

Winchcombe CSEC - Water Resources Assessment Report

National Grid Cotswolds Visual Impact Provision (VIP)
Project

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VERSION CONTROL

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Abbreviations

Acronym	Definition
BGS	British Geological Survey
CEMP	Construction Environmental Management Plan
CIRIA	Construction Industry Research and Information Association
CSEC	Cable Sealing End Compound
DEFRA	Department for Environment, Food and Rural Affairs
EA	Environment Agency
EIA	Environmental Impact Assessment
FRA	Flood Risk Assessment
GCC	Gloucestershire County Council
LLFA	Lead Local Flooding Authority
NPPF	National Planning Policy Framework
OHL	Overhead Line
OS	Ordnance Survey
PPG	Planning Practice Guidance
RNAG	Reasons for Not Achieving Good
SuDS	Sustainable Drainage System
WFD	Water Framework Directive
VIP	Visual Impact Provision

1 Introduction

1.1 Overview

- 1.1.1 Arcadis Consulting (UK) Ltd. ("Arcadis") has been commissioned by National Grid (NG) to prepare this Non-Statutory Water Resources Assessment Report. This document does not attempt to apply the rigours of the Environmental Impact Assessment (EIA) Regulations and is provided for information only. Its content should help NG to understand the site, guide the performance of their construction contractors in delivering on their policies, and support compliance with relevant legislation and the adoption of best practice construction techniques where appropriate.
- 1.1.2 The wider Cotswolds Visual Impact Provision (VIP) project (hereafter referred to as the 'wider project') has undergone formal EIA screening and EIA is not required.
- 1.1.3 An Outline Construction Environment Management Plan (CEMP) has been produced for the wider project. Measures mentioned in this report have been included within the Outline CEMP and are not considered onerous.

1.2 Limitations

- 1.2.1 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.

1.3 The Proposed Project

- 1.3.1 The Proposed Project forms part of the wider 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.
- 1.3.2 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).

1.3.3 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.

1.3.4 The scope of this report is for the Winchcombe CSEC and associated works, including the permanent access road and bell-mouth to the CSEC, in addition to a temporary bell-mouth created to support the cable construction along a classified road and a temporary bell-mouth to facilitate the construction of the temporary access road (hereafter referred to as the 'Proposed Project'). The Proposed Project is located within Tewkesbury Borough.

1.3.5 The proposed works within the Winchcombe CSEC redline comprise:

- Installation of a terminal pylon to connect the new underground cables to the remaining existing overhead line (note: the pylon is Permitted Development);
- CSEC infrastructure;
- Underground cabling from the Winchcombe CSEC towards the Whittington CSEC (note: this is Permitted Development);
- A permanent access road to the CSEC, including a bell-mouth and turning area;
- A hardstanding area where the overhead line meets with the new underground cables;
- A retaining wall;
- New screening comprising native trees, woodland and scrub planting; and
- Temporary bell-mouths with the B4632 and a classified road to facilitate construction.

2 Methodology

- 2.1.1 The appraisal has been informed by a desk study, in consultation with key statutory bodies, and has drawn on sources of guidance on appraising the effects of development on the water environment, such as:
- LA 113 – Road Drainage and the Water Environment¹.
 - Construction Industry Research and information Association (CIRIA) Report C628: Control of water pollution from linear construction projects².
 - National Planning Policy Framework (NPPF) Flood Risk and Coastal Change Planning Practice Guidance (PPG)³.
 - Water Framework Directive (WFD) Advice Note 18⁴.
- 2.1.2 The study area, illustrated in Figure A-1 in Appendix A, has been defined to include all surface water and groundwater receptors within 500m of the Proposed Project redline boundaries. This is considered an appropriate study area based on professional judgement and technical knowledge of similar schemes and the nature of the construction and operational activities associated with the Proposed Project.
- 2.1.3 Baseline information on the water environment and flood risk for the study area has been sourced from the following datasets:
- Flood Zones – Environment Agency (EA)⁵.
 - Long term flood risk map⁶.
 - Historical data and local flooding sources from the Lead Local Flood authority (LLFA).
 - Groundwater Source Protection Zones and aquifers – Department for Environment, Food and Rural Affairs (DEFRA)⁷.
 - WFD Status and Objectives – Severn River Basin⁸ District Basin Management Plan.
 - EA Severn Vale⁹ Abstraction Licensing Strategy.
 - EA Catchment Data Explorer¹⁰.
 - British Geological Survey (BGS)¹¹.

¹ Highways England (2020) LA 113 Road Drainage and the Water Environment, accessed May 2024, <https://www.standardsforhighways.co.uk/tse/attachments/d6388f5f-2694-4986-ac46-b17b62c21727?inline=true>

² CIRIA (2006) Report C648: Control of water pollution from linear construction Proposed Projects, accessed May 2024, <https://www.ciria.org/CIRIA/ProductExcerpts/C648.aspx>

³ National Planning Policy Framework Planning Practice and Guidance: Flood Risk and Coastal Change, accessed May 2024, <https://www.gov.uk/guidance/flood-risk-and-coastal-change>

⁴ Water Framework Directive Advice Note 18, accessed May 2024, <https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-18/>

⁵ EA Flood Maps for Planning accessed May 2024, <https://flood-map-for-planning.service.gov.uk/flood-zone-results?polygon=%5b%5b399145,221967%5d,%5b399148,221176%5d,%5b400561,221330%5d,%5b400847,221269%5d,%5b400457,225137%5d,%5b398433,225042%5d,%5b398796,223647%5d,%5b399145,221967%5d%5d¢er=%5b399640,223156%5d&location=cheltenham>

⁶ Long term flood risk, accessed May 2024, <https://check-long-term-flood-risk.service.gov.uk/map>

⁷ Defra Magic Map, accessed May 2024, <https://magic.defra.gov.uk/magicmap.aspx>

⁸ Severn River Basin District Basin Management Plan, accessed May 2024, <https://www.gov.uk/guidance/severn-river-basin-district-river-basin-management-plan-updated-2022>

⁹ Severn Vale Abstraction Licensing Strategies, accessed May 2024, <https://www.gov.uk/government/publications/severn-vale-abstraction-licensing-strategy>

¹⁰ EA Catchment Data Explorer, accessed May 2024, <https://environment.data.gov.uk/catchment-planning/>

¹¹ British Geological Survey Geology of Britain, accessed May 2024, <https://www.bgs.ac.uk/map-viewers/geology-of-britain-viewer/>

- EA Statutory Main Rivers¹² and Ordnance Survey (OS) Open Rivers¹³.

3 Baseline Conditions

3.1 Waterbodies

- 3.1.1 An overview of the watercourses in the study area is shown in Figure A-2 in Appendix A.
- 3.1.2 The headwaters of the River Isbourne are located within the study area. These are ordinary watercourses, with the Isbourne becoming an EA designated main river approximately 9km north of the site.

3.2 Water Quality

- 3.2.1 There is one Water Framework Directive (WFD) surface water body (River Isbourne) within the study area. The waterbody status and Reasons for Not Achieving Good (RNAG) are summarised in Table 1.

Table 1: WFD Surface Water Bodies within the study area

River	ID	Ecological Status	Chemical Status	Overall Status	RNAG
Isbourne	GB109054039631	Poor	Fail	Poor	Poor livestock management, poor soil/nutrient management, sewer discharge

- 3.2.2 There is one WFD groundwater body which underlies the redline boundaries, summarised below in Table 2.

Table 2: WFD Groundwater Bodies

Name	ID	Overall Status	RNAG
Warwickshire Avon Jurassic Limestone Cotswolds Edge North	GB40901G304400	Good	n/a

¹² EA Statutory Main River Map, accessed May 2024, <https://environment.maps.arcgis.com/apps/webappviewer/index.html?id=17cd53dfc524433980cc333726a56386>

¹³ OS Open Rivers, accessed May 2024, <https://www.data.gov.uk/dataset/dc29160b-b163-4c6e-8817-f313229bcc23/os-open-rivers>

3.3 Water Resources

- 3.3.1 The redline boundaries are underlain by a variety of bedrock geology types. These are presented in Table 3 below, alongside their aquifer designations.
- 3.3.2 There are very few drift deposits in the study area. Where they do occur, they follow the corridors of watercourses.

Table 3: Bedrock Geology

Parent Group	Formation	Aquifer Designation
Inferior Oolite	Birdlip Limestone	<u>Principal aquifer:</u> defined as exhibiting high permeability and/or providing a high level of water storage. They can support abstraction and/or river bas flow on a strategic scale.
Lias	Whitby Mudstone	<u>Unproductive:</u> largely unable to provide usable water supplies and unlikely to have surface water and wetland ecosystems depend on them.
	Marlstone Rock	<u>Secondary A:</u> permeable layers that can support local water supplies.
	Dyrham	<u>Secondary undifferentiated:</u> Secondary aquifers where it is not possible to apply either a Secondary A or B definition because of variable characteristics of the rock type.

- 3.3.3 Licensed abstraction and consented discharge data for the study area was requested from the EA and was received in January 2024. The data shows two discharge points into the River Isbourne within the study area, comprising of sewage discharges from an undefined source (SP0050027200), and sewage discharge from a trade business (SP0136027180). The latter of these licensed discharges lies within the Proposed Project redline boundaries, along the route of the permanent access road to the Winchcombe CSEC.

3.4 Flood Risk

- 3.4.1 The majority of the redline boundary is at very low risk of tidal and fluvial flooding, lying in Flood Zone 1, equivalent to an annual chance of flooding from both sources of less than 0.1%. There are very small areas within the Proposed Project redline boundaries which lie in Flood Zones 2 and 3, as illustrated in Figure A-3 in Appendix A (Flood Zone 1 is clear in this figure as in the Flood Map for Planning). This is land defined as having a medium and high probability of flooding from rivers and the sea, with an annual chance of fluvial flooding between 0.1% (1 in 1000) and 1% (1 in 100) and greater than 1% (1 in 100) respectively. These areas of Flood Zone 2 and 3 are associated with the River Isbourne.
- 3.4.2 Flood risks from surface water, groundwater, and artificial sources have also been appraised. Further details are provided in the standalone Flood Risk Assessment (FRA document reference: 30167905-ARC-XX-260-RP-W-00005) which concludes a generally low risk of flooding from these sources to the site.

4 Embedded Measures

4.1 Construction

- 4.1.1 The following section describes the embedded design measures that have been considered in the assessment of any potential temporary impacts associated with the Proposed Project, assessed in Section 5.
- 4.1.2 Good practice measures to avoid and reduce the effects of construction are documented in the Outline CEMP.
- 4.1.3 These include measures to safeguard the water quality of waterbodies within the study area. For example, construction machinery would be refuelled within bunded areas with sealed drainage systems, away from waterbodies. Wastewater generated from the construction compounds would be disposed of via appropriate means, for example, to foul sewer or pumped out and removed from site by tanker.
- 4.1.4 An emergency spillage response plan would document measures to be implemented to prevent pollutants infiltrating into the soils beneath the site and reaching surface and groundwater receptors. Appropriate equipment (e.g. absorption mats) would also be made easily accessible on site to deal with accidental spillages and the plan would provide a full list of protocols and communication channels with the Environment Agency in the event of an accidental pollution incident.
- 4.1.5 Where the permanent access route crosses the River Isbourne, the existing crossing route is proposed to be used. If this proves not to be practicable, provision of a new temporary crossing designed to convey flows under both flood and low flow conditions would avoid any adverse impact on baseline flood risk and the hydromorphology of the watercourse. Works would be undertaken in accordance with relevant consents.
- 4.1.6 Soil would be stored outside the floodplain (demarked by Flood Zone 3).
- 4.1.7 As part of pre-construction works, a record of existing land drainage would be compiled and, subject to landowner/occupier agreement, new drains would be established to help prevent damage to soil structure, maintain work areas in a dry condition and to enable current drainage systems to continue to operate through the construction period.
- 4.1.8 Following construction, topsoil and excavated material would be reinstated to ensure no detriment to the existing land drainage regime where feasible.
- 4.1.9 Any Ordinary Watercourse Consents required would be secured prior to the commencement of the construction period.

4.2 Operation

- 4.2.1 Any new permanent land take that results in increased impermeable land cover would be drained in accordance with the planning policy requirements/local Sustainable Drainage Systems guidance of the LLFA, Gloucestershire County Council (GCC).

5 Potential Impacts

5.1 Surface Water Quality

- 5.1.1 Surface water runoff from the proposed CSEC, associated permanent access road (and permanent bell-mouth) and the two temporary bell-mouths along existing classified roads to the north and south of the CSEC (see Section 1.3.5) would be managed to prevent discharge of silted water into any surface watercourse or drain.
- 5.1.2 The potential for water quality effects is therefore restricted to the possibility of localised contained spills and/or silt releases during the construction phase. The procedures in place would limit the consequences of construction phase incidents such that they would be minor and rapidly cleaned up, with no impact to the wider area or the water quality attributes of surface water features within the study area.
- 5.1.3 The water quality of the underlying groundwater body is unlikely to be impacted. This is because there is only a very limited pathway to this receptor as depths of excavation would be relatively shallow, and discharges to ground are not proposed.
- 5.1.4 Considering the embedded design measures outlined in Section 4 and the potential impacts discussed above, the overall impact of the Proposed Project on surface water quality is considered to be negligible.

5.2 Water Resources

- 5.2.1 Appropriate measures to manage any groundwater encountered during excavations to construct the CSEC would be secured in the CEMP, with any qualifying dewatering activities undertaken in accordance with an Environment Agency permit. The quality and flow regimes of the receiving surface watercourse(s) and the underlying groundwater body are not expected to be affected by the works required for the Proposed Project.
- 5.2.2 With regard to the water resource/supply attributes of surface waterbodies, a non-consumptive approach is proposed.
- 5.2.3 With regard to the water supply attributes of the underlying groundwater body, no consumptive groundwater use is proposed and there would be no change to the current recharge regime.
- 5.2.4 Considering the embedded design measures discussed in Section 4, and the impacts discussed above, the Proposed Project is considered to have a low overall impact on water resources.

5.3 Flood Risk

- 5.3.1 A standalone FRA has been produced to support the planning application for the Proposed Project (FRA document reference: 30167905-ARC-XX-260-RP-W-00005).
- 5.3.2 Regarding the permanent access track which crosses over the River Isbourne, as described in 4.1.5, there should be no impact on flood risk as a result of this watercourse crossing.
- 5.3.3 Appropriate measures to manage the potential for increased flood risk from increased surface water runoff are documented in the Outline CEMP and the current land drainage regime would be maintained, as noted in Section 4.
- 5.3.4 Given the embedded design measures discussed in Section 4, and the minimal baseline flood risk to the site reported in the FRA, the Proposed Project is considered to have a negligible impact in terms of increasing baseline flood risk.

6 Summary and Next Steps

- 6.1.1 This report has considered the potential impacts of the Proposed Project on the surface and groundwater receptors in the context of the baseline water environment, following consideration of embedded design measures and good practice for both the construction and operational phases.
- 6.1.2 This assessment has determined that both the construction and operation of the Proposed Project would result in no adverse impacts to the baseline water environment.
- 6.1.3 The Contractor will be responsible for reviewing and updating the Outline CEMP prior to construction commencing.
- 6.1.4 Any Ordinary Watercourse Consents required would be secured prior to the commencement of the construction period.

Appendix A – Figures

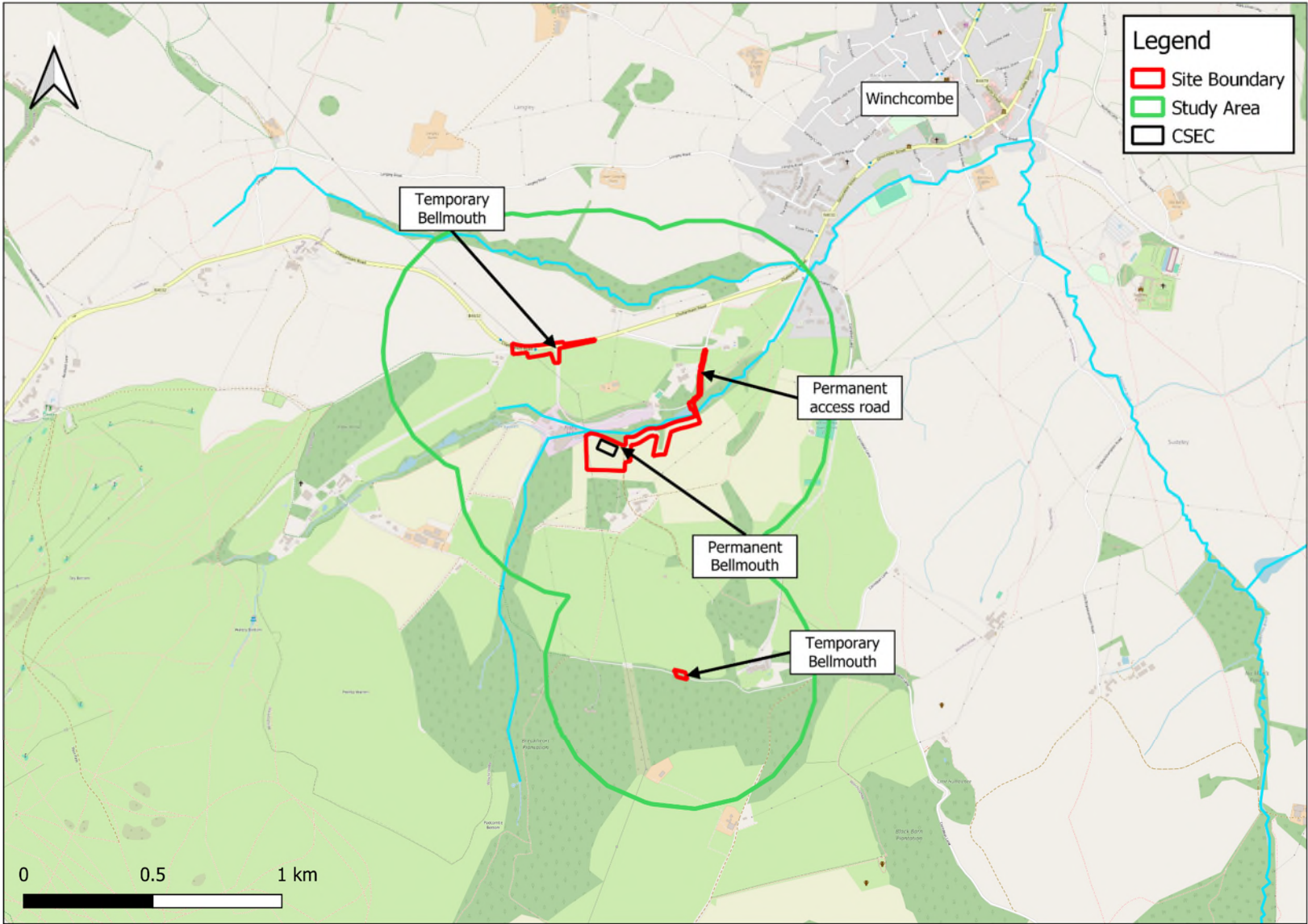


Figure A-1: Study Area
Background map contains data © OS Mapping

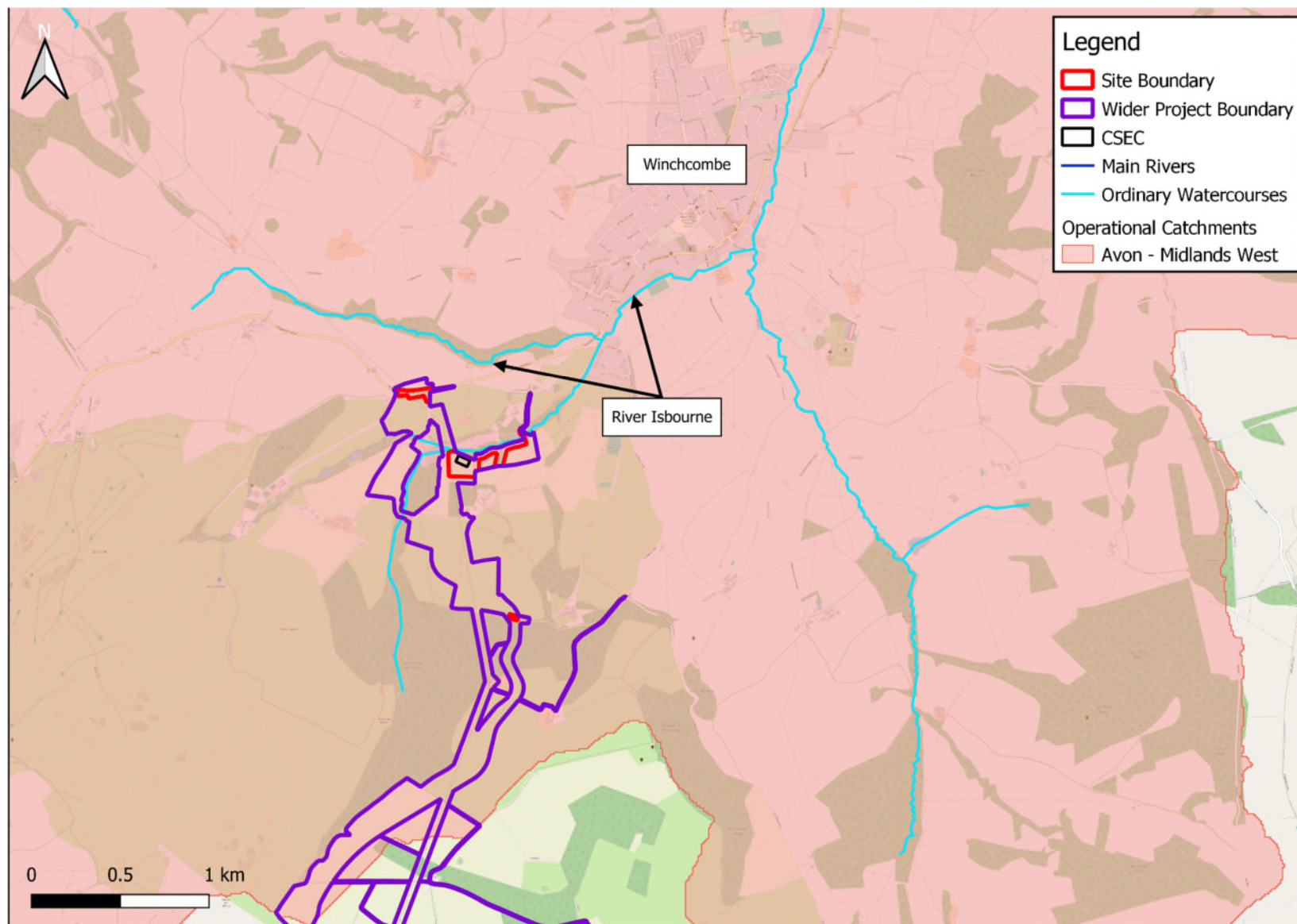


Figure A-2: Watercourses

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.

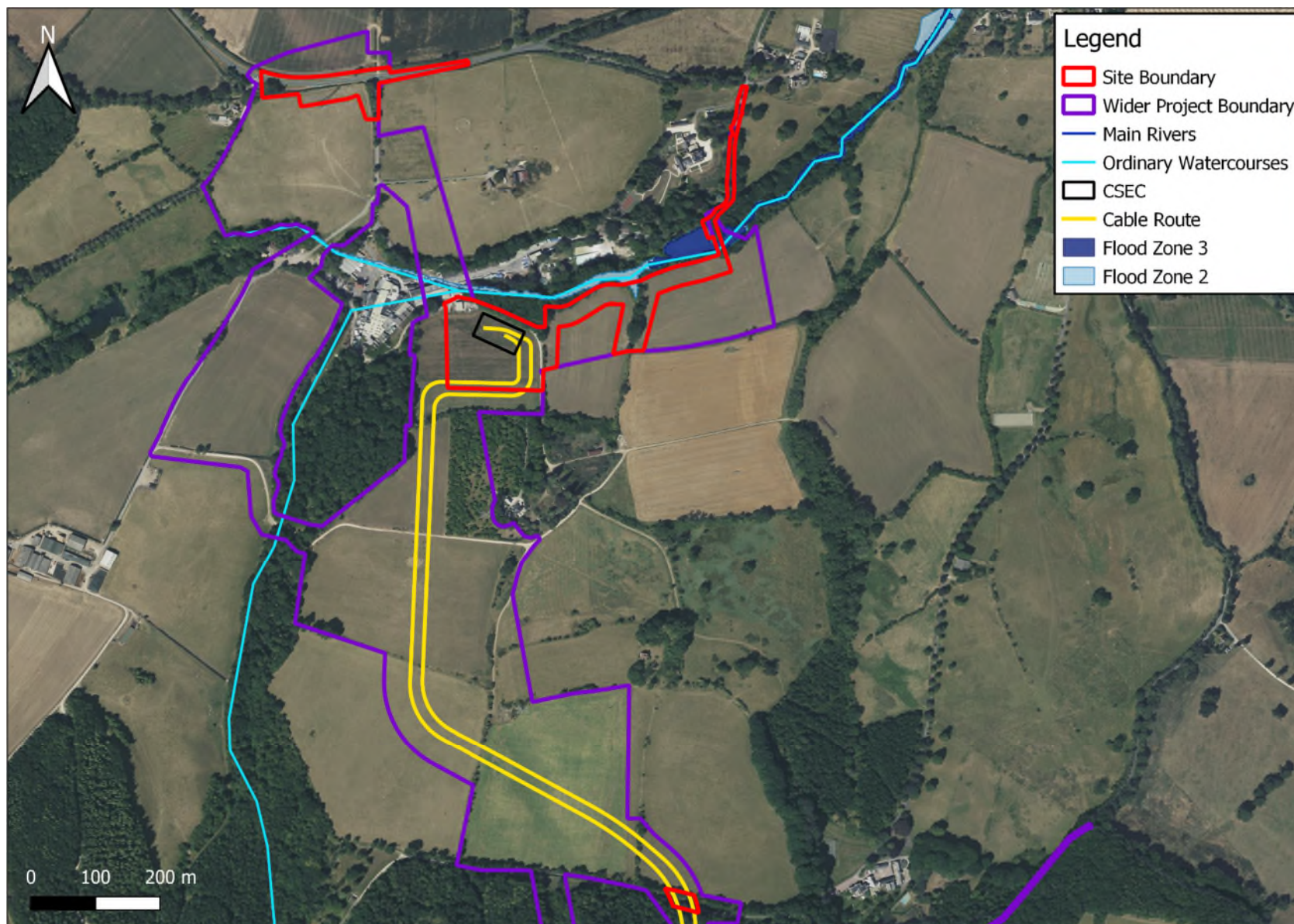


Figure A-3: Baseline Fluvial Flood Risk (Flood Zones)

Contains map data @2024 Bing. Contains Environment Agency information © Environment Agency and/or database right.

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