



**HS2**

# **Save St. Giles**

House of Lords Select Committee

7<sup>th</sup> November 2016

# Introduction to Save St.Giles



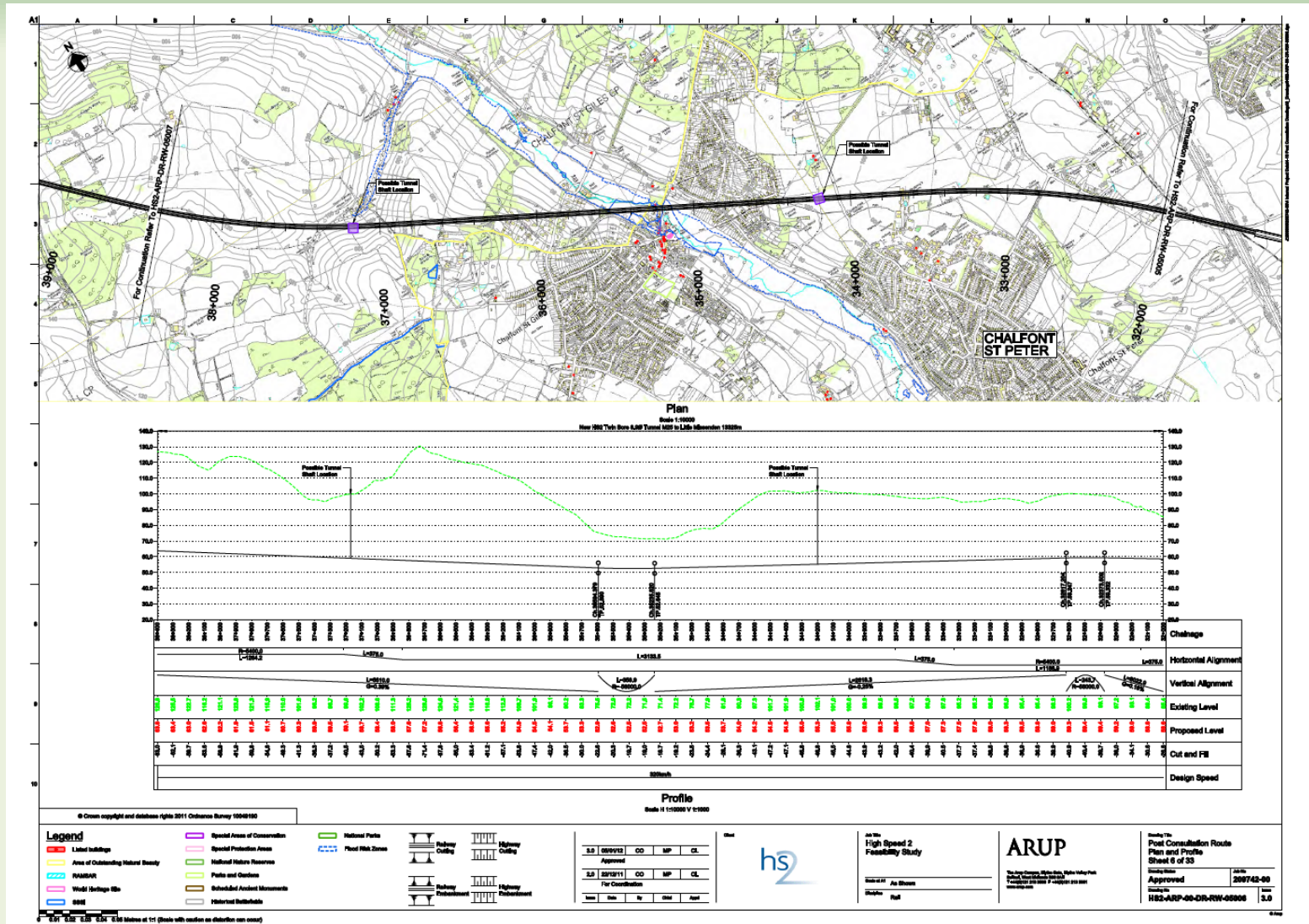
- 6000 villagers
- An area of Outstanding Natural Beauty
- Historical Significance
- Home to the River Misbourne
- Buckinghamshire Best Kept Village 2016
- Named **Best Village in Britain** in 2010

# An idyllic Buckinghamshire village

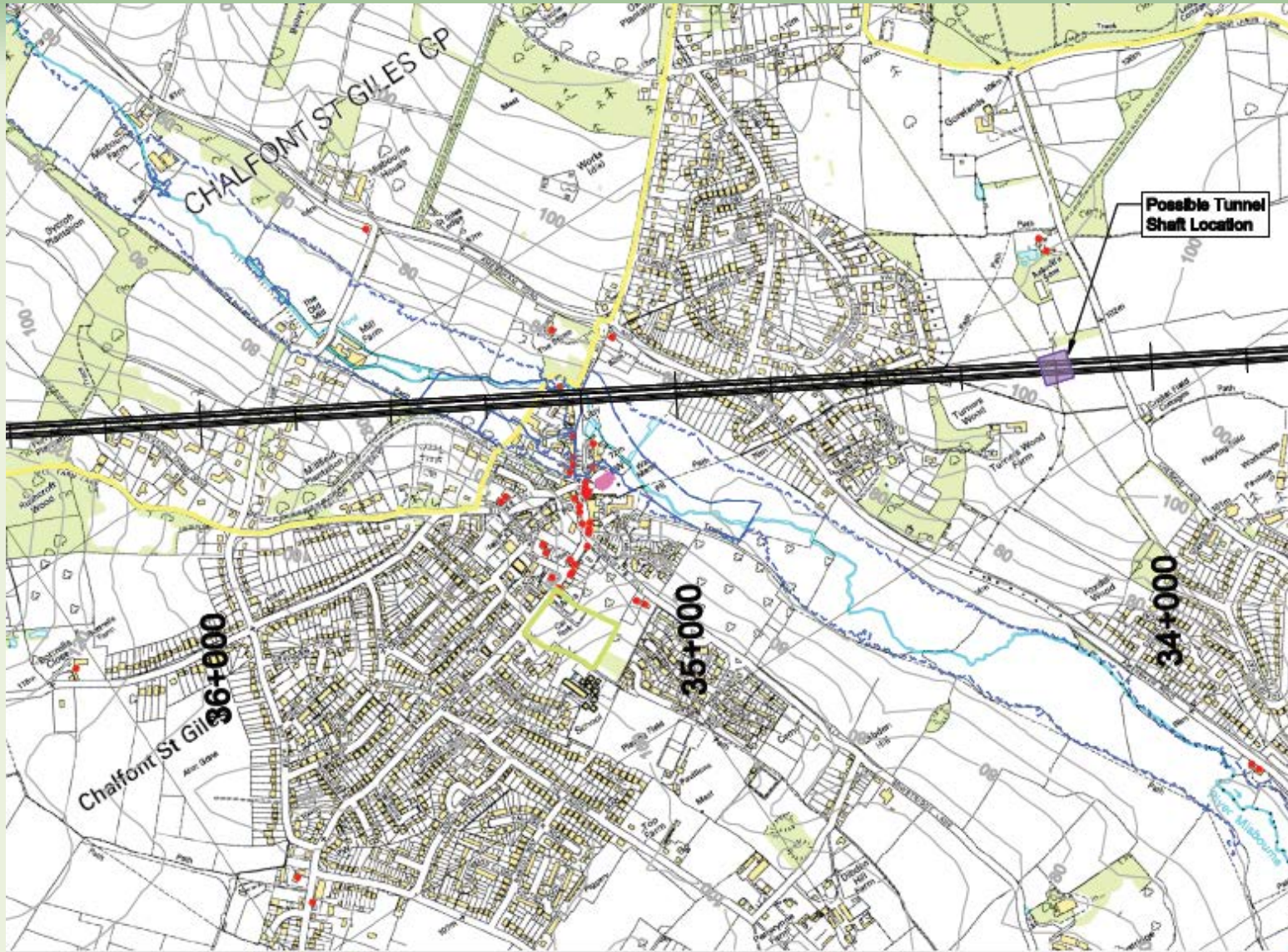


Online Copy Protection. ©The Francis Frith Collection

# Map of tunnel in relation to village

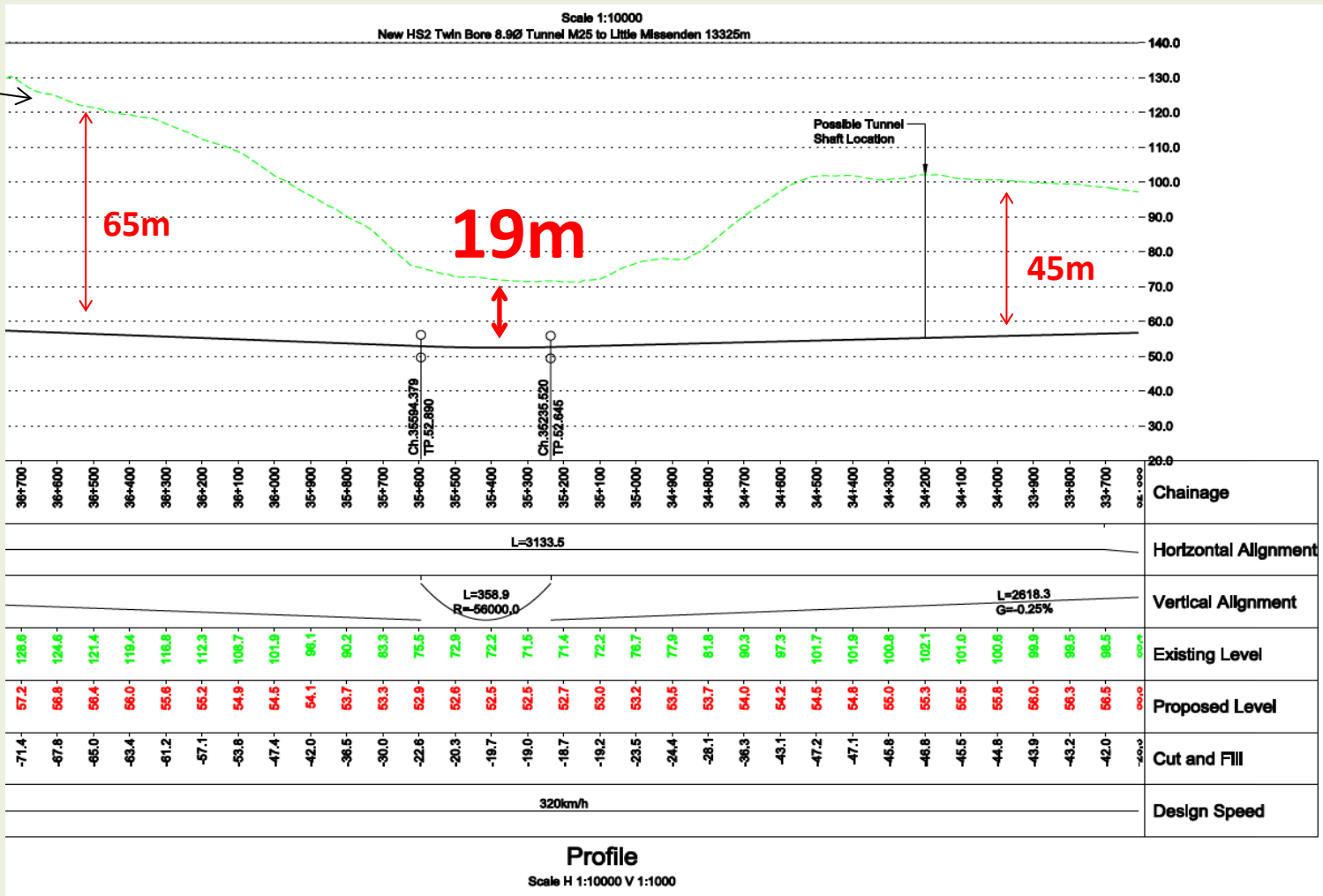


# A closer look at the tunnel



# Tunnel depth only **19m** as it passes under our village

Surface →  
Tunnel →



# Background

- HS2 have not fully considered the impact and implications of the new tunnel depth as it passes under the village of Chalfont St.Giles
- We are asking that the following be considered:
  - 1. Drill deeper**
  - 2. Safeguard the river**
- This will lessen the potential impact on our village and could lessen the long term financial impact for HS2

# Latest Developments





# Latest Developments



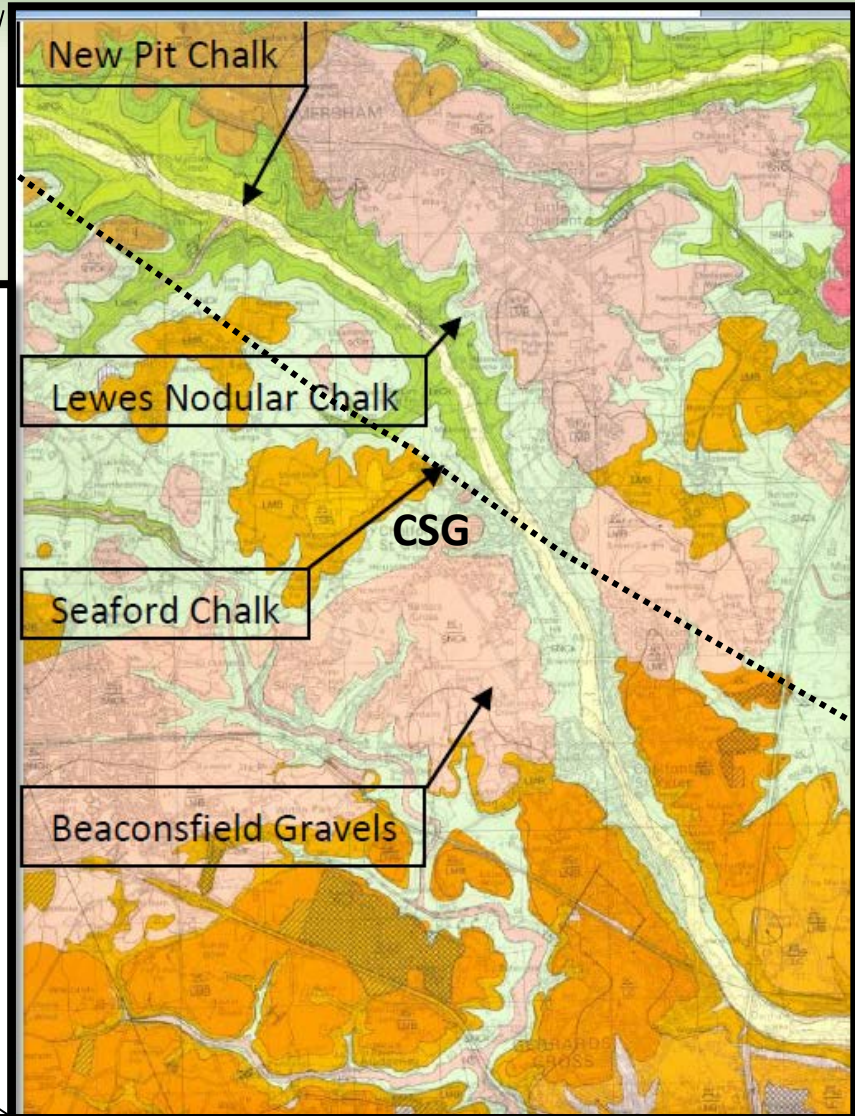
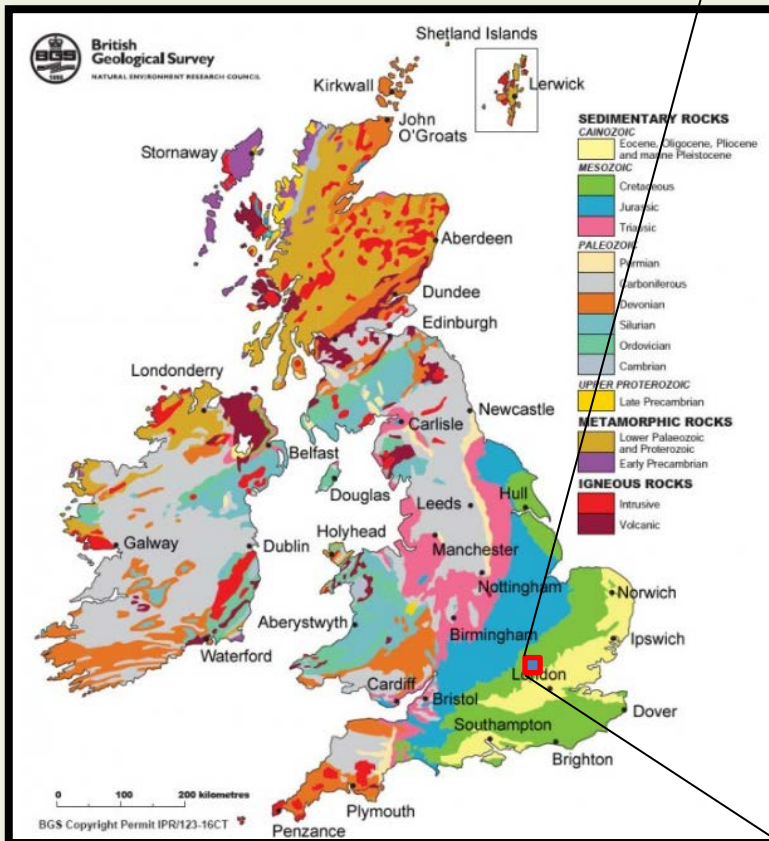
# Our Petition

- HS2 assumptions based upon desk-based research
- Lacking thorough understanding of the area or of the make-up of the soil and surrounding land
- HS2 have said that if there is any negative impact on the river then they will simply "make good"
- We cannot afford to “wait and see” what happens.
  - Damage to the riverbed and aquifer could be irreversible
- We have enlisted the help of two experts in drilling and rivers:
  - Drilling : Ian Cloke (Vice President - Tullow Oil)
  - Rivers: Bob Older (Misbourne River Action)

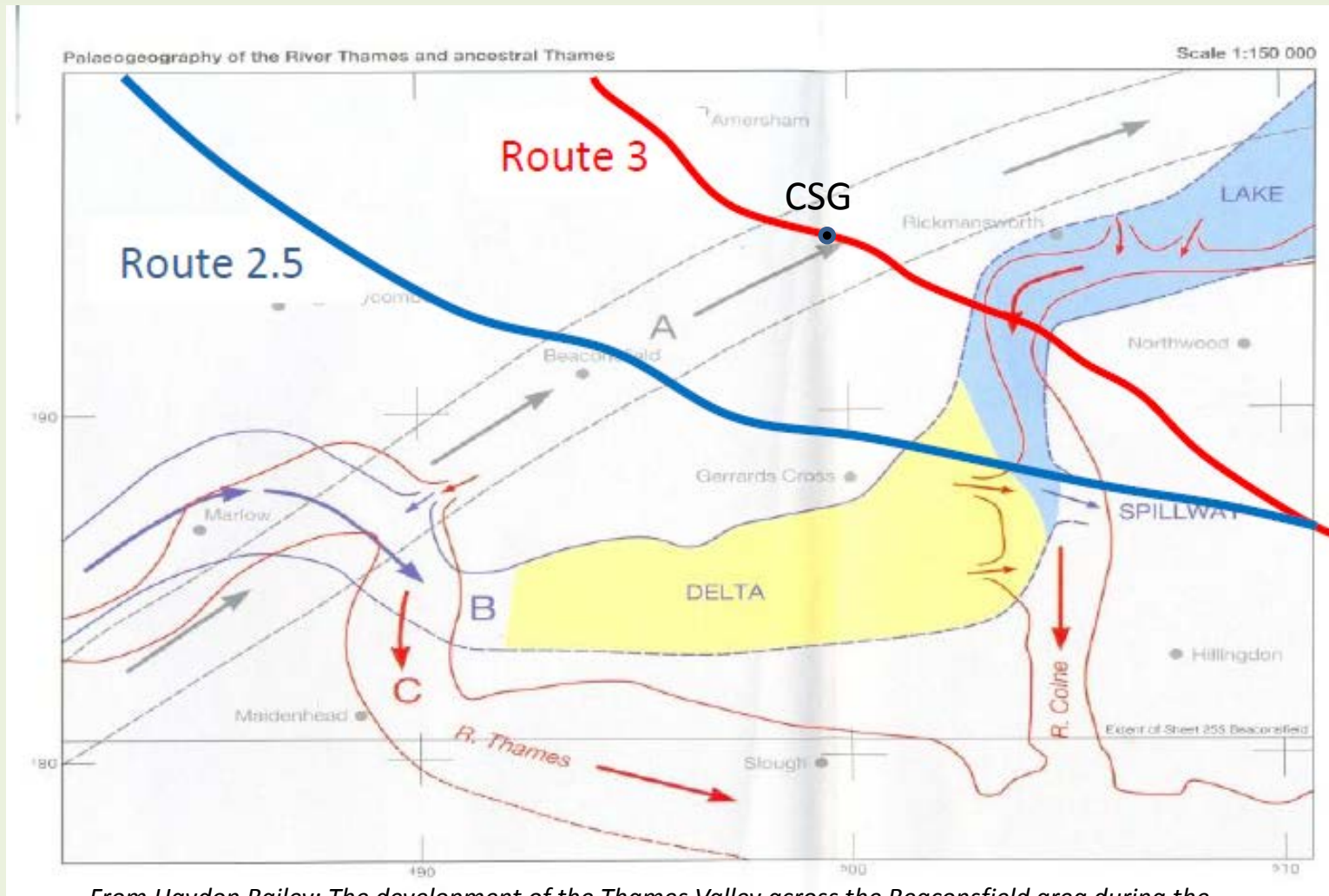
# Geological Map of Chalfont St Giles

Geological map of the Misbourne valley; BGS Beaconsfield Sheet 255, showing older chalk formations in the north west; also chalk overlain by pre-glacial Beaconsfield Gravels along the line of the proto-Thames.

..... Approx HS2 Route  
CSG Chalfont St Giles



# Chalfont St Giles 450,000 years ago



From Haydon Bailey: *The development of the Thames Valley across the Beaconsfield area during the Anglian ice age; from the Geological Survey 1:50 000 Beaconsfield Solid and Drift map (Sheet 255).*

# What does the Chalk look like and why are we concerned?

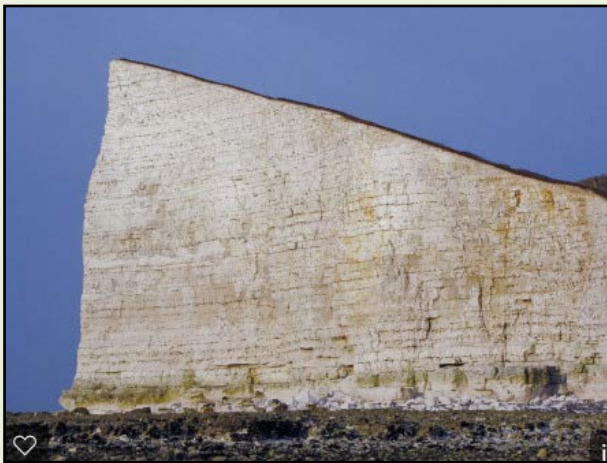
Lewes Nodular Chalk



Typical flint nodule



Seaford Chalk

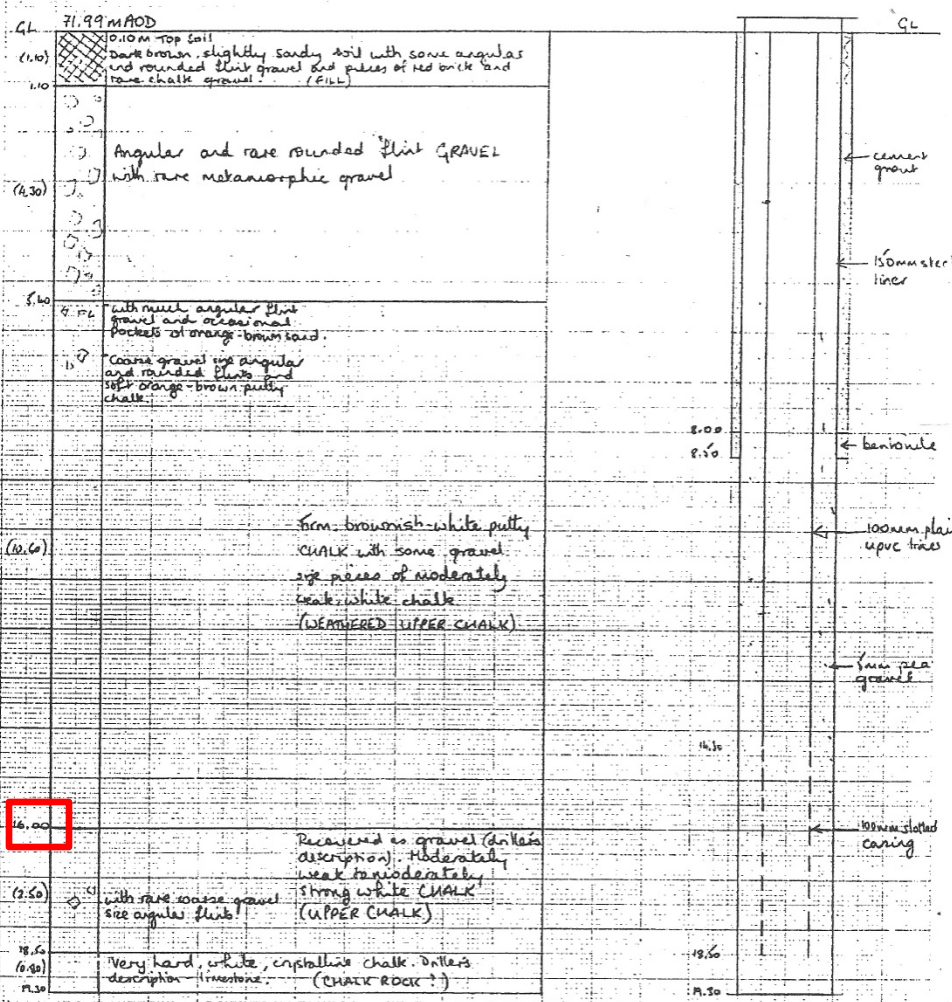


Fractured Chalk



HS2 will drill through **these** beneath CSG due to the shallow depth of the tunnel

Borehole No. M8 SU 99/64  
 NGR SU 991 936  
 LOCATION HISBOURNE  
 EQUIPMENT & METHODS Hand dug pit to 1.50m shell and auger 200mm diam to 16.00m, 150mm diam 16.00 to 19.30m  
 DATE 26-28/6/91



# Chalfont St. Giles Borehole - Original drillers log

Surface

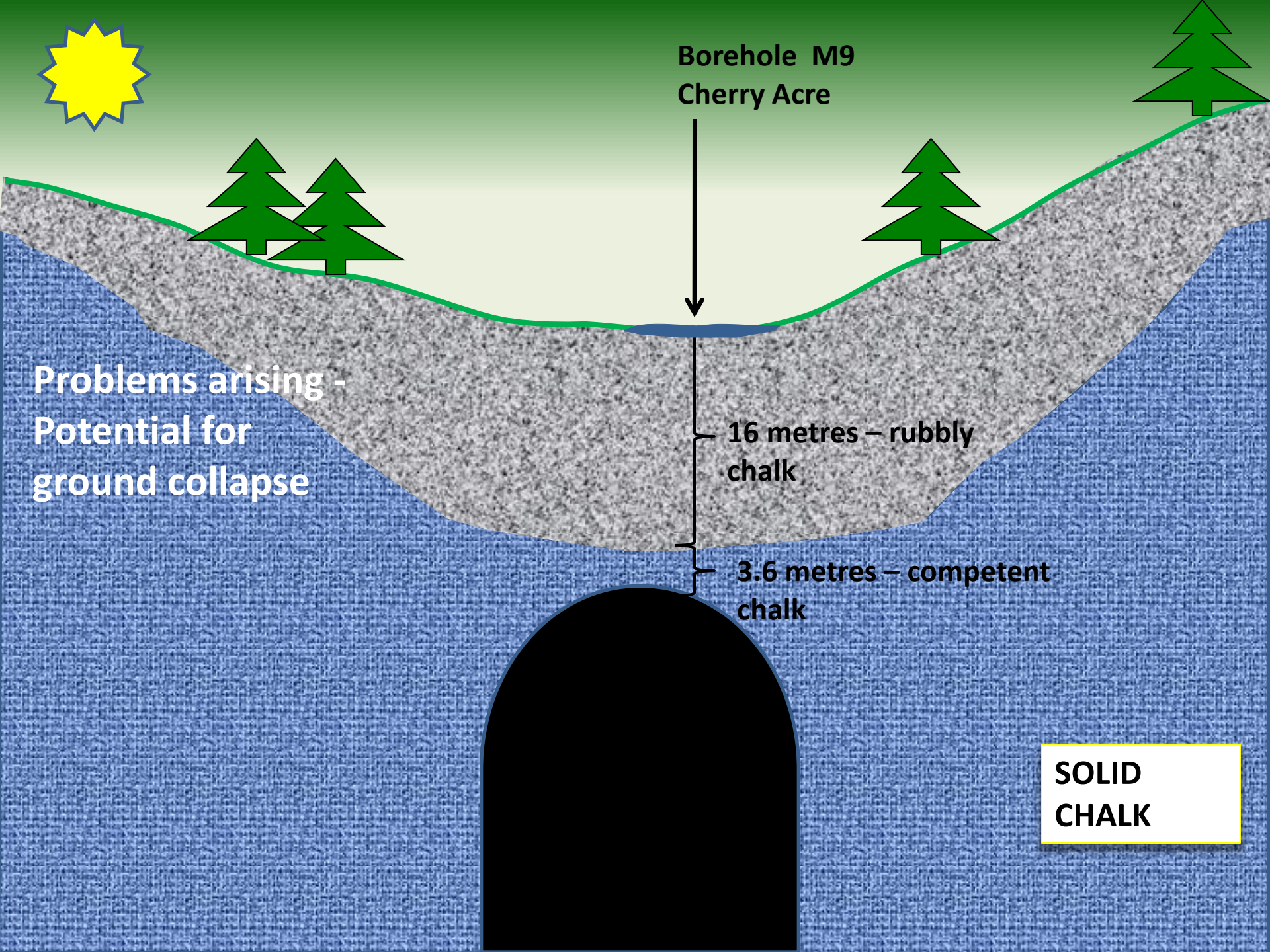
Top soil

Flint gravel

Weathered Upper Chalk

Solid chalk

Chalk Rock



Borehole M9  
Cherry Acre

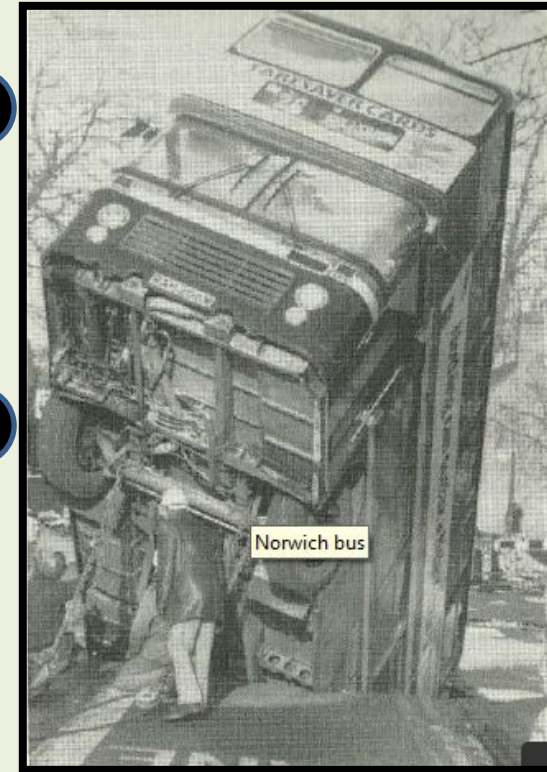
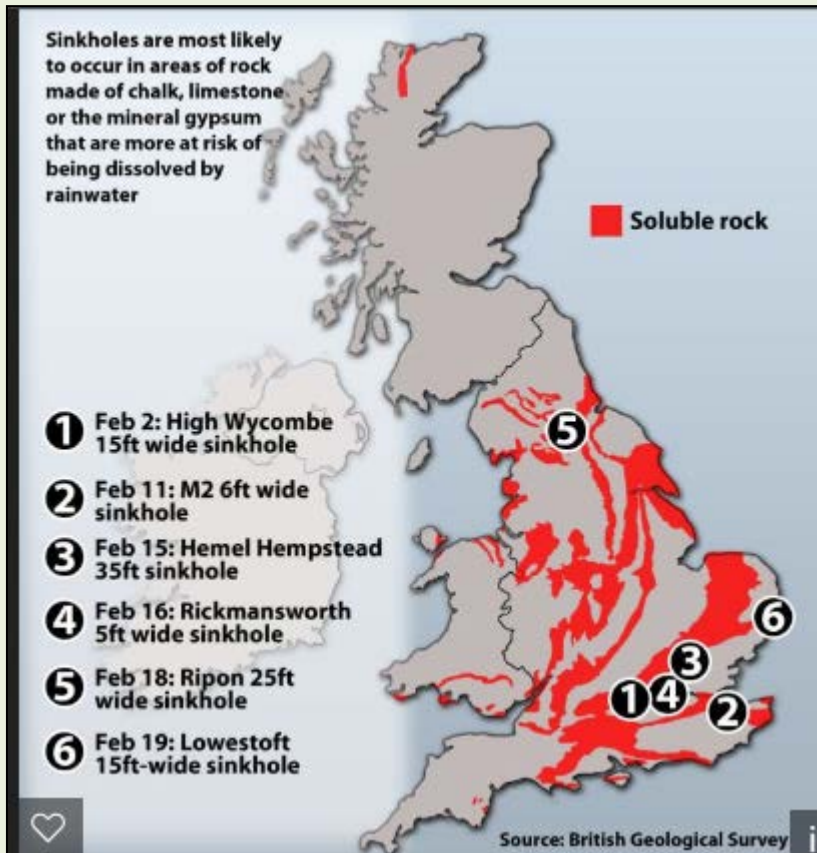
Problems arising -  
Potential for  
ground collapse

16 metres - rubblely  
chalk

3.6 metres - competent  
chalk

**SOLID  
CHALK**

# Ground collapse from Chalk dissolution



Chalk is highly fractured and will dissolve : the tunnels 'halo' will extend 100's of metres



# Fractures and Reactivation



Fracture developed in house above a sinkhole



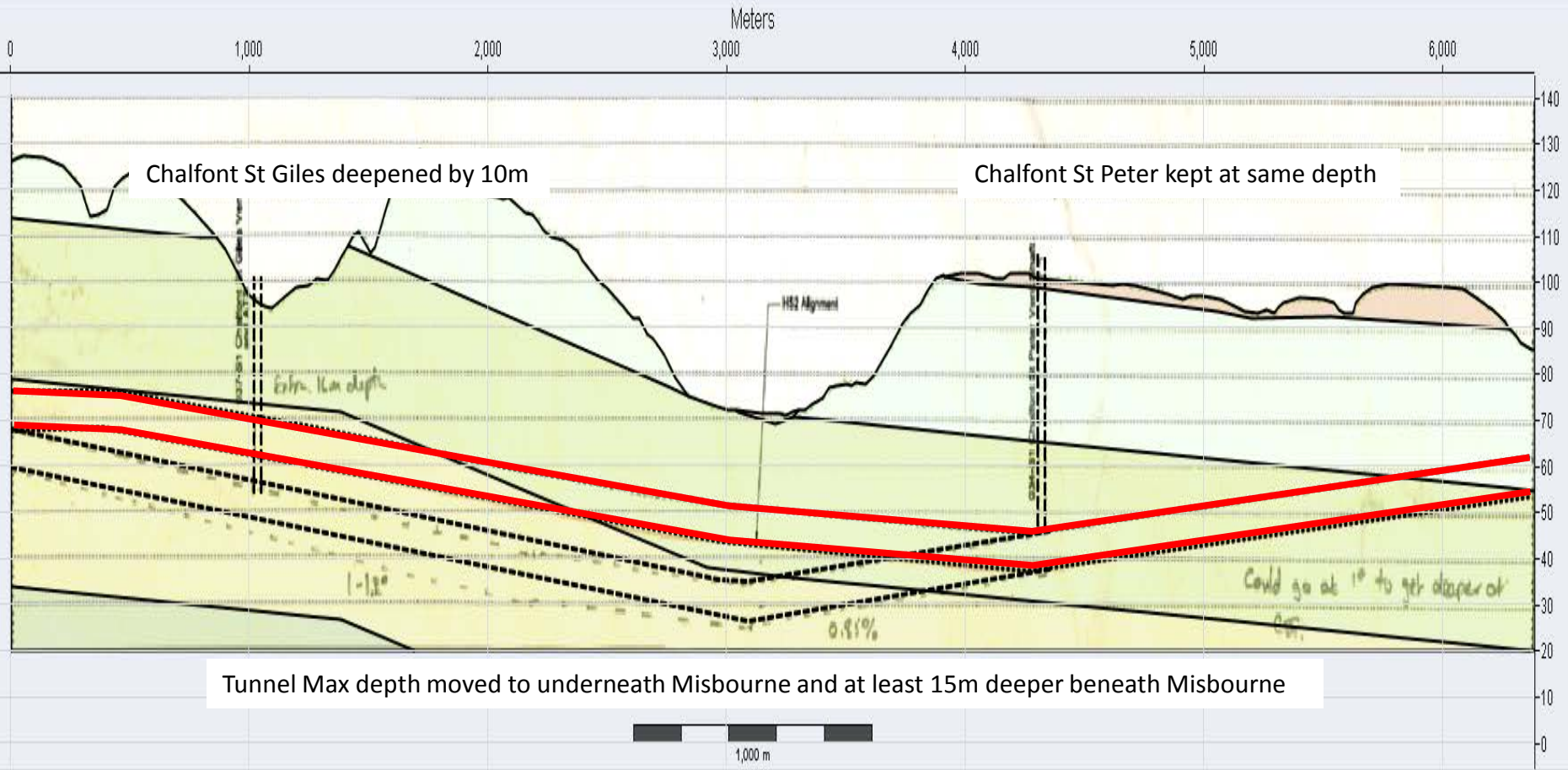
Tunnel crosses under Misbourne



Tunnel is less than 200m from this

Damage from the tunnel is **WHEN** not **IF**

# HS2 and other options



# Revised tunnel depths under Misbourne

- Additional Tunnel depth beneath Misbourne essential:
  - Mitigates chalk collapse possibility
  - Mitigates risk of reduction of flow of Misbourne
  - Mitigates shallow fracture risk and damage to buildings
  - Deeper in Chalk away from nodules / chert and easier to drill
- >15m (35m) Additional depth **simply** by shifting deepest point of tunnel under Misbourne
- A tunnel at 50m depth below the Misbourne requires only 1 degree inclination (Hyde Heath is 2 degrees)
- **Increasing depth below the Misbourne is simple and eminently achievable. Why would HS2 not do it?**

# Protecting the River Misbourne

**Bob Older BSc(Eng) CEng FICE**



**Chalfont** means "Chalk Spring",

# Misbourne River Action

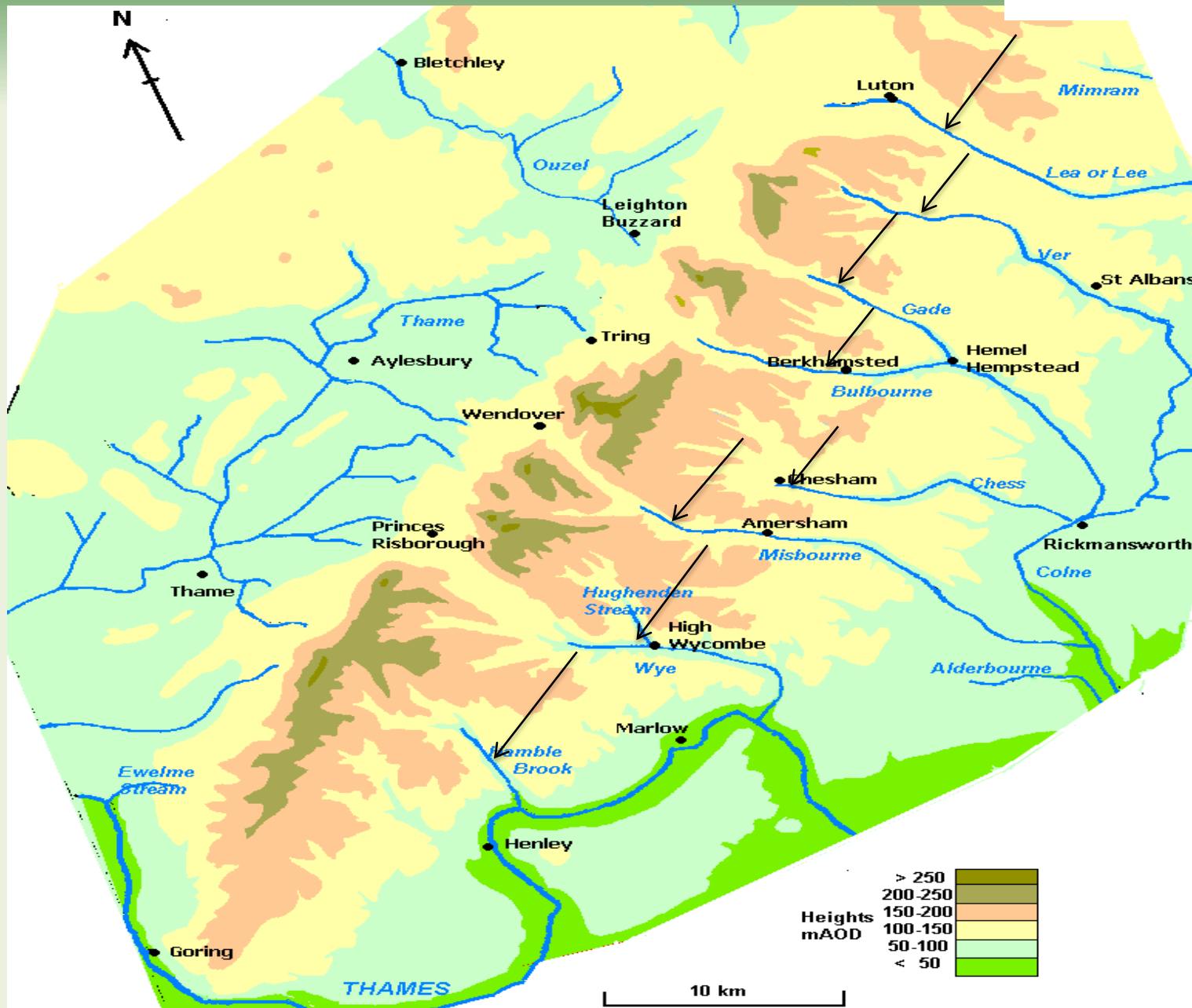


# River Misbourne



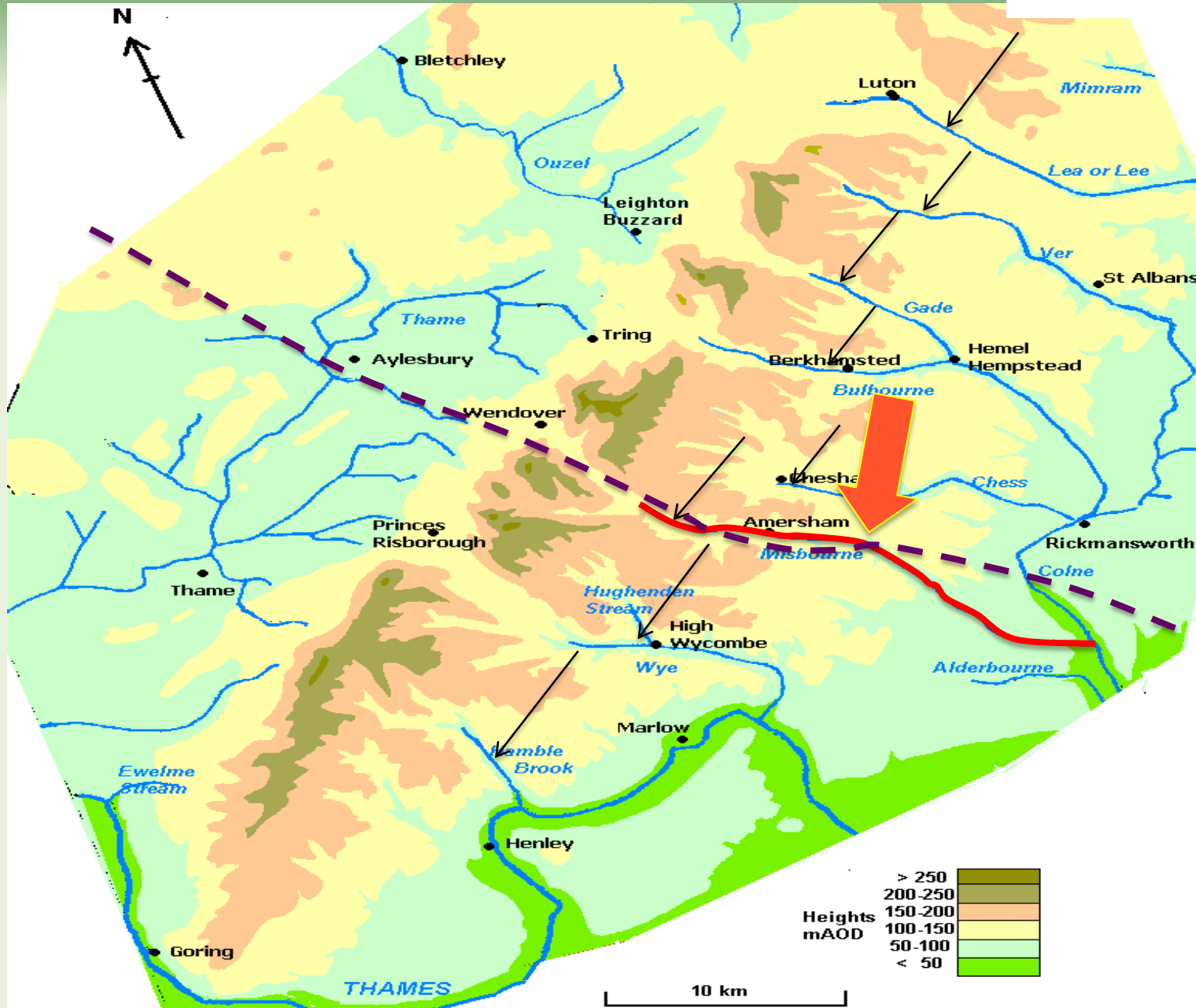
# The Chilterns

## Chalk Streams



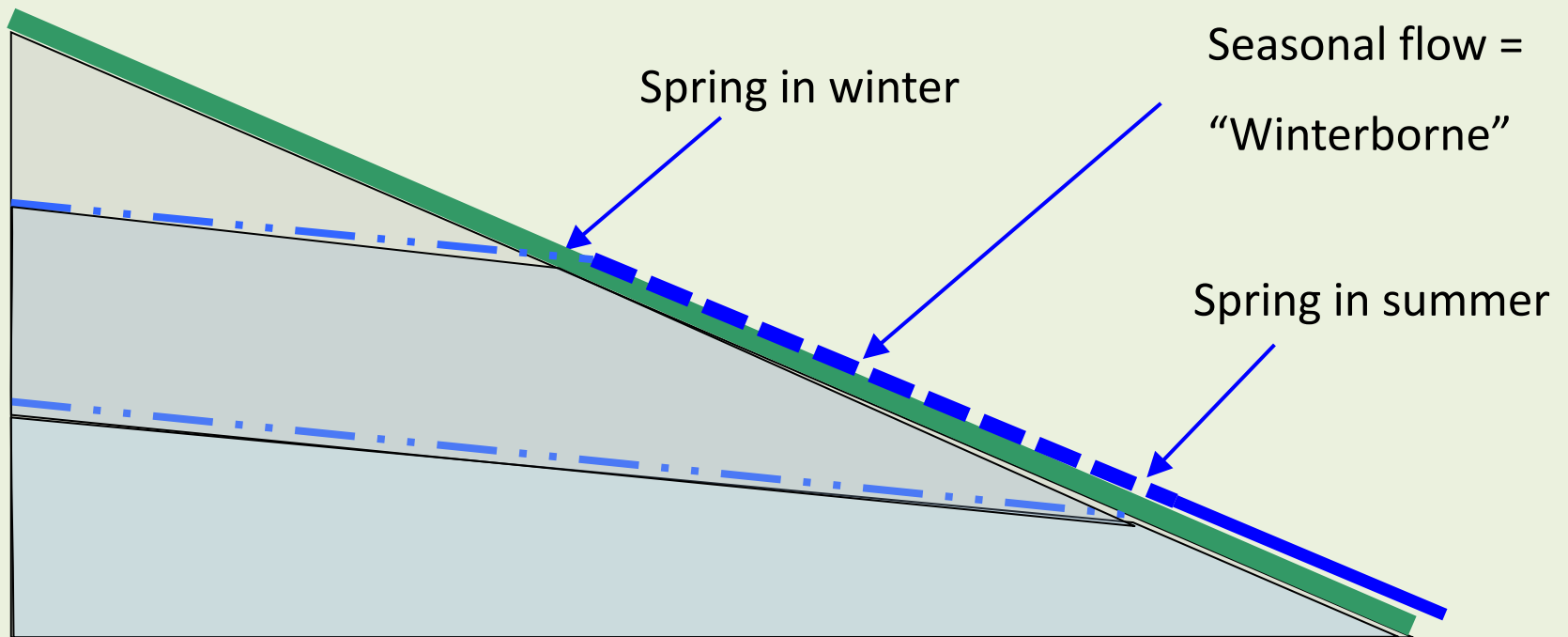
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## Chalk Streams





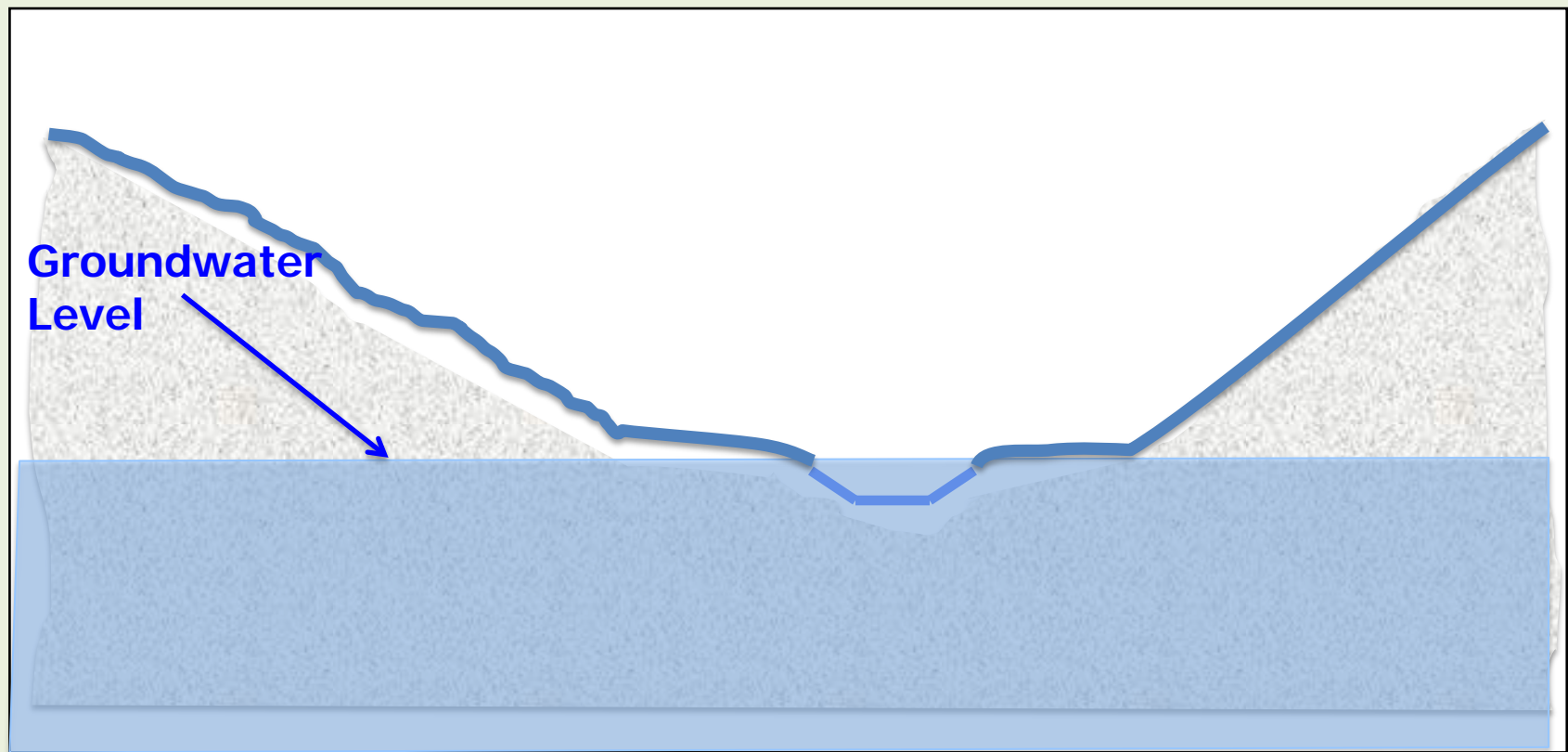
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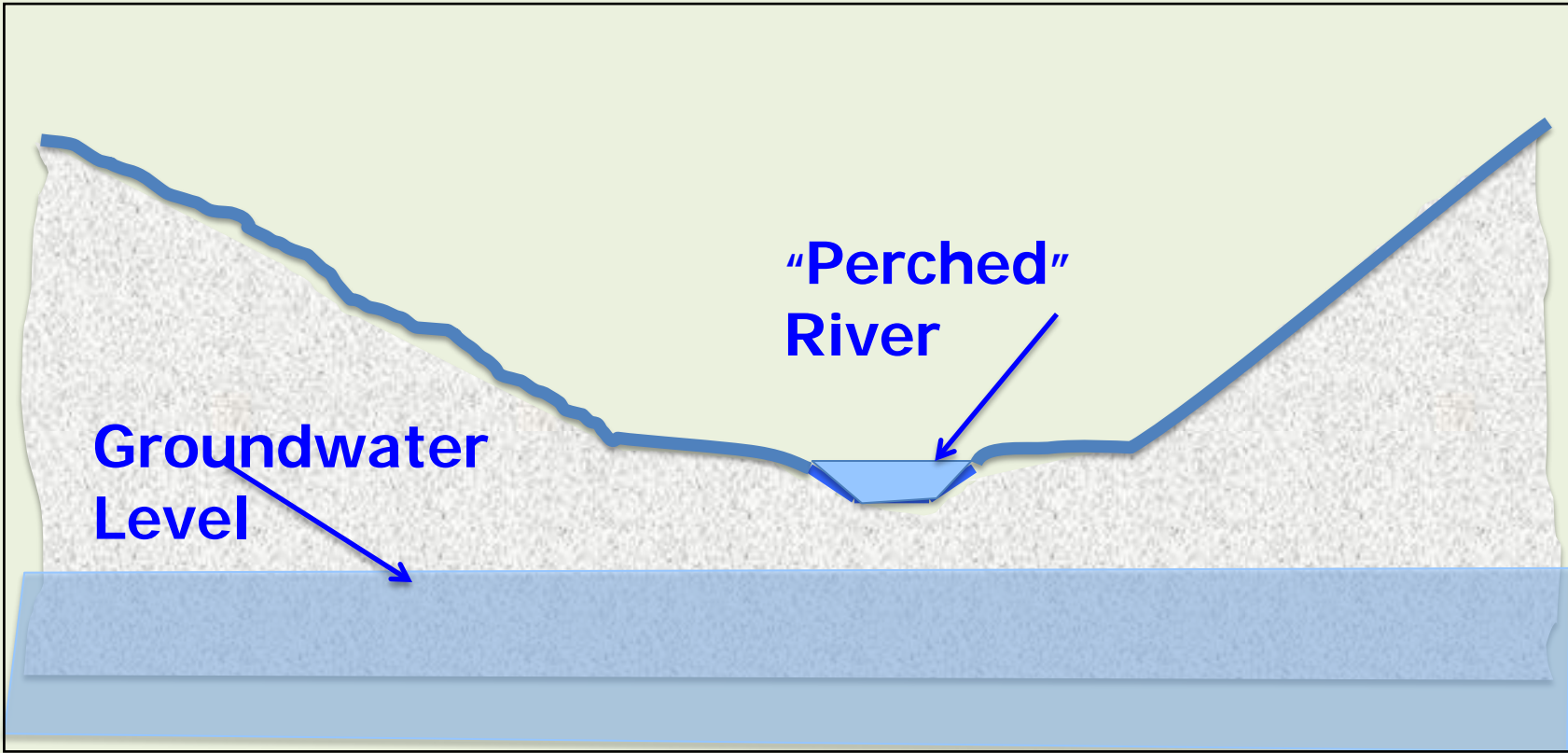
# Winterbourne in Summer



# St Giles cross section with high groundwater levels



# St Giles cross section with normal groundwater levels



# The Risk

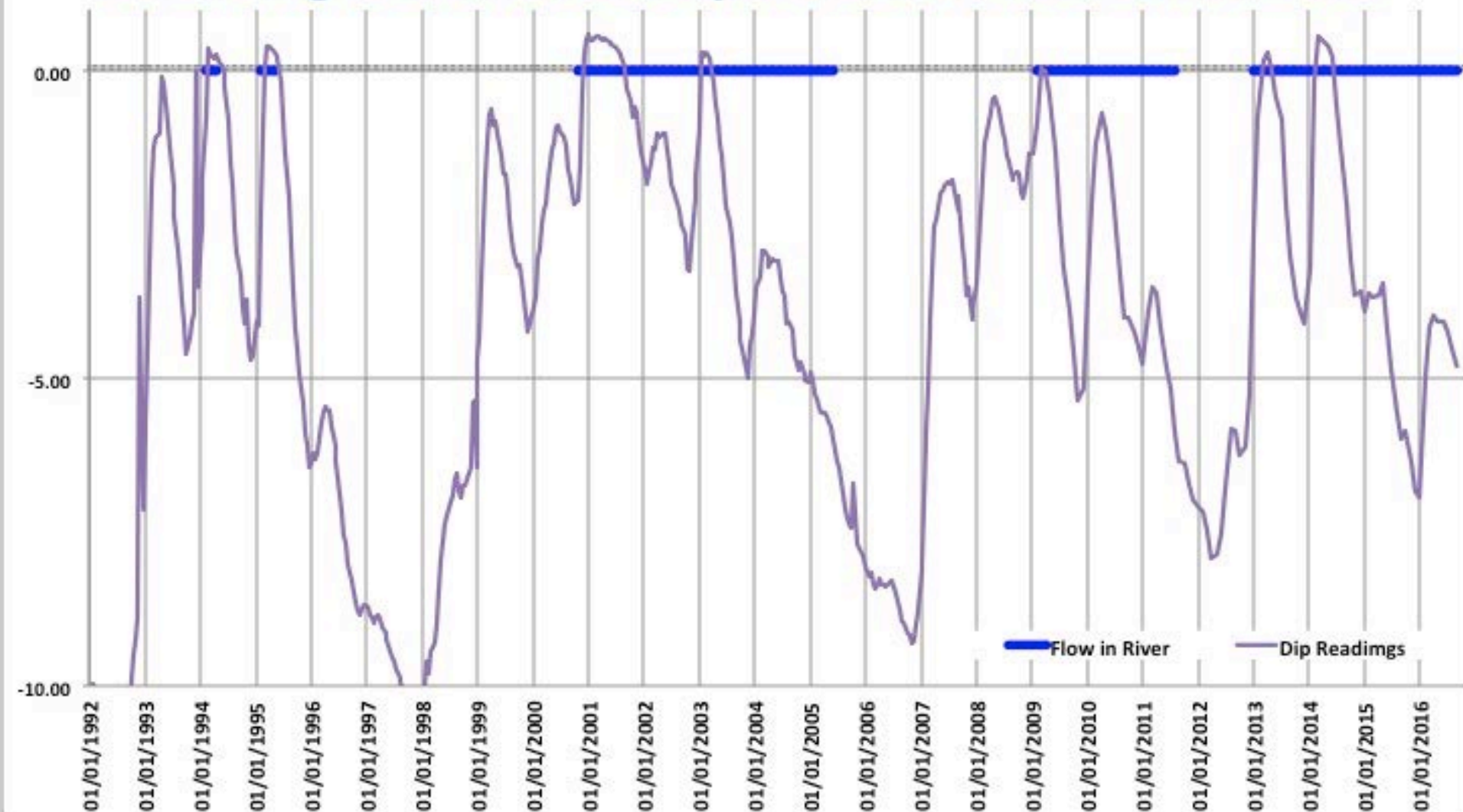


# River Misbourne in St Giles



# River Misbourne in St Giles

## St Giles groundwater depths below bed since 1992



# Case for Lining

- HS2 accept there is a risk to the river
- HS2 propose to mitigate it by “monitoring” for 12 months
- Monitoring is not a solution

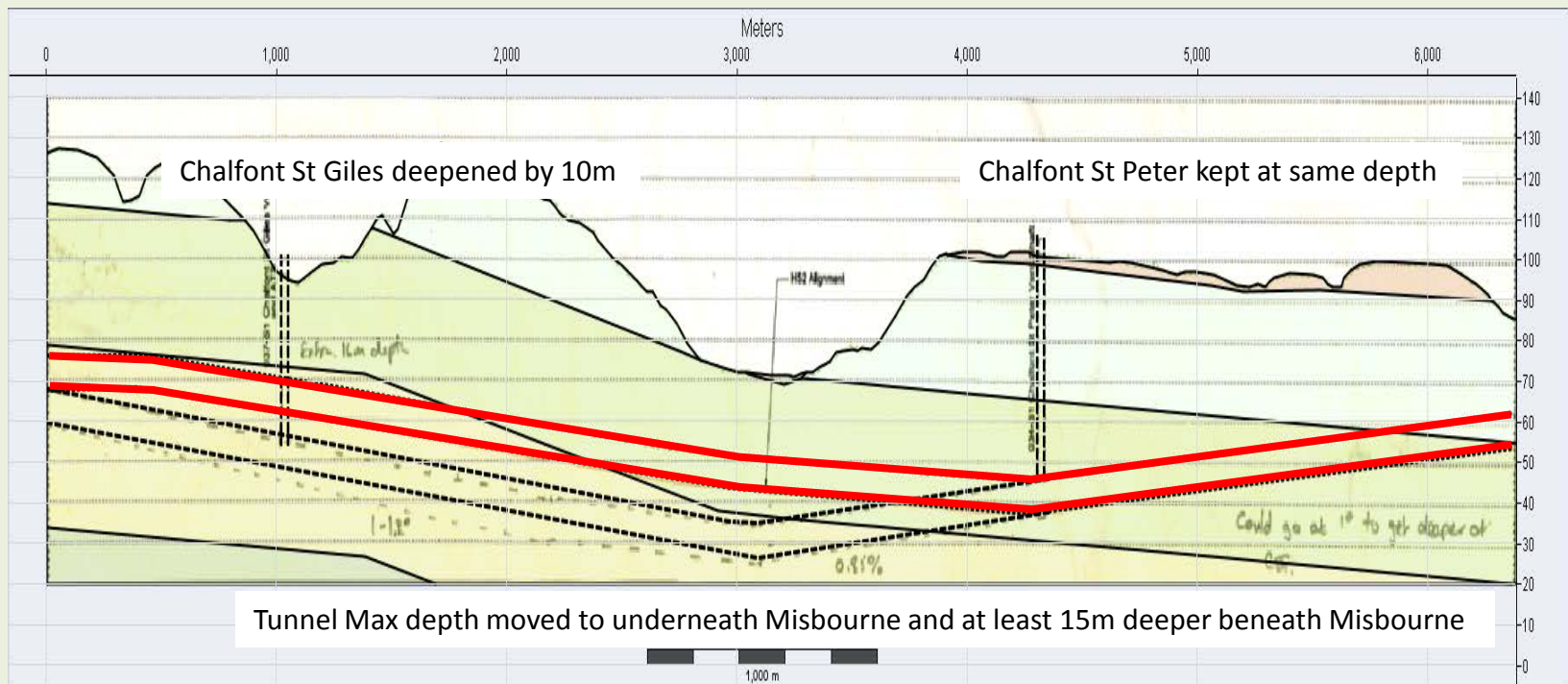


- Lining provides a simple, effective, cheap mitigation



# Summary

- Dig a deeper tunnel
  - Prevent land collapse and environmental damage



# Summary

- Protect the River Misbourne
  - Mitigating the risk via protective lining



# Summary

- We need to ensure that the HS2 tunnel drilling adequately protects the village of Chalfont St.Giles for future generations
- Better ENVIRONMENTAL impact
- Lessen FINANCIAL impact in the long run

THANK YOU