The Great Grid Upgrade

Sea Link

Sea Link

Volume 9: Examination Submissions

Document 9.101: Kent Onshore Scheme – Fluvial Flooding from the River Stour

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Version History

Date	Version	Status	Description/Changes
February 2026	A	Final	
April 2026	B	Final	Updated for Deadline 6

Executive Summary

Ex1.1 Purpose of this Report

Ex1.1.1 National Grid Electricity Transmission plc (herein referred to as the Applicant) is making an application for development consent to reinforce the transmission network in the South East and East Anglia. The Sea Link Project (hereafter referred to as the 'Proposed Project') is required to accommodate additional power flows generated from renewable and low carbon generation, as well as an addition to new interconnection with mainland Europe. The reinforcement would be achieved via the construction and operation of a High Voltage Direct Current (HVDC) Link between the proposed Friston substation in the Sizewell area of Suffolk and the existing Richborough to Canterbury 400 kV overhead line close to Richborough in Kent.

Ex1.1.2 This report has been produced to support the application for development consent and the accompanying Environmental Statement under the Planning Act 2008. In the **Application Document Late Deadline 2 Submission - Accepted at the discretion of the Examining Authority [REP2-144]**, new information was provided by the Environment Agency (issue reference EA069 and EA089) confirming that within the Order Limits there are areas of floodplain that are fluvially influenced. Previous advice had been that the floodplain was tidally dominated and the distinction is important in determining the need to mitigate for any losses of floodplain storage due to development.

Ex1.1.3 This report details how the Kent Onshore Scheme would interact with the River Stour fluvial floodplain. Calculations of floodplain storage volume losses and consequent flood risk impact are presented, in addition to proposals for mitigating the very minor impact.

Ex1.2 Summary of the Assessment

Ex1.2.1 Overhead line works are proposed within the 5% and 1% AEP fluvial floodplain. These works are essential to allow connection of the Proposed Project into the existing Richborough to Canterbury overhead line, and there is limited flexibility in the placement of new pylons to avoid the fluvial floodplain of the River Stour at this location.

Ex1.2.2 The impact of the construction phase of the Kent Onshore Scheme on the River Stour fluvial floodplain is limited to one temporary drainage attenuation basin, and the operational phase is limited to the proposed Overhead Line works. Calculations presented herein confirm that floodplain storage losses are very small, associated only with the above ground footprint of four new pylons and one temporary attenuation basin. There is ample space within the Order Limits to accommodate the necessary floodplain compensation areas required, and this mitigation will be secured through addition of a new commitment (W35) to the relevant control document (e.g. **Application Document 9.84 Register of Environmental Actions and Commitments (REAC)**) submitted at Deadline 6.

Ex1.2.3 The impact of climate change has been incorporated into volume loss and compensation calculations for the proposed permanent infrastructure.

Ex1.2.4 This assessment supplements the information provided within **Application Document 6.8 (B) Flood Risk Assessment,** submitted at Deadline 6, and does not alter the conclusions of the FRA.

1. Background

1.1.1 A Flood Risk Assessment (FRA) (**Application Document 6.8 Flood Risk Assessment [APP-292]**) was prepared for the Sea Link Development Consent Order application. In Kent, the FRA assessed flood risk to the Proposed Project from the River Stour and the potential for the Proposed Project to increase flood risk from this source. The assessment presented was based on the assumption that the River Stour floodplain within the Order Limits was tidally dominated, as discussed with the Environment Agency (EA) during pre-application discussions.

1.1.2 In their **Application Document Late Deadline 2 Submission - Accepted at the discretion of the Examining Authority [REP2-144]**, the Environment Agency provided new information (issue reference EA069 and EA089) confirming that, within the Order Limits in Kent, there are also areas of floodplain that are fluvially-influenced, as well as having areas of tidal/fluvial crossover.

1.1.3 This assessment is therefore presented to supplement the information provided in **Application Document 6.8 Flood Risk Assessment [APP-292].**

1.1.4 The distinction between tidal and fluvial floodplain is important in determining the need to mitigate for any losses of floodplain storage due to development. This position is set out in the Flood Risk and Coastal Change Planning Practice Guidance (Ministry of Housing, Communities and Local Government, 2025), which states that:

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

1.1.5 The EA has requested that floodplain compensation is provided for any areas of development in fluvial areas, to manage flood risk by avoiding displacing fluvial flood storage.

1.1.6 This report presents information on the interactions of the Kent Onshore Scheme with the fluvial floodplain of the River Stour. Although this report has a focus on the permanent, operational aspects of the Proposed Project, during a consultation meeting on 19 March 2026, the EA requested additional provision of compensation storage for one temporary drainage basin. Other construction activities within the fluvial floodplain (haul roads) would not cause losses of floodplain storage due to ground raising and construction of the temporary Stour bridge would be governed through the Flood Risk Activity permitting process to ensure no unacceptable flood risk impacts, as secured by Commitment W01 in **Application Document 9.84 Register of Environmental Actions and Commitments (REAC)**. Materials storage would be controlled in accordance with commitment W06.

2. Fluvial Flood Risk Assessment

2.1 Model Data Review

2.1.1 Fluvial defended flood extents from the Lower Stour modelling study were provided by the EA on 19 January 2026. Flood extents for the 5% (1 in 20), 1% (1 in 100) and 1% plus climate change (+CC) annual exceedance probability (AEP) events were provided for the River Stour, which were overlaid with the Kent Onshore Scheme Order Limits. The climate change extent represents flows being uplifted by 20%, in line with the guidance at the time of the modelling study (Environment Agency, 2016). It should be noted this does not align with the most recent climate change allowance guidance for peak flows for the area, which is 30% (Department for Environment Food & Rural Affairs, 2026). However, this is not a limitation to this assessment. This is because all of the new pylons proposed south of the River Stour sit within the 1% AEP +20% CC flood extent. Any increase in the flood extent due to an uplift in the modelled climate change allowance would therefore make no difference to this assessment, as there would be no additional pylons to account for.

2.1.2 The fluvial flood extents are presented in Plate 2.1 which provides an overview for the whole of the Kent Onshore Scheme Order Limits. Further detail, for where the overhead line works are proposed, is illustrated in Plate 2.3.

2.1.3 At the Kent landfall site any interactions with the fluvial flood zone are avoided due to the selected trenchless cable installation technique. At the environmental mitigation area, which comprises 10 hectares (ha) of ecological mitigation land for golden plover and skylark, no changes to the topography of the land are proposed, hence there is no potential for any loss of fluvial floodplain storage in this location.

2.1.4 The key area of interest is therefore the area of land to the south of the river channel, where the Proposed Project is proposing Overhead Line works. Flood extents are similar in the 5%, 1% and 1%+CC AEP events, however fluvial flood extents spread further south of the river, and there is a narrow band of flooding to the north of the river in these larger magnitude floods (Plate 2.3).

2.1.5 One temporary drainage attenuation basin (TC-18-ATPN) and one temporary drainage outfall (TC-18-ATPN Outfall) are located within the fluvial floodplain (Plate 2.3).

2.1.6 A summary of the operational infrastructure with an above ground footprint located within the fluvial flood extents is summarised in Table 2.1 below.

Table 2.1 Proposed pylon works in the flood extents

Flood Event	New Pylons	Modification of Existing Pylons	Existing Pylons Removed
5% AEP	4	1	n/a
1% AEP	5	1	1
1% AEP +20%CC	5	2	1

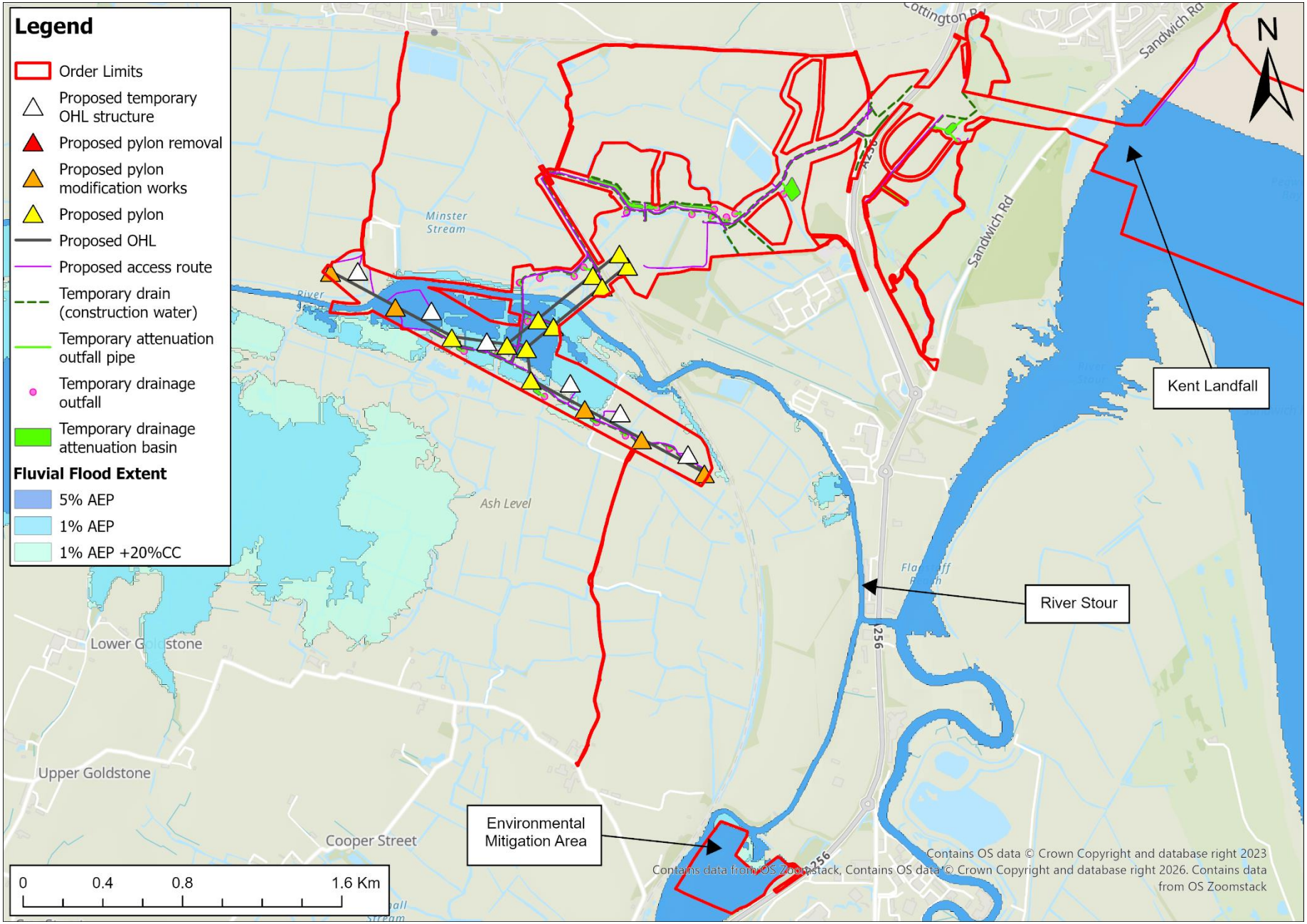

Plate 2.1 Lower Stour fluvial flood extent

2.1.7 The Overhead Line works are essential to allow connection of the Proposed Project into the existing Richborough to Canterbury overhead line. The OHL alignment has been selected to minimise the number and size of the pylons required and maximise the distance of the pylons from the River Stour and associated riparian habitat.There is therefore limited flexibility in the placement of new pylons due to technical and environmental constraints, for example, the need to achieve certain angles to turn the line and heights to maintain clearances (from the ground or anything under the line), and impacts on birds. Therefore, whilst pylons will be micro-sited at the detail design stage to try and minimise impacts on the floodplain, it is considered that entirely avoiding the 5% AEP flood extent is not practicable.

2.2 Assessment of Fluvial Floodplain Storage

2.2.1 During the construction phase of the Proposed Project, one temporary drainage attenuation basin and one temporary drainage outfall are located within the flood extent of the 5%, 1% and 1%+CC AEP events (Plate 2.3).

2.2.2 In terms of the operational phase of the Proposed Project, in all three of the flood events, new pylons would be constructed in the fluvial floodplain. In the case of the 1% AEP events, the removal of one existing pylon offsets the construction of one of the five new pylons (Plate 2.3).

2.2.3 The design of the pylon structures (open metal lattice and raised cables) means that they are resilient to periodic inundation and can remain safe and operational in times of flood.

Calculation of Permanent Floodplain Storage Volume Losses

2.2.4 The temporary drainage attenuation basin, TC-18-ATPN, within the modelled flood extents would serve the purpose of attenuating surface water runoff from the haul road before discharging it into an existing watercourse via a control device at a reduced runoff rate. The design would replicate as closely as possible the natural runoff characteristics of the existing site, intercepting all flows from the permanent works and temporary works into attenuation basins prior to discharging into the nearest watercourse.

2.2.5 Specific details regarding the drainage strategy within the Kent Onshore Scheme are included in **Application Document 9.17.2 (B) Kent Drainage Strategy [REP5-085]**. Attenuation basin TC-18-ATPN is designed with a depth of 0.5 m and a minimum attenuation volume of 96 m^3.

2.2.6 The pylons within the modelled floodplain extents consist of steel lattice structures, the typical characteristics of which are detailed in Table 4.1 of **Application Document 6.2.1.4 (D) Part 1 Introduction Chapter 4 Description of the Proposed Project [REP1A-003].**

2.2.7 The typical footprint of each of these pylons is 340 m^2, however when considering losses of floodplain storage volume, it is the above ground footprint that is of relevance. As illustrated in Plate 2.2, each of the new pylons would have four foundational bases (one at the base of each leg), each measuring 1 m^2. Each pylon would therefore have a total above ground footprint of 4 m^2. The volume of floodplain storage loss is a function of the above ground footprint of the pylons and the floodwater depth whereby:

*Storage Loss (m^3) = Pylon Footprint (m^2) * Flood Depth (m)*

Plate 2.2 Typical pylon foundation base

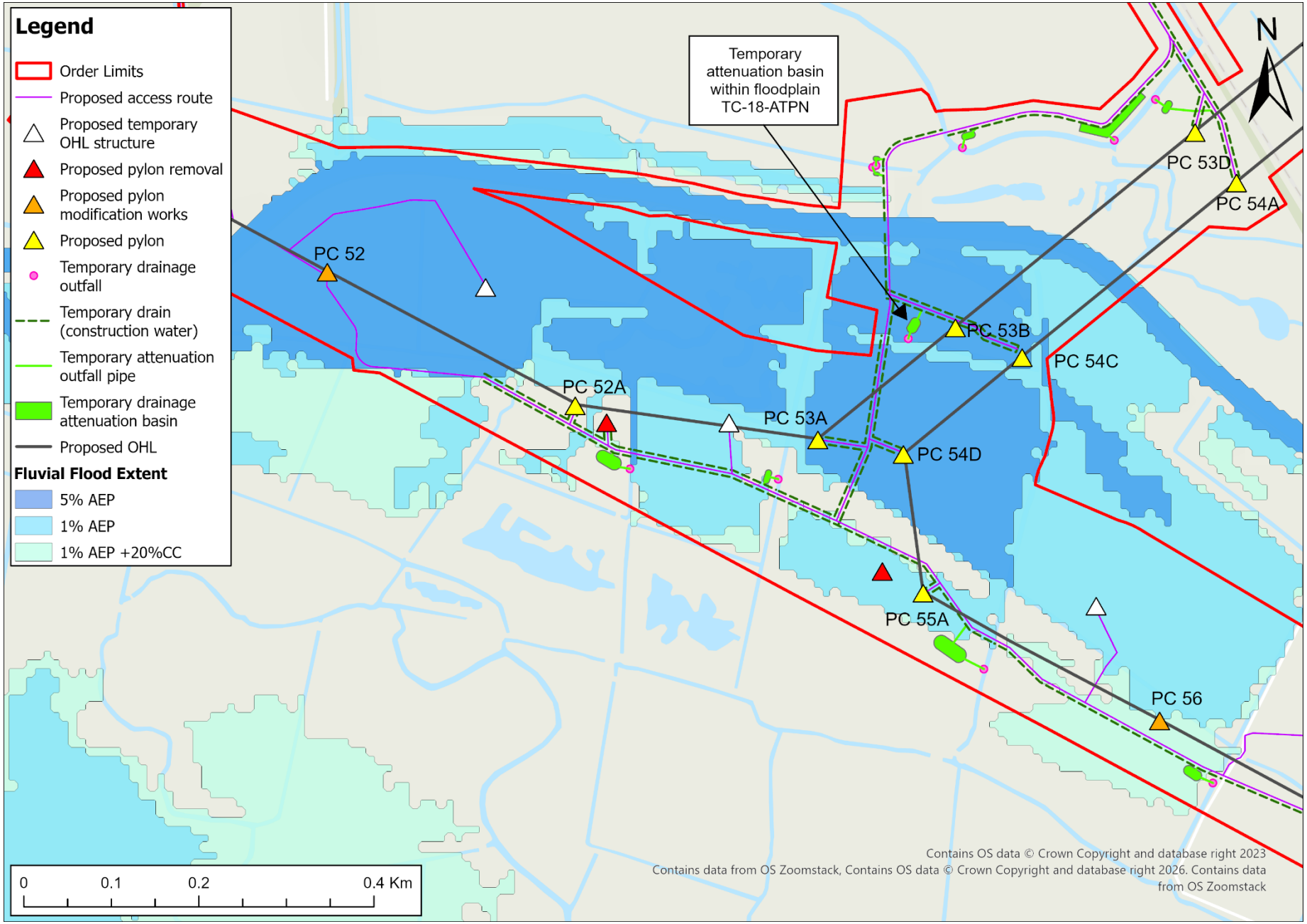

Plate 2.3 Infrastructure within fluvial flood extents

2.2.8 Predicted flood depths at the pylon and temporary drainage attenuation basin locations have been drawn from the NaFRA2 Risk of Flooding from Rivers and Sea (RoFRS) dataset (Environment Agency, 2025), with a calculation undertaken based on the 'low' risk event, representative of the 1% AEP flood, which the NPPF stipulates is the design event for which any losses of fluvial floodplain storage must be compensated for. Given the operational life span of the Proposed Project, the NaFRA2 climate change depth data has also been applied to the pylons to reflect predicted changes to flood risk in the future.

2.2.9 As illustrated in Plate 2.2 above, the raised foundational feet of the pylons, the structure opens up, limiting the restriction to floodwater flows and the losses of storage. Calculations have been completed based on the NaFRA2 flood depths, as tabulated below, however, on a precautionary basis compensation volumes would be provided assuming the potential for storage loss up to 1.5 m above ground level, these volumes are reported as the bracketed values in the table.

Table 2.2 Predicted floodplain losses

Pylon / Basin Reference	Pylon / Basin Ground Footprint (m^2)	Present Day		Climate Change	
		Predicted Maximum Flood Depth[1] (NaFRA2) (m)	Floodplain Loss Volume (m^3)	Predicted Maximum Flood Depth (NaFRA2) (m)	Floodplain Loss Volume (m^3)
PC 53B	4	0.9	3.6 (6)	1.2	4.8 (6)
PC 54C	4	0.6	2.4 (6)	0.6	2.4 (6)
PC 53A	4	0.6	2.4 (6)	0.9	3.6 (6)
PC 54D	4	0.6	2.4 (6)	0.9	3.6 (6)
TC-18-ATPN	194	0.6	116	-	-
Total			126.8 (140)		14.4 (24)

2.3 Proposed Mitigation

2.3.1 The calculations confirm that the operational phase of the Proposed Project would cause very minor cumulative fluvial floodplain volume loss due to pylon construction (Table 2.2). The consequential impact on the 1% AEP flood level in the relevant floodplain cell has been calculated, and water level increases would be limited to less than 1 mm in the 1% AEP event for both present day and climate change scenarios, which is not a perceptible impact.

2.3.2 Regardless, the regulator's position (the EA) is that any loss of fluvial floodplain storage should be compensated for. Floodplain compensation may be delivered in a range of ways, a typical example being to lower an area of land that is hydraulically connected to

[1] Note the NaFRA2 depth data is presented in bands/ranges e.g. from 0.6-0.9m; 0.9m-1.2m.

the same floodplain cell in which the losses occur, to re-provide storage on a volume for volume basis as a minimum.

2.3.3 Plate 2.4 illustrates that, due to the minor losses, the land take required for providing compensation is very minor, with ample space within the Order Limits. Final floodplain storage compensation proposals would be presented by the appointed contractor and this mitigation will be secured through commitment W35 within **Application Document 9.84 (D) Register of Environmental Actions and Commitments (REAC)** submitted at Deadline 6**.**

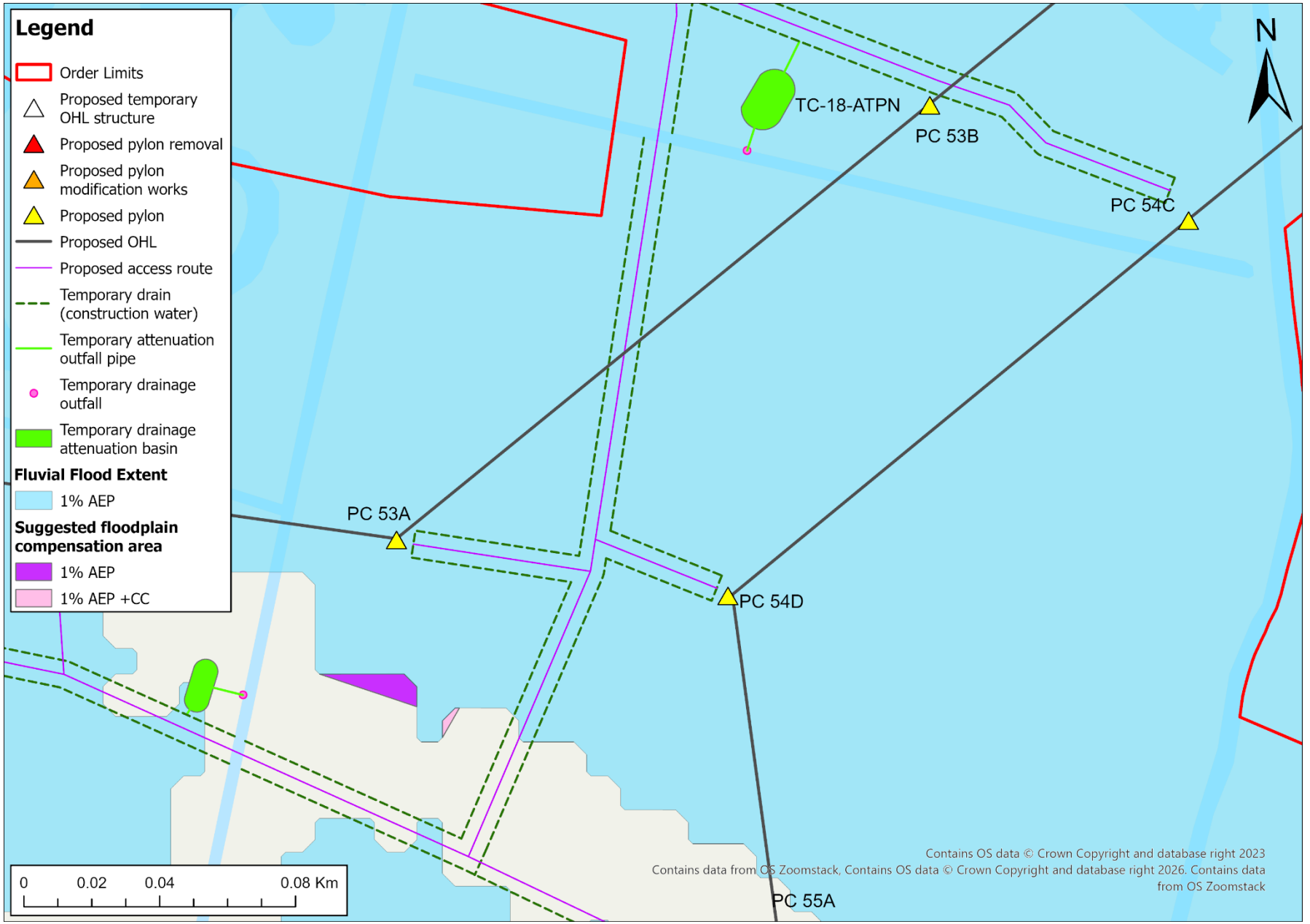

Plate 2.4 Potential floodplain compensation provision locations

3. Summary

3.1.1 The impact of the Kent Onshore Scheme on the River Stour fluvial floodplain is limited to the one temporary drainage attenuation basin in the construction phase and the proposed Overhead line tower and pylon works in the operational phase. Calculations presented herein confirm that floodplain storage losses are very small, associated with the above ground footprint of proposed new pylons and the temporary drainage attenuation basin.

3.1.2 While these features are themselves flood resilient, floodplain compensation would be required for the estimated floodplain volume losses. There is sufficient space to create the necessary compensation areas within the floodplain cells where storage is lost. This mitigation is secured through commitment W35 within **Application Document 9.84 (D) Register of Environmental Actions and Commitments (REAC)** submitted at Deadline 6.

References

Department for Environment Food & Rural Affairs. (2026). *Stour Management Catchment peak river flow allowances*. Retrieved from Climate Change Allowances: https://environment.data.gov.uk/hydrology/climate-change-allowances/river-flow?mgmtcatid=3087

Environment Agency. (2025). *Risk of Flooding from Rivers and Sea*. Retrieved March 24, 2025, from https://www.data.gov.uk/dataset/bad20199-6d39-4aad-8564-26a46778fd94/risk-of-flooding-from-rivers-and-sea1

Ministry of Housing, Communities and Local Government (2025) Flood Risk and Coastal Change Planning Practice Guidance: Https://www.gov.uk/guidance/flood-risk-and-coastal-change

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