

A417 Missing Link  
TR010056

6.4 Environmental Statement  
Appendix 13.8 GWDTEs Assessment

Planning Act 2008

APFP Regulation 5(2)(a)  
Infrastructure Planning (Applications: Prescribed Forms and  
Procedure) Regulations 2009

Volume 6

May 2021

Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning  
(Applications: Prescribed Forms  
and Procedure) Regulations 2009**

**A417 Missing Link**

Development Consent Order 202[x]

---

**6.4 Environmental Statement  
Appendix 13.8 GWDTEs Assessment**

---

<b>Regulation Number:</b>	5(2)(a)
<b>Planning Inspectorate Scheme Reference</b>	TR010056
<b>Application Document Reference</b>	6.4
<b>Author:</b>	A417 Missing Link

<b>Version</b>	<b>Date</b>	<b>Status of Version</b>
C01	May 2021	Application Submission

# Table of Contents

	Pages
1 Introduction	i
2 Methodology	i
3 Baseline	i
4 Step 1 - Identify potential linkages	ii
5 Summary	ii
References	iii

# 1 Introduction

- 1.1.1 A groundwater dependant terrestrial ecosystem (GWDTE) is defined as<sup>1</sup>:  
*“A terrestrial ecosystem of importance at Member State level that is directly dependent on the water level in or flow of water from a groundwater body (that is, in or from the saturated zone). Such an ecosystem may also be dependent on the concentrations of substances (and potential pollutants) within that groundwater body, but there must be a direct hydraulic connection with the groundwater body.”*
- 1.1.2 This document describes the assessment of risk to GWDTEs resulting from the construction and operation of the scheme.

# 2 Methodology

## Groundwater dependent terrestrial ecosystems assessment

- 2.1.1 An assessment of GWDTEs has been carried out in line with the guidance provided in Appendix B of DMRB LA 113.
- 2.1.2 The methodology has a stepped, risk-based approach which depends upon establishing linkages between potential impacts from the road development on the hydrological and hydrogeological regime and a GWDTE:
- Step 1 - Identify potential linkages
  - Step 2 - Assess GWDTE importance (if required)
  - Step 3 - Assess potential impacts (if required)

## Baseline

- 2.1.3 GWDTEs were identified using the Phase 1 and National Vegetation Classification (NVC) surveys conducted for the scheme and provided in ES Appendix 8.3 NVC Woodland Survey Report (Document Reference 6.4) and the habitat communities at protected sites within the scheme’s study area. The habitat communities present were compared with the communities listed in Annex 1 of the UKTAG report<sup>1</sup>, identifying that have a potential to be groundwater dependant.
- 2.1.4 The hydrogeological conceptual model developed for the scheme is presented in ES Appendix 13.7 Hydrogeological impact assessment (Document Reference 6.4) and was used to identify potential linkages.

# 3 Baseline

## Identified GWDTEs and potential GWDTEs

- 3.1.1 NVC surveys indicated that Bushley Muzzard Site of Special Scientific Interest (SSSI) supports NVC community M22 (*Juncus subnodulosus* – *Cirsium palustre* fen meadow), which has a potential to be moderately dependent on groundwater.
- 3.1.2 No potentially groundwater dependent NVC communities were noted at Crickley Hill SSSI. Crickley Hill and Barrow Wake SSSI is designated for calcareous grassland habitats, broadleaved woodland (including beech woodland) and nationally important rock exposures<sup>2</sup>. It is located adjacent to the existing A417 on Crickley Hill and at Barrow Wake. Springs supplying the tributary of Norman’s Brook are outside the protected area downgradient and south of Barrow Wake. The National Vegetation Classification (NVC) code for beech trees (*Fagus*

*sylvatica*) is 'W12', which is not classified as being groundwater-dependant according to relevant guidance<sup>3</sup>. The ecological surveys completed for the scheme did not identify the presence of potentially-groundwater-dependent habitats<sup>4</sup>.

- 3.1.3 Cotswold Commons and Beechwoods SSSI and Cotswold Beechwoods Special Area of Conservation (SAC), located to the west and downslope of the B4070. As mentioned above the beech woodland is not classified as a groundwater-dependent habitat, however these designated sites include areas of vegetation dependent on springs and seepage from high groundwater levels. These areas of vegetation are associated with some nationally rare invertebrate species. These protected areas extend from the south-east of Birdlip to High Brotheridge and include springs supplying the Horsbere Brook.
- 3.1.4 Witcombe Reservoirs, at the foot of the escarpment, is primarily supplied by spring-fed watercourses. It discharges to the Horsbere Brook. There are a number of small ponds in the area that may be partially groundwater-dependent or fed by springs.

## 4 Step 1 - Identify potential linkages

- 4.1.1 The hydrogeological conceptual model presented in ES Appendix 13.7 Hydrogeological impact assessment (Document Reference 6.4) identified that the drawdown in groundwater levels associated with cuttings along the scheme, in particular the Stockwell-Nettleton Bottom cutting, does not extend to Bushley Muzzard SSSI or any other above-mentioned groundwater fed systems.
- 4.1.2 The calculated drawdown encroaches on the Crickley Hill and Borrow Wake SSSI area. However, no groundwater dependent species have been identified in that area and therefore this will not pose a risk to this protected area. In addition, based on groundwater monitoring data from near Crickley Hill and Barrow Wake SSSI, the groundwater is at least 20 metres below ground level (mbgl) and is anticipated to result in a relatively deep unsaturated zone below the SSSI. Consequently, an interaction between groundwater and root systems of beech trees is unlikely. The beech woodlands are therefore considered to be fed by near-surface flow and precipitation.
- 4.1.3 The conceptual model demonstrates there is no linkage between the potential impacts from the road to groundwater levels and the GWDTE.

## 5 Summary

- 5.1.1 It is considered that the scheme does not pose a risk to the identified or potential GWDTEs and no further assessment is required.

## References

---

- <sup>1</sup> UK Technical Advisory Group (2004). Guidance on the identification and risk assessment of groundwater dependant terrestrial ecosystems (Working Draft Rev. 5) [Online]. Available at: [https://www.wfduk.org/sites/default/files/Media/Characterisation%20of%20the%20water%20environment/Risk%20assessment%20of%20terrestrial%20ecosystems%20groundwater\\_Draft\\_210104.pdf](https://www.wfduk.org/sites/default/files/Media/Characterisation%20of%20the%20water%20environment/Risk%20assessment%20of%20terrestrial%20ecosystems%20groundwater_Draft_210104.pdf) (Accessed 25/01/21).
- <sup>2</sup> Natural England (2021). Crickley Hill and Barrow Wake SSSI Citation [Online]. Available at: <https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1001395.pdf> (Accessed 25/01/2021).
- <sup>3</sup> UK Technical Advisory Group (2004). Guidance on the identification and risk assessment of groundwater dependant terrestrial ecosystems (Working Draft Rev. 5) [Online]. Available at: [https://www.wfduk.org/sites/default/files/Media/Characterisation%20of%20the%20water%20environment/Risk%20assessment%20of%20terrestrial%20ecosystems%20groundwater\\_Draft\\_210104.pdf](https://www.wfduk.org/sites/default/files/Media/Characterisation%20of%20the%20water%20environment/Risk%20assessment%20of%20terrestrial%20ecosystems%20groundwater_Draft_210104.pdf) (Accessed 25/01/2021).
- <sup>4</sup> Vegetation Survey & Assessment Ltd (2019). A417 Missing Link at Air Balloon Cross, Botanical Assessment