



# Barnsley, Dearne & Dove Canals – HS2 Mitigation Options

December 2013

restoring the missing link



Elsecar Branch, Top Pound

Prepared by  
Ulrich Signer, Director, BDDCT  
Mike Silk, Engineer, BDDCT

The Barnsley, Dearne and Dove Canals Trust  
22 Cyprus Avenue, Wakefield, West Yorkshire, WF1 2RT; Tel 01924 373866;  
[www.bddct.org.uk](http://www.bddct.org.uk)

Company No 2600350. Limited By Guarantee and not having a share capital.

Registered Charity No. 1002651

Registered with ENTRUST as an Environmental Body No 014718

## INDEX

Page 3	Purpose of Document
Page 4	Appeal of Restoration and Economic Benefits
Page 5	Historical notes
Page 6	Map of overall area with HS2 Leeds Section
Page 7	Section 1 Winterset Dam and Cold Hiendley Reservoir
Page 9	Section 2 Worsbrough Arm and Stairfoot Junction with the Dearne & Dove Main Line (Northern Section)
Page 10	Sketch of possible Aqueduct at HS2 crossing point
Page 11	Possible alternative crossing at Dearne & Dove Main Line
Page 12	Section 2 Worsbrough Arm and Stairfoot Junction with the Dearne & Dove Main Line (Southern Section)
Page 13	Possible complete realignment from approximately HSL16-CH10+000 to HSL17-CH6+000

Statement

The Trust's Directors consider that it is for Government and Parliament to decide whether the line should be built; our task is to ensure that canal restoration is not compromised if the rail line is built.

Barnsley / Sheffield Railway over Worsbrough Arm

Original route passed through farm gate then under large span of rail bridge

### Document Purpose

The purpose of this document is to identify the interaction points of the Barnsley, Dearne & Dove Canals with HS2 phase 2 (Leeds Line) and suggest the mitigation options available to both parties.

The HS2 alignment considered is the Phase 2 Consultation Route as announced in July 2013. It is accepted that this preliminary alignment may be subject to change.

Further information about the restoration of the Barnsley, Dearne & Dove Canals including maps etc. can be found on the Barnsley, Dearne & Dove Canals Trust web site at [www.bddct.org.uk](http://www.bddct.org.uk)

The Trust accepts that as the HS2 route crosses the main line of the proposed restoration route of the Dearne and Dove Canal at almost right angles, significant compromises will be needed from both parties.

There are two areas of interaction which will necessitate adjustment to both the canal and rail routes, namely

- 1 Winterset Dam and Cold Hiendley Reservoir
- 2 Worsbrough Arm and Stairfoot Junction with the Dearne & Dove Main Line

This Mitigation Options Report has been compiled by the Directors of the Trust in consultation with other interested parties.

Appeal of proposed restoration of Barnsley, Dearne & Dove Canals

- Linkage of two canals via a safe, scenic route
- Creation of wide beam Yorkshire Ring
- Promotes extra use of quieter navigations
- Scope to expand tourism market of sub-region
- Provides opportunities for strong links between canal and local towns
- Long summit level valuable for local amenity
- Regeneration of communities along canal length
- Future connection with the Chesterfield Canal via Rother Link

Economic Benefits, (Annual)

Taken from Atkins Restoration Feasibility report November 2006

Activity		Sum
Hire Boat Rental		£630,000
Hire Boat Daily Spend	Based on canal	£264,168
	Visiting	£73,380
Private Boat Spend	Upkeep	£390,000
	Daily Spend	£124,352
	Non-cruising visits	£17,440
	Visiting boats	£174,800
Trip and Restaurant boats		£69,800
Day Boats		£11,112
Canoeists		£3,660
Angling		£23,170
Informal Visitors		£1,350,000
<b>Total</b>		<b>£3,131,882</b>

Historical information.

The Barnsley Canal was first proposed in 1792. Construction began in 1793 and the Barnsley Canal northern section to Barnsley was opened in 1799 with the Barnsley to Barnby section opened in 1802. The Dearne & Dove Canal was completed in 1804.

These canals were mainly for the carriage of coal from the various pits in the area.

Competition from the railways began to have a significant effect on the canals by the 1840s but despite this coal traffic rose to over 200,000 tons per annum between 1885 and 1909. Other traffic included limestone and grain

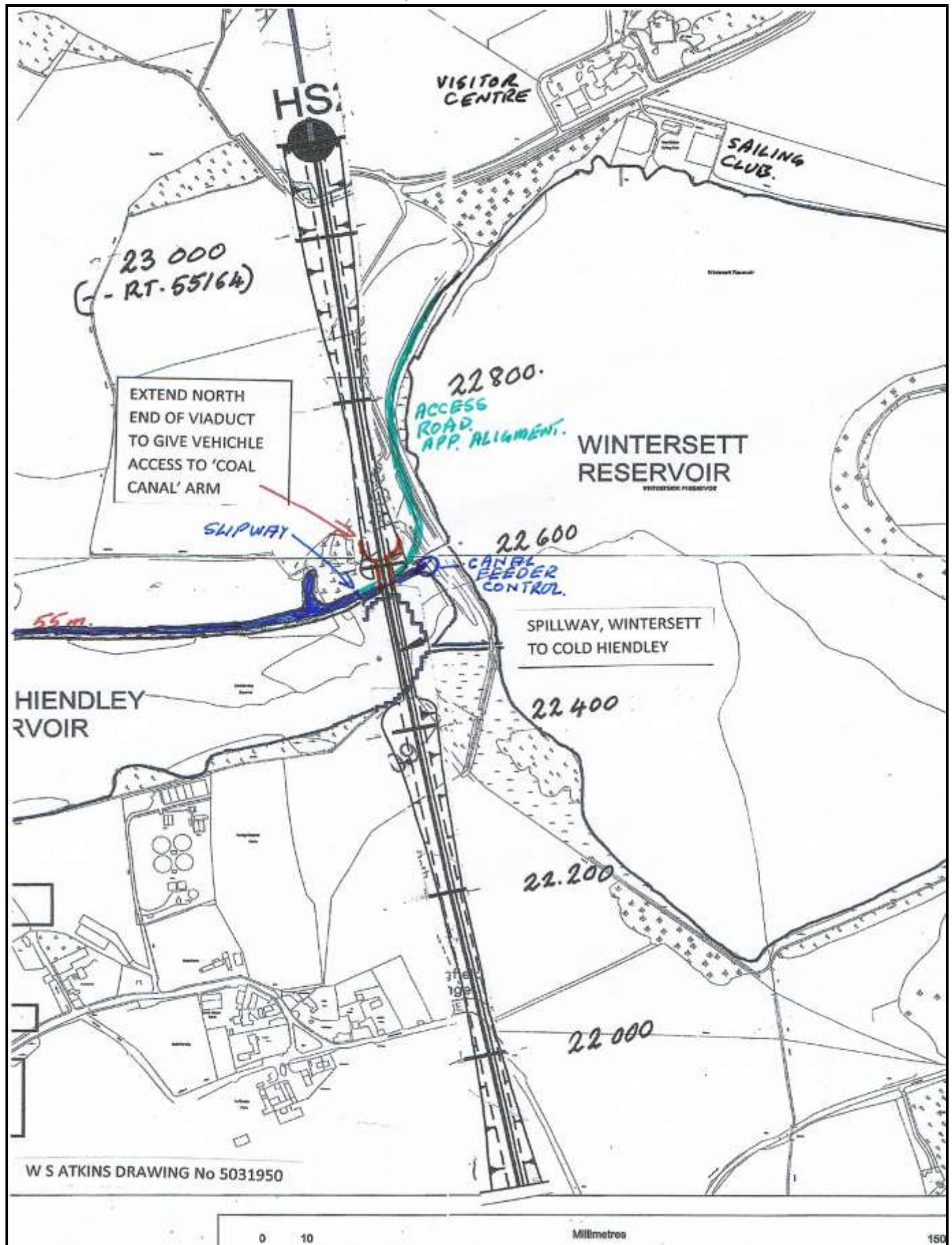
The canal's demise was the result of a number of factors; mines closing, traffic moving to rail transport and finally, serious mining subsidence resulted in the two canals being closed to traffic in 1952.

The Barnsley aqueduct across the River Dearne near Barnsley was partly demolished in 1954 as "potentially unsafe"

The Barnsley Canal route is relatively intact and reusable. However the Dearne & Dove Canal route has been obliterated by major roads and other development, and the feasibility study recommends a new route which parallels the old route for a significant proportion of its length.



Section 1 Winterset Dam and Cold Hiendley Reservoir



HS2 Map – C321-MMD-RT-DPP-130-551604 Chain Point 22,600.

BDDCT Map - Atkins 5031950/WA/102

Ordnance Survey SE/374/147

The HS2 viaduct passes across the front of Winterset Dam and the embankment north of the viaduct will be constructed on top of the access road to the dam control and spillway area, which also provides access to the end of the Coal Canal arm of the Barnsley Canal and site of the Cold Hiendley Pump Station.

A new access road will need to be provided which will run from the end of the Visitor Centre access road, along the front of the dam to the dam control area and then under the Viaduct to the end of the Coal Canal arm. Ideally, a launching ramp and area of hard standing suitable for trail-boat launching should be included with the works.

The northern end of the viaduct will need to be extended approximately 10 – 15 metres to allow vehicular access.

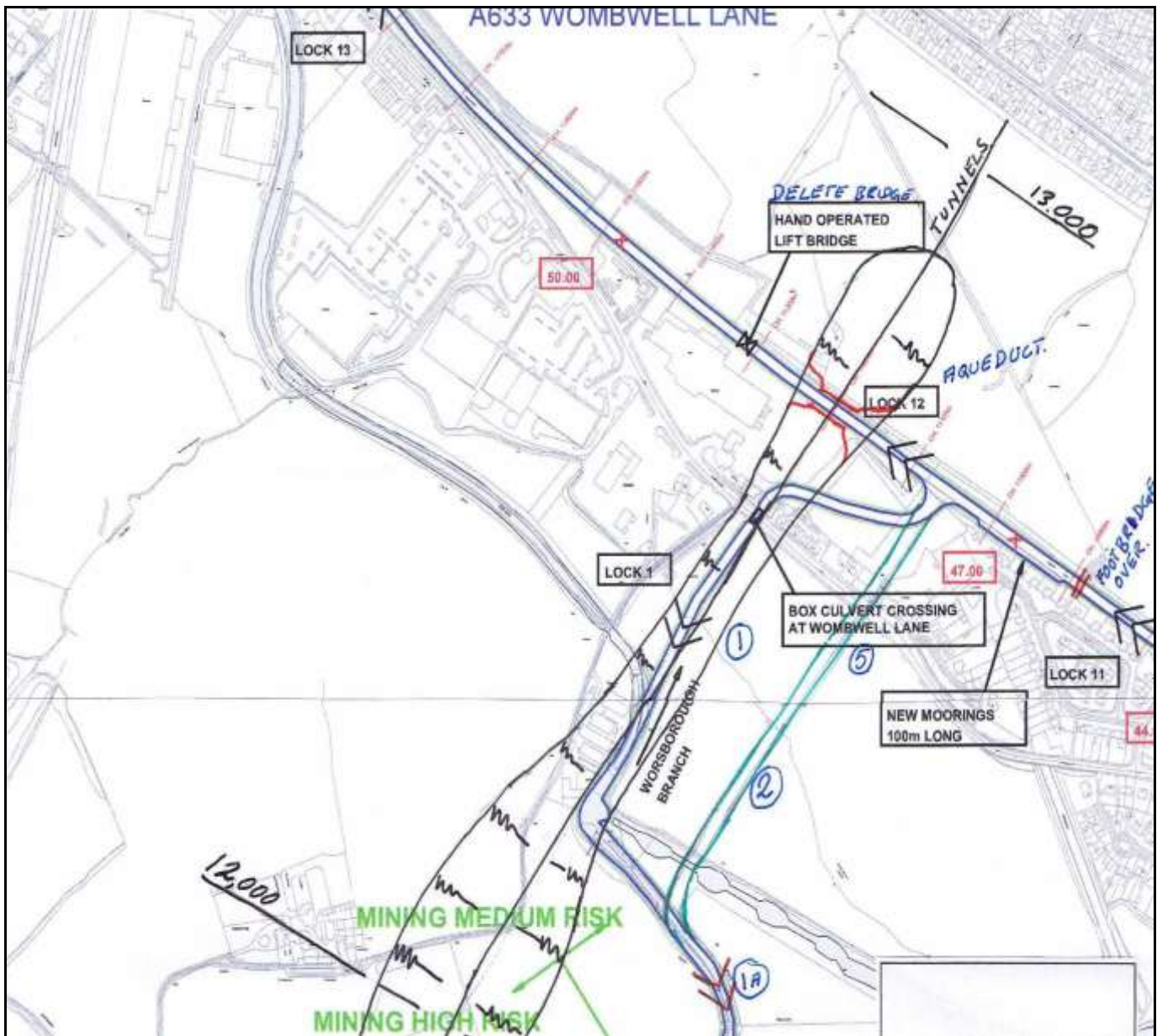
#### Environmental considerations

Winterset Dam was built in 1854 and is probably of earth bund construction. Specific knowledge of its construction and water retaining design may not be available. It is assumed that the design process will take the fragility of the dam into account when evaluating the impact of both short term vibration during construction, and long term vibration from the passage of trains during the life of the HS2. The downstream effects of either dam failing would probably be catastrophic.



## Section 2 Worsbrough Arm and Stairfoot Junction with the Dearne &amp; Dove Main Line

## Northern Section



HS2 Map – C321-MMD-RT-DPP-130-551602

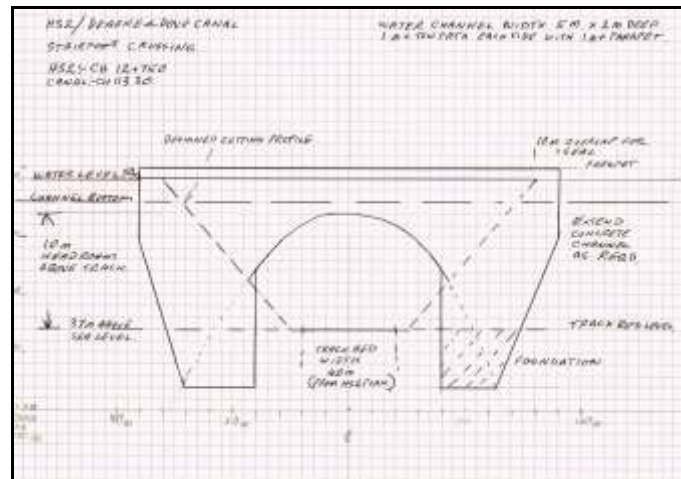
BDDCT Map - Atkins 5031950/WA/125

Main Line crossing point HS2 CH 12720, BDDCT CH11200

At this point HS2 passes under the proposed main line of the Dearne & Dove Canal with a height differential of approximately 13 metres.

There should be sufficient head room to allow a suitable aqueduct over the railway – see the sketch below for a possible arrangement.

### Sketch of possible Aqueduct at HS2 crossing point



To the south west of the viaduct the Worsbrough Arm will be obliterated by the HS2 cutting.

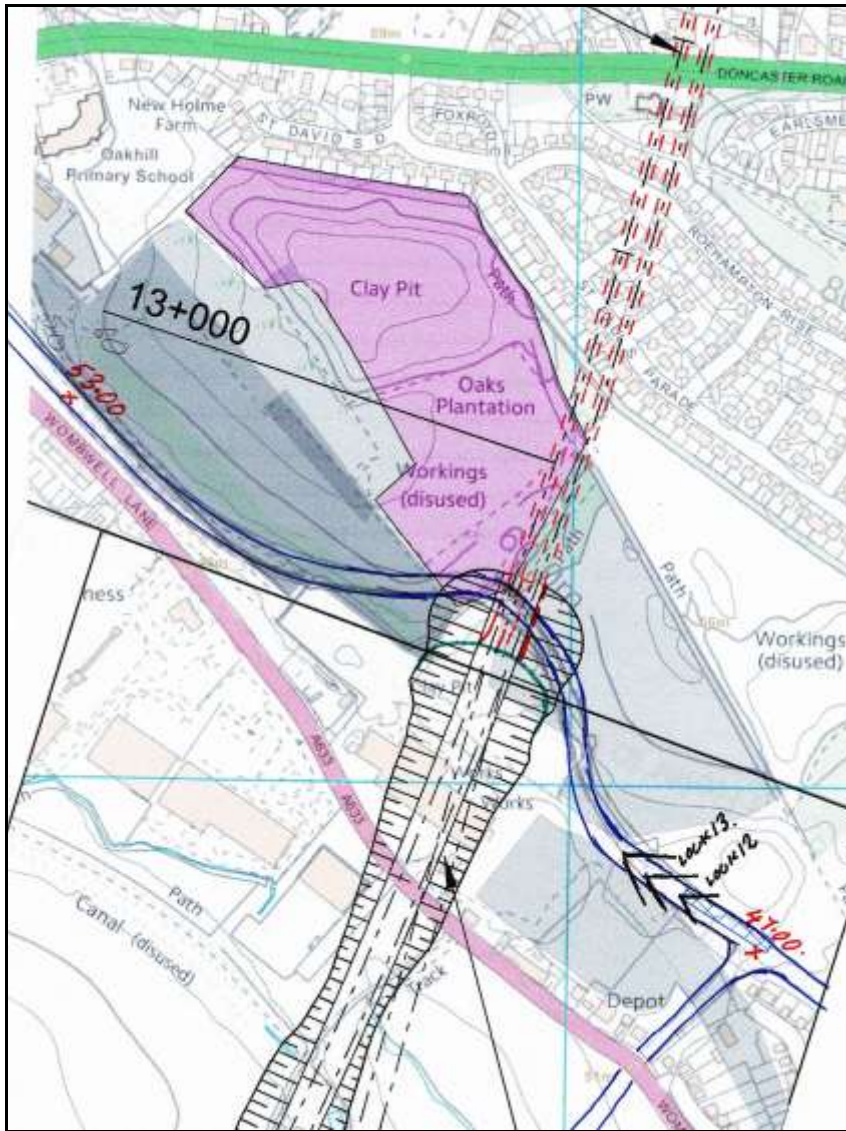
Point 1: The proposed reroute of the canal will require the relocation of Worsbrough Arm Lock 1 to a point south of the old Stairfoot locks - visible on the plan.

Point 2: The canal will then need to be diverted across the pound below Stairfoot No 2 Lock across the adjacent field, under Wombwell Lane (A633), via a box culvert (Point 5), across private land and the bottom end of the 'Brickworks' yard to join the Main Line at about CH 11050.

### Environmental Considerations

The environmental impact of HS2 construction and operation has not yet been assessed.

### Possible alternative crossing at Dearne & Dove Main Line



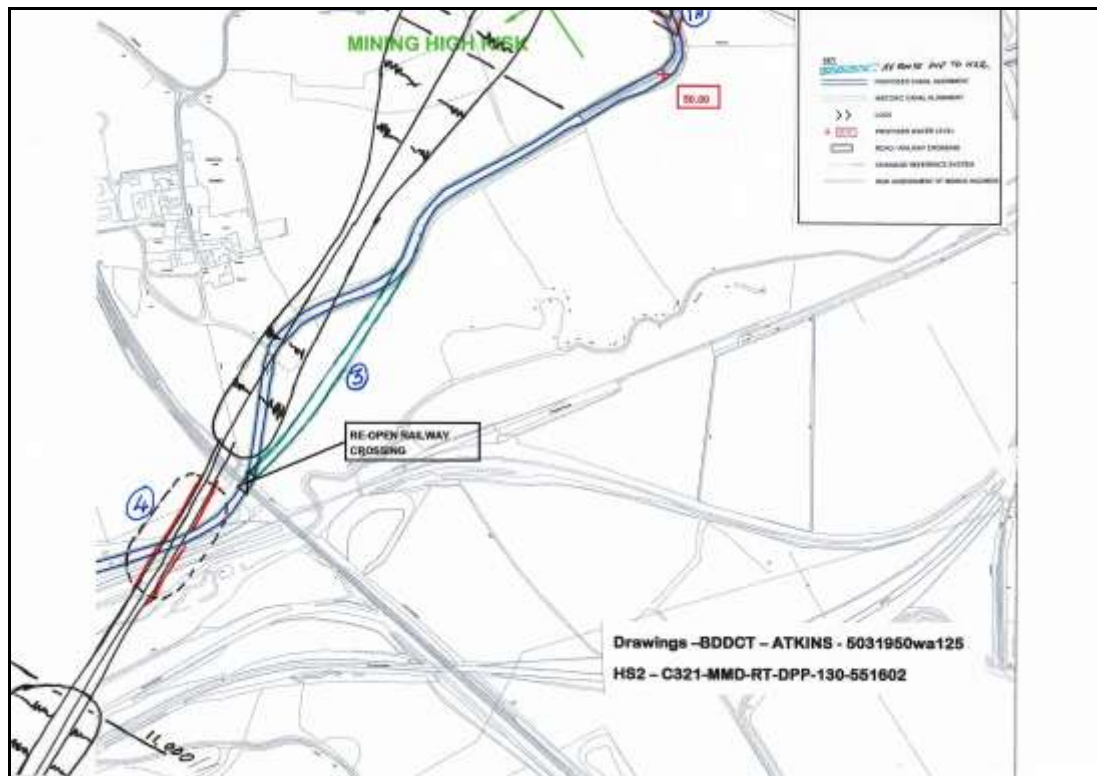
#### Possible Alternative.

- 1 Lower HS2 track by 3-5 metres and start tunnel approximately 100 metres before existing point.
- 2 Move lock 13 from existing point (N/West) to adjoin existing planned Lock 12 making a 'Double Lock' – water level over tunnel raised to 53 metres OD
- 3 Make Oxbow on canal around end of tunnel with suitable channel fabrication (eg Stalybridge or Slaithwaite town centres)

Advantages – this should reduce overall construction costs and minimise any vibration problems with canal seals at structure / earthworks joins.

## Section 2 Worsbrough Arm and Stairfoot Junction with the Dearne & Dove Main Line

### Southern Section



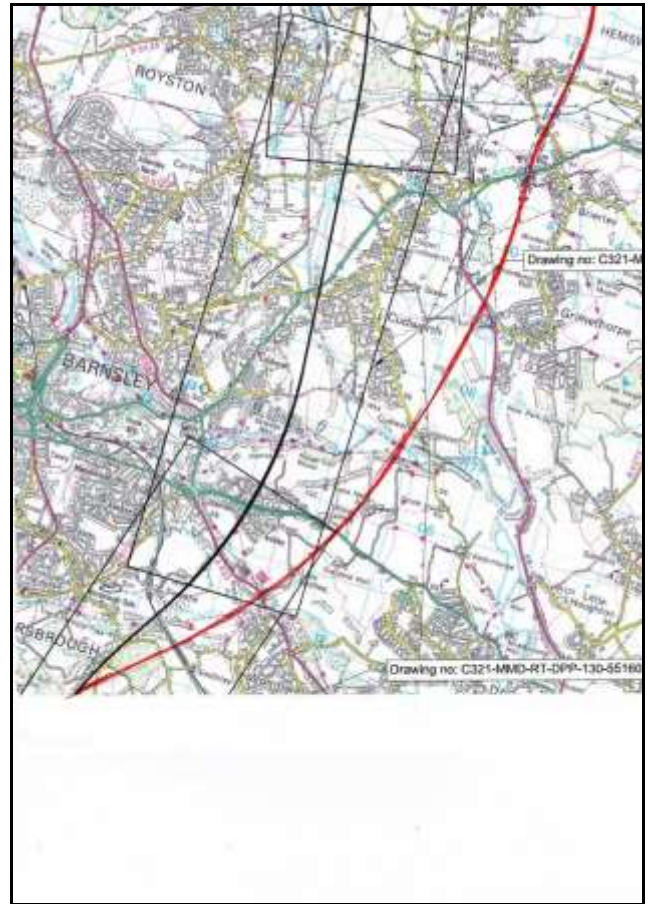
Point 3: The original line of the canal followed the land contour and will be obliterated by HS2 embankment. To link the unaffected sections of the canal will require a new channel about 300 metres long on an embankment across the adjacent field.

Point 4: After passing under the Barnsley/Sheffield railway (photograph on page 12), the canal route turns west towards Worsbrough Reservoir. Initial HS2 plans show an embankment between the existing rail line and the HS2 viaduct over the River Dove and valley. To link the sections of canal obliterated by the embankment would either require the elimination of the short embankment and its replacement with a continuous viaduct, or the creation of a large, navigable culvert through the planned embankment.

### Environmental Considerations

The environmental impact of HS2 construction and operation has not yet been assessed.

## Possible complete realignment from approximately HSL16-CH10+000 to HSL17-CH6+000



A possible total realignment due to potential restrictions at Winterset Dam is shown in RED running from HSL16-CH10+000 to HSL17-CH6+000

Most of the route appears to be agricultural/open land

There might be a benefit in the access to the 'Crofton Rolling Stock Depot' (Drg. 550301) from the east.