



**Haweswater Aqueduct Resilience Programme - Proposed Bowland
Section**

Environmental Statement

Volume 4

Appendix 3.1: Development Description

June 2021



Haweswater Aqueduct Resilience Programme - Proposed Bowland Section

Project No: B27070CT
Document Title: Proposed Bowland Section Environmental Statement
Volume 4 Appendix 3.1: Development Description
Document Ref.: LCC_RVBC-BO-TA-003-001
Revision: 0
Date: June 2021
Client Name: United Utilities Water Ltd

Jacobs U.K. Limited

5 First Street
Manchester M15 4GU
United Kingdom
T +44 (0)161 235 6000
F +44 (0)161 235 6001
www.jacobs.com

© Copyright 2021 Jacobs U.K. Limited. The concepts and information contained in this document are the property of Jacobs. Use or copying of this document in whole or in part without the written permission of Jacobs constitutes an infringement of copyright.

Limitation: This document has been prepared on behalf of, and for the exclusive use of Jacobs' client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this document by any third party.

Contents

1.	Additional Information – Compounds	1
1.1	Introduction	1
1.2	Selection of transport routes	1
1.3	Lower Houses Compound.....	4
1.4	Newton-In-Bowland Compound.....	6

1. Additional Information – Compounds

1.1 Introduction

- 1) This appendix supports Chapter 3: Design Evolution and Development Description of the ES. It provides information regarding the anticipated construction activities required for the Proposed Bowland Section in relation to both construction compounds and the construction traffic transport routes serving the compounds.
- 2) This appendix considers the Lower Houses compound and the Newton-in-Bowland compound, the locations of which are shown on Figure 3.1 of the ES (Volume 3).

1.2 Selection of transport routes

- 3) Before arriving at the proposed access route options described in Sections 1.3 and 1.4, United Utilities undertook a thorough assessment of all potentially feasible options. The type and volume of traffic requiring access to the Lower Houses and Newton-in-Bowland compounds is detailed in the Transport Assessment for the Proposed Bowland Section (Appendix 16.1). This information was used to assess the suitability of potential routes, according to physical, environmental and community constraints and guided by the advice of the Highway Authority (Lancashire County Council).

1.2.1 Lower Houses Compound

- 4) Initial reviews and investigatory work were undertaken in 2019 regarding potential construction vehicle access routes to and from the Proposed Lower Houses Compound. As the most practical and convenient access to site from the Strategic Road Network (SRN), each route option used Junction 34 of the M6 as its starting point. Similarly, the A683 provided a direct access to the Wray-with-Botton district from the SRN and as such the use of this road was consistent across all options considered.
- 5) Following a site visit in November 2019 and initial swept path assessments¹, two route options within the Wray-with-Botton district between the A683 and Proposed Lower Houses Compound were identified. These routes comprised:
 - Access along Main Street in Wray and along Helks Brow
 - Access along the B6480 *via* Low Bentham, Long Lane and Furnessford Road.
- 6) Main Street is the primary route through Wray village and its practical width is constrained by building frontages and local amenities abutting the road. For this reason, it was considered that managing and manoeuvring regular construction traffic along Main Street would prove difficult without causing significant disruption to the local community through the imposition of traffic management measures. As a result, alternative routeing strategies were explored, in addition to the two initial options.
- 7) The alternative route options utilised local links, such as School Lane, Trinket Lane and Furnessford Road, in order to bypass Main Street. The option to use School Lane was discounted on the basis that larger vehicles would not be able to safely negotiate the School Lane / Main Street corner in either direction.
- 8) A further option considered the establishment of a construction access route along Trinket Lane, thus avoiding Main Street. This option would have involved Trinket Lane becoming an 'Access Only' road for residents and local businesses and extensive modifications would have been required to enable two-way traffic. Swept path analysis (appended to the Construction Traffic Management Plan: LCC-BO-APP-007 and RVBC-BO-APP-007) concluded that this route would only be suitable for general construction traffic as larger vehicles would be unable to make the turn between Main Street and Helks Brow in either direction. In an attempt to avoid this constraint, a further option to access the site via Trinket Lane, Spen Brow and then Furnessford Lane was considered. Again, swept path analysis revealed a pinch point for

¹ A swept path assessment is a computer modelling technique which predicts the area of highway (and sometimes adjacent land) that is required by large vehicles, normally when turning at junctions or passing through tight bends in the road.

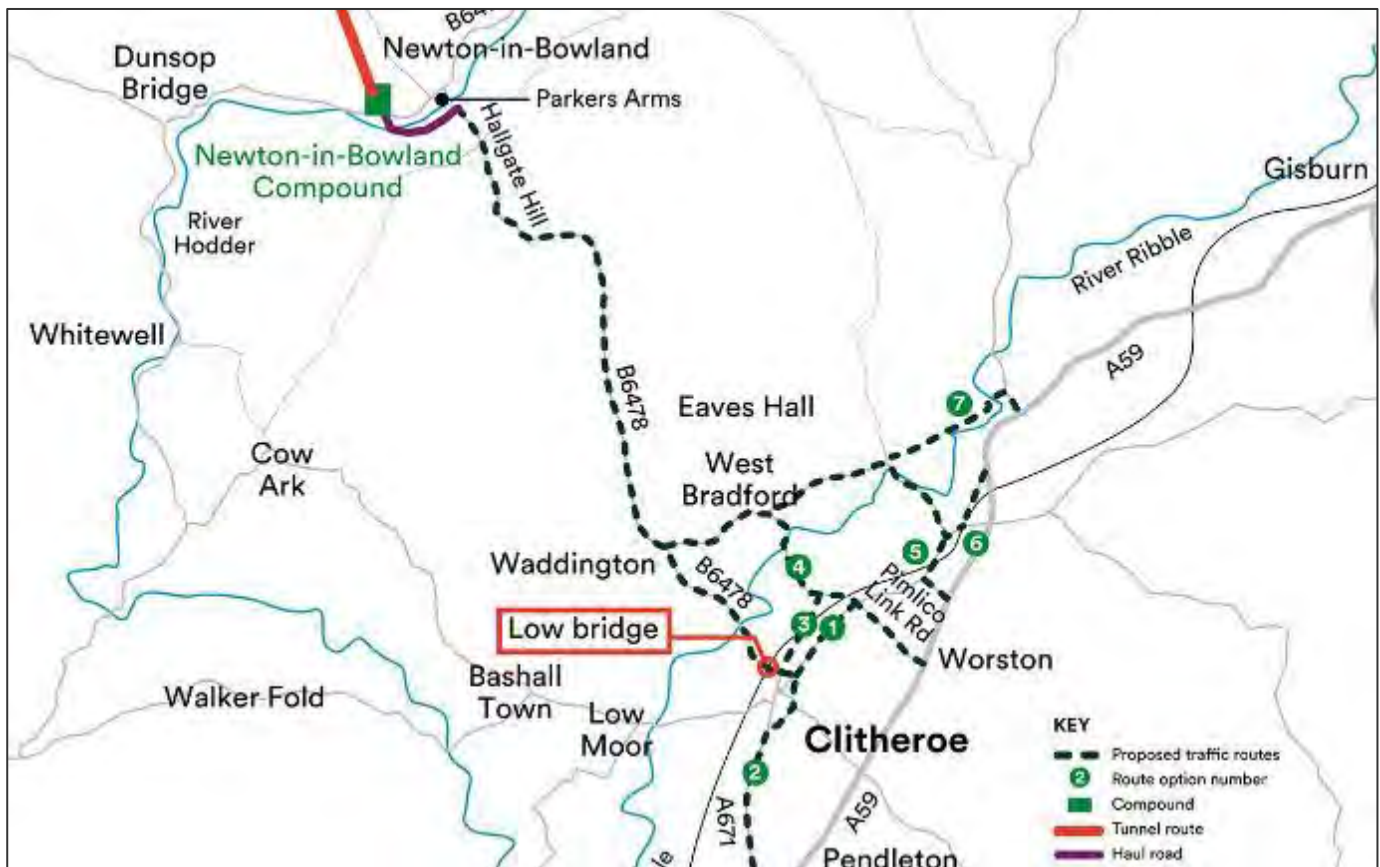
larger HGVs at the southern end of Furnessford Road through Park House Farm, presenting a constraint to the use of this route by all required construction traffic.

- 9) In an effort to remove the risk of conflicts between vehicles travelling in opposite directions on single-track routes, a further option, incorporating elements of those previously considered, was appraised. This option comprised a one-way system, for both construction traffic and local non-construction traffic, encompassing Furnessford Road and Helks Brow. This route option still involved the use of Trinket Lane for vehicles travelling in either direction and as such would have involved a range of traffic management measures and highway modifications to remove the potential for conflicts.
- 10) To avoid the requirement for restricted access to Trinket Lane, an additional option to use the wider, albeit longer, route of the B6480 *via* Wennington and Low Bentham was considered. The main advantage of this route is that there is reduced potential for conflicting two-way vehicle movements to occur due to the width of the existing carriageways. For this reason, this option has been taken forward as the preferred route for general construction traffic.
- 11) Due to constraints on the existing highway network, neither the preferred route, nor any of the other options discounted, was considered suitable for use by 18.5 m HGVs and other abnormal loads. As a result, it is proposed that these vehicles would access the Lower Houses Compound *via* Main Street and along Helks Brow. This route would need to be used only infrequently and often only by a small number of vehicles at a time. On such occasions, traffic management measures along Main Street would be required to prevent obstructions and conflicts with oncoming vehicles. For example, it is anticipated there would need to be a temporary restriction on vehicle parking along sections of Main Street. To enable displaced vehicles to park elsewhere, a temporary parking area is proposed at Bridge House Farm Tea Rooms at the southern end of Main Street. In addition, to avoid conflicts between construction traffic travelling to and from the Lower Houses Compound, a satellite compound is proposed just outside of Wray off the B6480. The proposed satellite compound would allow vehicles seeking access to the Lower Houses Compound to be held until being cleared to proceed via a communication system. An appraisal of the proposed satellite compound is presented in Volume 5: Off-site Highways Works.

1.2.2 Newton-in-Bowland Compound

- 12) An assessment of several options was undertaken prior the selection of the route options outlined below.
- 13) As a starting point, all options assessed took access from Junction 31 of the M6 and along the A59, as the primary arterial route serving the study area. It was not considered viable for construction vehicles to gain access to the Newton-in-Bowland Compound from the north due to the constrained nature of the local highway network. On this basis, the focus of the options appraisal exercise was to identify the most suitable route(s) for construction vehicles between the A59 and the B6478 (Slaidburn Road) north of Waddington. The options appraisal was informed by a range of criteria, including road safety data, presence of obstacles and pinch points on the network, swept path analysis and impact on sensitive receptors (e.g. residential properties and community facilities).
- 14) In the first phase of options assessment, a total of seven route options between the A59 and B6478 (Slaidburn Road) were considered, as shown in Illustration 1. These options were identified following a feasibility assessment that discounted other routes on the wider highway network due to significant capacity limitations including via Bashall Town, Dunsop Bridge or Slaidburn.

Illustration 1: Construction Traffic Route Options



- 15) Route option 1 exits the A59 onto Pimlico Link Road then turns left onto the A671 (Chatburn Road) towards Clitheroe Town Centre and along the B6478 (Waddington Road). This route option uses primarily A and B roads, however it is constrained by the 3.5 m height restriction on the Waddington Road rail bridge which passes over Waddington Road.
- 16) Route option 2 would use the A671 Whalley Road, through Clitheroe Town Centre along Queensway/Peel Street, Waterloo Road and onto the B6478 through Waddington. Although a large portion of this route uses A-roads, making it theoretically easier for HGVs to manoeuvre, it passes a large number of residential and commercial properties, including those within the Whalley Road Air Quality Management Area (AQMA). In addition, the 3.5 m height restriction on the Waddington Road rail bridge means that not all vehicles would be able to use it to access the proposed compound site. The use of Pendle road (from the A59) was considered as an alternative to Whalley road, but this ultimately has the same issues with vehicles passing through Clitheroe town centre.
- 17) Route Option 3, like option 1 also uses the A671 (Pimlico Link Road), continuing on West Bradford Road before turning onto Pimlico Road and joining the B6478 (Waddington Road) before travelling north through Waddington towards the Proposed Newton-in-Bowland compound. This route option avoids crossing Clitheroe town centre and commercial areas and uses primarily A & B roads, however, as with previous options considered, is constrained by the 3.5 m height restriction on the Waddington Road rail bridge and Pimlico Road is residential area with narrow sections caused by parked cars.
- 18) Route Option 4 (A59 onto Pimlico Link Road before travelling along West Bradford Road, over the existing West Bradford road bridge, through West Bradford and joining Slaidburn Road to the north of Waddington) avoids Clitheroe Town Centre, however, runs through West Bradford and past the village Primary School. In addition, a number of pinch points were identified along this route, including through West Bradford and the existing road bridge over the River Ribble.
- 19) Route option 5, leaves the A59 onto Pimlico Link Road before turning north-east towards Chatburn along the A671, along Ribble Lane towards Grindleton and turning onto West Bradford Road towards West

Bradford and Waddington before joining the B6478 (Slaidburn Road) in Waddington. This route would involve construction traffic travelling through Chatburn, Grindleton, West Bradford and the north of Waddington and is constrained by a number of pinch points such as Ribble Lane and East View Bridge, south of Grindleton. The main advantage of this route option is that it avoids the 3.5 m height restriction on the Waddington Road rail bridge.

- 20) Route option 6 is an alternative to option 5, however it leaves the A59 via Sawley Road before travelling south west towards Chatburn whereupon it follows the same route. This option also avoids the 3.5m height restriction on Waddington road would, but it would require extensive junction modifications between bridge road (in the centre to Chatburn) and Ribble Lane.
- 21) Route option 7 is a further alternative to option 5 which leaves the A59 onto Sawley road and passes through Sawley and Grindleton whereupon it follows the same route. This option also avoids the 3.5 m height restriction on Waddington road, but it is severely constrained by the narrow road between Sawley and Grindleton.
- 22) On balance, it was considered that Route Option 1 represented the most convenient and least disruptive route to the Newton-in-Bowland compound, however, not all construction traffic would be able to use the route due to the 3.5 m height restriction on the Waddington Road rail bridge. For this reason, a secondary route was also considered necessary for vehicles over 3.5 m in height and abnormal loads. Whilst there are no straightforward routes for this type of traffic to access the proposed compound, Route Option 5 was considered to be viable subject to a number of necessary modifications at pinch points along the highway network.
- 23) In public consultation carried out between August and September 2020, Route Option 1 was presented as the preferred option for general construction traffic, with Route Option 5 presented as a secondary route for vehicles over 3.5m high and abnormal loads. As detailed in the Statement of Community Involvement (LCC-BO-APP-006 and RVBC-BO-APP-006) a number of concerns were raised by members of the local community regarding the preferred route options. For this reason, in late 2020, a further feasibility study was carried out in an attempt to identify potential alternative routes.
- 24) The feasibility study focused on possible options to avoid the need to use large sections of public highway altogether and construct a new temporary crossing of the River Ribble. This temporary new crossing, referred to as the Proposed Ribble Crossing, runs between West Bradford Road in the south (opposite Ribblesdale Cement Works) and West Bradford Road to the north-west (to the west of Waddington and West Bradford C of E Primary School). The study concluded that a new temporary Ribble Crossing was viable and would offer benefits in terms of allowing construction traffic to bypass Clitheroe, Chatburn, Grindleton, West Bradford and parts of Waddington. A preferred alignment and crossing point was determined and is included as one of the Haulage Route Options for access to the Newton compound. Further information regarding the Proposed Ribble Crossing, and an assessment of likely significant effects potentially arising during its construction and operation, is reported in Volume 6 of this Environmental Statement.
- 25) Route Option 1 and Route Option 5 now collectively form 'Haulage Route Option 1' and are referred to as 'Route 1' and 'Route 2' respectively in ES and planning application documents. The Proposed Ribble Crossing 'Route 3' comprises 'Haulage Route Option 2'.

1.3 Lower Houses Compound

- 26) The Lower Houses Compound would be a reception site receiving the TBM from the Newton-in-Bowland Compound to the south. The compound is located to the south of Wray.

1.3.1 Haulage Routes

- 27) Access to the Lower Houses construction site for general construction traffic would be via a partial one-way system from the outskirts of Low Bentham which would avoid the centre of Wray. Abnormal loads would access the site through Main Street, Wray and Helks Brow.

28) Details of anticipated construction vehicle movements associated with the Lower Houses compound are provided in the Transport Assessment (Appendix 16.1 of the ES).

1.3.2 Offsite Highways Works

29) Traffic management plans and potential highway improvements (e.g. temporary access roads, passing places, etc.) have been developed in consultation with Lancashire County Council and local communities to minimise potential conflicts with other road users and enable the safe and timely movement of HGVs and other construction vehicles along local roads, prior to joining the strategic road network.

30) Further details on the offsite highways works including the Wray Satellite Compound and Temporary Residents' Parking, Wray are provided in Volume 5.

1.3.3 Construction Accesses

31) Access tracks would be constructed from the public highway to laydown areas and construction compounds. Access tracks, with passing places, would be in the order of 4 m wide. They would be constructed along a soil-stripped and vegetation-cleared easement comprising a layer of crushed stone or tarmac where required. Temporary drainage may need to be installed alongside or across the access tracks to maintain existing drainage lines, and the tracks would be aligned to minimise flood risk within the development envelopes or local watercourses.

32) Proposed points of access to and from the public highway are subject to further design development and would need to be agreed with the relevant highways authority.

1.3.4 Tree/Hedgerow Removal, Pruning and Protection

33) Works would include where unavoidable, the clearance of vegetation including felling of trees and hedge removal. These works would be scheduled to take account of the breeding bird season and other seasonally-constrained times of the year wherever possible and under the supervision of a suitably qualified Environmental Clerk of Works where such works are unavoidable.

1.3.5 Public Rights of Way

34) Footpath 1-38-FP 22 would be intersected by the compound and would be temporarily diverted around the Lower Houses Compound for the duration of the works.

1.3.6 Earthworks

35) Earthworks would be required to create a level platform in preparation of compound set up works. Topsoil would be stripped and stored within the planning application boundary prior to subsequent reuse in reinstatement.

1.3.7 Compound Establishment Works (including material laydown areas if relevant)

36) Fencing would include hoarding installed around the compounds to a height of 2.4 m. Where appropriate, heras-type fencing would be used around any areas which fall outside of the primary construction area surrounding the shaft i.e. lagoons.

37) Lighting would be required for safety reasons and where 24-hour working is required. Lighting designs and locations would minimise light spill towards adjacent properties and other sensitive locations.

38) Hard-standing and drainage provision for offices/welfare/parking/shaft and tunneling areas would be installed.

39) Installation of compound surface run off drainage and attenuation tanks (or lagoons) would be required.

40) Excess water from the tunnelling activities would be pumped to temporary treatment facilities prior to being discharged.

41) Storage areas for shaft and tunnel segments, pipes, fittings and tunnel ancillaries would be established.

- 42) Crane platforms, spoil bays, tunnel ventilation, compressors, grout batching, tunnel stores and workshops would need to be created.

1.3.8 Shaft Construction

- 43) The reception shaft at Lower Houses would be approximately 15 m in diameter and approximately 10 m to 15 m deep. This shaft would be constructed in advance of the arrival of the TBM and made safe until the TBM arrives. At this point a large crane would be used to lift the TBM from the shaft and load this onto lorries for removal from site.

1.3.9 Material/Waste Arisings

- 44) Surplus material arising from the construction of the reception shaft, connecting pipework and associated structures would be stockpiled and sorted as necessary on site. Suitable material from these arisings would then be incorporated in the reinstatement and landscaping of the proposed site. It is proposed that approximately 6,000 m³ of material would be placed to the south of the proposed reception shaft within the existing field boundary. The material would be placed to blend with the existing patterns of surrounding field boundaries, topography and vegetation within the wider landscape. These permanent landscaping works would affect a plan area approximately 200 m by 100 m. The works would comprise careful stripping of topsoil and subsoil from the land, appropriate storage within the construction area for later reinstatement, placement and compaction of the appropriately selected material, modification or provision of land drainage as necessary, reinstatement of subsoil and topsoil and planting as appropriate.

1.4 Newton-In-Bowland Compound

- 45) The Newton-in-Bowland Compound would be the launch site for the TBM. The compound would be located to the west of Newton-in-Bowland.

1.4.1 Haulage Route Option 1

- 46) Vehicles up to 3.5 m in height, would use Route 1, accessing the compound from the A59 via Pimlico Link Road, Chatburn Road and through Waddington. Vehicles over 3.5 m in height would access the site along Route 2 via Pimlico Link Road, Chatburn Road, and through Chatburn, Grindleton and West Bradford.

1.4.2 Haulage Route Option 2

- 47) Haulage Route Option 2 incorporates a proposed temporary haul road crossing the River Ribble adjacent to existing West Bradford Bridge to access the B6478 at the north of Waddington from the A59 south of Clitheroe (Route 3). The temporary haul road for the Ribble crossing would require the creation of temporary new junctions with West Bradford Road (Clitheroe, south of the River Ribble) and West Bradford Road (Waddington, north of the River Ribble).

1.4.3 Hodder Crossing

- 48) In order to gain access to the Newton-in-Bowland Compound, Haulage Route Options 1 and 2 both require the construction of a new temporary construction access off Hallgate Hill, south of Newton-in-Bowland, with a temporary track and clear span crossing of the River Hodder.

- 49) Details of anticipated construction vehicle movements associated with the Lower Houses compound are provided in the Transport Assessment (Appendix 16.1) of the ES.

1.4.4 Offsite Highways Works

- 50) Traffic management plans and potential highway improvements (e.g. temporary access roads, passing places, etc.) have been developed in consultation with Lancashire County Council highways department and local communities to minimise potential conflicts with other road users and enable the safe and

timely movement of HGVs and other construction vehicles along local roads, prior to joining the strategic road network.

- 51) Further details on the offsite highways working including the Clitheroe Park and Ride and the Clitheroe HGV Holding Area are provided in Volume 5.

1.4.5 Construction Accesses

- 52) Access tracks would be constructed from the public highway to laydown areas and construction compounds. Access tracks would be in the order of 7.7 m wide, and would be constructed along a soil-stripped and vegetation-cleared easement comprising a layer of crushed stone or tarmac where required. Temporary drainage may need to be installed alongside or across the access tracks to maintain existing drainage lines, and the tracks would be aligned to minimise flood risk within the development envelopes or local watercourses.

- 53) Proposed points of access to and from the public highway are subject to further design development and would need to be agreed with the relevant highways authority.

1.4.6 Tree/Hedgerow Removal, Pruning and Protection

- 54) Works would include where unavoidable, the clearance of vegetation including felling of trees and hedge removal. These works would be scheduled to take account of the breeding bird season and other seasonally-constrained times of the year wherever possible and under the supervision of a suitably qualified Environmental Clerk of Works where unavoidable for site preparation and off-site highways works.

1.4.7 Public Rights of Way

- 55) Two PRoWs (footpaths 3-29-FP 31 and 3-29-FP 26) would be affected by the Newton-in-Bowland Compound. Footpath 3-29-FP 31 would be intersected by the construction compound and would be temporarily diverted around the Newton-in-Bowland Compound for the duration of the works. Similarly, footpath 3-29-FP 26 would cross the proposed haul road; this would require controlled crossing points being introduced for the duration of the works.

1.4.8 Earthworks

- 56) Earthworks would be required to provide a level platform in preparation for full construction of the compound areas and the construction haul road. This may include retaining wall structures such as gabion baskets, depending on the final design working levels.

1.4.9 Compound Establishment Works (including material laydown areas if relevant)

- 57) In order to facilitate the construction of the new aqueduct the provision of the following would be required with the compound area:
- Fencing would include hoarding installed around the compounds to a height of 2.4 m. Where appropriate, heras-type fencing would be used around any areas which fall outside of the core construction compound e.g. lagoons
 - Lighting would be required for safety reasons and where 24-hour working is required. Lighting designs and locations would minimise light spill towards adjacent properties and other sensitive locations.
 - Temporary site cabins would be brought to site for offices, workshops and stores. The remainder of the compound would be used for construction related activities such as car parking, plant and commercial vehicle storage, material storage areas and traffic circulation routes connecting and servicing these areas.
 - Power supply for the compounds would be via connection with the local electricity network where appropriate or via generators. Generators would need to operate 24 hours a day. A water

connection would be provided from the nearest suitable connection point or, where necessary, water bowsers would be provided.

1.4.10 Portal Construction

58) The Newton-in-Bowland Compound would be used to launch the TBM. The topography of the site is such that a portal would be required to do this. The portal would comprise a significant cutting into the existing sloping ground to create a level working area and expose a vertical face for the TBM to tunnel into. The portal would be constructed using a suitable rock excavation technique (potentially involving blasting) which would be undertaken at agreed times and intervals to minimise disruption to local residents.

1.4.11 Material/Waste Arisings

59) Material arising from tunnel construction would be brought to the surface at the Newton-In-Bowland compound. This surplus material would be taken off site for disposal via heavy goods vehicles. Vehicle movements would be restricted to agreed hours to minimise effects on local communities. United Utilities is engaged in discussions with the operators of Waddington Fell Quarry with a view to the material being utilised as part of a revised and enhanced quarry restoration scheme, which is the subject of a separate planning application.

60) The tunnel arisings would be brought to the surface on a 24 hours per day basis so there would be a need to temporarily store materials, given that construction vehicle movements into and out of the site would be restricted to agreed working hours. Depending upon ground conditions there may be a requirement to process the material (examples include dewatering or grading) to optimise the number of vehicle movements. Both temporary storage and any processing activities would be completed within the planning application boundary.