Derbyshire District Local Plan 2014 – 2034 (Ref 9A.25)	The Local Plan was formally adopted in November 2021. There is a focus on flood risk in the Local Plan, specifically regarding strategic placement of new development to reduce the potential impact of flooding across the borough. Policy SDC11: Flood Risk and Drainage offers more details on policy requirements, which include compliance with the Sequential and Exception Tests, ensuring surface water runoff is sufficiently managed at source, and the development of SuDS.
South Derbyshire District Council Local Plan (Ref 9A.26)	South Derbyshire Local Plan was adopted in 2016. The following policies are of relevance to flood risk: Policy SD1: Amenity and Environmental Quality (flood risk); Policy SD2: Flood Risk; and Policy SD3: Sustainable Water Supply, Drainage and Sewerage Infrastructure. These three policies together take into account water quality management, flood risk resilience and the need for appropriate mitigation measures for new developments, and the importance of effective implementation of SuDS.
Derby City Local Plan – Part 1: Core Strategy (Ref 9A.38)	The Derby City Local Plan Core Strategy was adopted in 2017 with a focus on outlining policies to inform the location of new development in the Derby city area. Policy CP2 includes points for flood risk and water management including, but not limited to: • ensuring that development is resilient to impacts from flooding and doesn't pose a higher risk to adjacent areas; • appropriate application of the sequential and exception tests; and • implementation of sustainable drainage principles.

Other Statutory Bodies

The Environment Agency

9A.6.23 The EA is the lead statutory body responsible for the protection of the water environment and is a statutory consultee to the DCO process. It is also responsible for flood defence and drainage in relation to main rivers along with estuarine and coastal areas.

9A.6.24 The EA produces regional management plans and policies, including Catchment Flood Management Plans, which are summarised below.

Climate change

9A.6.25 Overarching NPS for Energy (EN-1) (Ref 9A.5) and NPS for Electricity Networks Infrastructure (EN-5) (Ref 9A.2) provide advice on accounting for climate change, identifying that developments should be resilient and adaptive to the latest applicable climate change projections.

9A.6.26 The EA's FRA climate change guidance (Ref 9A.30) is to be used to determine appropriate climate change allowances for the FRA. The guidance provides allowances for the projected increases in peak river flow, peak rainfall intensity, sea level rise, offshore wind speed and extreme wave height. Further details on the climate change allowances applicable to each element of the Project are provided in section 9A.10 (**Table 9A.16**).

Peak river flow

9A.6.27 The EA's allowances for peak river flow detail the anticipated changes to peak flow by sub-catchments of river basin districts known as management catchments.

9A.6.28 The range of climate change allowances for peak river flow given by the EA's guidance is based on percentiles which describe the proportion of possible scenarios that fall below a given allowance level and are defined as follows:

- the 'central' allowance is based on the 50th percentile;
- the 'higher central' allowance is based on the 70th percentile; and
- the 'upper end' allowance is based on the 95th percentile.

9A.6.29 The allowances are provided for three epochs which are to be applied as appropriate given the intended design life of a given development:

- the 2020s, covering the period 2015 to 2039;
- the 2050s, covering the period 2040 to 2069; and
- the 2080s, covering the period 2070 to 2115.

9A.6.30 The latest allowances for peak river flow for the management catchments in which the Project is located are summarised in **Table 9A.5**.

Table 9A.5: Climate change allowances (peak river flow)

Allowance Category	Allowances for Peak River Flow (%) for the '2080s' (2070 – 2115)
Don and Rother Management Catchment	
Central	28
Higher central	38
Upper end	60
Derwent Derbyshire Management Catchment	
Central	29
Higher central	39
Upper end	63
Lower Trent and Erewash Management Catchment	
Central	29

Allowance Category	Allowances for Peak River Flow (%) for the '2080s' (2070 – 2115)
Higher central	39
Upper end	62

9A.6.31 The EA's FRA climate change guidance (Ref 9A.30) advises that allowances should be applied based on the vulnerability of a given development using the following criteria:

- *'In Flood Zones 2 or 3a for:*
  - *essential infrastructure – use the higher central allowance;*
  - *highly vulnerable – use central allowance (development should not be permitted in Flood Zone 3a);*
  - *more vulnerable – use the central allowance;*
  - *less vulnerable – use the central allowance; and*
  - *water compatible – use the central allowance.*
- *In Flood Zone 3b for:*
  - *essential infrastructure – use the higher central allowance;*
  - *highly vulnerable – development should not be permitted;*
  - *more vulnerable – development should not be permitted;*
  - *less vulnerable – development should not be permitted; and*
  - *water compatible – use the central allowance.'*

9A.6.32 The EA's FRA climate change guidance provides advice on the application of allowances for peak river flow in the assessment of off-site impacts and in the calculation of floodplain compensation, stating that developments should use the*:*

- '*central allowance for most cases; and*
- *higher central allowance when the affected area contains essential infrastructure.*'

Peak rainfall intensity

9A.6.33 The EA's FRA climate change guidance (Ref 9A.30) for peak rainfall intensity is required to be used for the design of surface water drainage infrastructure and for the assessment of surface water flood risk in small catchments with an area of less than 5 km^2.

9A.6.34 The range of allowances for peak rainfall intensity given by the EA's guidance is based on percentiles which describe the proportion of possible scenarios that fall below a given allowance level and are defined as follows:

- the 'central' allowance is based on the 50th percentile; and
- the 'upper end' allowance is based on the 95th percentile.

9A.6.35 The allowances are provided for two epochs which are to be applied as appropriate given the intended design life of a given development:

- the '2050s', for development with a lifetime up to 2060; and
- the '2070s', for development with a lifetime between 2061 and 2125.

9A.6.36 The latest allowances for peak rainfall intensity for the management catchments in which the Project is located are summarised in **Table 9A.6**.

Table 9A.6: Climate change allowances (peak rainfall intensity)

Allowance Category	Allowances for Peak Rainfall Intensity (%) (3.33% annual rainfall exceedance event) for the '2070s' (2061 – 2125)	Allowances for Peak Rainfall Intensity (%) (1% annual rainfall exceedance event) for the '2070s' (2061 – 2125)
Don and Rother Management Catchment		
Central	25	25
Upper end	35	40
Derwent Derbyshire Management Catchment		
Central	25	30
Upper end	35	40
Lower Trent and Erewash Management Catchment		
Central	25	25
Upper end	35	40

9A.6.37 The EA's FRA climate change guidance (Ref 9A.30) provides advice on the application of allowances for peak rainfall intensity for developments with an expected lifetime beyond 2100, stating that:

'For flood risk assessments and strategic flood risk assessments assess the upper end allowances. You must do this for both the 1% and 3.3% annual exceedance probability events for the 2070s epoch (2061 to 2125). Design your development so that for the upper end allowance in the 1% annual exceedance probability event:

- *there is no increase in flood risk elsewhere*
- *your development will be safe from surface water flooding'.*

Catchment flood management plans

9A.6.38 Catchment flood management plans consider inland flooding from all potential sources of flooding within a given river basin district with the aim of helping the EA and other flood risk stakeholders plan for the effective management of flood risk.

9A.6.39 The Study Area traverses the Humber River Basin District. The relevant policies from the associated Catchment Flood Management Plans for river catchments from within the Humber River Basin District (Ref 9A.36) are summarised in **Table 9A.7** with reference to the following policy options:

- Policy 1 – *'Areas of little or no flood risk where we will continue to monitor and advise.'*
- Policy 2 – *'Areas of low to moderate flood risk where we can generally reduce existing flood risk management actions.'*
- Policy 3 – *'Areas of low to moderate flood risk where we are generally managing existing flood risk effectively.'*
- Policy 4 – '*Areas of low, moderate or high flood risk where we are already managing the flood risk effectively but where we may need to take further actions to keep pace with climate change.*'
- Policy 5 – *'Areas of moderate to high flood risk where we can generally take further action to reduce flood risk.'*
- Policy 6 – *'Areas of low to moderate flood risk where we will take action with others to store water or manage run-off in locations that provide overall flood risk reduction or environmental benefits.'*

Table 9A.7: Catchment Flood Management Plan policy summary

Catchment Flood Management Plan	Sub-Area	Policy
Humber River Basin District		
River Don (Ref 9A.41)	Chesterfield and River Hipper	6
River Trent (Ref 9A.42)	Burton, Derby and Nottingham	5

Flood Risk Activity Permits (FRAPs)

9A.6.40 The EA is responsible for regulating engineering works liable to affect main rivers through the issuing of Flood Risk Activity Permits (FRAPs) under The Environmental Permitting (England and Wales) Regulations 2016 (Ref 9A.20). Any works associated with the Project proposed within 8 metres (m) of the top of bank of a main river or within 8 m of the landward side of a flood defence, increasing to 16 m for a tidal main river, would require an application for a FRAP to be submitted to the EA for approval. Activities within the wider floodplain that are likely to divert or obstruct floodwaters, to damage any river control works or to affect drainage would also be subject to a FRAP.

9A.6.41 FRAPs are also required for electrical cable services crossing over a main river. This is dependent on the vertical and horizontal clearance from the top of the bank or flood defence for the cable and associated pylons respectively, the angle of the crossing, and the voltage of the cable in question.

9A.6.42 The specific requirements of the FRAP needed for this Project will be determined as the Project progresses beyond PEIR stage.

Lead Local Flood Authorities

9A.6.43 Lead Local Flood Authorities are defined as risk management authorities under the Flood and Water Management Act 2010 (Ref 9A.18). They are responsible for the management of local flood risk which includes that posed from all sources except from main rivers and the sea. This is achieved through the process of developing

Preliminary Flood Risk Assessments (PFRAs) (which are separate to this pFRA), Local Flood Risk Management Strategies (LFRMSs), Strategic Flood Risk Assessments (SFRAs), and Surface Water Management Plans.

9A.6.44 Lead Local Flood Authorities are statutory consultees to the DCO process and will advise on local requirements for the management of surface water that would be generated by the Project. They are also responsible for regulating engineering works likely to affect ordinary watercourses through issuing Ordinary Watercourse Consents (OWCs) outside of Internal Drainage Board (IDB) areas under the Land Drainage Act 1991 (Ref 9A.19). Ordinary watercourses include streams, drains, ditches and passages through which water flows that are not classified as a main river. OWCs will need to be applied for any proposed works associated with the Project which are liable to affect flows or levels in ordinary watercourses outside of IDB Districts.

9A.6.45 The Study Area is within the Derbyshire County Council LLFA area.

Derbyshire County Council Local Flood Risk Management Strategy

9A.6.46 Derbyshire County Council's Local Flood Risk Management Strategy (LFRMS) (Ref 9A.27) was updated in June 2023 and it was published in two parts.

9A.6.47 Part 1 offers details on the main sources of flood risk in line with the NPPF including fluvial, surface water, reservoir and highways, amongst others. It also discusses the responsibilities of different bodies, such as the EA and water companies, and individuals, in managing flood risk. It also outlines five local objectives for managing flood risk:

- to understand flood risk in Derbyshire and the increasing impacts of climate change whilst working collaboratively with all other Risk Management Authorities and relevant groups;
- to work with all relevant bodies to ensure development in Derbyshire delivers sustainable drainage with multiple benefits;
- to reduce the level of flood risk to the residents of Derbyshire;
- to enable and support Derbyshire communities and residents to recognise, understand and manage their own flood risk; and
- to restore, protect and enhance the historic and natural environments of Derbyshire.

9A.6.48 Part 2 focuses more on details about objectives and specific action plans for how future risks will be managed including:

- current understanding of flood risk - description of ordinary watercourses, highways drainage, flooding from surface water and groundwater and also Flood Risk Management Plans from 2021 to 2027;
- objectives and actions in line with National Strategy, Local Strategy and an overview of priorities and timescales;
- details regarding the joint approach taken by the LLFA partnership groups comprising member-focused groups, officer-led groups and community-led groups;
- details regarding partnership funding, bidding and the Council's investment plan for flood mitigation;

- an overview of the roles of the LLFA and LPA and how flood strategy feeds into wider environmental objectives; and
- the Council's service level for flood risk management including in emergency situations, prioritisation, statutory duties and flood investigations, planning application responses and land drainage consents.

Other Non-Statutory Bodies

Internal Drainage Boards (IDBs)

9A.6.49 IDBs are not statutory consultees to the DCO process but are designated as risk management authorities under the Flood and Water Management Act 2010 (Ref 9A.18) with responsibility for managing water levels in low-lying areas. The responsibilities of IDBs include the management of land drainage and flood defence works on ordinary watercourses in their areas along with the issuing of OWCs in accordance with the Land Drainage Act 1991 (Ref 9A.19) and their own local byelaws.

9A.6.50 The Study Area does not traverse any IDBs, therefore no further assessment is required in relation to IDBs.

Other Technical Guidance

National Grid

Generic Electricity Substation Design Manual for Civil, Structural and Building Engineering

Site Drainage

9A.6.51 Section 9 of National Grid's Generic Electricity Substation Design Manual for Civil, Structural and Building Engineering TS 2.10.13 (Ref 9A.28) will inform the drainage assessment. It states National Grid's requirements for the design of drainage infrastructure at new and existing substations along with other relevant assets.

9A.6.52 It states that the preferred method for the estimation of design rainfall depths is the depth-duration-frequency model detailed in the Flood Estimation Handbook (FEH) (Ref 9A.31) and that volumetric flow is to be calculated using the Wallingford Procedure or other established method.

9A.6.53 The use of SuDS as detailed in the CIRIA SuDS Manual (C753F) (Ref 9A.32), described below, is to be considered as appropriate. Surface water generated by access roads and parking areas should drain to adjacent stone surfacing.

9A.6.54 Additional detailed design requirements are provided in relation to the management of potential contaminants, minimum flow velocities, sampling chambers, penstocks, headwalls, access covers and vehicle loading.

9A.6.55 National Grid's Generic Electricity Substation Design Manual for Civil, Structural and Building Engineering TS 2.10.13 (Ref 9A.28) details National Grid's requirements with respect to resilience to flooding at new and existing substations, and is to be read in conjunction to the Energy Networks Associations Engineering Technical Report 138 (ETR 138) (Ref 9A.29), described below.

9A.6.56 National Grid's requirements for the assessment of flood risk, associated hydraulic modelling studies and specific guidance in relation to particular types of flood defence infrastructure are all detailed in TS 2.10.13.

9A.6.57 Section 1 of TS 2.10.13 confirms that the design of all new substations shall be informed by an FRA undertaken in accordance with the requirements of the EA and other relevant stakeholders, the NPPF (Ref 9A.6) and associated planning guidance, and ETR 138.

9A.6.58 If it is considered appropriate to locate a proposed substation in Flood Zone 2 or Flood Zone 3 (as defined in **Table 9A.1**) following the application of the Sequential Test and/or the Exception Test, National Grid's default position is to provide resilience up to the 1 in 1,000-year annual probability flood event including appropriate allowances for climate change and uncertainty.

9A.6.59 Resilience is to be provided through the setting of finished ground levels within the substation, localised raising of critical equipment, and/or other flood defence techniques as appropriate. If the raising of equipment is adopted as a proposed mitigation measure, it should be ensured that the maximum flood depth above finished ground levels should be no greater than 300 mm to facilitate access during a flood event for the purposes of maintenance.

9A.6.60 A typical allowance for uncertainty is given as 300 mm, but TS 2.10.13 identifies that this requirement is to be reviewed should it prove to be decisive in option selection or prove to have a significant impact on capital costs.

9A.6.61 Substations should be designed to ensure that critical equipment is not at risk of surface water flooding during a 1 in 1,000-year annual probability storm event. The design of surface water drainage infrastructure serving new substations should ensure that there is no flooding on site during a 1 in 30-year annual probability storm event or in operational areas during a 1 in 100-year annual probability storm event. Substations should be designed to prevent flooding of neighbouring third-party land during storm events that exceed the design storm scenario.

Energy Networks Association

Resilience to Flooding of Grid and Primary Substations

9A.6.62 Engineering Technical Report 138 (Ref 9A.29) provides guidance to the energy industry on improving the resilience of substations to flooding in the context of ensuring ongoing supply to consumers. It provides a summary of the availability of flood risk information, outlines national planning requirements and flood defence schemes, details a systematic approach for the assessment of flood risk and the identification of appropriate mitigation measures, and provides guidance on the assessment of societal risk, available investment avenues and cost/benefit analysis.

9A.6.63 The report recommends that the assessment of predicted peak flood levels should include an allowance of 300 mm to account for uncertainties alongside a suitable allowance for climate change.

CIRIA

The SuDS Manual

9A.6.64 The SuDS Manual (C753F) (Ref 9A.32) represents current industry best practice guidance for the planning, design, construction, management, and maintenance of effective SuDS. The surface water drainage infrastructure required to deliver the Project should be designed in accordance with the requirements of The SuDS Manual where practicable.

DEFRA

National Standards for Sustainable Drainage Systems

9A.6.65 The National Standards for Sustainable Drainage Systems (Ref 9A.33) is a national guidance document that provides a set of SuDS design standards for new developments. The guidance is based on a number of guiding principles relating to a natural approach to managing surface water runoff, ensuring surface water management is considered in the early stages of development and integrated into design and that the guidance is considered for sites included within planning applications. The guidance requires that runoff destinations are considered in the following order (1 being highest priority, 5 being the lowest):

1) collected for non-potable use;
2) infiltration to ground;
3) discharge to surface water body (above ground level);
4) discharge to a piped surface water sewer; and
5) discharge to a combined sewer.

Scoping Opinion and Consultation

9A.6.66 As per Table 9.5 in the Scoping Report, flood risk from rivers, flood risk from surface water and effects on the land drainage regime and flood risk from groundwater were all scoped in for further assessment through the construction and operational phases of the Project.

9A.6.67 Flood risk from other sources (the sea, sewers, artificial water bodies) were proposed to be scoped out based on the expected low vulnerability to flooding from these sources and the expected limited potential to impact on flood risk from these sources.

9A.6.68 However, the points in **Table 9A.8** were included in the Scoping Opinion that was received from the Planning Inspectorate in December 2024 in response to the proposed scoping out of these flood risk mechanisms.

Table 9A.8: Scoping Opinion responses to flood risk points

Consultee	Inspectorate's Comments	Response
Planning Inspectorate	*'The Inspectorate agrees that significant effects are not as likely as a result of the natural disasters and manmade/technological disasters detailed in Table 5.9 of the Scoping Report, with the exception of flood defence failure. These matters can be scoped out of the ES chapter based on the reasoning set out in Table 5.9* [of the Scoping Report]. *With regards to flood defence failure, the Applicant is advised to discuss the approach further with the EA, and if the measures including the proposed buffers are not agreed to be adequate to avoid the potential for effects on flood defences, then this matter should be scoped into the ES.'*	The topic of flood defences and adequate buffers around flood defence assets will be assessed in greater detail at full FRA stage where the potential for impacts to flood defences will be assessed. Flood defences will also be discussed as part of further consultation with the EA at full FRA stage.
Planning Inspectorate	In response to the Applicant's proposal to scope out "Flood risk from other sources (the sea, sewers, artificial water bodies) - Construction and operation (including maintenance)": *'Table 9.5 of the Scoping Report proposes to scope out this matter due to the nature of the Project (overhead line and buried cable) making it of low vulnerability to flooding from other sources and as it has limited potential to impact on flood risk from these sources. However, paragraph 9.7.14 states that these potential sources of flooding would be reviewed as part of a Flood Risk Screening Assessment. In addition, paragraph 9.5.13 notes that parts of the site are at risk of reservoir flooding and no consideration has been given to flooding at the substation. The Inspectorate therefore considers it premature to scope this matter out. The ES should assess significant effects from all sources of flood risk, where significant effects are likely, or provide evidence of agreement with relevant consultation bodies that significant effects are not likely.*'	A Flood Risk Screening exercise has been undertaken as part of this pFRA which has informed the more detailed preliminary assessment of flood risk from fluvial, surface water, groundwater and artificial sources, such as canals and reservoirs. This preliminary assessment has also considered the risk of flooding to the Chesterfield Substation as well as the overhead line. However, the Willington substation has been omitted at this preliminary stage because it is already an existing site and will be used for the Project. A more detailed assessment of the flood risk impacts to receptors will also be undertaken at full FRA stage and will be informed by further consultation with statutory authorities such as the EA and LLFA.

Consultee	Inspectorate's Comments	Response
Planning Inspectorate	'*The EA has advised that the "geology along the route is highly variable, including locations with a Principal bedrock aquifer and no superficial deposits. Groundwater flooding can occur in superficial and bedrock aquifers and the Applicant should note that aquifer designation is not a direct indicator of likelihood of groundwater flooding." The Applicant is advised to further assess the likely groundwater regime to determine the risk of groundwater flooding and seek agreement with the EA on the need to assess groundwater flooding within the ES.*'	A baseline assessment of the underlying geological composition across the Study Area has been undertaken for this pFRA. A preliminary assessment of the potential for groundwater flooding has also been included. Groundwater flooding will also be explored in greater detail at full FRA stage and will be discussed with the EA and LLFA as appropriate.
Barrow upon Trent Parish Council	*'The route travelling South of Barrow upon Trent would not be the ideal route; not only from an aesthetic point of view but due to the risk of the land flooding. If cables come down in a storm or flood, access for repair would be very limited due to flood water.*'	In line with relevant policy and guidance, all best efforts to ensure safe access and egress for maintenance purposes during periods of flooding will be made. Existing access tracks are proposed to be used for maintenance access, but quantification of flood levels at key locations within the Study Area will also be undertaken at full FRA stage to confirm that safe access and egress can be achieved. In addition, through the design development of the Project, due consideration has been given to the high risk flood zones. As a result, going into Stage 2 consultation, the Project is located to the north of Barrow-on-Trent and the A5132.
Canal and River Trust	'*We note that the report states that the ES will be informed by consultation and engagement with stakeholders, including the Canal and River Trust (paragraph 9.5.2* [of the Scoping Report]*), and we consider that this engagement will be essential to ensure that the potential impacts on the canal can be identified and*	The request for further consultation is acknowledged. Flood risk posed from artificial sources such as canals has been considered in this pFRA, including the Trent

Consultee	Inspectorate's Comments	Response
	addressed as the scheme is further developed. The Trent and Mersey Canal is correctly identified in the list of watercourses potentially affected by the proposal set out in paragraph 9.5.5 [of the Scoping Report]*. At this stage it is difficult to comment in any detail as the proximity of the final route of the overhead line to the canal and the location of any crossing points are not yet known. As noted elsewhere, it will be important to engage with the Trust as the route is refined and as potential crossings of the canal are identified.*'	and Mersey Canal. A more detailed assessment of the risk posed by artificial sources will be undertaken at full FRA stage.
EA	Flood Risk and Modelling '*We are generally satisfied with the proposed scope in relation to fluvial flood risk during the construction and operational phases. However, there are some additional environmental aspects which we would like to see scoped in regarding flood risk management assets and reservoirs.*'	The EA's comment is acknowledged; the additional environmental aspects are discussed below.
EA	Flood Risk Management Assets *'We do not agree with the decision to scope out vibration effects from construction activities in relation to flood risk management assets as shown in Table 14.9* [of the Scoping Report]. *This matter should be scoped in, or justification for its exclusion from the ES provided. We also do not agree with the decision to scope out flood defence failure as detailed in Table 5.9* [of the Scoping Report]. *Flood defence failure should be scoped as the Applicant will cross watercourses.* *Proposed infrastructure should be setback from watercourses to allow for future remediation, replacement and the raising of flood assets in the context of a changing climate and increased flood risk. The proposed cable crossing route should consider the adaptability of assets along the watercourse to optimise placement. If underground cabling is chosen, then we would need to agree an appropriate depth to ensure that future flood assets are not constrained by the cables (e.g., sheet piling). Additionally, Section 4.2.5* [of the Scoping Report] *discusses conductor height. The Applicant will need to ensure that the conductor height allows sufficient space for emergency works and access to flood risk management assets.*	Flood defences and the wider impacts on these assets will be subject to further engagement with the EA as the Project develops. The full FRA that will be submitted alongside the ES will consider flood defence failure in its assessment of the residual impacts of flooding. As part of this work, access to the flood defence assets will be considered to allow for maintenance, replacement and upgrade in the future. In addition, the requirement for pre- and post-construction surveys to check the condition of the assets that intersect the proposed route alignment will be discussed with the EA at full FRA stage. Potential impacts to flood defence assets from vibration effects through the construction phase will be assessed at ES

Consultee	Inspectorate's Comments	Response
	We note that exemption two may be applicable to the proposed proximity of infrastructure relative to watercourses. Further details on exempt flood risk activities can be found here: https://www.gov.uk/government/publications/environmental-permitting-regulations-exempt-flood-risk-activities/exempt-flood-risk-activities-environmental-permits. *The Applicant should note that they will need to:* • *Survey the pre-works and post-works condition of flood assets that intersect the cable route, with remediate of any defects identified.* • *Assess vibration levels for proposed works (i.e. pylon or Sealing End Compound installation) in close proximity to flood assets to identify safe levels of vibration, such that the flood assets are not adversely affected, and ensuring this through real-time monitoring during the works. British Standard 5228-2:2009+A1:2014 may be appropriate in the assessment of vibration.* *Flood assets within the* [draft] *Order Limits which are key to the management of flood risk within the area, and for which the cable corridor should seek to circumnavigate, include but are not limited to the following:* • *Ambaston Ring Embankment defence* • *Shardlow Ring Embankment defence* • *Shardlow Coppice embankment defence* • *Draycott Front Floodbank* *As the proposal develops it would be beneficial for the Applicant to produce and share with us a Crossing Register which details all proposed crossing placements and their type. This would allow us to consult with our Asset Performance teams to ensure that the proposed crossing position is optimal in the context of flood risk and future adaptation of flood assets.*	stage in **Chapter 14 Noise and Vibration**. Further consultation with the EA will be undertaken as required. A watercourse crossing schedule can be found in **Appendix 4C Indicative Bridge and Culvert Schedule**; crossing types will be discussed through further consultation with the EA.
EA	<u>Reservoirs</u> *Section 9.5.6* [of the Scoping Report] *states that the Study Area includes small reservoirs and that an assessment of effects on sites would be undertaken in*	At this preliminary stage, the risk of flooding from reservoirs has been considered as a residual impact due to strict monitoring and

Consultee	Inspectorate's Comments	Response
	collaboration with ecology and groundwater specialists and reported in ***Chapter 9 Hydrology and Land Drainage*** *of the ES. While this is welcomed, from a flood risk perspective the Applicant should liaise directly with the undertaker to help assess consequences of dam failure and potential mitigations. If the routeing is in close proximity to a reservoir, we would expect flood risk from reservoirs to be scoped in. The Applicant should liaise with the respective undertaker to seek their input and whether the proposed proximity is acceptable. The Proposed Development* [the Project] *could potentially alter the risk category of a reservoir.* *Separate to the above, we also provide the Applicant with the following advice. For completeness we have reiterated some of the advice that we provided to the Applicant in our response to the Stage 1 Non-Statutory Public Consultation held between* [14] *May and* [18] *September 2024.'*	management under the Reservoirs Act 1975 (Ref 9A.37). The closest reservoir to the draft Order Limits is Ogston Reservoir, which is approximately 3 km to the west; the risk posed to the Project from reservoirs will be assessed in further detail in the full FRA that will be submitted alongside the ES and further consultation will be undertaken, where necessary.
EA	<u>Proposed Lifespan and Decommissioning</u> *'We acknowledge that there are no plans to decommission the Project based on NPS EN-5 paragraph 2.1.4, which states that nationally significant electricity networks are likely to have an ongoing function, subject to maintenance and reinforcement works. While we find it reasonable that decommissioning has been scoped out of the ES, we would recommend that the Applicant assumes a conservative estimate for the proposed lifespan.* *If the Project (or aspects of the Project) are to be decommissioned, an assessment should be undertaken to ensure this is safe and doesn't leave a negative lasting effect on the flood risk of the site and surrounding area or cause increased risk whilst decommissioning.'*	The proposed lifespan for the Project is expected to be approximately 80 years, and the assessment of flood risk will consider this life span for the assessment over the operational phase. This life span has been deemed sufficient and further assessment of flood risk impacts beyond the life span of the Project would be considered under a separate application in the future.
EA	<u>Development in Flood Zones</u> *'Large parts of the proposals are located within Flood Zone 2 and 3, which is land assessed as having between a 1 in 100 and 1 in 1,000 annual probability (1% - 0.1%) and land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) in any given year. Other parts are located within Flood*	In the full FRA that will be submitted alongside the ES, where elements of the Project are to be located within Flood Zone 3, consideration will be paid to the requirements of the Sequential and Exception testing in line with relevant

Consultee	Inspectorate's Comments	Response
	Zone 1, which is land defined as a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%) in any given year. *For essential infrastructure to be permitted within Flood Zone 3, the proposal will need to pass the Sequential and Exception Tests.* *Where development is located within Flood Zone 3b (functional floodplain), essential infrastructure that has passed the Exception Test should be designed and constructed to:* • *Remain operational and safe for users in times of flood.* • *Result in no net loss of floodplain storage.* • *Not impede water flows and not increase flood risk elsewhere.* *The development should remain operational during the design flood plus climate change flood event. We welcome the decision to scope in flood risk when reviewing operation to ensure the Project is functional in times of a flood and remains safe.* *We advise that the Applicant should identify the areas of Flood Zone 3b to help inform the sequential approach to locating infrastructure.*'	policy. This includes Flood Zone 3b areas being identified and considered. Quantification of flood risk, including levels and depths, will be undertaken in relevant areas to determine the risk of flooding more accurately. Mitigation measures and best-practice guidance will be proposed in order to offer the relevant protection to infrastructure and personnel and to minimise impedance of flood water flow, and not increase flood risk in adjacent areas.
EA	<u>Flood Risk Assessment (FRA)</u> *'Section 2.2.20* [of the Scoping Report] *states that an FRA will be submitted in support of the Development Consent Order DCO application. It would be advisable to provide a draft FRA prior to submission with the ES.'*	Following the submission of this pFRA, a full FRA will be developed and submitted alongside the ES. Consultation with the EA will be undertaken as the full FRA is developed, with key points to be communicated and agreed upon.
EA	<u>Floodplain Storage</u> *'Section 4.5* [of the Scoping Report] *describes how the Project will be constructed and details aspects of this including the installation of roads, access widening, bellmouth(s), pylon working area(s) and joint bays. It should be noted that each of these aspects could lead to an increase in impermeable area, a loss of floodplain storage and act as an impediment to flood flow routes. They should be assessed to ensure that they do not adversely affect flood risk. Additionally, it*	The EA's concern regarding floodplain storage is acknowledged and this will be considered in the full FRA that will be submitted alongside the ES, particularly within the River Derwent and River Trent floodplains. In the full FRA, data from existing EA hydraulic models will be used to

Consultee	Inspectorate's Comments	Response
	is stated in Section 4.7.3 [of the Scoping Report] *that interlocking trackway panels may also be required. This could increase the impermeable area and should be mitigated for in terms of flood risk.'*	assess potential losses of floodplain storage. Mitigation measures will be proposed as appropriate.
EA	Culverts *'It is stated in section 4.5.5* [of the Scoping Report] *that construction of the overhead line will require the installation of access tracks including culverts. We would oppose the culverting of any watercourses and instead prefer the installation of a clear-span bridge crossing. This is in line with the EA's anti-culverting policy and our position is supported by paragraphs 2.10.87 and 2.10.88 of NPS EN-3, which state that culverting existing watercourses should be avoided and where culverting for access is unavoidable, applicants should demonstrate that no reasonable alternatives exist and where necessary it will only be in place temporarily for the construction period.* *We will normally only grant a permit for a culvert on a main river if there is no reasonably practical alternative, and if the detrimental effects would be sufficiently minor that a more costly alternative would not be justified or there are reasons of overriding public/economic interest.* *Further information should be provided on where culverts are proposed and whether proposed crossings are temporary. The Applicant should also justify why a clear span bridge is not feasible. The Applicant should also note that watercourse crossings including culvert installation will likely require hydraulic modelling and they will need to demonstrate how this relates to flood risk. Please see Appendix 2 for additional information on culverts.'*	The EA's concern regarding the use of culverts is acknowledged and will be considered as the design of the Project progresses.
EA	Underground Cable Crossings *'Section 1.1.5* [of the Scoping Report] *details the Project's likely components and this list includes installation of underground cabling using open cut and trenchless techniques such as horizontal directional drilling (HDD). Non-intrusive/trenchless methods should be used for underground cable crossing of main rivers and drill and launch pits should be placed outside of the design flood extent where possible. A minimal impact trenchless method may also be*	The location of sensitive infrastructure through the construction phase will be considered as the design of the Project progresses. Consultation will also be undertaken with relevant authorities, such as the LLFA, in advance of DCO submission, in addition to Ordinary

Consultee	Inspectorate's Comments	Response
	appropriate for ordinary watercourses, this will require further consultation with the inclusion of the LLFA/IDB, where applicable.'	Watercourse Consent being sought where required.
EA	Sequential Approach *'In accordance with the National Planning Policy Framework (NPPF) and the Sequential Test, development should apply a sequential, risk-based approach to the location of development, taking into account all sources of flood risk and the current and future impact of climate change, to avoid (where possible) flood risk to people and property. The Project should take a sequential approach where it can, if there are any opportunities for development to be located outside of Flood Zones 2 and 3 and into Flood Zone 1, this should be prioritised.* *The Applicant should apply a sequential approach to the placement of infrastructure within the* [draft] *Order Limits, positioning the most vulnerable components to the areas of lowest flood risk. Considering the Construction Phase, welfare facilities, security cabins, storage compounds for plant equipment, materials, construction compounds and so forth should be positioned outside of the 1 in 100-year flood extent where possible. Compounds, satellite compounds and storage of topsoil (as mentioned in Sections 4.5.3, 4.5.4, 4.5.11* [of the Scoping Report] *should all be positioned in a sequential way.'*	A sequential approach has been applied to the Project, as detailed in section 9.11 of this pFRA. This approach will be maintained for the full FRA that will be submitted alongside the ES.
EA	Flood Storage Compensation '*Flood storage compensation will be required for structures, or changes in ground level, within the design flood extent plus climate change flood extent. This should be:* • *Level-for-level* • *Volume-for-volume* • *Localised* • *Shown to achieve net gain where possible* • *Demonstrated to not inhibit flood flow routes*'	The EA's comments regarding flood storage compensation are acknowledged and will be addressed in the full FRA that will be submitted alongside the ES. At this preliminary stage, detailed quantification of flood depths and levels has not been undertaken (with the exception of the extraction of a sample of levels to give an indication of depths in key locations). This will be undertaken as part of an assessment of existing EA hydraulic models. Appropriate and proportionate

Consultee	Inspectorate's Comments	Response
		mitigation measures will be proposed following this exercise.
EA	Substation *'The proposed substation should be assumed to be a part of the proposal until it is excluded. This will help to ensure early consideration of likely significant effects. It would be preferential for the substation to be placed within Flood Zone 1. The finished floor level of sensitive equipment (e.g. the substation) should be 600 mm above the design flood plus climate change flood level.'*	The proposed new Chesterfield Substation has been included in this pFRA. A preliminary assessment of the risk of flooding from all sources has been undertaken.
EA	Scaffolding *'Section 4.5.24* [of the Scoping Report] *states that temporary scaffolding would be installed during construction. Scaffolding panels below the design flood level should be fixed in place. Scaffolding should not impede flood flow routes and be designed to be safe during the design flood event.'*	The location, constructability and potential impact of scaffolding on flood flow routes will all be considered within the full FRA that will be submitted alongside the ES following a more detailed assessment of flood levels and depths being undertaken.
EA	Climate Change Resilience Design and Control Measures *'We would welcome further discussion on the proposed design and control measures identified in relation to flood risk for receptors during the construction and operational phases in Table 5.11* [of the Scoping Report (Ref 9A.3)] *to agree design parameters going forward.'*	Consultation with the EA and LLFA has been undertaken to discuss the approach to some of the key points. Further consultation is planned at full FRA stage where aspects such as the design, control measures, mitigation measures and approach to risk assessment will be discussed in greater detail and approaches to all points will be agreed upon.
EA	Good Practice Mitigation Measures '*The likely good practice mitigation measures relevant to hydrology and land drainage are presented in section 9.6.5* [of the Scoping Report (Ref 9A.3)]. *We require a commitment to the proposed mitigations if they are being assumed in the assessment of likely significant effects.*'	Good practice mitigation measures are presented in section 9.10 of this pFRA and will be incorporated and considered through to the full FRA that will be submitted alongside the ES.

Consultee	Inspectorate's Comments	Response
EA	Magnitude '*The criteria for assigning impact magnitude* [are] *shown in Table 9.4* [of the Scoping Report]. *We wish to point out that any increase in flood risk is not acceptable, therefore an increase in peak flood level should be considered significant.*'	The EA's point regarding the magnitude of significant effects is acknowledged and will be considered going into the full FRA that will be submitted alongside the ES. The more detailed and quantified approach will lead to a more representative assessment of risk in key areas and will allow for proportionate mitigation measures to be applied, as appropriate.
EA	Communities Sensitive to Flood Risk '*Following recent flood events, we would like to highlight sensitive communities and areas within the proposed cable corridor:* • *Kilburn* • *Rawsons Green* • *Coxbench* • *Little Eaton* *Where the corridor crosses River Derwent there is a large area of Flood Zone 3, and a large area of Flood Zone 3 between the River Trent and A5132 in the south.*'	The areas suggested will be considered as part of the more detailed assessment in particular where hydraulic modelling is available, such as the 2012 Bottle Brook hydraulic model near Kilburn. A more detailed impact assessment for upstream and downstream receptors, including sensitive communities, will be undertaken as part of the full FRA that will be submitted alongside the ES.
EA	Climate Change '*The proposal will need to consider the future flood extent of the design flood plus climate change scenario. Climate change projections will be influenced by the proposed design life of the development. The developer will also need to consider the Credible Maximum Scenario in the context of climate change. Guidance on this can be found here: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances.*'	Project impacts over the lifetime of the development will be considered as part of the full FRA that will be submitted alongside the ES. A range of climate change scenarios are included in the existing EA hydraulic models. These will be used to project future impacts over the proposed 80 year design life of the Project. Further engagement with the EA and LLFA will also take place to confirm the approach taken.

Consultee	Inspectorate's Comments	Response
EA	Projects within the Area *'For awareness, ongoing or upcoming developments within the cable corridor include but are not limited to the following:* • *Thulston development - west of A6, Elvaston, Derbyshire (NGR: SK4000531954).* • *Infinity Garden Village - south of Derby (approximately NGR: SK3571531066).* • *Ambaston Ring Embankment defence – which may be upgraded as part of the Our City Our River (OCOR) scheme.'*	Ongoing and upcoming developments will be considered as part of an in-combination assessment in the **Chapter 17 Cumulative Effects**, of the ES, where deemed necessary.
EA	Climate Resilience *'Section 5.16* [of the Scoping Report] *implies that climate resilience will be scoped out of the ES, despite **Chapter 9 (Hydrology and Land Drainage)** implying impacts of climate change on fluvial flows and surface water will be considered. For avoidance of doubt please note that the impact of climate change on fluvial and surface water flood risk sources must be considered. As the construction phase is proposed to commence in 2028 and finish in 2032 it would be appropriate to use present day estimates for design flows. However, if there is any slippage in the programme or the construction period extends in duration, this should be evaluated with respect to climate change uplifts for the 2020s epoch.'*	As outlined above, climate change resilience over the lifetime of the Project will be considered. In addition, further consultation with the EA and LLFA will be undertaken as the Project progresses in order to agree upon the approach taken.
EA	Hydraulic Modelling *'It is noted in Table 9.2* [of the Scoping Report] *that where applicable existing EA hydraulic models will be reviewed to determine their limitations and whether any additional modelling is required. This is welcomed. For reference, when reviewing hydraulic models or building new ones please consult the guidance on using modelling for FRAs available online at: https://www.gov.uk/guidance/using-modelling-for-flood-risk-assessments.* *Table 9.2* [of the Scoping Report] *also describes how modelling will use the latest climate change guidance and acknowledges the requirement for floodplain*	This point is acknowledged. The hydraulic modelling exercise will be undertaken at full FRA stage and the findings will be presented alongside the ES.

Consultee	Inspectorate's Comments	Response
	compensation which will be considered when developing flood mitigation measures. This is welcomed. Please note, the latest available guidance on climate change with regards to fluvial flows and rainfall is available online at: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances.'	
EA	Impacts on Flood Flows and Storage '*It is noted in section 9.6.5* [of the Scoping Report] *that storage of materials during the construction phase will be done in such a way as to avoid barriers to floodplain flows. With regards to haul roads, access tracks, and works compounds, the potential impact on surface water and mitigation is described. The impact on flood flows and storage however is not described. Where construction materials, compounds, and access roads have the potential to influence flood flows and storage, this impact should be quantified through hydraulic modelling and appropriate mitigation put in place. Where a loss of floodplain storage is noted, this should be compensated for.*'	A more detailed assessment of the impacts on flood flows and storage through the construction phase will form part of the full FRA that will be submitted alongside the ES. There is a range of existing EA hydraulic models that will be used to determine the impacts in key areas. The approach taken to hydraulic modelling and the determination of these impacts will be agreed upon with the EA and LLFA.
EA	Watercourse Crossings '*It is positive to read in section 9.6.6* [of the Scoping Report] *that additional mitigation measures for hydrology and land drainage will include freeboard between water levels and crossing structure soffits. Bridge soffits should be 600 millimetres above the design flood level. The design flood level will depend on the period for which the bridge is in place. If bridge crossings are permanent, then typically for fluvial watercourses this would be the 1 in 100 year plus climate change scenario. For temporary crossings during the construction phase this would likely be the present day 1 in 100 year water level, although this will be dependent on the period for which the crossing is in place.*'	A full watercourse crossing schedule will be made available and incorporated into future, more detailed assessments. Appropriate mitigation will be proposed and will subject to further consultation where necessary.
EA	Magnitude of Impact *'With regards to impact magnitude as described within Table 3.71 within the Design Manual for Roads and Bridges (DMRB) which is presented in Table 9.4 of the Scoping Report, increases in peak flood levels of less than or equal to 10 millimetres are described as negligible. It should be noted that the classification*	These points are noted and will be taken into consideration in the hydraulic modelling. Work on the existing EA hydraulic models will be undertaken in line with relevant policy and guidance, and the

Consultee	Inspectorate's Comments	Response
	presented within this table is slightly at odds with the NPPF which details that there should be no increases to flood risk elsewhere because of new development. Any impacts to flood risk will need to be reviewed on a case-by-case basis as the spatial extent of any increase is also an important consideration not just the magnitude of any increase in peak water levels. *Furthermore, considerations around modelling precision may also influence what is classed as an observable increase or impact versus what might be attributable to model precision limitations and instability. There is a section on the impacts on off-site flood risk within the guidance on undertaking modelling for flood risk assessments which should be consulted and provides some useful considerations. This is available online at: https://www.gov.uk/guidance/using-modelling-for-flood-risk-assessments.'*	approach will be discussed through further consultation where necessary.
EA	Unmodelled Watercourses *'There are several watercourses which bisect the preferred corridor extent shown on the map in Appendix B Water Framework Directive Screening Assessment that have no associated Flood Zones. This is due to the small size of their respective catchments. There may be flood risk associated with these watercourses, but it is just not modelled or mapped as a catchment area of 3km^2 was the de minimis in the generalised 2D modelling used to determine the extent of Flood Zone 2 and 3 where no detailed hydraulic modelling is available. The Risk of Flooding from Surface Water (RoFSW) can give an initial indication of flood risk associated with small watercourses; however, this is broadscale modelling and does not consider the effects of climate change. Consideration should be given to this when assessing flood risk to the Project during the construction and operational phases and catchments of less than 3km^2 should be assessed for fluvial flood risk.'*	Potential limitations regarding the resolution of the fluvial flood modelling have been considered. As mentioned by the EA in the feedback, the Risk of Flooding from Surface Water mapping will be used where appropriate, and uplifts for climate change will also be considered as appropriate.
EA	Model Data *'The proposed corridor spans the Yorkshire and East Midlands EA area boundaries. Existing hydraulic modelling information held by the EA for the East Midlands can be obtained via emdenquiries@environment-agency.gov.uk. For*	This contact information is noted. A data request has already been submitted and a suite of modelling studies has been made available for assessment.

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	the Yorkshire area, which is the corridor area to the northeast of Stetton (439400, 361600), any available modelling information can be obtained via neyorkshire@environment-agency.gov.uk.'	
EA	Flood Modelling and Data *'The Applicant should consider fluvial flood modelling for watercourses which intersect with the Study Area to better understand fluvial flood risk. Additionally, where the corridor is at risk of tidal flooding, breach and overtopping modelling may need to be assessed. It is important to note that some of our model data is old and may present limitations. Even the data which is more recent may not be suitable for the purposes the Applicant may wish to use it for and should modelling work be required in connection with the activities, it will be necessary to check that the data used represents current risk, uses the latest available datasets, complies with current modelling standards, is at a scale suitable for the assessment being undertaken, captures the detail required for a site-specific assessment, and makes use of current climate change allowances.* *All of our models are built for our own specific purposes and are made available as is. It is the responsibility of all applicants to ensure that the models are fit for their intended purposes and in line with the following government guidance:* • https://www.gov.uk/guidance/using-modelling-for-flood-risk-assessments; • https://www.gov.uk/government/publications/river-modelling-technical-standards-and-assessment/river-modelling-standards-who-theyre-for-and-how-to-use-them; and • https://www.gov.uk/government/publications/river-modelling-technical-standards-and-assessment. *If modelling is used to support an application, then it will need to be reviewed and confirmed as meeting the above standards.* *The Applicant should review both our fluvial and tidal hazard mapping to gain an understanding of the possible risks of a flood event and assess the necessary mitigation and protection needed.* *Please be aware that:*	Existing hydraulic models received from the EA will be used to inform the full assessment of flood risk. Limitations of these models, for example regarding the hydrology, climate change scenarios and overall suitability for assessing third-party developments, will also be checked and discussed with the EA through further consultation. In addition, discussions will be held with the EA regarding the requirements for hydraulic modelling for watercourses that are intended to be crossed or potentially impacted, and that intersect the draft Order Limits – but where no models are available. Updates to national scale flood risk mapping will be checked at ES stage and incorporated into the full FRA that will be submitted alongside the ES. This will enable an acceptable and proportionate approach to the hydraulic modelling to be agreed upon.

Consultee	Inspectorate's Comments	Response
	• *EA models are not designed to assess third-party developments. The developer should not assume that the model is suitable for assessing the flood risk associated with the proposed development* [the Project]. • *It is the developer's responsibility to assess the suitability of a model for the project.* • *The developer should provide adequate evidence of any modelling checks and subsequent updates and document these in the FRA model reporting.* *Note that if the catchment size is less than 3 km^2, then the flood risk may not be represented by the Flood Map for Planning and that there may exist an "evidence-gap".* *Hydraulic models which the developer should consider include, but are not limited to, the below:* • *Derbyshire Trent, EA Revision 2021* • *Cuttle Brook JBA May 2006* • *River Derwent Derby OCOR Binnies 2023* • *Bottle Brook, B&V January 2012 & Bottle Brook Climate Change Scenarios EA 2021* • *River Amber – Amber Climate Change Scenarios EA 2021* • *Alfreton Brook Capita Symonds 2005* • *Ock Brook Climate Change Scenarios EA 2021* • *Middle and Lower Don 2018 – please note that this has had a 2024 recalibration which will soon be available for use.* *Please direct requests for all models stated above to EMDenquiries@environment-agency.gov.uk, excepting the Middle and Lower Don 2018 model which can be requested from neyorkshire@environment-agency.gov.uk.* *Watercourse within the cable corridor for which the EA does not have modelling include the Repton Brook and Calow Brook. If these are to be crossed, hydraulic modelling may be appropriate.*	

Consultee	Inspectorate's Comments	Response
	As the Flood Map for Planning is not presently being updated until the publication of NaFRA2, we would like to highlight the following areas where flood risk may have recently changed; • *The Derwent area to the east of Derby – it is understood that new flood extents will be made available when the proposal progresses, and they are requested.* • *A small patch on the bank of the Doe Lea closest to the draft Order Limits (approximate national grid reference: SK4601067254).'*	
EA	Groundwater Flooding *'We do not agree with section 9.5.15* [of the Scoping Report] *in that it states risk of groundwater flooding is considered to be low (in relation to use of underground cables) due to the presence of a Secondary A aquifer and predominately unproductive superficial deposits. This geological setting is not representative of the site. No part of the site has unproductive aquifer in the superficial deposits (see section 10.5.7, Table 10.3* [of the Scoping Report]*). The geology along the route is highly variable, including locations with a Principal bedrock aquifer and no superficial deposits. Groundwater flooding can occur in superficial and bedrock aquifers and the Applicant should note that aquifer designation is not a direct indicator of likelihood of groundwater flooding.* *We suggest the Applicant reviews historical borehole records (such as in Appendix 10, A10 D.3, and others from this source), and monitors groundwater levels during site investigation works to assess the likely groundwater regime.'*	As per the Flood Risk Screening in this assessment, the risk of flooding from groundwater sources has been assessed to range from low to high for the Project. This has been informed by a baseline assessment of the underlying geology across the Study Area. As part of the full FRA that will be submitted alongside the ES, further investigation into the potential for groundwater flooding will be undertaken. While quantification of flood risk elements is deemed to be outside the scope of this pFRA, further investigations will include a more detailed look at groundwater levels across the Study Area. Intrusive ground investigation works undertaken will make provisions for groundwater level monitoring through the use of standpipes and piezometers within boreholes. This will be undertaken to inform design development and environmental assessment. The requirement for water table level monitoring and seasonal variation will be subject to further consultation with the EA and LLFA.

Consultee	Inspectorate's Comments	Response
Holbrook Parish Council	*'In recent years there has been an increased frequency of flash flooding from the Bottle Brook which could transfer toxic materials disturbed in the area.'*	The risk of flooding from the Bottle Brook will be assessed in accordance with the existing hydraulic model provided by the EA. The potential for the transfer of toxic materials is outside the scope of this assessment of flood risk but is covered in **Chapter 9 Hydrology and Land Drainage**.
National Highways	*'The construction phase may have an impact on drainage and National Highways will wish the ensure the integrity of our own drainage assets. In that regard, the Applicant should note that new connections to our drainage assets will not be permitted. This is in accordance with DfT Circular 01/2022.'*	National Highways' comment is acknowledged and will be considered as part of the drainage strategy and design.
Ock Brook and Borrowash Parish Council	'*Flood risk to the Ock Brook catchment as the area already suffers significantly from this issue, and construction and operation compaction of the land would only increase this.*'	Flood risk to the Ockbrook area that falls within the Study Area will be assessed in detail using the available EA datasets and hydraulic modelling data. Proportionate mitigation measures will be proposed to mitigate against any potential increased impacts as a result of the Project.
Yorkshire Water	'*It is noted, the hydrogeological changes to groundwater flows and levels during the construction stage are scoped in the project. Construction activities have the potential to change groundwater flows and levels, which support sensitive receptors identified within the baseline. Flood risk from surface water and effects on the land drainage regime, has potential to cause temporary and permanent changes to impermeable land cover and potential for temporary disruption to existing land drainage routes during construction have therefore been scoped in.* *YW note relevant additional mitigation measures for hydrology and land drainage may include the use of suitable sustainable drainage (SuDS) measures to manage construction worksite runoff.*'	Yorkshire Water's comment is acknowledged; a preliminary assessment of hydrogeological conditions has been undertaken as part of this pFRA, and will be assessed further as part of the full FRA submitted as part of the ES. Surface water flood risk will also be assessed in greater detail as part of the full FRA and comments raised regarding drainage will be considered as part of drainage strategy works.

9A.6.69 This pFRA addresses the Planning Inspectorate's comments in the Scoping Opinion. The condition and efficacy of flood defences across the Study Area, including the Standard of Protection, will be discussed with the EA at full FRA stage, where required.

9A.6.70 A Flood Risk Screening Assessment and subsequent more detailed assessment has been undertaken, where necessary, including for the overhead line and proposed substation elements of the Project.

9A.6.71 The geology of the Study Area has also been considered along with the potential for future impacts from groundwater flooding. Further details regarding the geology and hydrogeology across the Study Area can be found in **Chapter 10 Geology and Hydrogeology**.

9A.6.72 A consultation meeting was held with the EA and LLFA where the approach to assessing potential flood risk impacts to the Project through the construction and operational phases of the Project were discussed. A summary of the points raised is shown in **Table 9A.9** below.

Table 9A.9: Summary of Environment Agency and Lead Local Flood Authority consultation outcomes

Topic of Discussion	Outcomes of Discussion
General approach and general methodology	The Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 9A.34) has considered flood risk and constraints. Application of the Sequential and Exception Tests and micro-siting has been used to avoid potential significant adverse effects as far as reasonably practicable.
Construction phase approach and methodology – temporary watercourse crossings	It is understood that there is a preference from the EA and LLFA for clear span bridges as opposed to culverts. The method of crossing will be subject to site conditions, constructability and survey outcomes. The design event would be expected to be the 1 in 100-year annual probability flood event with a sufficient uplift for climate change. However, in some instances this could be downgraded to a 1 in 30-year annual flood probability, subject to agreement with the EA and LLFA. The EA and LLFA confirmed that the requirement for climate change to be considered in the construction phase will be dependent on detailed design and will be subject to further consultation. The placement of watercourse crossings will be determined as part of the DCO application rather than a FRAP. It will need to be demonstrated that there will be no adverse impacts to receptors downstream in the design event. It was confirmed that EA permitting requirements also apply to the LLFA. In addition, OWCs will be required in line with policy. The LLFA has a no culverting policy, and justification will be required where culverts are proposed instead of clear span bridges. This includes where ordinary watercourses are dry for some parts of the year.
Construction phase approach and methodology – haul roads	There is no national guidance regarding the minimum flood depth at which modelling will be required. The guiding factor will be the location of the haul roads with respect to Flood Zone 3b. Confirmation was given to the EA and LLFA that haul roads are not expected to remain in place beyond the construction phase. The EA

Topic of Discussion	Outcomes of Discussion
	suggested that simple hydraulic modelling methods could be used to investigate loss of storage and conveyancing routes to provide quantitative evidence of whether impacts are considered to be negligible. The feasibility of this exercise will be assessed at full FRA stage. The potential for cumulative impacts between the Project and the Infinity Garden Village development to the south of Derby was raised. Modelling has not progressed far enough whereby the Infinity Garden Village to the south of Derby could be considered. However, cumulative effects will be considered as the Project progresses. In relation to haul roads, consideration is to be given to compensatory flood storage for volume lost, not inhibiting flood flow routes and a preference for using permeable materials where applicable, i.e. SuDS.
Construction phase approach and methodology – construction compounds	The EA confirmed that construction compounds are not wanted in Flood Zone 3b unless there is a strong justification. Location of compounds within Flood Zone 3a will require compensatory flood storage and evidence that the compound will not be inhibiting flood flow routes. Bunding will potentially be acceptable as a means of protection but should be considered separately to drainage as they are reviewed differently. The standard design flood event will need to be checked.
Operational phase approach and methodology – pylons within the floodplain	Modelling could be used to consider volumes of flood storage lost but it depends on the watercourse, e.g. conveyancing instead of loss of storage in the Derwent corridor, where pylons are located close to the channel side. For smaller watercourses where flow is not active, a volumetric understanding could be considered reasonable. For active floodplains, a float constriction or increased Manning's approach could be used if using the existing Derwent Trent confluence model. Pylon location is key with respect to flood risk areas. Further suggestions will be considered as appropriate for the ES once the design has developed.
Operational phase approach and methodology – substation drainage strategy	Proposed approach to design a surface water drainage strategy for the new substation to the 1 in 100-year annual probability flood event with an appropriate uplift for climate change was deemed acceptable in principle.
Operational phase approach and methodology – maintenance access routes	The intention will be for long-term operational maintenance of the Project to use existing watercourse crossings such as agricultural access routes or tracks where practicable. This will be mapped in greater detail as the Project progresses. There was a suggestion to consider any opportunities to remove culverts on main rivers and ordinary watercourses for Biodiversity Net Gain (BNG) purposes. This will be subject to further investigation.

Topic of Discussion	Outcomes of Discussion
Construction and operational phase approach and methodology – hydraulic modelling	The EA confirmed that exceptions to requiring modelling and hydrology through the construction phase will be dependent on the nature and length of the construction phase and how far it encroaches into the next epoch of climate change. If the construction phase is shorter, it may be acceptable to use present day flood risk outputs. For temporary crossings, levels like the 1 in 100-year annual probability event for Flood Zone 3b watercourses plus an allowance freeboard may need to be considered. The Manning's equation or the CIRIA guidance may be used where analysis is required. Quantitative assessment may be required to determine the design of some temporary crossings if it is important for site access and egress. It is important for associated construction activities to be sited outside of the functional floodplain where practicable to avoid flood risk and notable conveyance areas. Preference is for temporary or permanent components of the Project to be outside the functional floodplain but also outside the 1 in 100-year annual probability flood event. The EA was informed that hydraulic modelling studies for Twyford Brook and Park Brook were not received as part of the data request submitted to the EA. Alfreton Brook and Bottle Brook are both dated to around 2005 and 2012 respectively and the hydrology in other models is between 10 and 20 years old. Existing models are proposed to be used for temporary works with a high-level Revitalised Flood Hydrograph 2 (REFH2) approach to hydrology. The flows must be checked to confirm that they are conservative with respect to updated methods like REFH2. Regarding whether a full hydrology update will be expected, the method that was applied must be checked. It was suggested that the Derby St Mary's gauge and more recent flood events could show how QMED, the Median Annual Flood (with a return period of two years) might have changed. There is potential for new ongoing modelling for the River Derwent. There is potential for evidence gaps arising at the location of the Chesterfield Substation. The Flood Map for Planning does not assess catchments less than 3 km^2, meaning that there is a possibility of details regarding flood risk not being available due to resolution issues. This will be considered as part of the full FRA.
Next steps	• The location, design and approach to haul roads will be refined for detailed design and to inform the ES; • design standards for temporary drainage to be confirmed; • availability of missing modelling data to be checked; • modelling method for the River Derwent to be checked; • status of ongoing modelling for the Derwent River catchment to be confirmed; and • the risks associated with the hydraulic modelling studies are to be assessed at full FRA stage to ensure that a sufficient level of detail for the Project can be provided.

9A.7 Study Area and Project Description

Study Area

Introduction

9A.7.1 The extent of the draft Order Limits plus a 500 m buffer around this boundary is the Study Area for this assessment, and for consistency with the assessment of the potential impacts of the Project on the wider water environment detailed in **Chapter 9 Hydrology and Land Drainage**. The draft Order Limits are defined as the maximum extent of land within which the Project may be undertaken and includes both permanent and temporary land required to construct, operate and maintain the Project. The draft Order Limits are shown in **Figure 4.1 Proposed Project Design**.

9A.7.2 The information presented in this section includes only that deemed to be of relevance to the assessment of flood risk in the context of the scope of the pFRA as defined in section 9A.2. A detailed description of the baseline conditions in relation to the wider water environment is provided in **Chapter 9 Hydrology and Land Drainage**.

Location and land use

9A.7.3 The Study Area traverses a length of approximately 60 km, from east of Chesterfield to the east of the town of Willington, south west of Derby, in Derbyshire, as shown in **Figure 1.1 Proposed Project Location and Route Sections**. The Study Area generally follows a north south alignment before passing to the east and south of Derby.

9A.7.4 The Study Area covers an area that is predominantly rural, with large parts of the land under arable farming use. The towns of Clay Cross, Alfreton, Ripley, Belper and Derby are located within 5 km of the Study Area, with multiple villages and individual properties in the vicinity.

Topography

9A.7.5 The existing topography varies along the length of the Study Area. A description of the topography according to each Section of the proposed route alignment is provided below.

Section 1: Chesterfield to Tibshelf

9A.7.6 Ordnance Survey mapping shows varied topography with elevations between 184 m and 82 m above ordnance datum (AOD). Low-lying areas are mainly in the north east and south. These areas highlight key watercourses like Calow Brook, Muster Brook, and Westwood Brook. The land is mostly agricultural with limited development and roads including the A617, B6014 and B6039.

Section 2: Tibshelf to Ripley

9A.7.7 Ordnance Survey mapping shows varied topography with elevations between 150 m and 82 m AOD. Low-lying areas are present in the central part of the section. Alfreton Brook is the main watercourse in this area. Land use is mostly agricultural, with roads including the A61, A610, A615, B6025 and B6016.

Section 3: Ripley to Morley

9A.7.8 Ordnance Survey mapping shows varied topography with elevations between 150 m and 61 m AOD. Low-lying terrain is found in the central part of the section. Bottle Brook is a notable watercourse. The land is largely rural, with roads such as the A38, A608, A609 and Derby Road.

Section 4: Morley to Ockbrook

9A.7.9 Ordnance Survey mapping shows varied topography with elevations between 138 m and 57 m AOD. Low-lying areas are found centrally across the section. Ock Brook is the key water feature. The area is rural, with roads including the A608, A6096 and Derby Road.

Section 5: Ockbrook to Aston-on-Trent

9A.7.10 Ordnance Survey mapping shows varied topography with elevations between 76 m and 36 m AOD. Low-lying zones are located in the central area. The River Derwent is the main watercourse. Land use is mostly agricultural, with roads including the A52, A6, B5010, A6005 and Nottingham Road.

Section 6: Aston-on-Trent to Willington Substation

9A.7.11 Ordnance Survey mapping shows varied topography with elevations between 88 m and 33 m AOD. Low-lying areas are mainly in the centre of the section. Twyford Brook, the Trent and Mersey Canal and Cuttle Brook are the key water features. The land is mostly agricultural, with the Derby Southern Bypass and A514 as the major roads.

Geology and hydrogeology

9A.7.12 A summary of the geology and hydrogeology underlying the Study Area is given below with further detail contained in **Chapter 10 Geology and Hydrogeology**.

Section 1 (Chesterfield to Tibshelf) to Section 4 (Morley to Ockbrook)

9A.7.13 According to British Geological Survey (BGS) Geology Viewer mapping (Ref 9A.16), superficial geological deposits are limited across Section 1 (Chesterfield Substation to Tibshelf) to Section 4 (Morley to Ockbrook). Where present, these deposits are typically alluvial in nature and comprise gravel, sand, silt, and clay, generally associated with localised fluvial processes along watercourses. The absence of extensive superficial coverage suggests a greater influence of the underlying bedrock on hydrogeological conditions in this area.

9A.7.14 British Geological Survey Geology Viewer mapping shows that the bedrock geology between Chesterfield and Shirland consists predominantly of Pennine Lower and Middle Coal Measures Formations comprising mudstone, sandstone and siltstone. Areas of these formations are present across the majority of the proposed route

alignment up to where the alignment reaches the A6096 to the south of Stanley. Between Shirland and Oakerthorpe, there are pockets of Tupton Rock and Deep Hard Rock formation, which comprises mainly sandstone. Further south, between Belper and Stanley, there are areas of Wingfield Flags and Loxley Edge Rock, both of which comprise mostly sandstone.

9A.7.15 A review of DEFRA's MAGIC mapping (Ref 9A.17) shows that the bedrock and superficial aquifer designations vary across the Study Area. Section 1 (Chesterfield Substation to Tibshelf) to Section 4 (Morley to Ockbrook) are underlain predominantly by a Secondary A bedrock aquifer. The superficial geology underlying the Study Area in Section 1 (Chesterfield to Tibshelf) to Section 4 (Morley to Ockbrook) comprises mostly Secondary A and Secondary Undifferentiated aquifers.

9A.7.16 In Section 1 (Chesterfield to Tibshelf), groundwater strikes were encountered at 19 m below ground level (bgl) with seepage encountered from 12.5 m bgl. Groundwater strikes were recorded in Section 2 (Tibshelf to Ripley) at multiple borehole locations at depths ranging between 2.75 to 23 m bgl. Seepages were recorded at multiple locations in Section 3 (Ripley to Morley) at depths ranging between 3.5 to 15 m bgl. Groundwater levels have not been recorded in any borehole records within Section 4 (Morley to Ockbrook). In addition, there are no Groundwater Source Protection Zones (SPZ) within 500 m of the draft Order Limits in Section 1 (Chesterfield to Tibshelf) to Section 4 (Morley to Ockbrook).

9A.7.17 Further details regarding the hydrogeology of Section 1 (Chesterfield to Tibshelf) to Section 4 (Morley to Ockbrook) can be found in **Chapter 10 Geology and Hydrogeology**.

Section 5 (Ockbrook to Aston-on-Trent) to Section 6 (Aston-on-Trent to Willington Substation)

9A.7.18 According to BGS Geology Viewer mapping (Ref 9A.16), superficial deposits become more widespread in Section 5 (Ockbrook to Aston-on-Trent) and Section 6 (Aston-on-Trent to Willington Substation), particularly within the floodplain zones. These deposits predominantly consist of fluvially derived clay, silt, sand, and gravel, forming part of the Holme Pierrepont Sand and Gravel Member, Allenton Terrace Deposits, and Alluvium. The presence of these permeable units may locally enhance groundwater recharge and influence shallow groundwater flow patterns, contributing to the hydrogeological complexity of the area.

9A.7.19 South of the A6096 in Section 5 (Ockbrook to Aston-on-Trent) and Section 6 (Aston-on-Trent to Willington Substation), the bedrock composition is a mix of Chester Formation, Tarporley Siltstone Formation, Gunthorpe Member, Branscombe Mudstone Formation, all of which are a mixture of sandstone, pebble, siltstone and mudstone.

9A.7.20 A review of DEFRA's MAGIC mapping (Ref 9A.17) shows that the bedrock is predominantly a Secondary B aquifer but with areas of Principal Aquifer designation within the Study Area, particularly to the south of the A50 in Section 6 (Aston-on-Trent to Willington Substation). The superficial geology comprises Secondary A and Secondary Undifferentiated aquifers and a small area of Secondary B aquifer to the north of the Willington Substation in Section 6 (Aston-on-Trent to Willington Substation).

9A.7.21 Groundwater strikes have been recorded at multiple borehole locations in Section 5 (Ockbrook to Aston-on-Trent) at depths ranging between around 2.7 to 10 m bgl. Similarly in Section 6 (Aston-on-Trent to Willington Substation), multiple groundwater strikes were encountered. These were at depths ranging between around 0.90 to 25 m bgl. In addition, there are no Groundwater SPZs recorded within 500 m of the draft Order Limits in Section 5 (Ockbrook to Aston-on-Trent) and Section 6 (Aston-on-Trent to Willington Substation).

9A.7.22 Further details regarding the hydrogeology of Section 5 (Ockbrook to Aston-on-Trent) and Section 6 (Aston-on-Trent to Willington Substation) can be found in **Chapter 10 Geology and Hydrogeology**.

Hydrology and drainage

9A.7.23 The Study Area traverses the Don and Rother, Derwent Derbyshire and Trent Lower and Erewash EA management catchments. A review of the EA's Statutory Main River Map (Ref 9A.13) reveals that there are 11 statutory main rivers present within the Study Area. These are:

- Alfreton Brook;
- River Amber;
- Bottle Brook;
- Normanton Brook;
- River Derwent;
- Thulston Brook;
- Barrow Drain;
- Cuttle Brook;
- Hell Brook;
- Twyford Brook;
- Sands Brook;
- The Old Trent; and
- River Trent

9A.7.24 A review of online mapping suggests that the ordinary watercourses across the Study Area range in size and scale from small field drains and ditches to canals and brooks such as:

- Oakerthorpe Brook and Coppice Brook; and
- Cromford Canal, Derby Canal and Trent and Mersey Canal.

9A.7.25 Other surface water features include what appears to be lakes at Locko Park, a cluster of surface water bodies to the south of Ambaston, Hartshay Brook online pond, Doe Hill Country Park pond and Mercia Marina between Willington Power Station and the A50. A review of online mapping suggests that there are no above-ground reservoirs within 500 m of the draft Order Limits.

9A.7.26 A more detailed description of the surface water features within the Study Area are provided in **Chapter 9 Hydrology and Land Drainage**.

Flood defence assets

9A.7.27 The EA's Spatial Flood Defences dataset (Ref 9A.14) shows a range of formal flood defences across the Study Area. These include open channels, water storage areas, natural/engineered high ground, embankments and flood walls, amongst others. While there are formal flood defences located across the whole Study Area, the majority are located to the south of Derby, around the River Derwent and River Trent. The standard of protection varies.

9A.7.28 In line with Scoping Opinion responses from the EA, flood defence assets will be assessed in greater detail as part of the full FRA that will be submitted alongside the ES. This will include a desktop assessment of the standard of protection, an assessment of condition of each asset according to the EA's Spatial Flood Defences dataset (Ref 9A.14) and work to ensure that the structural integrity and access for maintenance is not compromised by any element of the Project. The need for asset surveys to confirm any details regarding the assets will be subject to discussion with the EA as the Project progresses.

9A.7.29 Normally, the EA's Reduction in Flood Risk from Rivers and Sea due to Defences dataset is used to offer a spatial representation of the areas identified to be benefitting from formal flood defences. However, at the time of writing, the EA has temporarily discontinued the dataset, intending to supersede it with updated information. As such, this information has not been reviewed as part of this pFRA but will be assessed as part of the full FRA, if available.

Project Description

Summary

9A.7.30 The key elements of the Project are summarised below with further information provided in **Chapter 4 Description of the Project**.

9A.7.31 The Project is a proposal by National Grid to build the following principal components:

- A new 400 kV overhead line, approximately 60 kilometres (km) in length between a proposed new Chesterfield Substation and the existing Willington Substation. It is anticipated that this would comprise steel lattice pylons in accordance with National Grid's guidance and national planning policy.
- A new 400 kV Chesterfield Substation, to be built in the vicinity of the existing Chesterfield 275 kV Substation and the existing 132 kV National Grid Electricity Distribution (NGED) Substation to the south east of Chesterfield (referred to as the 'new Chesterfield Substation'). This is proposed to be a Gas Insulated Switchgear substation.
- Replacement of short sections of existing overhead line and local changes to the lower voltage distribution networks to facilitate the construction of the Project.

9A.7.32 The Project would include other required works, for example, temporary and permanent diversions for works on existing overhead line routes, temporary access roads, highway works, temporary works compounds, work sites and other ancillary works. The Project would also include utility diversions and drainage works. There would also be land required for mitigation, compensation and enhancement of the environment including BNG.

9A.7.33 The Project would connect into the existing Willington Substation[2] located to the south west of Derby and a proposed new substation at Chesterfield. It is currently anticipated that the new Chesterfield Substation will be consented and delivered as part of a separate National Grid project, Chesterfield to High Marnham, distinct from this Project. However, it is possible that it will be decided to also include the new Chesterfield Substation works as part of the DCO application for this Project to provide an alternative consenting mechanism to remove reliance on that separate planning application/consent and so mitigate against the risk of delay to the delivery of the Project.

9A.7.34 Further details regarding the Project features will be included within the ES and would be incorporated within the DCO application.

Construction phase

9A.7.35 The design of the Project is currently in the early stages of development. The most up to date information on the design of the Project, including the proposed nature, number and location of temporary construction compounds associated with the proposed overhead line and proposed route alignment, is provided in **Chapter 4 Description of the Project**, along with details of the proposed construction access points and haul routes.

Overhead transmission lines

9A.7.36 The construction of the proposed 400 kV overhead line would generally follow the sequence outlined below:

- site surveys;
- ground investigation;
- installation of bellmouth easements (access points) and creation of visibility splays for construction access;
- installation of easement fencing and gates, or equivalent;
- earthworks, including temporary drainage installation where required;
- installation of access tracks (including culverts and bridges) and demarcated pylon working platforms;
- installation of pylon foundations (pad and column, mini pile, driven pile or bespoke);
- working area and layout of steelwork in preparation for erection;
- assembly of steelwork (painting if required) and erection of pylon structures;
- installation of temporary works (including scaffolding, traffic management), if required, where the proposed route alignment intersects existing infrastructure

[2] Separate from the Project, National Grid (Customer and Network Development) is developing plans for an extension to the existing substation to facilitate new customer connections. It is anticipated that these extension works would be delivered via permitted development rights and are expected to be completed by 2029. If confirmed, this potential development will be considered as part of the Project's cumulative assessment within the Environment Statement.

(e.g. highway or railways) for protection to allow the continued safe operation of those assets during stringing of conductors;

- installation of insulator assemblies and ancillary equipment for conductor stringing on suspension pylons;
- establishment of machine sites for conductor stringing;
- temporary earthing;
- conductor stringing;
- installation of insulator assemblies on tension and terminal pylons;
- installation of pylon furniture including signage, safety notice plates and anti-climbing devices;
- commissioning and energisation;
- removal of construction equipment and temporary works;
- removal of access tracks and bellmouths;
- removal of construction compounds; and
- reinstatement of ground and restoration of soils.

New Chesterfield Substation

9A.7.37 The Project is expected to comprise a new 400 kV Gas Insulated Switchgear substation and associated works comprising:

- approximately 15 bays including a Bus section;
- approximately six overhead line gantries;
- standard substation plant, including circuit breakers, disconnectors, earth switches, instrument transformers, cable sealing ends (CSEs), surge arrestors, and busbars (not necessarily an exhaustive list);
- three 400 kV / 275 kV 1100 MVA Interbus transformers (super grid transformers) and 24 CSE cables on 275 kV side;
- Gas Insulated Switchgear Hall Building including the site office, welfare, portable relay room, telecoms room, low voltage alternating current room, workshop and battery room with approximate dimensions of 76 m in length, 25 m width and 14 m height;
- security fencing;
- lighting columns;
- CCTV surveillance;
- a new permanent access route for vehicular traffic;
- temporary construction compounds, welfare and laydown areas; and
- landscaping, drainage features and BNG areas.

9A.7.38 A more detailed overview of the construction process is provided in **Chapter 4 Description of the Project**.

Operational phase

Overhead transmission lines

9A.7.39 The proposed sections of overhead line would comprise conductors supported by pylons. A typical span distance between pylons operating at 400 kV is approximately 350 m resulting in an approximate average of three pylons for every kilometre of overhead line.

9A.7.40 The pylon type used for the Project will be determined ongoing design studies, assessment and survey, coupled with feedback from consultation. Current proposals are based on standard lattice steel pylons which are typically approximately 50 m in height, with three crossarms on either side of a central body.

Substations

9A.7.41 One new 400 kV substation is proposed as part of the Project, being the Chesterfield Substation at the northern end of the Project.

9A.7.42 National Grid operates an existing 400 kV substation east of Willington adjacent to the former power station site. An existing 132 kV substation is also operated in this location by NGED. Of relevance to this Project, the 400 kV substation was built in the 1990s and will form the southern connection point for the Project.

Vulnerability Classification

9A.7.43 A sequential approach was taken in the selection of the route corridor, siting zones and siting areas, with flood risk being considered throughout the process alongside the numerous other technical, environmental, and socio-economic constraints.

9A.7.44 The Flood Risk and Coastal Change PPG (Ref 9A.7) provides guidance on the classification of flood risk vulnerability and the compatibility of vulnerability with the flood zones given by the EA's Flood Map for Planning (Ref 9A.8).

9A.7.45 **Table 9A.10**, which is adapted from Table 2 in the Flood Risk and Coastal Change PPG (Ref 9A.7), provides a summary of the flood risk vulnerability and associated flood zone compatibility of the various elements of the construction and operational phases of the Project. The ticks and crosses indicate if the Project element is compatible or not in the respective flood zones.

9A.7.46 There will be some components of the Project that will require the application of the Exception Test. Further evidence on the Exception Test will be provided as part of the FRA submitted in support of the DCO application for the Project, where necessary.

Table 9A.10: Flood risk vulnerability classification and flood zone compatibility

Project Element	Flood Risk Vulnerability	Flood Zone 1	Flood Zone 2	Flood Zone 3a	Flood Zone 3b
Construction Phase					
Temporary construction compounds	Less vulnerable	✓	✓	✓	X
Construction activity areas	Less vulnerable	✓	✓	✓	✓**
Watercourse crossings and drainage outfalls	Water compatible	✓	✓	✓	✓*2
Operational Phase					
Overhead line	Essential infrastructure	✓	✓	Exception Test required*1	Exception Test required*2
Substations	Essential infrastructure	✓	✓	Exception Test required*1	Exception Test required*2

Notes:

**1 In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.*

**2 In Flood Zone 3b (functional floodplain) essential infrastructure that has passed the Exception Test, and water-compatible uses, should be designed and constructed to:*

Remain operational and safe for users in times of flood;

Result in no net loss of floodplain storage; and not impede water flows and not increase flood risk elsewhere.

*** Construction activity areas would generally be considered to be compatible in Flood Zone 3b for the Project; compatibility would be assessed through consultation and discussed with the EA and LLFA, where necessary.*

9A.8 Flood Risk Screening

Introduction

9A.8.1 The following section summarises the screening of all potential sources of flood risk posed to, and arising from the Project, during both the construction and operational phases and to identify those that require further assessment. A subsequent preliminary assessment of the risk of flooding posed by those sources identified as requiring further assessment is presented in section 9A.9. The preliminary identification of the mitigation measures that are expected to be required to manage the risks is provided in section 9A.10.

Flood Risk Datasets

Fluvial and tidal flood risk

9A.8.2 The EA's Flood Map for Planning (Ref 9A.8) has been adopted as the basis for screening the potential risk of flooding posed from fluvial and tidal sources. Flood Zone 1, 2, and 3 indicate a 'Low', 'Medium', and 'High' likelihood of flooding, respectively, with full definitions of each flood zone provided in **Table 9A.1**. The most recent full update to the Flood Map for Planning was in March 2025; the latest available data have been used to inform the screening of flood risk from fluvial and tidal sources.

9A.8.3 **Figure 9A.1** shows an extract of the Flood Map for Planning (Ref 9A.8) fluvial flood risk mapping. In the figure, the areas outside the Flood Zone 2 and 3 areas are classed as Flood Zone 1.

9A.8.4 It is also noted that there were further updates to the Flood Map for Planning in August 2025; these changes, in addition to any subsequent changes between now and ES stage, will be incorporated into the full FRA.

9A.8.5 In some instances, the EA's Risk of Flooding from Surface Water mapping (Ref 9A.11) has been used to identify flood risk from small watercourses that the Flood Map for Planning would not include.

9A.8.6 Pre-application consultation with the EA has identified a number of existing hydraulic modelling studies within the Study Area of the Project. These studies add further definition to the risk of flooding from fluvial sources within the Study Area.

9A.8.7 **Table 9A.11** provides a summary of the available hydraulic modelling data received from the EA.

Table 9A.11: Summary of hydraulic modelling studies

Hydraulic Model Name	Year of Modelling Study	Model Type	Return Periods (Annual Probability) (as per Models Received)
Alfreton Brook	2005	1D only (ISIS software)	5yr, 10yr, 20yr, 50yr, 75yr, 100yr, 100yr + 20% Climate Change (CC), 200yr, 1,000yr Sensitivity tests
Amber Hazard Mapping	2012	A mix of 1D and 2D (ISIS-TUFLOW software)	100yr + 20% CC, 30% CC and 50% CC
Bottle Brook	2012 (including 2021 Climate Change updates)	A mix of 1D and 2D (ISIS-TUFLOW software)	5yr, 10yr, 20yr, 50yr, 75yr, 100yr, 100yr + 20% CC, 200yr, 1,000yr, Sensitivity tests
Cuttle Brook	2006	1D only (ISIS software)	5yr, 10yr, 20yr, 50yr, 75yr, 100yr, 100yr + 20% CC, 200yr, 1,000yr, Sensitivity tests.
Our City Our River (OCOR)	2023	A mix of 1D and 2D (ISIS-TUFLOW software)	2yr, 5yr, 10yr, 20yr, 50yr, 75yr, 100yr, 1,000yr, Sensitivity tests. CC 2020 (+13%), 2050 (+17%), 2080 (+29%) for 100yr.
Derbyshire Trent	2021	A mix of 1D and 2D (ISIS-TUFLOW software)	5yr, 10yr, 20yr, 50yr, 75yr, 100yr, 100yr + 20% CC, 100yr + 50% CC, 100yr + 30% CC, 200yr, 1,000yr, Sensitivity tests.
Ock Brook	2013	A mix of 1D and 2D (ISIS-TUFLOW software)	5yr, 10yr, 20yr, 50yr, 75yr, 100yr, 100yr + CC, 200yr, 1,000yr, Sensitivity tests.

9A.8.8 Data were also received for the Middle and Lower Don modelling study (2018) which contains a mixture of 1D/2D modelling.

9A.8.9 Modelling studies for Twyford Brook and Park Brook were not received as part of the data request that was submitted to the EA. This was raised in a consultation meeting with the EA. If they become available, an inspection of the data for these models will be undertaken at the full FRA stage alongside the ES.

9A.8.10 Amendments and updates to the existing hydraulic modelling studies are outside the scope of this pFRA. However, the need for amendments and/or updates to the modelling studies will be confirmed with the EA/LLFA as further design details are made available as the Project progresses.

9A.8.11 Hydraulic modelling study extents can be seen in **Figure 9A.2**.

Surface water flood risk

9A.8.12 The EA's Risk of Flooding from Surface Water mapping (Ref 9A.11) has been used to inform this screening of the potential risk to the Project of flooding from surface water sources. The mapping provides an indication of the extent of surface water flooding predicted during storm events with varying return periods. A summary of the probability of flooding definitions is provided in **Table 9A.2**.

9A.8.13 The EA's Risk of Flooding from Surface Water mapping was updated to reflect the outputs of the New National Flood Risk Assessment (NaFRA2) in January 2025, with the latest available data adopted as the basis for this screening exercise.

9A.8.14 **Figure 9A.3** shows an extract of the Risk of Flooding from Surface Water mapping.

Groundwater flood risk

9A.8.15 The geological and hydrogeological mapping described in section 9A.7 has been used to inform this screening of the potential risk of flooding posed from groundwater sources. The BGS mapping (Ref 9A.16) and MAGIC mapping (Ref 9A.17) offers an insight into the permeability of the underlying geology across the Study Area. This leads to an indication of which areas across the Study Area could be at higher risk of flooding from groundwater sources.

9A.8.16 In addition, Derbyshire County Council and Derby City Council's Strategic Flood Risk Assessment (Ref 9A.39) indicates that there is a risk of groundwater flooding within the county as a result of the pumping of mine water no longer taking place. Drawing No. SFRA 5 therein (Ref 9A.39) also shows areas that are deemed to be susceptible to groundwater flooding across the county.

Artificial sources of flood risk

9A.8.17 The EA's Reservoir Flood Maps (Ref 9A.12) provide an indication of the maximum extent of flooding that could occur in the unlikely event of a dam or reservoir failure. The Reservoir Flood Maps include two scenarios:

- The Dry Day scenario, which is defined as 'the flooding that could occur if the dam or reservoir failed when rivers are at normal levels'.
- The Wet Day scenario, which is defined as 'how much worse the flooding might be if a river is already experiencing an extreme natural flood'.

9A.8.18 Both scenarios have been considered as part of this assessment. **Figure 9A.4** shows an extract of the Reservoir Flood Risk mapping.

9A.8.19 The nature of sewer flooding means that there are no mapping datasets available to inform an assessment. As a result, a qualitative assessment of likely land uses has been used to inform this screening of potential sewer flood risk across the Study Area. This includes identifying sources of sewerage infrastructure that could potentially contribute to sewer flooding issues; consultation with the relevant water company will be undertaken at full FRA stage to confirm sewerage infrastructure assets present across the Study Area.

9A.8.20 There are also a number of additional surface water features across the Study Area including lakes and ponds, such as at Locko Park, and canals, such as the Trent and Mersey Canal, which could contribute to flooding from artificial sources.

Historic flooding

9A.8.21 The EA's Recorded Flood Outlines dataset (Ref 9A.15) has been utilised as a supplementary source of information to those given above in accordance with the requirements of NPS EN-1 (Ref 9A.5). An extract of the Recorded Flood Outlines mapping can be found in **Figure 9A.5**.

9A.8.22 The Recorded Flood Outlines dataset includes all historic flooding extents from fluvial, tidal, groundwater and surface water of which the EA has a record. The outlines take flood defences and other structures that existed at the time of flooding into account, in addition to flooding that may have been impacted by additional factors such as flood defence breaches.

9A.8.23 The Recorded Flood Outlines dataset is adopted for the purposes of this assessment as it includes a wider range of recorded flood events and provides information on the date, source and cause of each event.

9A.8.24 A review of online mapping suggests that flood risk in Derby and Derbyshire arises from multiple sources, including fluvial, surface water, and groundwater flooding, influenced by local topography and geology. Major rivers present flood risks to homes and businesses, while surface water flooding is linked to impermeable clays.

9A.8.25 In addition to online mapping, further information regarding flood extents was shared during an MP-led engagement event in spring 2025. The photos, taken between 2012 and 2024, show a number of pooling locations in fields between Harrys Farm and Merry Bower Farm in the southern areas of the Study Area, and potential surface water flow paths in more recent flooding events in 2023 and 2024.

Screening Assessment Summary

9A.8.26 The results of the screening undertaken for all potential sources of flood risk posed to, and arising from the Project, during both the construction and operational phases, are presented in **Table 9A.12** below.

Table 9A.12: Screening of all potential sources of flood risk

Source	Risk	Summary	Further Assessment Required
Tidal	Negligible	A review of the EA's Flood Map for Planning (Ref 9A.8) shows that the Study Area lies outside any areas of tidally influenced flood risk.	No
Fluvial	Low to High	The EA's Flood Map for Planning shows that the Study Area mostly lies within Flood Zone 1. However, Flood Zone 2 and 3 are located within the Study Area, mostly attributed with the main rivers as it bisects each catchment from north to south. The dominant source of flooding within the southern parts of the Study Area is expected to be fluvial, particularly impacts attributed to the River Derwent and the River Trent.	Yes

Source	Risk	Summary	Further Assessment Required
		A review of the EA's Asset Information Management System (AIMS) database (Ref 9A.14) suggests that these areas benefit from a variety of flood defences, including embankments, open channels and natural high ground, which offer varying degrees of protection.	
Surface water	Low to High	The EA's Risk of Flooding from Surface Water mapping (Ref 9A.11) shows that the Study Area lies within an area predominantly subject to a 'Very Low' probability of surface water flooding. However, areas subject to a 'Low' to 'High' probability of flooding from this source are shown throughout the Study Area, generally representing flow paths generated by runoff, localised ponding expected to occur in topographic low-spots or coinciding with the network of existing main rivers and ordinary watercourses present within the Study Area.	Yes
Groundwater	Low to High	The BGS mapping (Ref 9A.16) indicates that the underlying geology across the Study Area could lead to varying degrees of risk from groundwater flooding. Areas of sandstone and gravelly deposits are expected to exhibit moderate permeability whereas areas dominated by mudstone are likely to comprise strata of low permeability. Much of the Project is also underlain by Secondary A bedrock and superficial aquifers, in addition to there being Principal Aquifers within the Study Area in Section 6 (Aston-on-Trent to Willington Substation). Given the varied geology and close proximity to rivers throughout the Study Area, there is a potential risk of flooding to the Project from groundwater sources. In addition, Drawing No. SFRA 5 in Derbyshire County Council and Derby City Council's Strategic Flood Risk Assessment (Part 1) (Ref 9A.39) shows that much of the mapped area is deemed to be <25% susceptible to groundwater flooding; however, there are areas to the south of Derby in the vicinity of the River Trent and River Derwent that are ≥75% susceptible to groundwater flooding.	Yes

Source	Risk	Summary	Further Assessment Required
Artificial (reservoirs)	Residual	The EA's Reservoir Flood Risk map (Ref 9A.12) shows the Study Area to traverse areas that lie within the extent of flooding predicted to occur in the unlikely event of a dam or reservoir failure. The risk shown within the Study Area is associated with both the Dry Day and Wet Day scenarios. All large reservoirs must be inspected and supervised by reservoir panel engineers in accordance with the Reservoirs Act 1975 (Ref 9A.37). The EA serves as the enforcement authority for the Reservoirs Act 1975 in England and is required to ensure that reservoirs are inspected regularly, and that essential safety work is undertaken. Consequently, this is considered to represent a residual risk of flooding to the Project and will be assessed as such in accordance with the requirements of NPS EN-1 (Ref 9A.5).	Yes (Residual)
Artificial (sewers)	Low	The Study Area is predominantly rural, with large parts of the land used for arable farming. Surface water that will be generated by the Project is anticipated to be discharged to ground via infiltration or to surface water bodies in preference to the public sewer network in accordance with the drainage hierarchy. Consequently, interfaces between the Project and the public surface water sewer network are expected to be minimal. In the event that sewer flooding occurs, it is anticipated that the resultant flow paths will follow the existing topography and accumulate in low-lying areas, similar to that associated with surface water flooding. While the risk is expected to be Low for the aforementioned reasons, sewer flooding has been screened in for future assessment because water companies will be consulted at full FRA stage to confirm the location of sewerage assets and to confirm whether or not there is the potential for sewer flooding at any key locations within the Study Area.	Yes

Source	Risk	Summary	Further Assessment Required
Artificial (IDB drainage infrastructure)	Negligible	The Study Area does not lie within catchments in which water levels are managed by IDBs. Consequently, there is no risk of flooding posed to the Project associated with a potential failure of IDB drainage infrastructure.	No
Artificial (canals and other)	Residual	The Trent and Mersey Canal crosses the Study Area within the River Trent corridor (between Willington and Aston-on-Trent), and the Cromford Canal and Derby Canal are also present within the Study Area, although these are no longer navigable. Canals and their associated structures are highly maintained and regulated to maintain a constant water volume; therefore, for the purposes of this assessment, it is assumed that they pose a residual risk associated with a potential breach if the canal is impounded above existing ground levels or if there is a failure in any structures. There are also surface water features across the Study Area, such as the lakes at Locko Park, which pose a residual risk of flooding.	Yes (Residual)

9A.8.27 The risk of flooding posed to, and arising from, the Project, from fluvial, surface water and groundwater sources are all considered to require further assessment and are considered in detail in section 9A.9. The risk of flooding from reservoirs, canals and supporting infrastructure are to be assessed as a residual risk. This includes consideration of construction-related activities such as access tracks, construction compounds and working areas.

9A.9 Preliminary Flood Risk Assessment

Introduction

9A.9.1 The following section summarises the preliminary assessment of flood risk posed by those sources identified as requiring further assessment following the screening exercise presented in section 9A.8. It includes an assessment of the risk of flooding posed both to and arising from the Project in accordance with the requirements of NPS EN-1 (Ref 9A.5). Mitigation measures that are expected to be required to manage the risks assessed in this section are provided in section 9A.10.

9A.9.2 Additional information on the assessment of baseline flood risk within the Study Areas for the Project are provided in **Chapter 9 Hydrology and Land Drainage**.

Construction Phase Risks

Overhead transmission lines

9A.9.3 The anticipated sequencing of the construction phase for the proposed overhead line elements of the Project is summarised in section 9A.7, whilst plans detailing the anticipated temporary and construction features associated with the Project are provided in **Chapter 4 Description of the Project**. This section offers a preliminary assessment of flooding to the Project through the construction phase from the sources identified in the screening section above.

9A.9.4 The temporary and construction features anticipated to be required to deliver the proposed overhead line elements of the Project are summarised in section 9A.7.

Fluvial flood risk

9A.9.5 The proposed overhead line elements of the Project have the potential to increase the risk of flooding posed by fluvial sources to other receptors during the construction phase. The extent of fluvial flooding across the Study Area varies depending on which watercourse is considered, with the River Trent and River Derwent posing the greatest risk of fluvial flooding to the Project.

9A.9.6 Across the entire Study Area, there are a number of direct interactions with Flood Zone 2 and 3 areas as defined by the EA. These interactions include, but are not limited to, the following:

- tension/suspension pylon working areas being located within or immediately adjacent to Flood Zone 2 and 3 areas;
- scaffolding footprints and stringing areas being located within or immediately adjacent to Flood Zone 2 and 3 areas;
- multiple haul roads and construction access tracks traversing the floodplain for distances varying between a few metres and hundreds of metres; and
- multiple watercourse crossing locations for construction and maintenance purposes.

9A.9.7 Multiple watercourses are affected, including Calow Brook, Bottle Brook, Alfreton Brook and, in particular, where temporary infrastructure is located within the extents of the River Derwent floodplain. There are approximately 57 watercourse crossings required during the construction phase. Equipment associated with the construction of the pylons, such as stringing and scaffolding equipment, will also be located within or adjacent to Flood Zone 2 and 3 areas.

9A.9.8 The likely impacts resulting from the installation of construction phase infrastructure include a potential loss of floodplain storage and changes in flood conveyance. This is especially true in the River Derwent floodplain, to the south east of the Project, where new construction equipment and impermeable surfacing, such as haul roads and access tracks are to be installed.

Hydraulic modelling

9A.9.9 While amendments and updates to existing hydraulic models provided by the EA are outside the scope of this pFRA, flood depths have been extracted at a sample of pylon locations within the Study Area that fall within Flood Zones 2 and 3 for the 1 in

100-year annual probability, 1 in 100-year annual probability plus climate change, 1 in 200-year annual probability and 1 in 1,000-year annual probability flood events as presented in **Table 9A.13** below.

Table 9A.13: Hydraulic modelling study flood depths (metres)

Pylon Location	Model	1 in 100-year flood depths (m)	1 in 100-year + 20% CC flood depths (m)	1 in 100-year + 30% CC flood depths (m)	1 in 100-year + 50% CC flood depths (m)	1 in 200-year flood depths (m)	1 in 1,000-year flood depths (m)
4CW93	Bottle Brook	0.33	0.22	0.23	0.24	N/A	0.25
4CW138	Derwent Derbyshire	0.00	0.00	0.00	0.00	0.00	0.00
4CW139	Derwent Derbyshire	0.61	0.69	0.72	0.77	0.68	0.84
4CW140	Derwent Derbyshire	0.60	0.66	0.69	0.74	0.66	0.80
4CW141	Derwent Derbyshire	0.11	0.15	0.17	0.22	0.15	0.26
4CW142	Derwent Derbyshire	0.44	0.51	0.54	0.60	0.50	0.67
4CW143	Derwent Derbyshire	0.50	0.57	0.59	0.65	0.56	0.71
4CW144	Derwent Derbyshire	0.65	0.72	0.75	0.81	0.71	0.88
4CW145	Derwent Derbyshire	0.27	0.33	0.35	0.40	0.32	0.46
4CW146	Derwent Derbyshire	0.00	0.00	0.00	0.00	0.00	0.00
4CW147	Derwent Derbyshire	0.00	0.00	0.00	0.00	0.00	0.00

9A.9.10 For the purpose of this assessment, only existing EA models that directly interact with the Project have been considered. These include:

- Alfreton Brook;
- Bottle Brook;
- Derwent Derbyshire;
- Cuttle Brook;
- Derbyshire Trent; and
- Rother.

9A.9.11 While a sample of depths at the pylon locations listed in **Table 9A.13** were extracted, limitations were identified with the hydraulic modelling study data received from the EA. For example, there were a number of unknown values, in particular in the climate change scenarios for the Cuttle Brook and Alfreton Brook. In addition, value discrepancies were identified whereby lower return period scenarios returned higher flood depths than higher return period scenarios.

9A.9.12 Detailed investigation into the hydraulic modelling study issues listed above is outside the scope of this assessment. However, this should be noted as a point for future work at the full FRA stage. Value discrepancies would need to be discussed with the EA and LLFA where a general approach to hydraulic modelling should be agreed upon.

9A.9.13 Following this extraction of flood depths and the preliminary assessment of flood risk, the construction phase activities and temporary infrastructure are likely to be at high risk of fluvial flooding at multiple locations across the Study Area. Temporary removal of areas of the floodplain, in particular within the River Derwent floodplain, would require mitigation measures to offer adequate protection to personnel and other receptors associated with the loss of floodplain storage and potential disturbance to flood conveyance routes.

9A.9.14 Further details regarding the proposed future hydraulic modelling work are provided further in this section, and details regarding measures to manage the anticipated impacts are outlined in section 9A.10 of this pFRA.

Surface water flood risk

9A.9.15 The proposed overhead line elements of the Project have the potential to increase the risk of surface water flooding to other receptors during the construction phase. The EA's surface water flood risk mapping (Ref 9A.11) reveals that the entire Study Area ranges from being at very low to high risk of surface water flooding. This is largely attributed to the watercourses and variations in topography across the Study Area, amongst other factors.

9A.9.16 Many of the high risk surface water flood areas are attributed to the watercourses flowing across the Study Area. There are areas within the Study Area where temporary crossings and infrastructure are proposed to be located within or immediately adjacent to the high and medium risk surface water Flood Zone areas. There are also a number of areas of localised pooling or overland flow paths at the location of temporary infrastructure such as haul roads and access tracks.

9A.9.17 Following a review of the available surface water flood risk data, mitigation measures are required to offer protection to personnel, temporary infrastructure and other adjacent sensitive receptors. The standard of protection would be subject to additional consultation with the EA and LLFA following further design information being made available. These mitigation measures are likely to include temporary surface water drainage measures at high risk locations; the standard of protection would be determined as part of the full FRA that will be submitted alongside the ES. Further details regarding mitigation measures can be found in **Appendix 4A Draft Outline Code of Construction Practice**.

9A.9.18 In addition to the surface water flood extents shown on the mapping, the additional flood extents in Section 6 that were raised as part of an MP-led engagement event in spring 2025 have also been considered. The cause of the flooding is assumed to be pooling and overland flow paths generated during periods of heavy rainfall, though this has not been confirmed.

9A.9.19 Going forward, if these flooding events are deemed to directly or indirectly impact the Project or contribute to any increase in the risk posed to sensitive receptors as part of the construction phase, these flooding locations would be considered as part of a more detailed assessment at the full FRA stage.

Groundwater flood risk

9A.9.20 The underlying geology anticipated to be encountered in certain sections of the Study Area may indicate a higher risk of groundwater flooding. Where practicable, the sequential approach has been adopted to locate the pylons associated with the proposed overhead line elements of the Project outside of those areas identified as being subject to a risk of flooding from any source.

9A.9.21 The temporary infrastructure is deemed unlikely to displace volumes of groundwater or obstruct flows in such a way that could increase groundwater flood risk to adjacent receptors. This is because much of the equipment is expected to be at ground level with ground intrusion expected to be minimal.

9A.9.22 A full assessment of the risk of groundwater flooding to construction phase infrastructure is subject to further investigation. Additional consultation would be undertaken with the EA and LLFA at the full FRA stage where further investigation may be recommended to determine the risk of groundwater flooding more accurately.

9A.9.23 It should also be noted that boreholes will be installed at all pylon locations with a groundwater level monitoring data logger. This will offer insights into the groundwater level and also seasonal variations in the levels.

Artificial sources of flood risk

9A.9.24 As outlined in **Table 9A.12**, all large reservoirs must be inspected and supervised by reservoir panel engineers in accordance with the Reservoirs Act 1975 (Ref 9A.37). The EA serves as the enforcement authority for the Reservoirs Act 1975 in England and is required to ensure that reservoirs are inspected regularly, and essential safety work undertaken.

9A.9.25 Therefore, this assessment deems there to be only a residual risk of flooding posed to the construction phase infrastructure of the Project associated with a failure of a dam or reservoir. This is applicable to areas shown to be at risk of reservoir flooding according to the EA's Dry Day and Wet Day reservoir flood risk zone areas.

9A.9.26 Areas within the Study Area along the corridor of the River Trent and the corridor of the River Derwent and their associated tributaries lie within a mixture of both Dry Day and Wet Day reservoir flood risk areas. The Trent and Mersey Canal and additional surface water features, such as ponds and lakes, could also pose a residual risk of flooding to the overhead line of the Project during the construction phase if a potential breach occurs.

9A.9.27 In accordance with the EA's comments received as part of the Scoping Opinion, the extent to which reservoir flood risk is assessed would be subject to further consultation with the EA following more design information being made available. If it is deemed necessary for relevant authorities for specific reservoir operators to be contacted regarding potential impacts, then this will be undertaken as part of the full FRA that will be submitted alongside the ES.

9A.9.28 Following the Flood Risk Screening assessment, canals and surface water features across the Study Area, including lakes and ponds, could potentially pose a residual risk of flooding to the Project. This will be assessed in greater detail at the full FRA stage, and the assessment will be presented alongside the ES. In addition, while the potential for sewer flooding is expected to be Low, water companies will be consulted at full FRA stage to confirm this.

9A.9.29 The mitigation measures proposed to manage these risks are identified in section 9A.10. Additional details on proposed mitigation measures to protect the wider water environment are provided in **Chapter 9 Hydrology and Land Drainage** and **Appendix 4A Draft Outline Code of Construction Practice**.

Chesterfield Substation

9A.9.30 Details regarding the construction phase for the proposed Chesterfield Substation are summarised in section 9A.7.A more detailed overview of the construction of the new substation is provided in **Chapter 4 Description of the Project**.

Fluvial flood risk

9A.9.31 A review of online mapping suggests that there is a risk of fluvial flooding along the alignment of Calow Brook. This watercourse is proposed to be crossed by a haul road during the construction phase.

9A.9.32 While Calow Lane is an existing area of impermeable surfacing and the EA's Flood Map for Planning (Ref 9A.8) suggests that only a small area of Flood Zone 2 and 3 encroaches onto it, this will be subject to further investigation at the full FRA stage due to the potential importance of the access remaining operational throughout the construction phase to transport materials and personnel across the watercourse.

9A.9.33 The scope of further investigation is subject to further consultation with the EA and LLFA, where a standard of protection for the route would be ascertained and mitigation measures agreed upon.

Surface water flood risk

9A.9.34 The EA's surface water flood risk mapping suggests that the Chesterfield Substation construction compound, located to the north of Calow Lane is situated in an area of low to high surface water flood risk. This flood risk arises mostly from pooling in low-lying areas and also potential surface water flow paths that flow across the construction compound from the ordinary watercourse to the east of the compound to north of Calow Lane.

9A.9.35 In addition, online mapping suggests that the construction access track along Calow Lane is at high risk of surface water flooding, following the alignment of Calow Brook and an associated tributary to the northeast, with an overland flow path being generated along Calow Lane.

9A.9.36 As a result, surface water flooding poses an inundation risk to the compound where storage and construction activities would take place and also to the construction access track from Calow Lane.

9A.9.37 The mitigation measures proposed to manage these risks are identified in section 9A.10 with further details provided in **Chapter 9 Hydrology and Land Drainage** and **Appendix 4A Draft Outline Code of Construction Practice**. A more detailed assessment of the risk posed to the Project from surface water flooding will

be undertaken as part of the full FRA that will be submitted alongside the ES. Appropriate and proportionate mitigation measures would be agreed upon with the EA and LLFA.

Groundwater flood risk

9A.9.38 The underlying geology anticipated to be encountered at the Chesterfield Substation may indicate a higher risk of groundwater flooding. However, construction of the proposed Chesterfield Substation is not expected to displace large volumes of groundwater or obstruct flows in a way that poses an elevated risk to sensitive receptors. In addition, any impacts that arise from the construction process will be temporary.

9A.9.39 Where practicable, the location of construction phase infrastructure would be located in areas at as low risk as possible from groundwater flooding. A full assessment of the risk of groundwater flooding to construction phase infrastructure is subject to further investigation at the full FRA stage to determine the risk more accurately. This could include survey work to discover the depth of the water table and also monitoring to determine seasonal variation.

Artificial sources of flood risk

9A.9.40 The EA's Reservoir Flood Risk mapping (Ref 9A.12) shows that the construction access track from Calow Lane is within reservoir flood risk extents. The exact origin of this flooding is unclear from mapping; however, it appears to originate from areas north of Chesterfield impacting Spital Brook/Calow Brook and leading to an inundation risk along Calow Lane.

9A.9.41 As outlined in **Table 9A.12** above, all large reservoirs must be inspected and supervised by reservoir panel engineers in accordance with the Reservoirs Act 1975 (Ref 9A.37). The EA serves as the enforcement authority for the Reservoirs Act 1975 in England and is required to ensure that reservoirs are inspected regularly, and essential safety work undertaken.

9A.9.42 As above, if it is deemed necessary for relevant authorities for specific reservoir operators to be contacted regarding potential impacts, then this will be undertaken as part of the full FRA that will be submitted alongside the ES.

9A.9.43 Therefore, this assessment deems there to be a residual risk only of flooding posed to the construction phase infrastructure of the Project associated with a failure of a dam or reservoir or overtopping of artificial surface water features such as canals and lakes. In addition, while the potential for sewer flooding is expected to be Low, water companies will be consulted at full FRA stage to confirm this.

Operational Phase Risks

Overhead transmission lines

Fluvial flood risk

9A.9.44 The overhead line elements of the Project traverse a number of areas shown to be at high risk of flooding from fluvial sources. As previously stated, there are multiple pylons located within Flood Zones 2 and 3 across the Study Area for example at Morton Brook, Alfreton Brook, Bottle Brook and in particular in the River Derwent and River Trent floodplain extents to the south.

9A.9.45 Although pylons are located within Flood Zone 2 and 3, a Sequential approach has been adopted in the siting of pylons. Further details are provided in section 7.

9A.9.46 After construction of the Project has been completed, the majority of the pylons are expected to be located at ground level with four points of contact at the base of each pylon to the foundations. In addition, existing access routes or tracks would be used as much as possible for maintenance purposes. These access routes through the operational phase would utilise existing watercourse crossings and tracks, for example agricultural access tracks and other existing watercourse crossing structures.

9A.9.47 There is potential that the foundation design for pylons 4CW141 and 4CW142 may comprise a piled solution with concrete plinths (pile caps) raised above existing ground level due to them being sited within the area of a historic landfill to minimise intrusive works and disturbance of landfill material. While the piled solution with concrete plinths is not being considered specifically for flood risk purposes, this would result in a loss of floodplain storage as the pylons are located within the River Derwent floodplain. Therefore, these works have the potential to affect conveyance and flood storage, and therefore potentially increase flood risk elsewhere.

9A.9.48 The exact dimensions of the concrete plinths are unknown at the time of writing, and a more detailed assessment of potential impacts will be presented in the full FRA alongside the ES.

9A.9.49 As can be seen in **Table 9A.13** the extracted flood depths from the existing EA hydraulic modelling studies at the location of 4CW141 are greater than 0.2 m, and those at 4CW142 are greater than 0.5 m. Therefore, a more detailed interrogation of the hydraulic modelling studies and further consultation with relevant statutory bodies to determine the most appropriate mitigation measures is required at the full FRA stage.

9A.9.50 It should be noted that the more detailed interrogation of hydraulic modelling studies would consider all of the towers in the floodplain; however, 4CW141 and 4CW142 have been specifically noted here as the focus is on the potential for risks related to the concrete plinths.

9A.9.51 Following this assessment, it is acknowledged that there is a potential for increased fluvial flood risk through the operational phase, predominantly associated within the River Derwent floodplain. Further investigation into the hydraulic modelling studies will be undertaken at the full FRA stage to more-accurately ascertain floodplain storage loss and the magnitude of impacts to sensitive receptors. Proportionate mitigation measures would then be agreed upon with the EA and LLFA through further engagement.

Surface water flood risk

9A.9.52 The operational phase of the Project is subject to low to high risk of flooding from surface water sources. The EA's mapping suggests that multiple pylons would be located within or adjacent to areas of pooling resulting from topographical variations across the Study Area. Many of the high risk areas are also attributed to flooding from small watercourses across the Study Area and the generation of overland flow paths, including along existing highways infrastructure such as Calow Lane to the north.

9A.9.53 The cabling for the Project comprises overhead line and the lattice pylons are intended to be installed at ground level and not on platforms (with the exception of 4CW141 and 4CW142). With maintenance access by existing tracks and watercourse crossings to the pylons and overhead line, there is expected to be minimal increase in impermeable area associated with the overhead line and pylons, and therefore minimal increase in surface water flood risk. The small footprint of the pylons is not expected to increase existing surface water flood risk.

9A.9.54 Pylons 4CW141 and 4CW142 are expected to be installed on concrete plinths. However, a review of the EA's surface water flood risk areas shows that the footprint of these plinths is likely to lie within the Low surface water flood risk zone.

9A.9.55 The risk of surface water flooding to the overhead line and pylons during the operational phase is expected to be Low. This assessment will be refined as the design progresses and detailed mitigation measures would be subject to further consultation with the EA and LLFA, wherever necessary.

Groundwater flood risk

9A.9.56 The underlying geology anticipated to be encountered in certain sections of the Study Area may indicate a higher risk of groundwater flooding. Lattice pylons, including those to be installed on concrete plinths, are not expected to displace significant volumes of groundwater and pose minimal obstruction to groundwater flow. Therefore, where pylons are required to be located within areas identified as being susceptible to groundwater flooding, they are not expected to significantly affect conveyance or increase the risk of flooding in the event of groundwater emergence.

9A.9.57 Furthermore, the pylons are expected to be resilient to water damage from occasional flooding. Work would also be undertaken to ensure that the conductors are located sufficiently above expected groundwater emergence levels, ensuring that they would remain operational during a groundwater flooding event, and would not pose a safety risk. In situ groundwater monitoring within exploratory boreholes would be undertaken during intrusive ground investigation works for a period of time where deemed necessary, or appropriate, to inform design development and environmental assessment.

Artificial sources of flood risk

9A.9.58 A review of the EA's reservoir flood risk mapping (Ref 9A.12) suggests that most of the reservoir flood extents in the event of reservoir failure follow the alignment of watercourses. There are multiple pylons that are located in the immediate vicinity of the reservoir flood extents and also where the overhead line crosses the flood zones.

9A.9.59 However, all large reservoirs in England must be inspected and supervised by reservoir panel engineers in accordance with the Reservoirs Act 1975 (Ref 9A.37). The EA serves as the enforcement authority for the Reservoirs Act 1975 in England and is required to ensure that reservoirs are inspected regularly, and that essential safety work is undertaken to ensure safe operation.

9A.9.60 Therefore, this assessment deems there to be a residual risk only of flooding posed to the operational phase of the Project associated with a failure of a dam or reservoir. This is applicable to areas shown to be at risk of reservoir flooding according to the EA's Dry Day and Wet Day reservoir flood risk areas.

9A.9.61 As above, if it is deemed necessary for relevant authorities for specific reservoir operators to be contacted regarding potential impacts, then this will be undertaken as part of the full FRA that will be submitted alongside the ES.

9A.9.62 Following the Flood Risk Screening assessment, canals and surface water features across the Study Area, including lakes and ponds, could potentially pose a residual risk of flooding to the Project. This will be assessed in greater detail at the full FRA stage. In addition, while the potential for sewer flooding is expected to be Low, water companies will be consulted at full FRA stage to confirm this.

9A.9.63 The mitigation measures proposed to manage these risks are identified in section 9.10. Additional details on proposed mitigation measures to protect the wider water environment are provided in **Chapter 9 Hydrology and Land Drainage** and **Appendix 4A Draft Outline Code of Construction Practice**.

Chesterfield Substation

Fluvial flood risk

9A.9.64 According to the EA's Flood Map for Planning (Ref 9A.8), the footprint of the proposed Chesterfield Substation mostly lies within Flood Zone 1, although areas of Flood Zone 2 and 3 are close to the substation footprint. Therefore, at this preliminary stage, the substation is deemed to be at low to high risk of fluvial flooding during the operational phase.

9A.9.65 There are Flood Zone 2 and 3 areas to the west of the proposed substation attributed to Calow Brook. At the time of writing, a permanent access point and access road off Calow Lane would be required for the proposed Chesterfield Substation for operation and maintenance. Further investigation will be needed along Calow Lane to understand the flood depths in more detail to determine whether safe access and egress can be maintained over the lifetime of the proposed substation.

9A.9.66 Climate change scenarios will also be considered. While the EA's Flood Map for Planning is thought to offer a reliable indication of the level of flood risk to the development, following further consultation with the EA, additional work is likely to be required to determine what the increase in fluvial flood extents could be over the lifetime of the development.

Surface water flood risk

9A.9.67 The EA's surface water flood risk mapping (Ref 9A.11) suggests that localised surface water flooding is likely to occur over the lifetime of the proposed substation. This flood risk arises from pooling and surface water flow paths that flow from the ordinary watercourse to the east of the substation to the north of Calow Lane. This flooding is shown to occur during the 1 in 30-year, 1 in 100-year and 1 in 1,000-year (high, medium and low risk) events.

9A.9.68 With regard to new impermeable surfacing for the proposed substation, permanent impermeable surfaces are assumed to include tarmac access roads to and within the substation and concrete and/or tarmac hardstanding within the substation boundaries and associated building footprints. Also, the impermeable area on local highways may be increased as part of highway improvement works.

9A.9.69 Appropriate permanent drainage design would be incorporated for the proposed impermeable surfaces associated with the substation and local highway improvements. Given that the design of the Project remains in development, this is based upon a precautionary approach. A new outfall structure is designed to discharge at a controlled rate into Calow Brook to the east of the proposed substation and is positioned to avoid interference with natural flow paths or channel migration.

9A.9.70 In addition, the EA's surface water flood risk mapping suggests that Calow Lane is at high risk from surface water flooding in the form of pooling and flow paths to the west of the substation. This has the potential to impact Calow Lane as a primary access route from the local road network to the proposed substation.

9A.9.71 As a result, the proposed substation is expected to be at high risk from surface water flooding during the operational phase before mitigation measures are put in place. This includes high risk to the substation itself and also potentially to Calow Lane as the access route. Further work is required to provide sufficient mitigation.

9A.9.72 The mitigation measures proposed to manage these risks are identified in section 9A.10 with further details provided in **Chapter 9 Hydrology and Land Drainage** and **Appendix 4A Draft Outline Code of Construction Practice**.

Groundwater flood risk

9A.9.73 The underlying bedrock geology at the location of the substation according to BGS mapping is a Secondary A aquifer, with Secondary A superficial aquifers following the alignment of Calow Brook to the west of the substation. This may indicate a higher risk of groundwater flooding.

9A.9.74 An assessment of the risk of groundwater flooding to the substation is subject to further investigation. While the substation is not expected to displace large volumes of groundwater or obstruct groundwater flows in a way that poses an elevated risk to sensitive receptors, further investigation should be undertaken at the full FRA stage to determine the risk of groundwater flooding more accurately. This could include survey work to discover the depth of the water table and also monitoring to determine seasonal variation.

Artificial sources of flood risk

9A.9.75 The EA's reservoir flood risk mapping (Ref 9A.12) shows that there is an area deemed to be at high risk of reservoir flooding to the west of the proposed substation that follows the route of the Calow Brook. The exact origin of this flooding is unclear and is subject to further investigation, but a review of the mapping suggests that it emanates from areas north of Chesterfield impacting Spital Brook/Calow Brook. The proposed substation lies outside this area and is deemed to be at low risk of reservoir flooding in the unlikely event of reservoir failure.

9A.9.76 As summarised above, all large reservoirs must be inspected and supervised by reservoir panel engineers in accordance with the Reservoirs Act 1975 (Ref 9A.37). The EA serves as the enforcement authority for the Reservoirs Act 1975 in England and is required to ensure that reservoirs are inspected regularly, and essential safety work undertaken.

9A.9.77 If it is deemed necessary for relevant authorities for specific reservoir operators to be contacted regarding potential impacts, then this will be undertaken as part of the full FRA that will be submitted alongside the ES.

9A.9.78 Therefore, as above, this assessment deems there to be a residual risk only of flooding posed to the operational phase of the proposed Chesterfield Substation associated with a failure of a dam or reservoir. In addition, while the potential for sewer flooding is expected to be Low, water companies will be consulted at full FRA stage to confirm this.

Proposed Hydraulic Modelling Work

9A.9.79 **Table 9A.14** summarises the proposed hydraulic modelling work to be undertaken at the full FRA stage.

Table 9A.14: Summary of proposed hydraulic modelling works

Hydraulic Model	Proposed Works
Alfreton Brook	A flow estimation, implemented using REFH2, is proposed at the location of the temporary crossing at Morton Brook, a tributary of Alfreton Brook, because this crossing is not included in the existing model. REFH2 flows would be calculated, and culverts would be sized for the 1 in 100-year annual probability flow with a suitable freeboard allowance, which would be agreed upon with the LLFA. Where the temporary haul route is to be located within the Alfreton Brook floodplain and where small tributaries are crossed, a REFH2 flow estimation would be applied to the existing 2005 Alfreton Brook 1D model. A new/modified section would be added at model node AB1659(i) using LiDAR data. A REFH2 flow calculation would be undertaken for the crossing of the stream, with a culvert being sized for the 1 in 100-year annual probability flood event with an appropriate freeboard allowance added on, which would be agreed upon with the LLFA. REFH2 flow calculations are proposed to inform the assessment of flood risk to pylons within the Alfreton Brook floodplain.
Bottle Brook	Where the temporary haul road and pylons are within the Bottle Brook floodplain, the existing 2012 Bottle Brook EA model would be re-run, including any amendments for climate change, with updated REFH2 hydrology. No amendments to the model itself are currently proposed.
Park Brook	Where the temporary haul road crosses Park Brook, a REFH2 flow calculation is proposed with the culvert to be sized in line with the 1 in 100-year annual probability flood event with an appropriate freeboard allowance added on, which would be agreed upon with the LLFA. A flow-level rating would be estimated using the REFH2 hydrology and a LiDAR crossing section for pylons that are within the Park Brook catchment, but lie outside the model extents.
Ock Brook	Where the temporary haul road is within the Ock Brook floodplain, the existing 2013 Ock Brook EA model would be re-run with updated REFH2 hydrology. No amendments to the model itself are currently proposed.
River Derwent	The existing 2021 Derbyshire Trent EA model would be run with its existing 2020 hydrology, with the proposed temporary haul road and pylon infrastructure represented in the 2D model. For clarity, the extents of the

Hydraulic Model	Proposed Works
	existing 2023 River Derwent OCOR hydraulic model also available, do not cover the area where the Project proposes to cross the River Derwent and therefore the model has not been considered suitable for the proposed assessment. The 2021 Derbyshire Trent model does include the relevant areas around the River Derwent that intersect routeing for the Project, hence the rationale for using this hydraulic model as the basis for assessment. The flood risk to the pylons proposed to be located within the floodplain would be appraised using the existing model.
Twyford Brook	The proposed temporary haul routes cross flow paths and directly interact with the Twyford Brook floodplain. At the time of writing, a model for the Twyford Brook has not been made available by the EA. When a model is made available it will be used, along with updated REFH2 if necessary, to assess the risks to and from the temporary haul roads and pylons. If the model contains a 2D floodplain, the temporary haul roads would be represented using raised levels.

9A.10 Flood Risk Management

Introduction

9A.10.1 The following section summarises the mitigation measures that are expected to be required to ensure that the Project is designed and constructed to remain safe and operational, without increasing flood risk elsewhere, over its intended design life. This considers potential future effects of climate change, in accordance with the requirements of NPS EN-1 (Ref 9A.5).

9A.10.2 As such, this section outlines measures that would be considered and incorporated into the Project, where required, to comply with relevant policy and guidance.

9A.10.3 Efforts have been made to ensure that the Project avoids areas of high flood risk as far as practicable, with further details provided in **Chapter 3 Main Alternatives Considered**. The Sequential approach is to be utilised throughout the design process to minimise risk posed to the Project from all potential sources of flooding through the construction and operational phases of the Project.

Climate Change

9A.10.4 **Table 9A.15** summarises the climate change allowances applicable to the assessment and mitigation of flood risk in relation to both the construction and operational phases of the Project. The 'Allowance' column in **Table 9A.15** details the climate change allowance which is expected to be applied when assessing different climate change scenarios over different epochs using the EA's FRA climate change guidance (Ref 9A.30).

9A.10.5 It should be noted that climate change allowances for groundwater and artificial sources flood risk are not considered in the same way as fluvial and surface water flood risk. Therefore, they have not been considered in **Table 9A.15**; the potential for flood risk impacts resulting from groundwater and artificial sources in climate change scenarios would be discussed with the EA and LLFA at full FRA stage, where applicable.

Table 9A.15: Climate change allowances summary

Project Element	Flood Risk Vulnerability Classification	Epoch	Allowance
Construction Phase			
Fluvial Flood Risk			
Temporary construction compounds and construction activity areas	Less vulnerable	The 2020s (2015-2069)	Central
Watercourse crossings and drainage outfalls	Water compatible	The 2020s (2015-2069)	Central
Sensitive receptors such as personnel and residential/commercial properties	More vulnerable	The 2020s (2015-2069)	Higher central
Surface Water Flood Risk			
Temporary construction compounds and construction activity areas	Less vulnerable	The 2050s (Present-2060)	Central
Watercourse crossings and drainage outfalls	Water compatible	The 2050s (Present-2060)	Central
Sensitive receptors such as personnel and residential/commercial properties	More vulnerable	The 2050s (Present-2060)	Higher central
Operational Phase			
Fluvial Flood Risk			
Overhead lines	Essential infrastructure	The 2080s (2070-2115)	Higher central
Chesterfield Substation	Essential infrastructure	The 2080s (2070-2115)	Higher central
Floodplain compensation	Essential infrastructure	The 2080s (2070-2115)	Higher central
Sensitive receptors such as personnel and residential/commercial properties	More vulnerable	The 2080s (2070-2115)	Higher central
Surface Water Flood Risk			
Overhead line	Essential infrastructure	The 2070s (2061-2125)	Upper end

Project Element	Flood Risk Vulnerability Classification	Epoch	Allowance
Chesterfield Substation	Essential infrastructure	The 2070s (2061-2125)	Upper end
Sensitive receptors such as personnel and residential/commercial properties	More vulnerable	The 2070s (2061-2125)	Upper end

Construction Phase Mitigation Measures

9A.10.6 A Draft Outline Code of Construction Practice (CoCP) is provided in **Appendix 4A Draft Outline Code of Construction Practice**. The Draft Outline CoCP will be updated as the Project evolves to include additional measures identified through the engineering design, the Environmental Statement assessments and from further engagement with stakeholders to form the Outline CoCP submitted as an appendix to the ES in support of the DCO application.

9A.10.7 The Outline CoCP will be submitted with the ES and will be supported by relevant outline Environmental Control Plans (ECPs) including a Construction Environmental Management Plan(s) (CEMP) detailing how environmental impacts are to be mitigated during the construction phase. Compliance with the ECPs will be secured through the DCO.

9A.10.8 The full FRA submitted as an appendix to the ES in support of the DCO application will set out the mitigation measures required to ensure that the Project is designed to remain safe and operational, without increasing flood risk elsewhere, during the construction phase in accordance with the requirements of NPS EN-1 (Ref 9A.5).

9A.10.9 An outline Surface Water Drainage Strategy for temporary construction activities proposed as part of the Project will be submitted in support of the DCO application. This will be produced in accordance with relevant policies and guidance to ensure that adequate protection can be offered through the construction phase of the Project, in particular the proposed Chesterfield Substation. Subject to confirmation with the LLFA, this would include applying the drainage hierarchy throughout the drainage design process and designing to the 1 in 100-year annual probability storm event with a suitable uplift to account for future impacts of climate change.

9A.10.10 In addition, the EA and LLFA will be consulted regarding the sizing of haul roads and temporary culverts that are located within the floodplain. This would be informed by the hydraulic modelling work summarised in **Table 9A.14.** Following this, proportionate mitigation measures would be proposed as part of embedded construction phase mitigation.

9A.10.11 **Table 9A.16** summarises the good practice construction phase flood risk mitigation measures detailed in **Appendix 4A Draft Outline Code of Construction Practice**.

Table 9A.16: Good practice construction phase mitigation measures

Source of Flood Risk	Mitigation Measures	Reference
All	Environmental permits and consents for all qualifying works, e.g. dewatering of excavations, working in, over or under relevant watercourses will be secured where these are required.	HD01
Fluvial	Where practicable, stockpiles of soil would be located a suitable distance from watercourses.	HD02
Fluvial	Riverbank and in-channel vegetation would be retained where not directly affected by construction works, ecological mitigation and operation of the Project infrastructure. Natural bed substrate would be provided where temporary culverts are installed to facilitate access and crossings of Main Rivers would be either culvert or an open span bridge where access is required subject to design, constructability, and site constraints. Once the temporary culvert is installed, the area above the temporary culvert would be backfilled with suitable engineering material, such as construction mats or engineered fill, placed over the backfilled area to permit the passage of plant, equipment, materials, and people. Temporary culverts would be sized to reflect the span width, profile and the estimated flow characteristics of the watercourse under peak flow conditions and kept free from debris. Where used, temporary bridges would be designed specifically to consider the span length, and the weight and size of plant and equipment that would cross the bridge. Any culverted/bridged crossing would be subject to the appropriate consent by the relevant drainage authority (Flood Risk Activity Permit from the Environment Agency for Main Rivers, Ordinary Watercourse Consent (OWC) from the Lead Local Flood Authority (LLFA) or Internal Drainage Board (IDB) for ordinary watercourses). On completion of the works, temporary crossings would be removed unless otherwise agreed with the landowner, relevant authorities and stakeholders. Where temporary crossings are removed, there would be reinstatement of the riparian vegetation and natural bed of the watercourse.	HD03
Fluvial, surface water	Where construction activities take place in Flood Zone 3, work areas would be laid out in accordance with the Sequential Approach at the site level and incorporate flood resilience measures where necessary. Stora.ge of construction equipment and materials at active work fronts and in temporary laydown areas would be done in such a way as to avoid forming barriers to floodplain flows.	HD04
Fluvial	In accordance with EA guidance, buffers between pylons and watercourses would be adhered to where practicable.	HD05

Source of Flood Risk	Mitigation Measures	Reference
Surface water	Runoff across the site would be controlled through a variety of methods including but not limited to, header drains, buffer zones around watercourses, on-site ditches, silt traps and bunding and the like. These provisions would use drainage hierarchy and Sustainable Drainage Systems principles.	HD13
All	An Emergency Response Plan would be developed for the construction phase which would outline procedures to be implemented in case of unplanned events, including but not limited to extreme weather events, flood response and evacuation procedures, and pollution incidents.	HD14
Fluvial, reservoir	The Main Works Contractor would subscribe to the EA's Floodline service, which provides advance warning of potential local flooding events, and subscribe to the Met Office's Weather Warnings email alerts system and any other relevant flood warning information.	HD15
Fluvial	Temporary cofferdams would be used if required, to exclude work areas from the water bodies, thus reducing the risk of increased sediment loads or hazardous substances entering the main water flow.	HD17
Fluvial	During open cut crossings of watercourses in order to bury cables, if necessary, the watercourses would be temporarily dammed and over-pumped.	HD18
Fluvial	Where practicable, construction works would avoid works on watercourses during high flow events to reduce the risk of fine sediment release and reduce the risk to construction staff from flooding.	HD19

Operational Phase Mitigation Measures

9A.10.12 The full FRA submitted in support of the DCO application will summarise the outline designs of any proposed new permanent watercourse crossings, watercourse diversions, and surface water drainage infrastructure that is proposed to manage surface water that would be generated by the Project during the operational phase.

9A.10.13 This section outlines proposed mitigation measures for the operational phase. These measures would be subject to confirmation through consultation with the EA and LLFA at the full FRA stage.

Fluvial flood risk

9A.10.14 The proposed Chesterfield Substation is shown to lie wholly within Flood Zone 1 and therefore subject to a low probability of flooding from fluvial sources.

9A.10.15 At this stage of the Project, it is anticipated that resilience would be provided through the setting of finished ground levels above the predicted peak flood level for the design event, with localised raising of critical equipment and/or other flood defence techniques adopted as appropriate.

9A.10.16 The full FRA submitted in support of the DCO application for the Project would use the detailed outputs of existing hydraulic modelling studies, with updates or amendments to existing models made in agreement with the EA where required, to quantify any volumes of floodplain that may be lost to provide resilience during the design flood event as described above. Further details regarding proposed hydraulic modelling works are provided in **Table 9A.14**.

9A.10.17 Outline designs of any compensatory storage required to mitigate the risk arising would be provided as part of the mitigation measures summarised in the full FRA. This would demonstrate that the Project would not result in an increase in flood risk elsewhere over its lifetime in accordance with the requirements of NPS EN-1 (Ref 9A.5).

Surface water flood risk

9A.10.18 Surface water drainage strategies for the Chesterfield Substation proposed as part of the Project are to be developed at a later stage. The full FRA submitted in support of the DCO application will summarise the outline designs to ensure that they are in line with the relevant policies and best practice guidance.

9A.10.19 Proposed discharge locations for runoff generated by the operational phase of the Project would be determined in accordance with the drainage hierarchy. The 1 in 100-year annual probability storm event, including an appropriate allowance for the anticipated impacts of climate change on peak rainfall intensity, is intended to be adopted as the design storm, subject to confirmation from statutory consultees. Peak rate and volume control would be provided in accordance with the requirements of the Non-Statutory Technical Standards for Sustainable Drainage Systems (Ref 9A.33) or as prescribed by the LLFA.

9A.10.20 The outline designs of the surface water drainage infrastructure to serve the Chesterfield Substation should ensure that there is no flooding on-site or in operational areas up to the 1 in 100-year annual probability storm event plus climate change. Substations should be designed to prevent flooding of neighbouring third-party land during storm events that exceed the design storm scenario.

9A.11 Planning Requirements

The Sequential Test

9A.11.1 The purpose of the Sequential Test, which is set out in full in the Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 9A.34), is to ensure that a Sequential, risk-based approach is followed to steer new development to areas with the lowest risk of flooding, taking all sources of flood risk and climate change into account.

9A.11.2 National Grid has been through an iterative options appraisal process to determine the preferred option for the Project, with consideration given to a wide range of criteria including environmental, socio-economic, technical, and cost factors throughout the process. This process is presented in **Chapter 3 Main Alternatives Considered** which summarises the outcomes of The Strategic Options Report (Ref 9A.35), the CPRSS, the non-statutory consultation undertaken on the graduated swathe developed as part of the CPRSS and the work subsequently undertaken to further develop the Project.

9A.11.3 The Strategic Options Report identified a new primarily overhead line connection between a new Chesterfield Substation and the existing substation at Willington as the emerging preference to deliver the needs of the Project. The CPRSS summarises the identification and assessment of the preliminary route corridors, siting zones and siting areas undertaken following the publication of The Strategic Options Report.

9A.11.4 A Sequential approach was taken in the selection of the proposed route alignment, siting zones and siting areas, with flood risk being considered throughout the process alongside the numerous other technical, environmental, and socio-economic constraints. This process sought to ensure that the Project is sited in the lowest flood risk areas where possible, whilst acknowledging the wider aims of the Project and the extensive flood risk present throughout the region.

9A.11.5 In addition to this, non-statutory (Stage 1) consultations were undertaken between 14 May and 18 September 2024. The outcomes of these consultations, alongside ongoing assessments of environmental impacts, have been used to refine the design of the Project. Flood risk has been considered as part of this process and will continue to be considered as the design of the Project progresses beyond PEIR stage.

9A.11.6 Information from the various studies undertaken as part of the options appraisal process will be presented within the full FRA submitted in support of the DCO application for the Project to inform the application of the Sequential Test.

The Sequential Approach

9A.11.7 In accordance with the requirements of NPS EN-1 (Ref 9A.5), the Sequential approach will continue to be applied as the Project progresses to minimise risk by directing the most vulnerable uses to areas of the lowest flood risk, including residual risk where applicable. If that is not possible, then the Exception Test must be applied to ensure the infrastructure is safe for its lifetime without increasing flood risk.

The Exception Test

9A.11.8 The requirements of the Exception Test are detailed in section 9A.6, with its potential applicability to the various elements of the Project summarised in section 9A.7. **Table 9A.10** identifies that the Exception Test will need to be applied to any permanent infrastructure proposed to be located in Flood Zone 3a or Flood Zone 3b as part of the Project. In accordance with the requirements of NPS EN-1 (Ref 9A.5), where applicable, both parts of the Exception Test should be satisfied for the Project to be consented:

- Part (a) of the Exception Test requires the Project to provide wider sustainability benefits to the community that outweigh flood risk. The Project would make a significant contribution to delivering critical energy infrastructure for the UK and reducing wider carbon emissions in accordance with National Policy.
- Part (b) requires that 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. ‘Essential infrastructure’ proposed in Flood Zone 3a should also be designed and constructed to remain operational and safe in times of flood.

9A.11.9 Evidence will be provided within the full FRA submitted in support of the DCO application for the Project to inform the application of part (b) of the Exception Test.

9A.12 Conclusion

9A.12.1 This pFRA has been prepared by WSP on behalf of National Grid to support statutory consultation on the proposed reinforcement of the transmission network. The Project would include a new 400 kV electricity transmission line over a distance of approximately 60 km. The proposed route alignment would start from a new 400 kV substation to the east of Chesterfield, Derbyshire and would end at the existing Willington Substation in Derbyshire.

9A.12.2 The Project is classified as an NSIP under PA 2008 (Ref 9A.1) and National Grid is therefore required to apply for a DCO to the Secretary of State, with responsibility for determination delegated to the Planning Inspectorate.

9A.12.3 This pFRA has been prepared to inform statutory consultation under Section 42 of PA 2008 (Ref 9A.1), ahead of a subsequent application for a DCO and forms **Appendix 9A** of **Chapter 9 Hydrology and Land Drainage**. It has been prepared in accordance with the requirements of NPS EN-1 (Ref 9A.5) and NPS EN-5 (Ref 9A.2), with reference made to the NPPF (Ref 9A.6) and the associated Flood Risk and Coastal Change PPG (Ref 9A.7) for additional guidance where relevant.

9A.12.4 Multiple locations across the Project have been identified as potentially being at high risk of flooding from fluvial sources through the construction and operational phases. The interactions with fluvial Flood Zone 2 and 3 areas are at multiple watercourses including Calow Brook, Alfreton Brook, Bottle Brook, and particularly the River Derwent. An initial assessment of the flood depths extracted from existing EA hydraulic models suggest flood depths of greater than 0.5 m at some locations. This indicates a high level of risk to temporary construction phase infrastructure such as haul roads and construction equipment.

9A.12.5 At the full FRA stage, a more detailed assessment of the hydraulic modelling will be undertaken. This would reveal any limitations with the models or the available data and will inform the approach to modelling. The EA and LLFA have been consulted regarding the hydraulic modelling and will continue to be consulted as the approach is refined.

9A.12.6 There are a number of locations across the Study Area that are at medium to high risk from surface water flooding during both the construction and operational phases. The nature of interactions with these flood risk areas varies from temporary infrastructure crossing overland flow paths to construction equipment being located within or adjacent to areas of surface water pooling. EA mapping (Ref 9A.11) suggests that the proposed Chesterfield Substation is at high risk of surface water flooding before mitigation measures are considered.

9A.12.7 Knowledge of the surface water flood risk and key areas of concern will inform a surface water drainage strategy. Following consultation with the EA and LLFA, it is expected that the design storm event for a surface water drainage strategy will be the 1 in 100-year annual probability event with an uplift for climate change that is in accordance with national policy and guidance. This will be judged on a case-by-case basis as the level of flood risk to the Project is assessed in further detail at the full FRA stage.

9A.12.8 Additional sources of flooding will also be assessed in more detail at the full FRA stage in line with the findings in this pFRA. This will include a more detailed assessment of the potential for groundwater flooding across the Study Area in line with the findings in this pFRA. A more detailed look at the potential for flooding from artificial sources, such as reservoirs, canals and additional surface water features such as lakes, will also be undertaken.

References

Ref 9A.1 Planning Act 2008 [online]. Available at: https://www.legislation.gov.uk/ukpga/2008/29/contents [Accessed April 2025].

Ref 9A.2 Department of Energy Security and Net Zero (2023). National Policy Statement for Electricity Networks Infrastructure (EN-5) [online]. Available at: https://assets.publishing.service.gov.uk/media/65a78a5496a5ec000d731abb/nps-electricity-networks-infrastructure-en5.pdf [Accessed April 2025].

Ref 9A.3 National Grid (2024). Chesterfield to Willington: EIA Scoping Report [online]. Available at: https://national-infrastructure-consenting.planninginspectorate.gov.uk/projects/EN0210001 [Accessed September 2025].

Ref 9A.4 Planning Inspectorate (2024). Scoping Opinion Proposed Chesterfield to Willington. [online] Available at: https://nsip-documents.planninginspectorate.gov.uk/published-documents/EN0210001-000007-EN0210001%20Scoping%20Opinion.pdf [Accessed July 2025].

Ref 9A.5 Department of Energy Security and Net Zero (2024). Overarching National Policy Statement for Energy (EN-1) [online]. Available at: https://assets.publishing.service.gov.uk/media/65bbfbdc709fe1000f637052/overarching-nps-for-energy-en1.pdf [Accessed April 2025].

Ref 9A.6 Ministry of Housing, Communities and Local Government (2024). National Planning Policy Framework [online]. Available at: https://www.gov.uk/guidance/national-planning-policy-framework [Accessed January 2025].

Ref 9A.7 Ministry of Housing, Communities and Local Government (2025). Flood Risk and Coastal Change Planning Practice Guidance. Available at https://www.gov.uk/guidance/flood-risk-and-coastal-change [Accessed September 2025].

Ref 9A.8 The Environment Agency (2025). Flood Map for Planning [online]. Available at https://flood-map-for-planning.service.gov.uk [Accessed July 2025].

Ref 9A.9 The Environment Agency (2025). Risk of Flooding from Rivers and Sea [online]. Available at https://environment.data.gov.uk/dataset/96ab4342-82c1-4095-87f1-0082e8d84ef1 [Accessed July 2025].

Ref 9A.10 Environment Agency (2025). Check the Long Term Flood Risk for an Area in England [online]. Available at: https://www.gov.uk/check-long-term-flood-risk [Accessed July 2025].

Ref 9A.11 Environment Agency (2025). Risk of Flooding from Surface Water [online]. Available at: https://environment.data.gov.uk/dataset/b5aaa28d-6eb9-460e-8d6f-43caa71fbe0e [Accessed July 2025].

Ref 9A.12 Environment Agency (2025). Reservoir Flood Extents - Dry Day (National) and Reservoir Flood Extents – Wet Day (National) [online]. Available at: https://www.data.gov.uk/dataset/2e0f68b1-70df-43cc-ad61-ed5ef0e585d1/reservoir-flood-extents-dry-day-national and https://environment.data.gov.uk/dataset/d81646cf-37e5-4e71-bbcf-b7d5b9ca3a1c [Accessed July 2025].

Ref 9A.13 Environment Agency (2025). Statutory Main River Map [online]. Available at: https://www.data.gov.uk/dataset/4ae8ba46-f9a4-47d0-8d93-0f93eb494540/statutory-main-river-map [Accessed July 2025].

Ref 9A.14 Environment Agency (2025). AIMS Spatial Flood Defences (inc. standardised attributes) [online]. Available at: https://environment.data.gov.uk/dataset/8e5be50f-d465-11e4-ba9a-f0def148f590 [Accessed July 2025].

Ref 9A.15 Environment Agency (2025). Recorded Flood Outlines [online]. Available at: https://www.data.gov.uk/dataset/16e32c53-35a6-4d54-a111-ca09031eaaaf/recorded-flood-outlines1 [Accessed July 2025].

Ref 9A.16 British Geological Survey (2025). BGS Geology Viewer [online]. Available at: https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/ [Accessed July 2025].

Ref 9A.17 Department for Environment, Food and Rural Affairs (2025). Multi-Agency Geographic Information for the Countryside (MAGIC) [online]. Available at: https://magic.defra.gov.uk/ [Accessed July 2025].

Ref 9A.18 Flood and Water Management Act 2010 [online]. Available at: https://www.legislation.gov.uk/ukpga/2010/29/contents [Accessed July 2025].

Ref 9A.19 Land Drainage Act 1991 [online]. Available at: https://www.legislation.gov.uk/ukpga/1991/59/contents [Accessed May 2025].

Ref 9A.20 The Environmental Permitting (England and Wales) Regulations 2016 [online]. Available at: https://www.legislation.gov.uk/uksi/2016/1154/contents [Accessed July 2025].

Ref 9A.21 Amber Valley Borough Council (2024). Amber Valley Borough Local Plan 2022-2040 Submission (July 2024) [online]. Available at: https://info.ambervalley.gov.uk/docarc/docviewer.aspx?docGuid=0759cff495fa47f18ee469250a430c15 [Accessed September 2025].

Ref 9A.22 Bolsover District Council (2020). Local Plan for Bolsover District [online]. Available at: https://www.bolsover.gov.uk/component/edocman/12014-local-plan-for-bolsover-district/download [Accessed June 2025].

Ref 9A.23 Chesterfield Borough Council (2020). Chesterfield Borough Local Plan [online]. Available at: https://www.chesterfield.gov.uk/media/wfebaonf/chesterfield-borough-local-plan-2018-2035.pdf [Accessed June 2025].

Ref 9A.24 Erewash Borough Council (2014). Erewash Core Strategy [online]. Available at: https://www.erewash.gov.uk/sites/default/files/2025-02/Erewash%20Core%20Strategy%202011-2028.pdf [Accessed June 2025].

Ref 9A.25 North-East Derbyshire District Council (2021). North-East Derbyshire Local Plan 2014 - 2034 [online]. Available at: https://www.ne-derbyshire.gov.uk/documents/adopted-ned-local-plan-2014-2034/download?Itemid=189 [Accessed June 2025].

Ref 9A.26 South Derbyshire District Council (2016). South Derbyshire Local Plan [online]. Available at: https://www.southderbyshire.gov.uk/assets/attach/11431/Local-Plan-Part-1-Full-Version.pdf [Accessed June 2025].

Ref 9A.27 Derbyshire County Council (2023). Local Flood Risk Management Strategy [online]. Available at: https://www.derbyshire.gov.uk/environment/flooding/strategy/local-flood-risk-management-strategy.aspx [Accessed June 2025].

Ref 9A.28 National Grid Electricity Transmission (2014). National Grid Technical Specification 2.10.13: Technical Specifications - Flood Defences for Electricity Substations.

Ref 9A.29 Energy Networks Association (2018). Engineering Technical Report 138 Issue 3 2018: Resilience to Flooding of Grid and Primary Substations [online]. Available at: https://www.ena-eng.org/ena-docs/D0C3XTRACT/ENA_ET_138_Extract_180902050400.pdf [Accessed May 2025].

Ref 9A.30 Environment Agency (2022). Flood Risk Assessments: Climate Change Allowances [online]. Available at: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances [Accessed June 2025].

Ref 9A.31 UK Centre for Ecology and Hydrology (2025). Flood Estimation handbook (FEH) [online]. Available at: https://www.ceh.ac.uk/our-science/projects/flood-estimation-handbook [Accessed May 2025].

Ref 9A.32 Construction Industry Research and Information Association (CIRIA) (2015). The SuDS Manual (C753F).

Ref 9A.33 Department for Environment, Food and Rural Affairs (2025). National Standards for Sustainable Drainage Systems [online]. Available at: https://www.gov.uk/government/publications/national-standards-for-sustainable-drainage-systems [Accessed July 2025].

Ref 9A.34 National Grid Electricity Transmission (2024). Chesterfield to Willington Corridor Preliminary Routeing and Siting Study [online]. Available at: https://www.nationalgrid.com/document/151791/download [Accessed May 2025].

Ref 9A.35 National Grid Electricity Transmission (2024). Chesterfield to Willington Strategic Options Report [online]. Available at: https://www.nationalgrid.com/document/151781/download [Accessed May 2025].

Ref 9A.36 Environment Agency (2022). Humber River Basin District Flood Risk Management Plan 2021 to 2027 [online]. Available at: https://assets.publishing.service.gov.uk/media/638099ed8fa8f56eb302c6f8/Humber-FRMP-2021-2027.pdf [Accessed July 2025].

Ref 9A.37 Reservoirs Act 1975 [online]. Available at: https://www.legislation.gov.uk/ukpga/1975/23 [Accessed June 2025].

Ref 9A.38 Derby City Council (2017). Derby City Local Plan – Part 1: Core Strategy [online]. Available at: https://www.derby.gov.uk/environment-and-planning/planning/local-plan/part-1/about/#page-1 [Accessed September 2025].

Ref 9A.39 Derbyshire County Council and Derby City Council (2012). Strategic Flood Risk Assessment Level 1 [online]. Available at: https://www.derbyshire.gov.uk/site-elements/documents/pdf/environment/planning/planning-policy/minerals-waste-development-framework/strategic-flood-risk-assessment-level-1-august-2012.pdf [Accessed September 2025].

Ref 9A.40 Amber Valley Borough Council (2006). Amber Valley Borough Local Plan [online]. Available at: https://www.ambervalley.gov.uk/planning/planning-policy/adopted-local-plan/ [Accessed September 2025].

Ref 9A.41 Environment Agency (2010). Don Catchment Flood Management Plan [online]. Available at: https://assets.publishing.service.gov.uk/media/5a7ce231ed915d36e95f03f2/River_Don_Catchment_Flood_Management_Plan.pdf [Accessed September 2025].

Ref 9A.42 Environment Agency (2010). River Trent Catchment Flood Management Plan [online]. Available at: https://assets.publishing.service.gov.uk/media/5a7b7bf7e5274a7202e177a7/River_Trent_Catchment_Management_Plan.pdf [Accessed September 2025].

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