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Whittington CSEC - Flood Risk Assessment

National Grid Cotswolds Visual Impact Provision (VIP)

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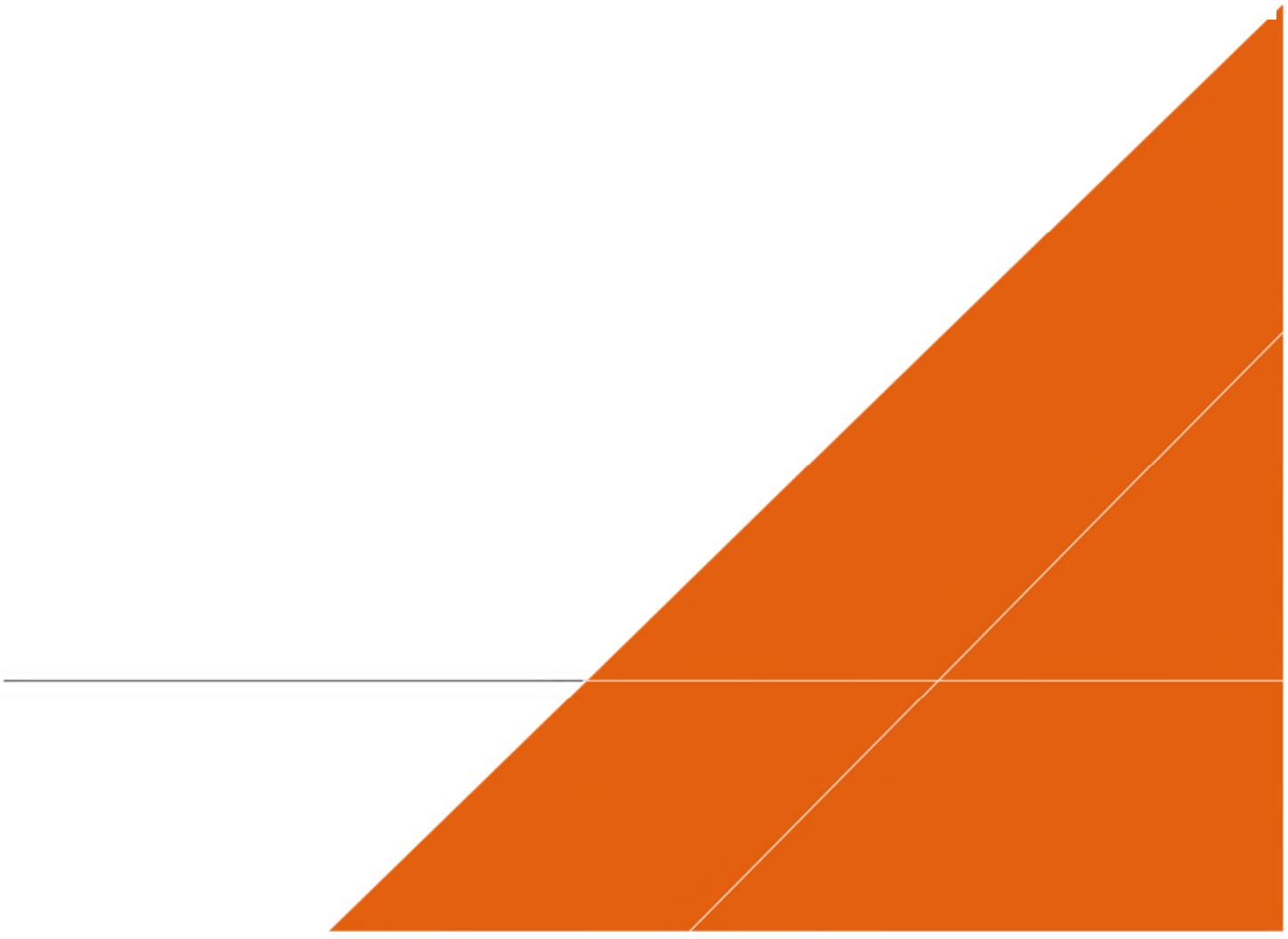

VERSION CONTROL

Version	Date	Author	Checker	Approver	Changes
V1	09/05/2024	E. Coward	L. Driscoll	N. Hartley	-
V2	09/05/2024	E. Coward	L. Driscoll	N. Hartley	Updated in line with final red line boundary

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Abbreviations

Acronym	Definition
AEP	Annual Exceedance Probability
AIMS	Asset Information Management System
AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
BGS	British Geological Survey
CSEC	Cable Sealing End Compound
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency
FEH	Flood Estimation Handbook
FRA	Flood Risk Assessment
GCC	Gloucestershire County Council
LLFA	Lead Local Flood Authority
NaFRA	National Flood Risk Assessment
NGR	National Grid Reference
NPPF	National Planning Policy Framework
OHL	Overhead Lines
OS	Ordnance Survey
PFRA	Preliminary Flood Risk Assessment
PPG	Planning Practice Guidance
RFO	Recorded Flood Outlines

Acronym	Definition
SFRA	Strategic Flood Risk Assessment
SSSI	Site of Special Scientific Interest
SuDs	Sustainable Drainage System
VIP	Visual Impact Provision

Executive Summary

This report documents the approach taken to assess sources of flood risk to the Whittington Cable Sealing End Compound (CSEC), proposed as part of the Cotswolds Visual Impact Provision (VIP) Project, which is necessary to facilitate a connection between new underground cables and the existing overhead line (OHL). The assessment also considers the associated permanent access road and bell-mouth to the CSEC, in addition to temporary bell-mouths proposed to support construction along classified roads, which are included within the planning application redline boundaries.

Land within the redline boundaries is located within the hydrological catchments of the Rivers Chelt and Coln. The Environment Agency Flood Map for Planning (Rivers and Sea) shows that the Proposed Project is located in Flood Zone 1.

This assessment has used published data sources to consider flood risk from a range of possible sources, namely fluvial flooding, surface water and groundwater flooding, as well as flooding from reservoirs, canals and other artificial sources.

Consultation with the Environment Agency and the Lead Local Flood Authority (LLFA), Gloucestershire County Council, has been ongoing during the preparation of this report.

This assessment has shown that the Proposed Project is at generally low risk of flooding from groundwater, sewers, surface water, and artificial sources. This assessment has outlined suitable management measures required to ensure that the Proposed Project is safe from flooding and that any effects on third party flood risk will be avoided.

1 Introduction

1.1 Overview

1.1.1 Arcadis Consulting (UK) Limited ("Arcadis") has been commissioned by National Grid ("the Client") to prepare a Flood Risk Assessment (FRA) to inform the proposed Whittington Cable Sealing End Compound (CSEC) and temporary bellmouths to facilitate construction of the wider Cotswolds Visual Impact Provision (VIP) Project, located in Gloucestershire. The proposed CSEC and the associated works forming part of the planning application are hereafter referred to as the 'Proposed Project'.

1.1.2 The Proposed Project forms part of the wider Cotswolds Visual Impact Provision (VIP) Project (referred to as the 'wider project'), the purpose of which is to underground a section of 400kV overhead electricity transmission lines, to mitigate the visual impact of existing electricity infrastructure through part of the Cotswolds National Landscape (previously known as Area of Outstanding Natural Beauty). The wider project is located immediately south of the B4632 and from Breakheart Plantation, runs in a south-westerly direction to the east of Cleeve Common Site of Special Scientific Interest (SSSI), past Wontley, Drypool and Wood Farms, towards Dowdeswell Wood.

1.1.3 The Environment Agency (EA) Flood Map for Planning (Rivers and Sea)[1] shows that all land within the redline boundaries is in Flood Zone 1, with an annual chance of flooding from rivers and the sea less than 1 in 1,000 (0.1%).

1.1.4 In line with requirements of the National Planning Policy Framework (NPPF)[2] all proposals for new development in Flood Zone 1 exceeding 1 hectare should be supported by an appropriate FRA that considers the risk of flooding from all sources.

1.2 Terminology

1.2.1 Flood risk is a product of both the likelihood and consequence of flooding. Throughout this report, flood events are defined according to their likelihood of occurrence. Floods are described according to an 'annual chance', meaning the chance of a particular flood occurring in any one year. This is directly linked to the probability of a flood. For example, a flood with an annual chance of 1 in 100 (a 1 in 100 chance of occurring in any one year on average), has an Annual Exceedance Probability (AEP) of 1%.

1.3 Limitations

1.3.1 This report has been informed by several data sources which Arcadis believes to be trustworthy. However, Arcadis is unable to guarantee the accuracy of information provided by others. The report is based on information available at the time of writing.

[1] EA Flood Map for Planning, accessed May 2024, https://flood-map-for-planning.service.gov.uk/
[2] National Planning Policy Framework (NPPF): National Planning Policy Framework - GOV.UK (www.gov.uk)

2 Background

2.1 Project Location

2.1.1 The proposed Whittington CSEC is located east of Cheltenham, in Gloucestershire, as shown in Figure 1 below, centred approximately at National Grid Reference (NGR) SO 99266 20998. The whole redline boundary would occupy an area of approximately 3.2 hectares (ha) in total.

2.1.2 The proposed CSEC site is located off Ham Road and is in a rural setting, surrounded by agricultural fields. Dowdeswell Wood is situated to the southeast and the River Chelt flows in a south westerly direction through the woodland, into Dowdeswell Reservoir approximately 590m south of the main study area, and 1.1km south of the CSEC. Access works are required to the A40 in proximity to St Bartholomew's Church in Whittington.

2.1.3 The Proposed Project falls under the Lead Local Flood Authority (LLFA) of Gloucestershire County Council (GCC).

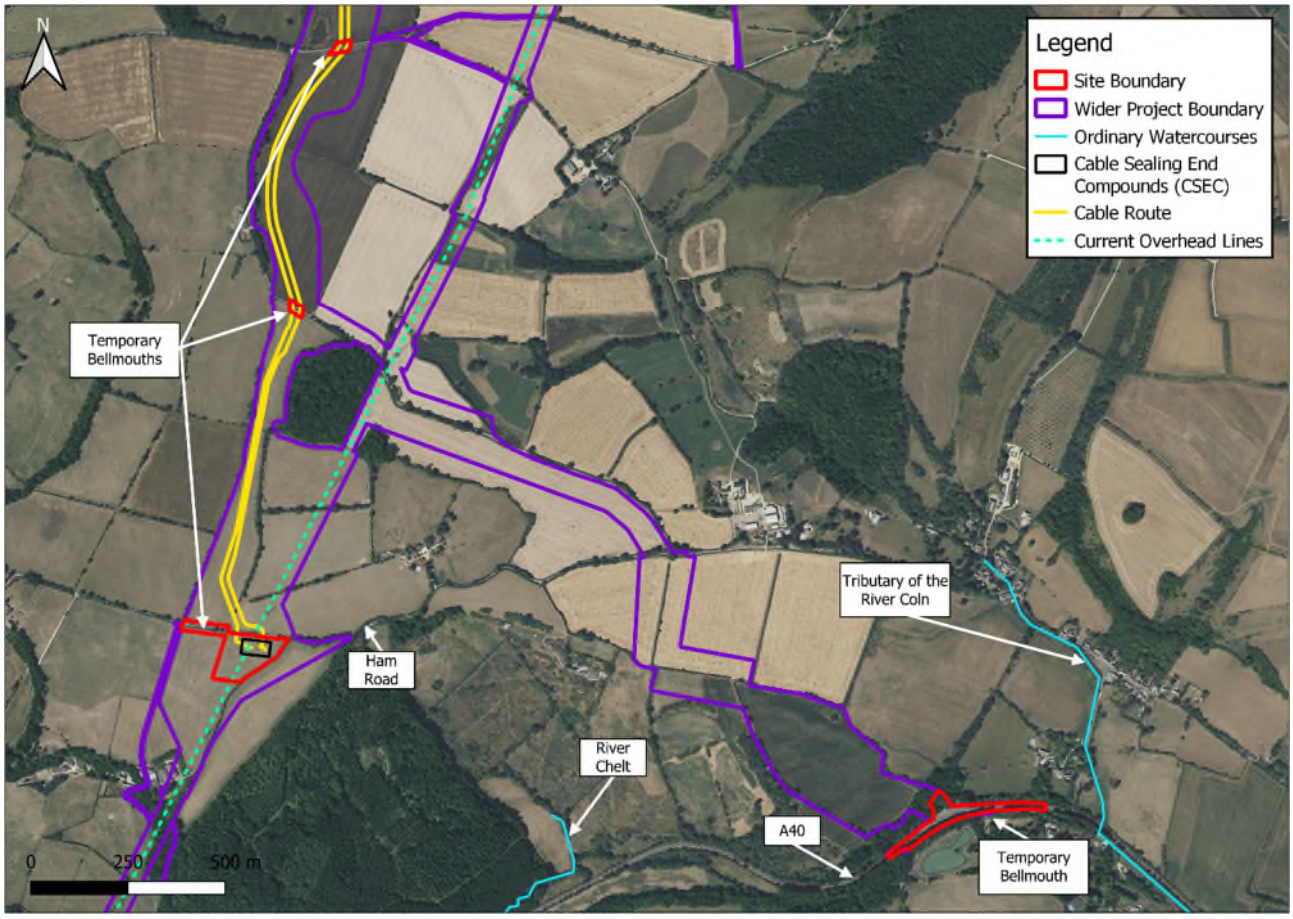

Figure 1: Whittington CSEC Location Overview

Contains Map data @ Bing 2024. Contains Environment Agency information © Environment Agency and/or database right. Contains information from Ordnance Survey.

2.2 Project Description

2.2.1 The Proposed Project forms part of the Cotswolds VIP Project (the 'wider project'), the purpose of which is to underground a section of 400kV overhead electricity transmission lines, to mitigate the visual impact of existing electricity infrastructure through part of the Cotswolds National Landscape (previously known as Area of Outstanding Natural Beauty). The wider project is located immediately south of the B4632 and from Breakheart Plantation, runs in a south-westerly direction to the east of Cleeve Common Site of Special Scientific Interest (SSSI), past Wontley, Drypool and Wood Farms, towards Dowdeswell Wood.

2.2.2 The wider project will comprise:

- The removal of a section of overhead lines (OHL), including the permanent removal of 16 pylons (18 pylons will be removed in total, however, two will be replaced under Permitted Development).
- Underground cabling of approximately 7km in length.
- Two new cable sealing end compounds (CSECs) at each end (north and south) and associated replacement terminal pylons (as mentioned above), to connect the new underground cables to the remaining existing overhead line.
- Associated temporary works to facilitate construction, including temporary/permanent access junctions and roads, a temporary haul road, construction compounds, material storage and welfare facilities.
- Ancillary off site infrastructure (including installation of arcing horns and shunt reactor installation / connection).

2.2.3 The majority of the works will be undertaken using Permitted Development rights under Schedule 2 of the Town and Country Planning (General Permitted Development) (England) Order 2015 (as amended), however, the CSECs require planning permission.

2.2.4 The scope of this report is for the Whittington CSEC only. and associated works including the permanent access and bell-mouth to the CSEC, and a series of temporary bell-mouths to facilitate construction of the wider project (hereafter referred to as the 'Proposed Project').

2.2.5 The proposed works within the Whittington CSEC redline comprise:

- CSEC infrastructure;
- Underground cabling from the Whittington CSEC towards the Winchcombe CSEC (note: this is Permitted Development);
- A permanent access road to the CSEC, including a bell-mouth with Ham Road and a turning area;
- A hardstanding area where the overhead line meets with the new underground cables;
- New screening comprising native trees, woodland and scrub planting; and
- Three temporary bell-mouths on classified roads to facilitate construction.
- The terminal pylon for the Whittington CSEC is located outside the CSEC redline (and is Permitted Development).

2.3 Topography

2.3.1 LiDAR data from the National LiDAR Programme[3], presented in Figure 2 below, indicates that ground levels at the proposed CSEC site are relatively uniform lying between approximately 239 metres (m) Above Ordnance Datum (AOD) and 244mAOD, with lower ground elevations of land within the redline boundary at the A40, between approximately 177mAOD and 183mAOD. The central temporary bell-mouth lies between approximately 263mAOD and 265mAOD while the northern temporary bell-mouth lies between approximately 279mAOD and 282mAOD. The prevailing topography slopes towards the river valleys of the Chelt and Coln.

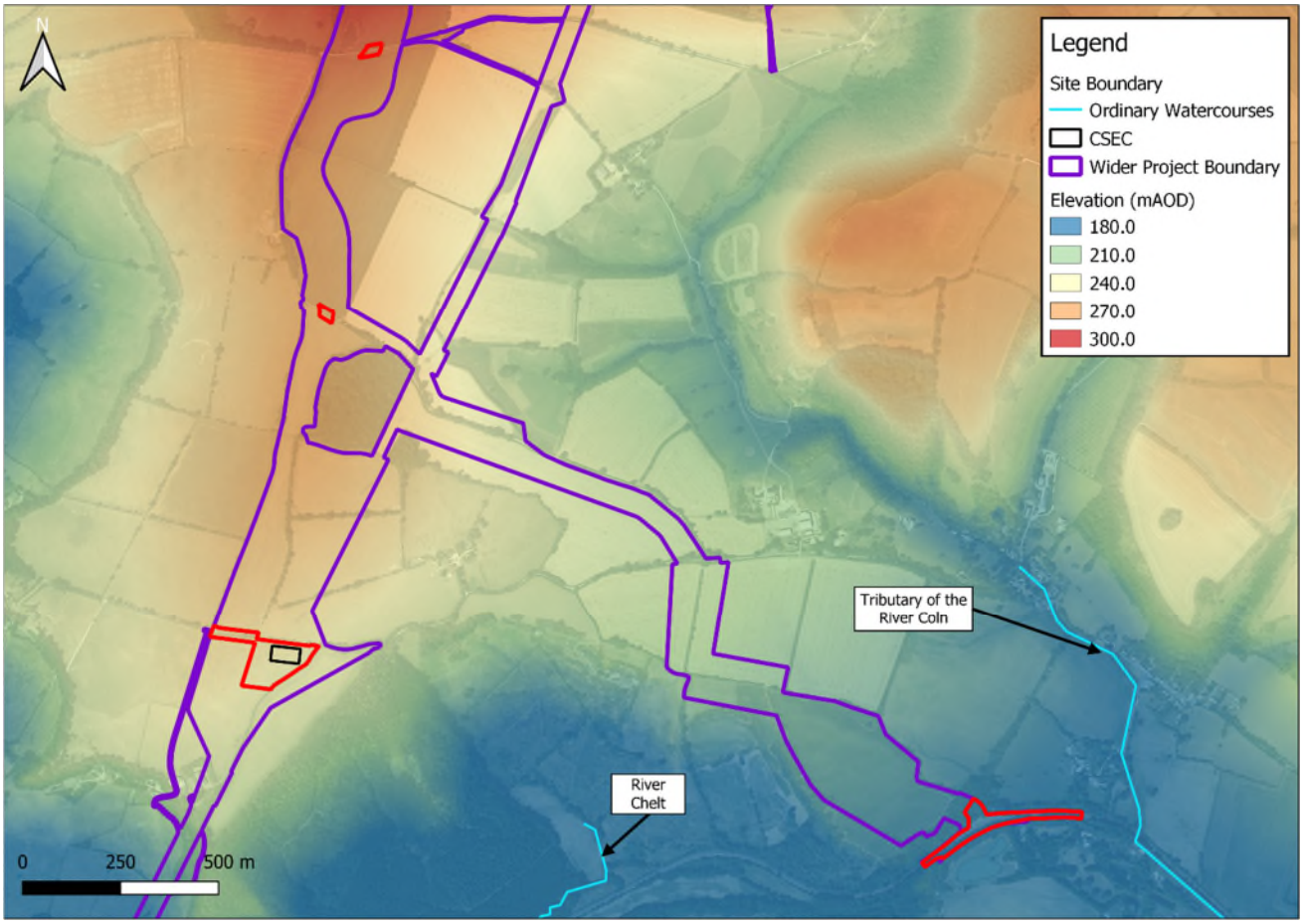

Figure 2: Whittington CSEC Topography

Contains map data @2023 Bing. Contains Department for Environment, Food, and Rural Affairs (DEFRA) Lidar data downloaded April 2024

[3] National Lidar Programme, accessed May 2024, https://www.data.gov.uk/dataset/f0db0249-f17b-4036-9e65-309148c97ce4/national-lidar-programme

2.4 Catchment Description

2.4.1 The EA Catchment Data Explorer[4] indicates the Proposed Project spans the Chelt, Hatherley and Normans Brook and the Upper Thames operational catchments. The proposed CSEC site is located in the headwaters of the catchment of the River Chelt, whereas the proposed highways works at the A40 and the other two bell-mouths to the north are located in the catchment of the River Coln and Upper Thames Operational Catchment, as illustrated in Figure 3.

2.4.2 There are no watercourses that flow through or immediately neighbour the proposed CSEC site, or any of the highway works proposed to the A40 and other classified roads. The closest water features comprise of headwater streams of the River Chelt located approximately 300 to 400m to the south and east of the site.

2.4.3 The British Geological Survey (BGS) online geology viewer[5] indicates the proposed CSEC site and northern two temporary bell-mouths are underlain by bedrock geology comprising of Birdlip limestone, classified as a principal aquifer according to the Department for Environment, Food and Rural Affairs (DEFRA) Magic Map[6]. The temporary bell-mouth on the A40 is underlaid by bedrock geology comprising of varying siltstone and mudstone formations. Principal aquifers are defined as exhibiting high permeability and/or providing a high level of water storage and they can support abstraction and/or river base flow on a strategic scale. There are no superficial deposits overlying the bedrock.

2.4.4 Soils[7] are typically slowly permeable seasonally wet, slightly acid but base rich loamy and clayey in nature.

[4] EA Catchment Data Explorer, accessed May, 2024, https://environment.data.gov.uk/catchment-planning
[5] BGS Geology Viewer, accessed May, 2024, https://geologyviewer.bgs.ac.uk/?_ga=2.77399765.1766386697.1699958121-313685352.1699958121
[6] DEFRA Magic Map, accessed May 2024, https://magic.defra.gov.uk/magicmap.aspx
[7] Soilscapes Viewer, accessed May 2024, http://www.landis.org.uk/soilscapes/

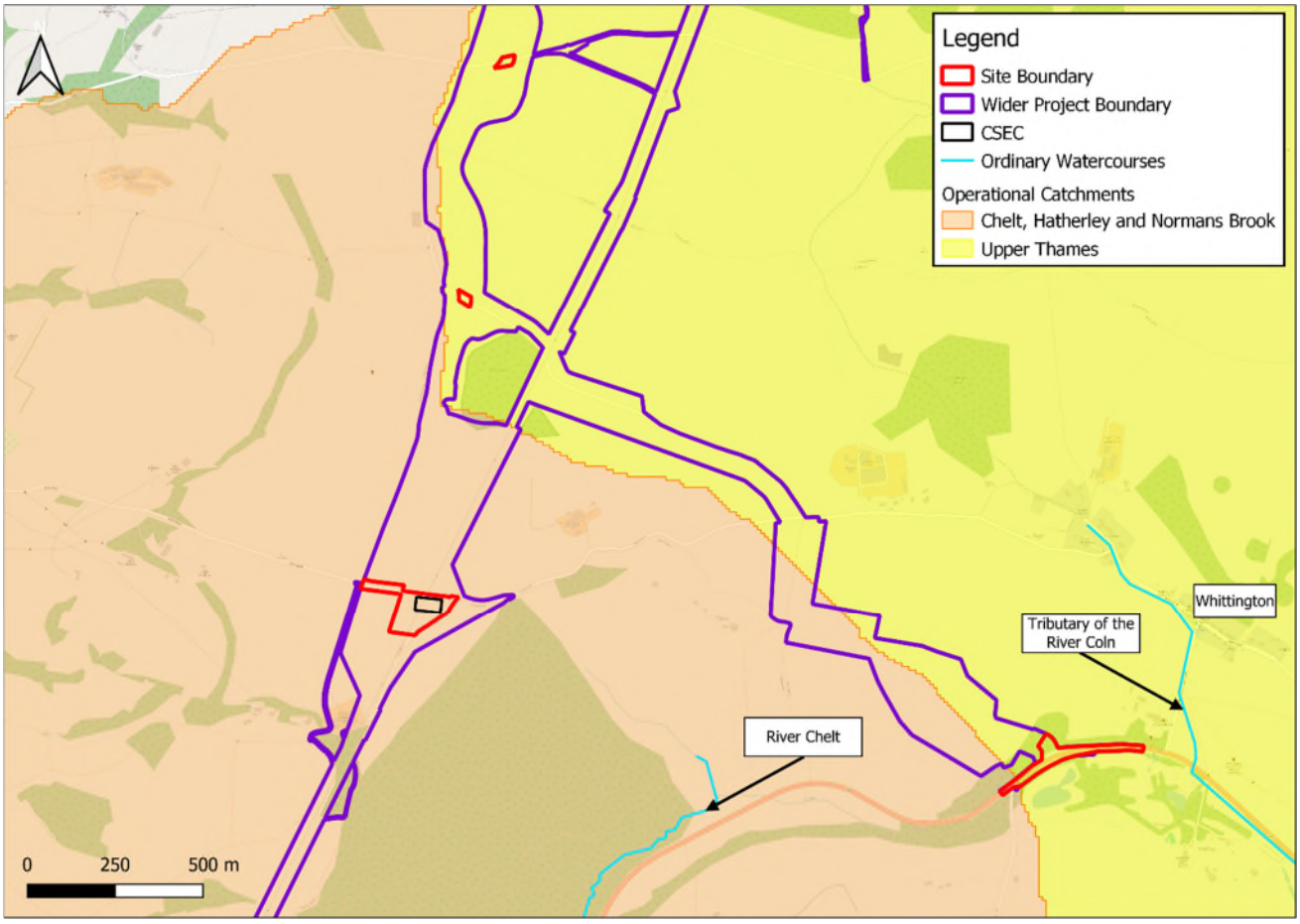

Figure 3: Catchment Overview

River data sourced from the EA Statutory Main River Map and Ordnance Survey (OS) Open Rivers. Contains Environment Agency information © Environment Agency and/or database right. Background map contains data © OS Mapping.

2.5 Flood History and Defences

2.5.1 The EA Historic Flood Map[8] and the EA Recorded Flood Outlines[9] (RFO) datasets show areas of land that have previously been subject to flooding. These datasets have been reviewed and they do not show any flood events at the Proposed Project location since records began in 1946.

2.5.2 Consultation with GCC, as the LLFA, confirmed they do not have any records of flooding incidents at or near the Proposed Project location (Appendix A) and there are no reports of historical flooding within the GCC Preliminary Flood Risk Assessment (PFRA)[10] or the Cheltenham Borough SFRA[11].

[8] EA Historic Flood Map, accessed May 2024, https://www.data.gov.uk/dataset/76292bec-7d8b-43e8-9c98-02734fd89c81/historic-flood-map
[9] EA Recorded Flood Outlines, accessed May 2024, https://www.data.gov.uk/dataset/16e32c53-35a6-4d54-a111-ca09031eaaaf/recorded-flood-outlines
[10] GCC PFRA, accessed May 2024, https://www.gloucestershire.gov.uk/media/5737/1_gcc_pfra_-_report_-rev_4-_november_2011-49979.pdf
[11] Cheltenham Borough SFRA, accessed May 2024, https://www.gloucestershire.gov.uk/media/6442/cheltenham_borough_council_level_1_sfra_final-28375.pdf

2.5.3 The EA Asset Information Management System (AIMS) Spatial Flood Defences dataset[12] and the EA Reduction in Flood Risk from Rivers and Sea map[13] show flood management assets and defences. The EA AIMS dataset indicates there are no flood defences locally, the closest defences comprising of nature high ground along the banks of the River Chelt approximately 1.1km to the south of the proposed CSEC site. These have a design Standard of Protection (SoP) of 25 years, meaning the defences withstand flooding up to the 1 in 25 year event.

2.5.4 The Cotswolds District SFRA indicates there are flood defences around the Dowdeswell Reservoir. The defences include a wave wall, gabion basket wall, a 2-stage wall, a gabion path, and an earth bank. Risk from this source is assessed further in Section 4.7.

[12] EA AIMS Spatial Flood Defences, accessed May 2024 dataset https://www.data.gov.uk/dataset/cc76738e-fc17-49f9-a216-977c61858dda/aims-spatial-flood-defences-inc-standardised-attributes
[13] EA Reduction in Flood Risk from Rivers and Sea, accessed May 2024, https://www.data.gov.uk/dataset/dcdcf96b-3293-4987-8ca8-9b8827f5ccf8/reduction-in-risk-of-flooding-from-rivers-and-sea-due-to-defences

3 Planning Policy Context

3.1 NPPF and Flood Risk

3.1.1 The NPPF was first published in 2012 and most recently updated in December 2023. Along with its accompanying Planning Practice Guidance (PPG)[14], the NPPF sets out the government's planning policies for England and how these are expected to be applied. The principal aim of the NPPF is to achieve sustainable development. This includes ensuring that flood risk is considered at all stages of the planning process, avoiding inappropriate development in areas at risk of flooding and directing development away from those areas where risks are highest. Where development is necessary in areas of flooding, the NPPF aims to ensure that it is safe, without increasing flood risk elsewhere.

3.1.2 Early adoption of, and adherence to, the principles set out in the NPPF and its Technical Guidance[15], with respect to flood risk, should ensure that detailed designs and plans for developments take due account of flood risk and the need for appropriate mitigation, if required.

3.2 The Sequential and Exception Test

3.2.1 The NPPF identifies four Flood Zone classifications, as detailed in Table 1.

Table 1: Flood Zones (PPG, Flood Risk and Coastal Change, Table 1)

Flood Zone	Annual Probability of Flooding Fluvial	Annual Probability of Flooding Tidal
1 Low Probability	<0.1%	<0.1%
2 Medium Probability	0.1-1.0%	0.1-0.5%
3a High Probability	>1%	>0.5%
3b Functional Floodplain	Land where water must flow or be stored in times of flood as identified by local authorities in SFRAs Identification of functional floodplain should take account of local circumstances and not be solely defined on rigid probability parameters. Functional floodplain normally comprises land having >3.3% annual probability of flooding (with any existing flood risk management infrastructure operating effectively); or Land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding).	

[14] NPPF PPG, accessed May 2024, https://www.gov.uk/guidance/flood-risk-and-coastal-change
[15] Technical Guidance to the National Planning Policy Framework, accessed May 2024, Technical Guidance to the National Planning Policy Framework (publishing.service.gov.uk)

3.2.2 The NPPF specifies that the suitability of all new development in relation to flood risk should be assessed by applying the Sequential Test to demonstrate that there are no reasonably available sites in areas with a lower probability of flooding that would be appropriate to the type of development proposed. The PPG provides further guidance on the compatibility of each land use classification in relation to each of the Flood Zones as summarised in Table 2.

Table 2: Flood Risk Vulnerability Classification (PPG, Flood Risk and Coastal Change, Table 2)

Flood Zone	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
1	✓	✓	✓	✓	✓
2	✓	Exception test required	✓	✓	✓
3a	Exception test required	×	Exception test required	✓	✓
3b	Exception test required	×	×	×	✓

Key: ✓ Development is appropriate × Development should not be permitted

3.2.3 If it is not possible for development to be located in zones with a lower risk of flooding, the Exception Test may have to be applied. For the Exception Test to be passed, it should be demonstrated that:

1) the development would provide wider sustainability benefits to the community that outweigh flood risk; and
2) the development would be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, reduce flood risk overall.

3.3 Flood Zone Classification

3.3.1 The EA Flood Map for Planning (Rivers and Sea) as in Figure 4 below shows that land within the redline boundaries is wholly within Flood Zone 1, equivalent to an annual chance of less than 0.1% (1 in 1000) of flooding from rivers and sea.

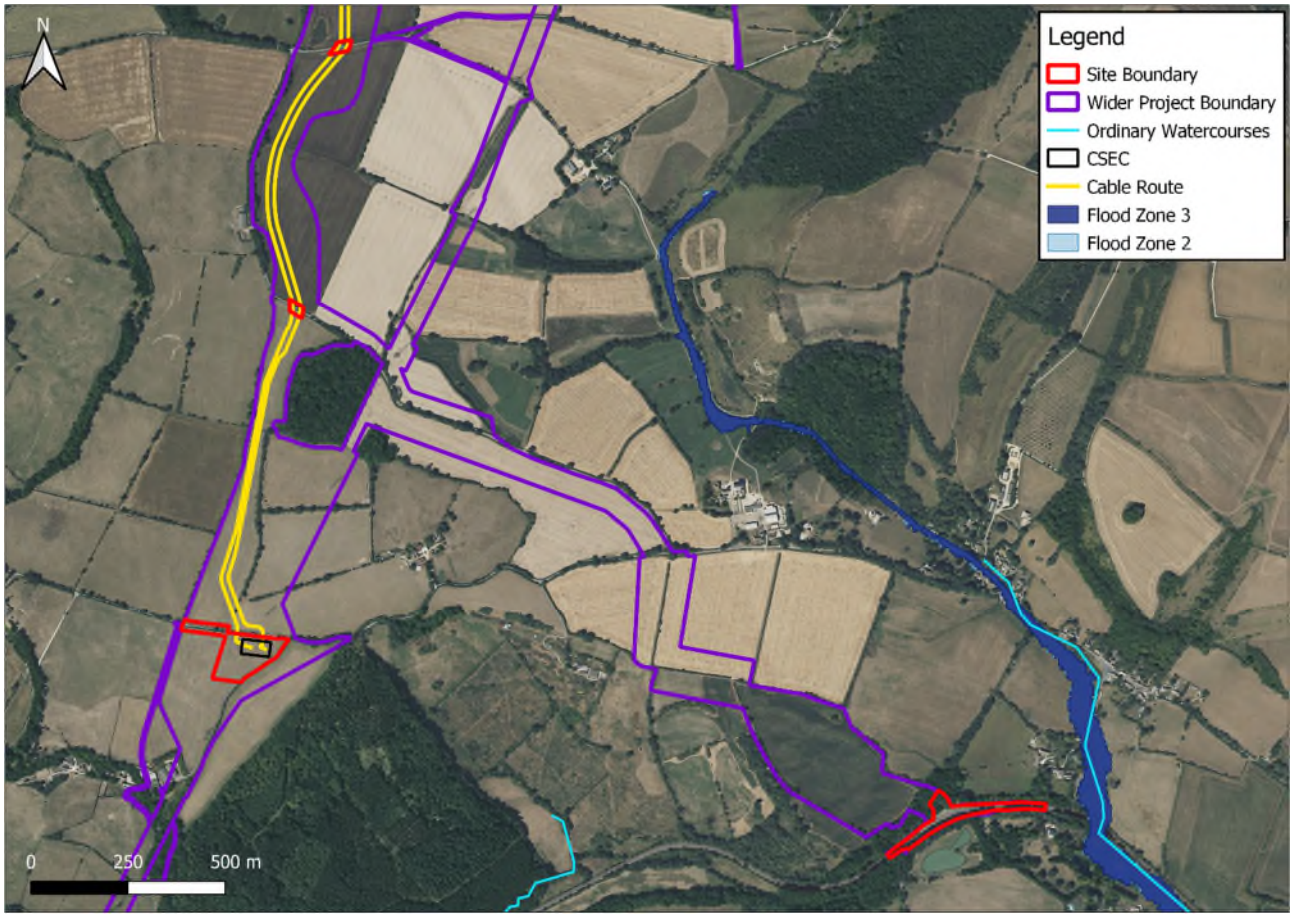

Figure 4: EA Flood Map for Planning (Rivers and Sea) - Flood Zone 2 and 3
Contains map data @2023 Bing Maps. Contains Environment Agency information © Environment Agency and/or database right.

3.4 Application of the Sequential and Exception Test

3.4.1 The Proposed Project is classified as ‘essential infrastructure’ in accordance with the NPPF. ‘Essential infrastructure’ is deemed appropriate in Flood Zone 1, with reference to Table 2, satisfying the Sequential Test. Application of the Exception Test is not required.

4 Potential Sources of Flooding

4.1 Overview

4.1.1 An overview of the sources of flooding and their brief description can be found in Table 3.

Table 3: Sources of flooding

Source of Flooding	Description
Flooding from rivers (fluvial)	Floodwater originating from a nearby watercourse when the amount of water exceeds the channel capacity of that watercourse.
Flooding from the sea (tidal)	Flooding originating from the sea or a connected waterbody when seawater overflows onto land through extreme tidal conditions, storm surge or breach.
Flooding from surface water (pluvial)	Flooding caused by intense rainfall exceeding the available infiltration and/or drainage capacity of the ground.
Flooding from groundwater	Flooding caused when groundwater levels rise above ground level following prolonged rainfall.
Flooding from sewers	Flooding originating from surface water, foul, or combined drainage systems, typically caused by limited capacity or blockages.
Flooding from reservoirs, canals, and other artificial sources	Failure of infrastructure that retains or transmits water or controls its flow.

4.2 Fluvial Flooding

4.2.1 The EA Risk of Flooding from Rivers and Sea Map[16] is informed by the EA National Flood Risk Assessment (NaFRA), which takes account of flood defence survey information and modelled river levels, factoring in a risk of overtopping or failure of raised defences where they exist, to provide a probabilistic assessment of flooding on a relatively coarse 50m grid. The flood risk categories are summarised in Table 4.

[16] EA Risk of Flooding from Rivers and Sea, accessed May 2024, https://www.data.gov.uk/dataset/bad20199-6d39-4aad-8564-26a46778fd94/risk-of-flooding-from-rivers-and-sea

Table 4: Flood risk categories for the EA Risk of Flooding from Rivers and Sea

Flood Risk	Description
Very Low	There is a chance of flooding of less than 0.1% (1 in 1000) in any year
Low	There is a chance of flooding between 0.1% (1 in 1000) and 1% (1 in 100) in any year
Medium	There is a chance of flooding between 1% (1 in 100) and 3.3% (1 in 30) in any year
High	There is a chance of flooding of greater than 3.3% (1 in 30) in any year

4.2.2 As indicated in Figure 5, the land within the redline boundaries is mapped as at very low risk of fluvial flooding.

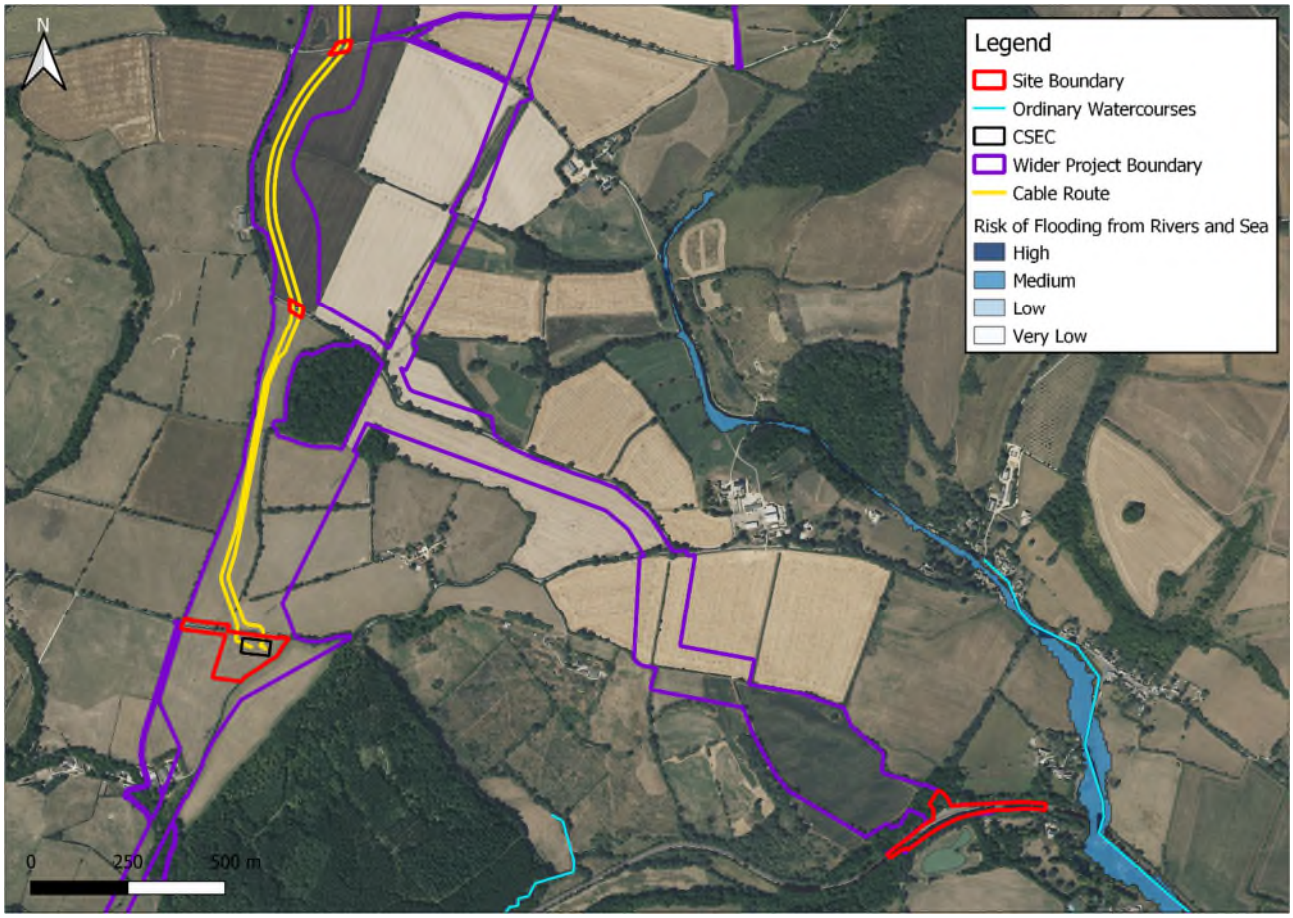

Figure 5: Risk of Flooding from Rivers and Sea

Contains map data @2023 OS Maps. Contains Environment Agency information © Environment Agency and/or database right.

4.3 Tidal Flooding

4.3.1 The Proposed Project is located approximately 90km from the coast and 30km from a tidally influenced waterway, at an elevation exceeding 97m AOD.

4.3.2 **The Proposed Project is not at risk of flooding from tidal sources.**

4.4 Flooding from Surface Water

4.4.1 The EA Risk of Flooding from Surface Water Map (RoFSW)[17] is informed by 'direct rainfall' modelling undertaken at a high (2m) spatial resolution. It illustrates the areas at elevated risk of surface water flooding, in low spots down-gradient of sloping ground or in topographic valleys associated with current or former watercourses.

4.4.2 As shown in Figure 6, land within the redline boundaries is at very low risk of flooding from surface water, equivalent to a less than 0.1% (1 in 1000) chance of flooding in any year. In the vicinity of the proposed works area at the A40 there is a very narrow strip of land that is at low risk of flooding from surface water, representing an overland flow path to the River Coln.

4.4.3 There would be a temporary increase in impermeable land cover associated with the provision of tarmac bellmouths from the highways and a permanent increase in impermeable land cover associated with the provision of a turning area and access at the CSEC. These increases would have negligible impacts on the surface water run off regime.

4.4.4 Overall, it is considered that the Proposed Project is at very low risk of surface water flooding. Further, considering the measures proposed to manage surface water runoff, described in Section 5.1, the Proposed Project will have little temporary or permanent impact on existing surface water flow regimes and flood risk from this source.

[17] EA Risk of Flooding from Surface Water, accessed May 2024, https://check-long-term-flood-risk.service.gov.uk/map?easting=423256&northing=600280&map=SurfaceWater

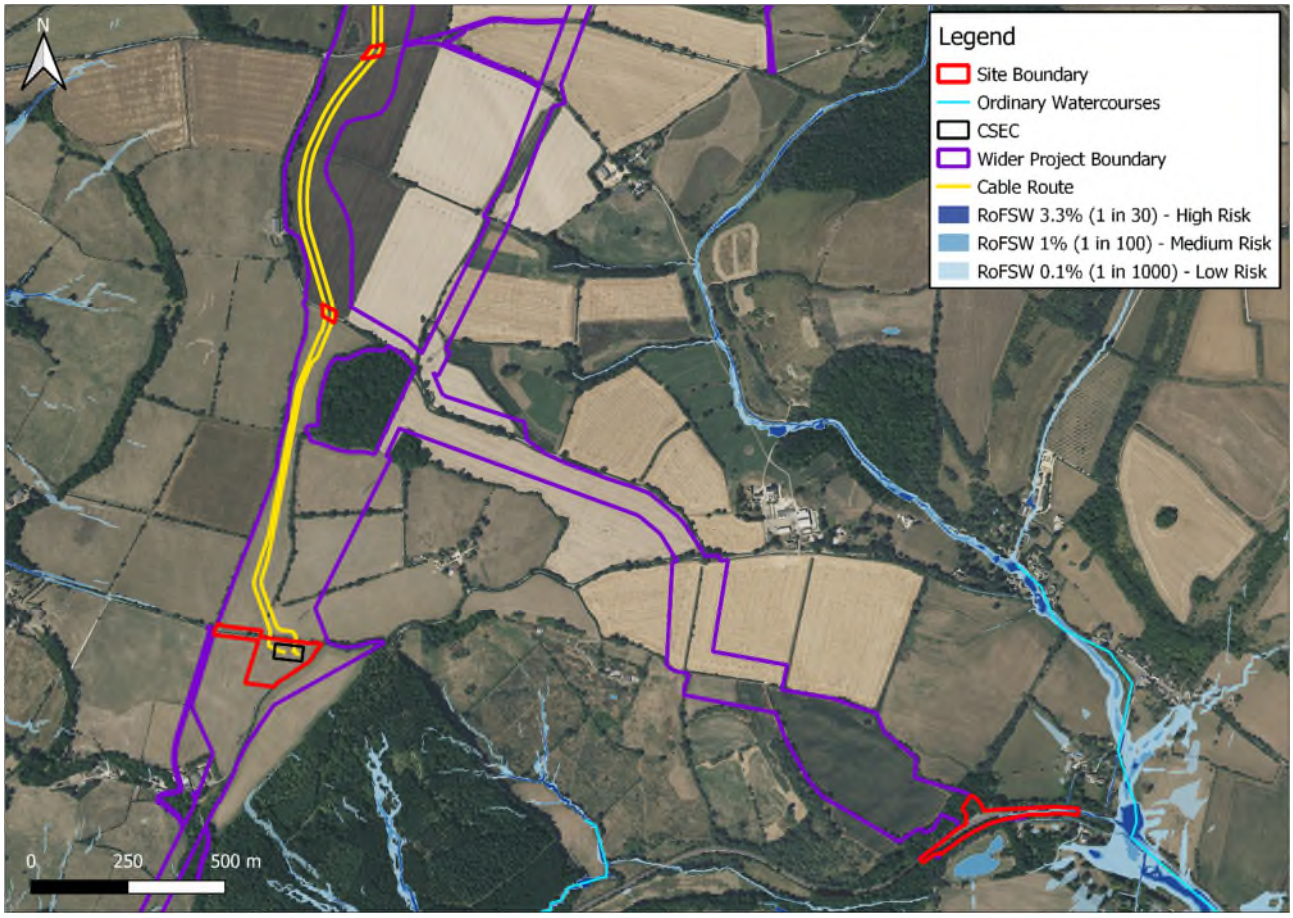

Figure 6: EA Risk of Flooding from Surface Water

Contains Map data @ Bing 2023. Contains Environment Agency information © Environment Agency and/or database right. Contains information from Ordnance Survey.

4.5 Flooding from Groundwater

4.5.1 Groundwater flooding occurs when groundwater rises to the ground surface. There are generally two forms of groundwater flooding. ‘Clearwater flooding’ is associated with the water table rising to the surface in areas of permeable bedrock geology such as chalk. 'River-groundwater interaction’ flooding occurs where river levels interact with permeable superficial deposits within river valleys, flooding areas far from the river without necessarily overtopping raised riverbanks.

4.5.2 According to the BGS online mapping[5], the CSEC study area is mainly underlain by limestone bedrock geology that supports a principal aquifer. Parts of the study area are also underlaid by Whitby Mudstone, an unproductive aquifer. Given the presence of a principal aquifer, there is a theoretical risk of ‘Clearwater flooding’. However, there are no historical records of groundwater flooding in the study area and given the prevailing topography, any groundwater emergence would accumulate on lower ground, in the river valleys. The distance between the site and the closest watercourses, as well as the prevailing topography also limits the risk of flooding by river-groundwater interaction.

4.5.3 During the operational phase, groundwater flooding is not considered to pose a significant source of flood risk to the CSEC, as, should groundwater emerge at the surface, depths would typically be shallow. Given the relatively small impermeable footprint of the operational Project there is not expected to be any significant change in existing groundwater recharge patterns, and so no increase in groundwater flood risk to third parties.

4.5.4 **The Project is considered to be at moderate risk but is of low vulnerability to groundwater flooding.**

4.6 Flooding from Sewers

4.6.1 Flooding from sewers can result from lack of sewer capacity, blockages within the sewer network or failure of infrastructure such as pumps. Any area that benefits from sewerage infrastructure has a potential risk of flooding, but the likelihood and consequences are increased by topographic constraints such as low spots or flow paths that could influence the behaviour of floodwater originating from sewers.

4.6.2 The Cheltenham Borough SFRA include records of incidents of flooding from sewers by postcode. Therefore, there is limited potential to identity if any of the recorded incidents occurred at the Proposed Project site.

4.6.3 However, in the absence of specific information on sewer flooding, the EA Risk of Flooding from Surface Water Map can aid understanding of how a failure of sewer infrastructure could impact the Proposed Project. There is no ‘ponding’ of surface waters within the redline boundaries, and the topography of the site suggest that it is unlikely that a sewer breach would result in significant flood depths on the Proposed Project site.

4.6.4 **Overall, given the rural location of the Proposed Project, it is not considered to be at risk from sewer flooding.**

4.7 Flooding from Reservoirs, Canals, and other Artificial Sources

4.7.1 The EA Risk of Flooding from Reservoirs Map[18] illustrates the potential flood extent resulting from the failure of large, raised reservoirs and release of the water that they hold. The map shows that no land within the redline boundaries is located within the reservoir flood extents.

4.7.2 There are no canals within the proximity of the Proposed Project.

4.7.3 **Based on the available information it is concluded that the Proposed Project is at low risk of flooding from artificial sources.**

[18] EA Risk of Flooding from Reservoirs, accessed May 2024, https://check-long-term-flood-risk.service.gov.uk/map

5 Management and Mitigation of Flood Risk

5.1 Introduction

5.1.1 This FRA has identified a low risk of flooding from all sources assessed. There is potential for some effects on the existing land drainage regime and associated surface water flood risk as a consequence of the construction and operation of the Proposed Project. Surface water management and mitigation measures are therefore outlined below. These measures align with CIRIA guidance C688: "Flood resilience and resistance for critical infrastructure"[19].

5.2 Surface Water Management

5.2.1 An Outline Construction Environmental Management Plan (CEMP) has been produced and includes measures to manage surface water runoff during construction.

Existing land drainage

5.2.2 As part of the pre-construction works, the location and condition of existing land drainage would be established, and a record of condition compiled. Where necessary, and subject to agreement with the landowner/occupier, new or restored field drains would:

- Enable farmers' current drainage system to continue working throughout the period of construction.
- Help prevent damage to the soil structure.
- Aid recovery after completion of the construction activity.
- Maintain the site work areas as dry as practicable.

5.2.3 The design of these drainage schemes would be agreed by National Grid, the contractor, and the landowners/occupiers.

CSEC

5.2.4 The construction of the turning area at the CSEC and the CSEC access would be the only works that would result in a permanent increase in impermeable land take. Any new land take resulting in the addition of impermeable surface would be drained in accordance with the planning policy requirements/local Sustainable Drainage Systems (SuDS) guidance of the LLFA.

5.2.5 Overall, considering the management /mitigation measures above, it is concluded that surface water can be suitably managed throughout construction and operation to ensure no long-term detriment to the existing land drainage regime and surface water flood risk.

[19] CIRIA C688 Flood resilience and resistance for critical infrastructure, accessed May 2024, https://www.gov.uk/flood-and-coastal-erosion-risk-management-research-reports/flood-resilience-and-resistance-for-critical-infrastructure

6 Conclusions

6.1.1 This FRA has been prepared for the Whittington CSEC, its permanent access, and temporary bellmouths required to facilitate construction of the wider project described in Section 2.2. Flood risk for the Proposed Project has been assessed from all sources. The key conclusions are as follows:

- The land within the redline boundaries lies within Flood Zone 1 and is considered to be at very low risk of fluvial flooding.
- There is also a very low risk of surface water flooding, equivalent to less than 0.1% (1 in 1000) chance in any year.
- The Proposed Project is located in an area where the permeable, limestone bedrock geology poses a theoretical risk of groundwater flooding. However, given the nature of the Proposed Project, vulnerability to groundwater flooding is low. Also, given the small impermeable footprint of the operational Proposed Project, there is not expected to be any significant change in existing groundwater recharge patterns, and so no increase in groundwater flood risk to third parties.
- The turning area at the CSEC and the permanent access/bell-mouth are the only works that would result in a permanent increase in impermeable land area. Any new permanent land take at the CSEC would be drained in accordance with the planning policy requirements/local SuDS guidance of the LLFA.
- All other sources of flooding assessed in this FRA are considered to pose a low risk to the Proposed Project.
- It is considered that, subject to the implementation of appropriate surface water management measures, the flood risk to the Proposed Project would be acceptable and the Proposed Project would not increase third party flood risk, thus satisfying the Exception Test in line with the NPPF requirement.

Appendix A

LLFA Consultation Record

RE: Data request: Cotswolds VIP Project

[redacted]

Flood Risk Management <FloodRiskManagement@gloucestershire.gov.uk>

Wed 10/25/2023 6:49 PM

[redacted]

Hi [redacted]

We don't have any records of flooding in this area; however, we only have records of flooding that is reported to us, so this doesn't guarantee it hasn't occurred. I have also attached a copy of our pre-app advice.

Kind regards,

[redacted]

Flood Risk Management Officer
Flood Risk Management (Strategic Infrastructure)
Gloucestershire County Council
1st Floor (West), Block 5, Shire Hall, Gloucester, GL1 2TH

[redacted]

Go to www.gloucestershire.gov.uk to find information on any County Council service.
It couldn't be easier to find information instantly and in some cases apply for services online.

Gloucestershire COUNTY COUNCIL

Flood Online Reporting Tool

You can now report property flooding online using **FORT**

If your home or business has been affected by flooding and you would like the Council to investigate the cause, you can report the incident on FORT. Click here or visit "Flooding and Drainage" at www.Gloucestershire.gov.uk.

From: [redacted]@arcadis.com>
Sent: Wednesday, October 18, 2023 9:18 AM
To: Flood Risk Management <FloodRiskManagement@gloucestershire.gov.uk>
Subject: Data request: Cotswolds VIP Project

Good morning,

Arcadis are undertaking a Flood Risk Assessment on behalf of National Grid. Please could you provide any information regarding previous flooding or historic flood records for the area shown

below. We are interested in the area marked by the redline.

Site details

From Langley Brook (SO 99951 27994) to the A40 (SO 98032 19920)

Approximate Grid Reference for centre of the site: SP 00746 24606

Many thanks,

[redacted]

ARCADIS

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