

A303 Amesbury to Berwick Down

Secretary of State letter 20 June 2022

Applicant's response to the request for comments
Q2 - Conclusion on alternative routes
Environmental Appraisal – Bored Tunnel Extension

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1 Introduction

- 1.1.1 This report has been prepared to support the consideration of alternatives requested by the Secretary of State as part of the re-determination of the application by Highways England (now National Highways) (the Applicant) for an order granting development consent for the A303 Amesbury to Berwick Down (the Scheme).
- 1.1.2 This report focusses on the Bored Tunnel Extension presented as an alternative to the DCO Scheme (as described by the Development Consent Order (DCO) application made by National Highways), which is described in Section 2. This extension comprises a refinement of the longer tunnel option considered in our response to question AL.1.29 of the Examining Authority's First Written Questions on alternatives, and in our [response to the Statement of Matters Bullet Point One – Alternatives](#) [Re-determination 1.1]. As described in the Re-determination 4.2 Document, the Bored Tunnel Extension represents what is considered a best case option for a longer tunnel alternative, in that it balances all the operational, heritage, and environmental considerations. Consideration of the Bored Tunnel Extension against the overarching Scheme objectives listed below is presented in the Re-determination 4.2 Document.
- Transport – To create a high quality reliable route between the South East and the South West that meets the future needs of traffic;
 - Economic growth – To enable growth in jobs and housing by providing a free-flowing and reliable connection between the South East and the South West;
 - Cultural heritage – To help conserve and enhance the World Heritage Site and to make it easier to reach and explore; and
 - Environment and community – To improve biodiversity and provide a positive legacy for nearby communities.
- 1.1.3 This appraisal provides further detail on the consideration of the environment and community objective, with specific regard to the potential for significant environmental effects. Along with the documents focusing on cultural heritage (Re-determination documents 4.3, 4.4, 4.5 and 4.6), this appraisal considers the topics listed at paragraph 1.1.8, and so is consistent with the 'balanced appraisal' of important and relevant matters presented in our response to Question AL.1.29 of the Examining Authority's First Written Questions. This appraisal, along with the other documents submitted in response to the Secretary of State's June 2022 letter, therefore provides the Secretary of State with sufficient information to allow for a re-determination of the DCO Scheme taking into account all material considerations.
- 1.1.4 Bringing forward the Bored Tunnel Extension as an alternative to the DCO Scheme has the potential to have implications on the scope of the Environmental Impact Assessment (EIA) previously agreed for the DCO Scheme, and policy implications for the Scheme considered as part of the application process. Section 3 of this report reviews the assessment scope and policy implications of the Bored Tunnel Extension.

- 1.1.5 The appraisal in this report is split into two parts: a consideration of the environmental implications of the Bored Tunnel Extension (Section 4); and a comparison between the Bored Tunnel Extension and the DCO Scheme highlighting where there is potential for the Bored Tunnel Extension to result in different effects to those reported for the DCO Scheme (Section 5).
- 1.1.6 The appraisal draws on material comprising the October 2018 Environmental Statement (ES) for the DCO Scheme, as amended by the DCO and Errata Report [REP7-022] (collectively the 2018 ES); information produced during examination and post-examination (available on the PINS project website), and the Environmental Information Review generated in response to Statement of Matters (document reference: Redetermination-1.4). This material is referred to collectively as ‘the environmental information’ in this report. As set out in the response to Statement of Matters (document reference: Redetermination-1.4), the environmental information generated for the DCO Scheme to date is considered sufficient and appropriate to inform this report, due to the similar scale and location of the Bored Tunnel Extension (see Section 2).
- 1.1.7 The appraisal considers the below topics¹ using the above information and professional judgement:
- Air Quality;
 - Landscape and Visual;
 - Biodiversity;
 - Noise and Vibration;
 - Geology and Soils;
 - Road Drainage and the Water Environment;
 - Materials and Waste;
 - People and Communities;
 - Climate; and
 - Assessment of Cumulative Effects.
- 1.1.8 Cultural heritage implications have been considered in a separately provided reports (Re-determination documents 4.3, 4.4, 4.5 and 4.6).
- 1.1.9 The design of the Bored Tunnel Extension has not been developed to the same level as that for the DCO Scheme. The level of assessment therefore is not equivalent to the full environmental impact assessment undertaken for the DCO Scheme. The information provided here and previously in the environmental information is considered to be sufficient for the Secretary of State to make a robust decision on alternatives to the DCO Scheme. The appraisal assumes that applicable mitigation committed to in the environmental information for the DCO Scheme would be applied to the Bored Tunnel Extension as appropriate, including implementation of relevant measures detailed in the Outline Environmental Management Plan (OEMP). The appraisal also assumes that where bespoke mitigation for the

¹ Topic titles are consistent with those of the 2018 ES.

Bored Tunnel Extension would be required, this would be provided to the same level as the DCO Scheme.

1.1.10 This report has regard to the latest versions of the Design Manual for Roads and Bridges guidance documents.

1.2 Structure of this Report

1.2.1 This report is broken down into the following sections:

- Section 1 – Introduction
- Section 2 – Description of the Bored Tunnel Extension
- Section 3 – Scoping and Policy
- Section 4 – Consideration of scoping, policy and environmental implications of the Bored Tunnel Extension
- Section 5– Consideration of the environmental implications of the Bored Tunnel Extension in comparison to the DCO Scheme

2 Bored Tunnel Extension Description

2.1.1 The Bored Tunnel Extension provides an alternative to the DCO Scheme by altering three principal components of the DCO Scheme design as follows:

1. An extended bore for the tunnelled section of the A303 within the western portion of the World Heritage Site (WHS). In comparison to the DCO Scheme, the bore would be extended from chainage 7400 to 6150 along the main line of the DCO Scheme, circa (c.) 80m west of the WHS boundary. Tunnel service buildings would be located north of the eastbound carriageway outside the western tunnel portal.
2. The realignment of the A360 west of its existing alignment. The realigned A360 would pass over the proposed A303 via a green bridge c. 450m west of the western tunnel portal. A roundabout would be provided on the realigned A360, south of the A303, to give access to the link road to Longbarrow Junction, relocated as part of the Bored Tunnel Extension, and Winterbourne Stoke. The A360 realignment for the Bored Tunnel Extension follows approximately the same route as the DCO Scheme.
3. The relocation of the Longbarrow Junction c. 750 west of the DCO Scheme Longbarrow Junction. The Alternative Longbarrow Junction takes the form of a grade separated skewed dumbbell junction consisting of two roundabouts connected by a short length of dual carriageway, carried over the A303 on a new green bridge. The northern roundabout would service the eastbound lane of the A303; while the southern roundabout would service the westbound lane of the A303 and provide links to the A360 and Winterbourne Stoke.

2.2 Traffic Management at the Alternative Longbarrow Junction

2.2.1 In order to build the tunnel and Alternative Longbarrow Junction, it would be necessary to divert the existing A303. Design of the diversions and the traffic management strategy will be dependent on the construction methodology and programme to be determined by the main works contractor. For the purposes of this assessment, the following construction sequence has been assumed:

- Stage 1: With traffic on the existing A303 and existing A360, construct a temporary diversion for the A303 from the existing Longbarrow roundabout, around the north of the site for the proposed A360 bridge, and tying back to the existing A303 to the south of the Alternative Longbarrow Junction. Include a temporary bridge to cross the route of the new A303.
- Stage 2: Retain the A360 on its existing route but divert the A303 onto the temporary diversion. Commence construction of the remainder of the Alternative Longbarrow Junction and of the tunnel. Some local diversions and Traffic management will be required at tie-ins.

- Stage 3: On completion of the new A360 bridge, divert the A303 traffic on to the new bridge and remove the temporary bridge. Continue construction of Alternative Longbarrow Junction and tunnel.
- Stage 4: On completion of Alternative Longbarrow Junction and of Winterbourne Stoke Bypass, divert A303 traffic on to one carriageway of the bypass. The other carriageway would be kept as a construction route to complete the tunnel. At this stage all A303 traffic would remain diverted over the A360 bridge as at Stage 3.
- Stage 5: After opening of the tunnel, the A360 would be diverted onto its new alignment and the temporary diversion removed.

3 Scoping and Policy

3.1 Scoping

- 3.1.1 As part of the application process, the Applicant set out the proposed scope of work and methods to be applied in carrying out the Environmental Impact Assessment (EIA) for the DCO Scheme in a Scoping Report². The scope of the EIA was subsequently confirmed by the Scoping Opinion³ provided by the Planning Inspectorate and agreed through engagement with the relevant consultees.
- 3.1.2 The Bored Tunnel Extension design sits almost entirely within the Order Limits for the DCO Scheme (see Section 5.3) so has the same environmental setting. The Extension comprises existing components of the DCO Scheme – bored tunnel, grade separated junction and slip roads – altered to provide an alternative design (Section 2), rather than new, different scheme components which have not previously been considered. As such, the agreed scope of the EIA methodology is applicable and appropriate for consideration of the Bored Tunnel Extension and no changes are required to be considered by this report.

3.2 Policy

- 3.2.1 The Applicant considered policy implications for the DCO Scheme as part of the application process. In response to Statement of Matters, the Applicant reviewed all of the updated and new relevant policy documents referred to in the Applicant's Case for the Scheme [APP-294] submitted during the examination for the DCO Scheme (document reference: Redetermination-1.2). The Applicant has concluded that the position presented in the Case for the Scheme with regard to the DCO Scheme's compliance with national and local policy remains unchanged and development consent for the DCO Scheme should therefore be granted.
- 3.2.2 Also in response to the Statement of Matters, the Environmental Information Review (document reference: Redetermination-1.4) considered if any legislation or policy had changed since the submission of the 2018 ES such that it would alter the way that the assessment was carried out, potentially resulting in new conclusions. No such policy changes were identified.
- 3.2.3 The Bored Tunnel Extension design sits almost entirely within the Order Limits for the DCO Scheme (see Section 5.3) so has the same environmental setting. The Extension comprises existing components of the DCO Scheme – bored tunnel, grade separated junction and slip roads, and

² A303 Stonehenge – Amesbury to Berwick Down EIA Scoping Report available at: <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010025/TR010025-000032-Scoping%20Report.pdf>

³ Scoping Opinion: Proposed A303 Stonehenge – Amesbury to Berwick Down available at: <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010025/TR010025-000039-STON%20-%20Scoping%20Opinion.pdf>

public rights of way – altered to provide an alternative design (Section 2), rather than new, different scheme components which have not previously been considered. As such, the Bored Tunnel Extension does not represent a change to the DCO Scheme that would alter the compliance with national and local policy.

4 Topic Appraisal of the Bored Tunnel Extension

4.1 Introduction

- 4.1.1 This section of the report identifies the potential impacts of the Bored Tunnel Extension on the existing environmental baseline (without the DCO Scheme) together with a high level appraisal of whether or not these impacts could be expected to result in likely significant effects. This section considers the environmental topics addressed in the Environmental Statement for the DCO Scheme, with the exception of Cultural Heritage, which is addressed in separate Re-determination Documents 4.3, 4.4, 4.5 and 4.6.
- 4.1.2 Each topic considers receptors relevant to that topic, identified using professional judgement in reviewing the environmental information, which could potentially be impacted by the components of the Bored Tunnel Extension that are different to those in the DCO Scheme, that is:
- Reduced infrastructure associated with the A360 realignment, in comparison with the DCO Scheme;
 - The extended bored tunnel;
 - The more western location of Longbarrow Junction;
 - Resultant changes to journeys on local roads; and
 - Changes to Public Rights of Way.
- 4.1.3 Receptors that would be impacted where the components for the Bored Tunnel Extension and the DCO Scheme are the same (e.g. eastwards from the eastern tunnel portal), are not considered.
- 4.1.4 This section does not provide a comparison between the likely significant effects associated with the Bored Tunnel Extension and the DCO Scheme. Such a comparison is provided in Section 5.

4.2 Air Quality

Key Environmental Receptors

- 4.2.1 Sensitive receptors include locations where members of the public may be exposed to and affected by air quality impacts, as well as designated ecosystems. Those receptors identified in the environmental information relevant to the Bored Tunnel Extension are listed in Table 4.1.

Table 4.1 Air Quality Receptors

Receptor	Location
Byway WSTO6B	Crosses the Bored Tunnel Extension north-south, north of Hill Farm. This byway would be closed during construction.
River Till Site of Special Scientific Interest (SSSI) and River Avon Special Area of Conservation (SAC)	Located c. 200m north of the Alternative Longbarrow Junction east bound off slip.

Receptor	Location
Hill Farm Cottages	Located c. 150m south of the southern arm of the Alternative Longbarrow Junction.
Parsonage Down National Nature Reserve (NNR) and County Wildlife Site (CWS)	Located c. 1km north west of the of the Alternative Longbarrow Junction east bound off slip. Abuts the B3083 to the west.
Salisbury Plain SAC	Located c. 1.5km west of the Alternative Longbarrow Junction.
The residents of Winterbourne Stoke	The closest lie c. 450m south west of the westbound off slip for the Alternative Longbarrow Junction.
Sensitive receptors on the local road network	n/a

Construction

- 4.2.2 There is potential for adverse effects during the construction of the Bored Tunnel Extension from construction dust, plant equipment and vehicle emissions. Impacts from plant equipment and construction dust are likely to be relatively limited at Hill Farm Cottages, along with construction dust impacts at the ecological designations. These impacts would be controlled by best practice mitigation measures provided within the Outline Environmental Management Plan (OEMP) and are not anticipated to result in significant effects. Vehicle emission impacts as a result of the Bored Tunnel Extension construction traffic, are also anticipated not to be significant.
- 4.2.3 The construction of the Bored Tunnel Extension requires the diversion of A303 road users via temporary roads in five stages (see Section 2). However, as a result of the traffic management required by the Bored Tunnel Extension, driver routing and flows are not anticipated to result in anything greater than negligible air quality impacts.

Operation

- 4.2.4 During operation, air quality is not expected to be notably affected by emissions from the location of the Alternative Longbarrow Junction and the Bored Tunnel Extension tunnel portal. Localised changes in air quality from traffic emissions close to the designated sites are likely to be not significant.
- 4.2.5 The location of the Alternative Longbarrow Junction is anticipated to increase journey times for road users travelling westbound on the A303 to Shrewton via the A360, as well as for users travelling in the opposite direction. This is anticipated to encourage some drivers to use the section of the B3083 north of Winterbourne Stoke to Shrewton as a shorter alternative. Adverse impacts on human air quality receptors along these routes are not anticipated to be significant due to the good baseline air quality in the area. Impacts to Salisbury Plain SAC, Parsonage NNR and CWS which abut the B3083 are also not anticipated to result in significant effects.

4.3 Cultural Heritage

4.3.1 Please refer to cultural heritage documentation provided separately (Re-determination documents 4.3, 4.4, 4.5 and 4.6).

4.4 Landscape and Visual

Key Environmental Receptors

4.4.1 Landscape and Visual receptors identified in the environmental information relevant to the Bored Tunnel Extension are provided in Table 4.2.

Table 4.2 Landscape and Visual Receptors

Receptor	Location
Landscape	
Landscape Features: Rolling landform crossed by watercourses Open fields and chalk grassland, with isolated blocks of woodland and smaller tree groups, and roadside hedgerows along A360 and the A303	The Bored Tunnel Extension is located within these features.
Wiltshire Landscape Character Types (WLCT): High Chalk Plain and Chalk River Valley	The Bored Tunnel Extension is located mainly within High Chalk Plain, with the western edge partially within Chalk River Valley.
Wiltshire Landscape Character Areas (WLCA): 3a Salisbury Plain West and 5e Wyllye Valley	The Bored Tunnel Extension is located mainly within WLCA 3a, with the western edge partially within 5e.
District Landscape Character Type (DLTC): D: High Chalk Plain and A: Chalk River Valley	The Bored Tunnel Extension is located mainly within LCT D, with the western edge of partially within LCT A.
District Landscape Character Areas (DLCA): A1: Till Narrow Chalk River Valley and D3: Larkhill Chalk Downland	The Bored Tunnel Extension is located mainly within A1, with the western edge of the partially within D3.
Local Landscape Character Area (LLCA): 04: Upper Till Valley Slopes, 10: Winterbourne Stoke Dry Valleys, 11: Oatlands Hill, 14: Stonehenge and Normanton Ridges, and 15: Springbottom and Woodford Dry Valleys	The Bored Tunnel Extension is located mainly within LLCAs 10 and 11, with the western edge partially within 04, and the northern section of the A360 is re-alignment partially within 14. Tunnelling works and removal of the old A303 are carried out in 11, 14 and 15.
Special Landscape Area (SLA) (saved policy of the former Salisbury District Council adopted Local Plan)	The Bored Tunnel Extension is located within the SLA.
World Heritage Site (WHS)	The Bored Tunnel Extension abuts the WHS where the A360 is re-aligned westwards. The proposed western tunnel portal is located approximately 50m west of the WHS.
Visual	

Receptor	Location
Byway WSTO6B	Crosses the Bored Tunnel Extension north-south, north of Hill Farm. This byway would be closed during construction.
Hill Farm Cottages	Located c. 150m south of the southern arm of the Alternative Longbarrow Junction
Restricted Byway BSJA9	Routes west from the A360, c. 320m south of where the A360 is re-aligned westwards by the Bored Tunnel Extension, south of the existing Longbarrow roundabout.
WHS	Bored Tunnel Extension abuts the WHS where the A360 is re-aligned westwards. The proposed western tunnel portal is located approximately 50m west of the WHS.
Footpath WSTO11	Routes west to Winterbourne Stoke from byway WSTO6B c. 360m south west of the southern arm of the Alternative Longbarrow Junction.
Byway and footpath WSTO4	Routes north from Winterbourne Stoke c. 360m west of the westbound off slip for the Alternative Longbarrow Junction.
Bridleway WSTO5	Routes north from Byway WSTO6B c. 680m north of the northern edge of the Alternative Longbarrow Junction.
The residents of Winterbourne Stoke	The closest lie c. 450m south west of the westbound off slip for the Alternative Longbarrow Junction.
The residents of Oatlands Bungalows	Located c. 950m south of Bored Tunnel Extension.

Construction

Landscape

- 4.4.2 The construction of the Bored Tunnel Extension would result in a direct change to the existing surface landform associated with topsoil stripping, excavation for the sections of cutting, and embankments. Construction activity is also likely to necessitate the removal of hedgerows along the A360 and the A303 which could have an adverse impact on LLCA 10 and 11.
- 4.4.3 As a result of construction, Wiltshire and District LCAs are unlikely to experience significant adverse effects because of their large scale. There would be no direct impact on the landscape within the WHS as the Bored Tunnel Extension extends the tunnel bore to the west of the WHS. There would however be the potential for indirect temporary impacts from construction activities to the west of the WHS on the landscape character within the WHS. This would likely result in temporary significant adverse landscape effects.

Visual

- 4.4.4 Other than the restoration of the A303 to a byway, there would be no above ground construction activity within the western part of WHS, however there is still the potential for sensitive receptors within the WHS to be impacted by temporary construction activities associated with the Bored Tunnel Extension to the west of the WHS.
- 4.4.5 Despite construction of the Alternative Longbarrow Junction being located outside of the WHS and some distance from the WHS boundary, works at the Alternative Longbarrow Junction, including the Slurry Treatment Plant, are anticipated to be visible from sensitive receptors within the WHS. This would likely result in a temporary significant adverse visual effect.
- 4.4.6 Works at the Alternative Longbarrow Junction are likely to be visible to residents of Hill Farm Cottages, and to receptors in Winterbourne Stoke. The construction of the Alternative Longbarrow Junction is likely to impact users of local Public Rights of Way (PRoW) within the Till Valley, particularly WSTO4 due to the proximity of the Alternative Longbarrow Junction. This would likely result in a temporary significant adverse visual effect.

Operation

Landscape

- 4.4.7 The proposed location for the tunnel portal outside of the WHS, combined with the location of the Alternative Longbarrow Junction, would avoid direct landscape impacts. There are however likely to be indirect impacts as a result of the operation of the A360 diversion which are likely to adversely impact the landscape character of the WHS, despite being an improvement on the existing alignment of the A360. The WHS would however benefit from physical and visual reconnection of the landscape, restoration of the landscape pattern and from increased tranquillity.
- 4.4.8 Adverse impacts to LLCA 04, 10, 11 and 14 are likely. Significant adverse effects caused by the location of the Alternative Longbarrow Junction and A360 diversion are anticipated for LLCA 10 and 11. There would be significant beneficial landscape effects for LLCA 11, 14 and 15 with the removal of surface traffic from the old A303. With regard to County and District LCAs, the change to the landscape would be localised and therefore, given the scale of the character areas, the effect would be neutral.
- 4.4.9 The above represents a worst case scenario in the absence of detailed landscape mitigation measures, though it is assumed that should the Bored Tunnel Extension be taken forward the same principles of mitigation would be adopted as for the DCO Scheme. For the sake of this appraisal it is assumed that, as for the DCO Scheme, a materials balance can be achieved by treating tunnel arisings as appropriate to enable their use in earthworks for the Scheme, including to integrate the Bored Tunnel Extension into the landscape. 1.1.9

Visual

- 4.4.10 The proposed location of the A360, the removal of the existing lit surface roundabout, and the removal of the A303 from the WHS, combined with the location of the western tunnel portal, to the west of the WHS, is likely to result in a significant beneficial change for high sensitivity receptors within the WHS. However, this benefit would be reduced as lighting associated with the Alternative Longbarrow Junction may be visible from the western part of the WHS.
- 4.4.11 The Alternative Longbarrow Junction and associated lighting may be visible to residents of Hill Farm Cottages, and to receptors in Winterbourne Stoke. Intrusion of signage, lighting columns during the day, and increased light levels at night has the potential to result in significant adverse effects for these receptors.
- 4.4.12 The Bored Tunnel Extension is also likely to impact users of local Public Rights of Way (PRoW), particularly WSTO4 which may have views of the Alternative Longbarrow Junction. This would likely result in significant adverse visual effects.

4.5 Biodiversity

Key Environmental Receptors

- 4.5.1 Biodiversity receptors identified in the environmental information relevant to the Bored Tunnel Extension are set out in Table 4.3.

Table 4.3 Biodiversity Receptors

Receptor	Location
Existing habitats and species.	Within the Bored Tunnel Extension boundary.
Parsonage Down NNR and CWS	Located 1km north west of the of the Alternative Longbarrow Junction east bound off slip. Abuts the B3083 to the west.
River Till SSSI and River Avon SAC	Located c. 200m north of the Alternative Longbarrow Junction east bound off slip.
Salisbury Plain SAC	Located c. 1.5km west of the Alternative Longbarrow Junction.

Construction

- 4.5.2 There would be no direct habitat loss within the statutory or non-statutory designated sites listed in Table 4.3 associated with the construction activities for the Bored Tunnel Extension. Mitigation measures within the OEMP would prevent degradation of these sites via pollution/contamination and dust released during construction. The adverse impacts caused by the removal of the existing habitat and disturbance to species as a result of the Bored Tunnel Extension are anticipated to be not significant.

4.5.3 The location of the tunnel portal for the Bored Tunnel Extension would avoid biodiversity impacts associated with construction land take and species disturbance within the WHS.

Operation

4.5.4 No direct impacts are anticipated for statutory or non-statutory designated sites as a result of the Bored Tunnel Extension. Negligible impacts to habitat and species during operation are anticipated.

4.5.5 Impacts to designated sites associated with nitrogen deposition are discussed in Section 4.1 Air Quality and indicate that a change in air quality at these sites would be negligible. Changes to groundwater flow at the River Till (and River Avon and River Wylye) affecting the River Avon SAC are not anticipated to be significant (see paragraph 4.8.6). No impacts to the Salisbury Plain SAC are anticipated.

4.6 Noise and Vibration

Key Environmental Receptors

4.6.1 Sensitive receptors are where members of the public may be exposed to and affected by noise impacts. Those identified in the environmental information relevant to the Bored Tunnel Extension comprise those listed in Table 4.4.

Table 4.4 Noise and Vibration Receptors

Receptor	Location
The residents of Winterbourne Stoke	The closest lie c. 450m south west of the westbound off slip for the Alternative Longbarrow Junction.
Hill Farm Cottages	Located c. 150m south of the southern arm of the Alternative Longbarrow Junction
B3083 Shrewton	Located at the southern end of Shrewton on the B3083.
Stonehenge Visitors Centre	Located c. 470m north east of the Alternative Longbarrow Junction.
Various PRoW	Byway WSTO6B crosses the Bored Tunnel Extension north-south, via the relocated Longbarrow Junction. This byway would be closed during construction. Various other PRoWs are located around Winterbourne Stoke.

4.6.2 Please refer to cultural heritage documentation provided separately (Re-determination documents 4.3, 4.4, 4.5 and 4.6) for a consideration of disturbance to scheduled monuments and other cultural heritage features.

Construction

- 4.6.3 A significant adverse construction noise effect (as defined by LA 111) is likely at the receptors at Hill Farm/ Hill Farm Cottages due to the proximity of the Alternative Longbarrow Junction to the properties. The construction of the Bored Tunnel Extension may also adversely impact users of local PRow. However, due to the transitory nature of the exposure this is not anticipated to be significant. Significant adverse construction noise effect for the Stonehenge Visitors Centre is not anticipated.
- 4.6.4 Construction traffic impacts are not anticipated to be significant (as defined by LA 111). Access to the construction works for the Bored Tunnel Extension would be via busy main roads (A303 and A360), therefore significant increases in traffic noise are not anticipated. The construction of the Bored Tunnel Extension requires road users of the A360 and A303 to be diverted via temporary roads in five stages (see Section 2). However, there are no noise sensitive receptors in close proximity to the diversion routes, therefore the traffic management required by the Bored Tunnel Extension, is not anticipated to result in significant effects.
- 4.6.5 Due to the nature of the works and the location of sensitive receptors, construction vibration is not anticipated to result in significant adverse effects.

Operation

- 4.6.6 The proposed location for the tunnel portal is outside of the WHS. The tunnel would provide an area shielded from traffic noise and provide a beneficial effect for users of the affected area of the WHS. Adverse impacts as a result of traffic noise to PRow users are not anticipated to be significant due to the transitory nature of the exposure.
- 4.6.7 The location of the Alternative Longbarrow Junction is likely to increase traffic noise levels from the junction at Hill Farm/Hill Farm Cottages. However, these receptors will experience a large reduction in traffic noise from the old A303. Therefore, a significant adverse effect is unlikely at these receptors.
- 4.6.8 The location of the Alternative Longbarrow Junction is anticipated to increase journey times for road users travelling westbound on the A303 to Shrewton via the A360, as well as for users travelling in the opposite direction. This is anticipated to encourage some drivers to use the section of the B3083 north of Winterbourne Stoke to Shrewton as a shorter alternative. Due to the existing low traffic flows and consequent low levels of traffic noise, this is likely to result in a significant adverse effect for residential receptors in Shrewton along the B3083. Mitigation at this location would be hard to deliver as it is not within or near the Scheme order limits boundary.
- 4.6.9 A significant adverse effect at Foredown House on the north-east edge of Winterbourne Stoke is anticipated. For other receptors within Winterbourne Stoke, the location of the Alternative Longbarrow Junction is likely to increase traffic noise levels, as well as noise from the re-routing described

in paragraph 4.6.8. However, these receptors will experience a large reduction in traffic noise from the old A303. Overall, other than at Foredown House, significant adverse effects are not anticipated at receptors in Winterbourne Stoke.

- 4.6.10 Operational vibration is not anticipated to result in significant adverse effects.

4.7 Geology and Soils

Key Environmental Receptors

- 4.7.1 Receptors and potentially contaminative land uses identified in the environmental information relevant to Bored Tunnel Extension are set out in Table 4.5.

Table 4.5 Geology and Soils Receptors

Receptors and potentially contaminative land uses	Location
Human receptors	n/a
The River Till	Located c. 200m west north of the Alternative Longbarrow Junction east bound off slip.
Chalk aquifer (Principal)	Underlies the Scheme.
Former Larkhill Military Light Railway (Dismantled) (CL025) (potentially contaminative land use)	Located east of the existing Longbarrow roundabout.
Pig Farm (CL034) (Longbarrow Roundabout) (potentially contaminative land use)	Located east of the existing Longbarrow roundabout.
Infilled and unspecified Pits and Ground Workings (1879 - 1957) (CL020) (potentially contaminative land use)	Located c. 210m south of existing Longbarrow roundabout.
RAF Oatlands Hill (1941-48) (CL018) (potentially contaminative land use)	The re-alignment of the A360 is within the north east part of the site.
Historic Barn and Above Ground Tank (1877 - 1961) (CL016) (potentially contaminative land use)	Located c. 10m north of the link road between the Alternative Longbarrow Junction and the A360 diversion, abutting the northern boundary of the existing A303.
Unspecified Pit (1878 - 1926) (CL014) (potentially contaminative land use). Adjacent/within CL015.	Located c. 30m north of eastbound off slip of the Alternative Longbarrow Junction.
Approximate location of historically observed demolition rubble (CLO15) (potentially contaminative land use)	Located c. 15m west of northern edge of the Alternative Longbarrow Junction.

Construction

- 4.7.2 In accordance with the OEMP, an assessment will be undertaken of any potential contaminative land uses on, or within 50m of construction activities. The outcome of this assessment will define the extent to which mitigation is required to prevent harm to human, ecological, or controlled waters receptors. The OEMP also includes measures to appropriately

manage any unexpected contamination that may be encountered. No significant effects are anticipated.

Operation

- 4.7.3 No geology and soils impacts are predicted during operation. Any soil contamination during construction would be mitigated prior to the operational phase.

4.8 Road Drainage and the Water Environment

Key Environmental Receptors

- 4.8.1 Road Drainage and the Water Environment receptors identified in the environmental information relevant to the Bored Tunnel Extension are set out in Table 4.6.

Table 4.6 Road Drainage and the Water Environment Receptors

Receptor	Location
An area at Low risk of surface water flooding	The footprint of the Alternative Longbarrow Junction would include an area at Low risk of surface water flooding.
The River Till	Located c. 200m west north of the Alternative Longbarrow Junction east bound off slip.
The River Avon	Located c. 3.8km south east of the Alternative western tunnel portal.
The River Wylfe	Located c. 5.4km south west of the Bored Tunnel Extension western tunnel portal.
River Till flood zones	Flood Zone 2 is located c. 75m west north of the Alternative Longbarrow Junction east bound off slip.
Chalk aquifer (including abstractors and springs)	Underlies the Scheme.

Construction

- 4.8.2 The Bored Tunnel Extension is not located within a fluvial flood zone. The Alternative Longbarrow Junction would be constructed within an area vulnerable to a Low risk of surface flooding (between 0.1% and 1% Annual Exceedance Probability). There is the potential to change the overland flow route which could impact on catchment hydrology and increase flood risk. However, drainage proposals would be designed to replicate the natural surface flow channels of the valley conveying surface runoff to the River Till.
- 4.8.3 During construction there is also the potential for the release of contaminants and the potential to increase the surface water runoff rate due to the removal of vegetation and topsoil stripping. These impacts would be avoided through the implementation of best practice measures contained within the OEMP.
- 4.8.4 Potential adverse impacts to the River Till and chalk aquifer associated with a reduction of groundwater baseflow as a result of any required dewatering

activities would be controlled through application for abstraction licences from the Environment Agency.

Operation

- 4.8.5 In accordance with the OEMP, drainage proposals for the Bored Tunnel Extension would be designed to the same standards as the DCO Scheme and would include measures to contain and control surface water runoff from the highway and convey the flows to drainage treatment areas, thereby minimising the risk of flooding elsewhere and preventing impacts arising from pollutants entering the surface waters or the aquifer.
- 4.8.6 Changes to the groundwater flow which impact the River Avon and River Wylfe are not anticipated due to their distance from the Bored Tunnel Extension. Impacts to the River Till as a result of changes to groundwater flow associated with underground structures comprising the tunnel and portal foundations are possible. However, the groundwater modelling reported in the environmental information [APP-282] supports the conclusion that, due to the anticipated depth of the bored tunnel and the location of the tunnel portal, effects related to groundwater flow at the River Till are not likely to be significant.

4.9 Materials and Waste

Key Environmental Receptors

- 4.9.1 As identified in the environmental information, receptors for Materials and Waste comprise construction materials supplies and regional waste management facilities.

Construction

- 4.9.2 The Bored Tunnel Extension will generate tunnel spoil and other arisings. It is assumed that the spoil will be re-used within the boundary of the Scheme, either to the east of Parsonage Down National Nature Reserve, or treated as appropriate to enable its use in earthworks. Waste generated by the Bored Tunnel Extension is not anticipated to adversely impact regional waste management facilities. No significant effects are anticipated for waste.

Operation

- 4.9.3 No materials or waste impacts during operation are anticipated.

4.10 People and Communities

Key Environmental Receptors

- 4.10.1 The receptors for People and Communities identified in the environmental information relevant to the Bored Tunnel Extension are listed in Table 4.7.

Table 4.7 People and Communities Receptors

Receptor	Location
Areas of Grade 2, Subgrade 3a and Subgrade 3b soils	The Bored Tunnel Extension footprint
Farming properties	The Bored Tunnel Extension footprint
Byway WSTO6B	Crosses the Bored Tunnel Extension north-south, north of Hill Farm. This byway would be closed during construction.
Restricted Byway BSJA9	Routes west from the A360, c. 320m south of where the A360 is re-aligned westwards by the Bored Tunnel Extension, south of Longbarrow roundabout.
Users of the WHS	The Bored Tunnel Extension abuts the WHS where the A360 re-alignment joins the existing A303. The proposed western tunnel portal is located approximately c. 50m west of the WHS.
Footpath WSTO11	Routes west to Winterbourne Stoke from byway WSTO6B c. 360m south west of the southern arm of the Alternative Longbarrow Junction.
Byway and footpath WSTO4	Routes north from Winterbourne Stoke c. 360m west of the westbound off slip for the Alternative Longbarrow Junction.
Bridleway WSTO5	Routes north from Byway WSTO6B c. 680m north of the northern edge of the Alternative Longbarrow Junction.
Byway WCLA1	Routes south west from the existing A303, south west of Stonehenge, to the A360. Located c. 845m south east of the Alternative Longbarrow Junction.

Construction

- 4.10.2 The construction of the Bored Tunnel Extension would result in the loss of 32ha of Agricultural Land Classification Grade 2, Subgrade 3a and Subgrade 3b best and most versatile land resulting in an adverse impact. The construction of the Bored Tunnel Extension is also anticipated to adversely impact agricultural holdings through severance and land loss, both during construction and permanently following the completion of works. Impacts to other private assets and development land are not anticipated.
- 4.10.3 Byway WSTO6B would be closed during construction, adversely impacting non-motorised users (NMU). A local alternative route to the byway is available to the west using the B3083 road, albeit with the added presence of traffic. NMU would still be able to complete their journeys but would be adversely impacted due to this. The effect of the NMU closure is anticipated not to be significant.
- 4.10.4 The Bored Tunnel Extension would provide a diversion for WSTO6B. For NMU entering the red line boundary from the north on WSTO6B, the diversion would direct NMU south west, under the Till Viaduct, and south to the existing A303. The Bored Tunnel Extension would also provide a new bridleway along the north of the A303 between the Alternative Longbarrow

Junction and Winterbourne Stoke. In accordance with LA 112⁴, the distance NMU would be diverted (c. 925m) has the potential to result in a significant effect. The diversion would however avoid a conflict between NMUs, such as horse riders, and vehicular traffic than if a shorter route across the Alternative Longbarrow Junction was taken. Impacts to other PRow are not anticipated to result in significant effects.

- 4.10.5 Impacts to human health as a result of the construction of the Bored Tunnel Extension are anticipated to be neutral.

Operation

- 4.10.6 The Bored Tunnel Extension will provide new PRow allowing NMU to benefit from greater access to and through the WHS resulting in a significant benefit.

- 4.10.7 Impacts to human health as a result of the operation of the Bored Tunnel Extension are anticipated to be neutral.

4.11 Climate

Key Environmental Receptors

- 4.11.1 As identified in the environmental information, environmental receptors for the climate topic comprise the global climate and, in relation to climate resilience, the DCO Scheme itself. These are also relevant to the Bored Tunnel Extension.

Construction

- 4.11.2 The construction of the new junction will lead to adverse impacts associated with emissions resulting from material use, plant use and energy use. These are anticipated to be a small proportion of UK carbon budgets and would not prevent the UK achieving its carbon reduction targets. Mitigation committed to in the environmental information to reduce emissions through energy use reduction and materials selection would be implemented. No significant effects are anticipated.

Operation

- 4.11.3 There may be a potential impact associated with flood risk due to the removal of permeable land. However, drainage designs would include future climate change allowances to ensure greenfield runoff rates are maintained. No significant effects are anticipated.
- 4.11.4 Operational emissions as a result of changes in traffic flow as a result of the Bored Tunnel Extension are anticipated to be a small proportion of UK carbon budgets and would not prevent the UK achieving its carbon reduction targets. No significant effects are anticipated.

⁴ LA 112 - Population and human health. Available at: <https://www.standardsforhighways.co.uk/prod/attachments/1e13d6ac-755e-4d60-9735-f976bf64580a?inline=true>

4.12 Assessment of Cumulative Effects

Combined effects of the Bored Tunnel Extension

- 4.12.1 Table 4.8 and Table 4.9 provide a summary of the potential combinations of construction and operational impacts upon a single receptor which have been discussed in the topic appraisal above.
- 4.12.2 Combined effects experienced by designated sites as a result of Air Quality and Biodiversity impacts, and related to climate change and flood risk are considered above and so are not considered further here.
- 4.12.3 Receptors relevant to the materials and waste topic are not considered vulnerable to combined effects and so have not been considered further here.

Table 4.8 Summary of potential combined construction impacts

Receptor	AQ	L VIA	Bio	Noise	G & S	Water	People	Discussion
Recreational users of PRow within the River Till floodplain								Users of the local PRow network may be impacted by changes in air quality due to construction, noise generated during construction, and visually by the construction works. Diverted users of the closed WSTO6B may also be among those affected. Due to the transitory nature of the exposure, and temporary construction phase, impacts as a result of noise and air quality are not anticipated to be large. Therefore, any cumulative effect is anticipated to be no larger than the significant adverse visual effect predicted.
Hill Farm Cottages								Residents of Hill Farm Cottages may be impacted by changes in air quality due to construction, noise generated during construction, and visually by the construction works. Due to the location of Hill Farm Cottages, air quality impacts are likely to be relatively limited. Both noise and landscape effects have the potential to be significant. Therefore, any cumulative effect is anticipated to be of greater significance than the individual effects in isolation, but would be temporary in nature.
Residents of Winterbourne Stoke								Residents of Winterbourne Stoke may be impacted by noise generated during construction, and visually by the construction works. Both noise and visual effects have the potential to be significant. Therefore, any cumulative effect is anticipated to be of greater significance than the individual effects in isolation, but would be temporary in nature.
The River Till								During construction, air quality impacts from plant equipment and construction dust to the River Till SSSI and River Avon SAC designations are not considered to be significant. There is potential for release of contaminants from the works to surface water or because of mobilisation of contaminants from known contaminated sites; however, these impacts would be avoided through the implementation of best practice measures contained within the OEMP. Impacts to the River Till caused by a reduction of groundwater baseflow as a result of abstraction would be controlled through application for abstraction licences from the Environment Agency. Any cumulative effect is therefore not anticipated to be significant.

Receptor	AQ	LVI/A	Bio	Noise	G & S	Water	People	Discussion
Chalk aquifer								There is potential for release of contaminants from the works to groundwater or because of mobilisation of contaminants from known contaminated sites; however, these impacts would be avoided through the implementation of best practice measures contained within the OEMP. Impacts to aquifer as a result of abstraction would be controlled through application for abstraction licences from the Environment Agency. Any cumulative effect is therefore not anticipated to be significant.

Table 4.9 Summary of potential combined operational impacts

Receptor	AQ	LVI/A	Bio	Noise	G & S	Water	People	Discussion
Recreational users on byways within the River Till floodplain								Users of the local PRoW network may be impacted by operational noise generated by traffic, and visually by the Alternative Longbarrow Junction. Diverted users of WSTO6B re-routed by the Bored Tunnel Extension would also be among those affected. Due to the transitory nature of the exposure, impacts as a result of noise are not anticipated to be large. The Bored Tunnel Extension would likely result in significant adverse visual effects. Other than those committed to in the OEMP, landscaping mitigation measures are not currently taken into account in this report but would be considered as an integral part of the overall design of the Alternative Longbarrow Junction (see paragraph 4.4.9). Overall, any cumulative effect is anticipated to be no larger than the significant visual effect predicted.
Hill Farm Cottages								The location of the Alternative Longbarrow Junction is likely to increase traffic noise levels from the junction at Hill Farm Cottages. However, these receptors will experience a large reduction in traffic noise from the old A303. Therefore, a significant adverse noise effect is unlikely at these receptors. The Alternative Longbarrow Junction and associated lighting columns and signage has the potential to result in significant adverse visual effect at Hill Farm Cottages. Other than those

Receptor	AQ	L/VIA	Bio	Noise	G & S	Water	People	Discussion
								committed to in the OEMP, landscaping mitigation measures are not currently taken into account in this report but would be considered as an integral part of the overall design of the Alternative Longbarrow Junction (see paragraph 4.4.9). Overall, any cumulative effect is anticipated to be no larger than the significant visual effect predicted.
Residents of Winterbourne Stoke								The location of the Alternative Longbarrow Junction may encourage some drivers to use the section of the B3083 north of Winterbourne Stoke to Shrewton, which may result in air quality and noise impacts to the residents of Winterbourne Stoke. These impacts are not anticipated to result in significant effects due to reductions in existing traffic flows. The Alternative Longbarrow Junction and associated lighting columns and signage has the potential to result in significant adverse visual effect for the residents of Winterbourne Stoke. Other than those committed to in the OEMP, landscaping mitigation measures are not currently taken into account in this report but would be considered as an integral part of the overall design of the Alternative Longbarrow Junction (see paragraph 4.4.9). Overall, any cumulative effect is anticipated to be no larger than the significant adverse visual effect predicted.
Receptors on the local road network								The location of the Alternative Longbarrow Junction may encourage some drivers to use the section of the B3083 north of Winterbourne Stoke to Shrewton, which may result in air quality and noise impacts to the residents of Shrewton. Adverse impacts on human air quality receptors along these routes are not anticipated to be significant due to the good baseline air quality in the area. Due to the existing low traffic flows, this is likely to result in a significant adverse effect for noise. Overall, any cumulative effect is anticipated to be no larger than the significant noise effect predicted.
The local river network								Localised changes in air quality from traffic emissions close to the designated sites at River Till SSSI and River Avon SAC are likely to be not significant. Impacts to the River Till as a result of changes to groundwater flow associated with underground structures comprising the tunnel and portal foundations are not likely to result in significant effects. Any cumulative effect is therefore not anticipated to be significant.
WHS								The proposed location for the tunnel portal is outside of the WHS, which would provide an area shielded from traffic noise and provide a beneficial effect for users of the affected area of the WHS. The removal of the existing Longbarrow Roundabout

Receptor	AQ	LVIA	Bio	Noise	G & S	Water	People	Discussion
								as part of the Bored Tunnel Extension is anticipated to result in a beneficial visual impact for users of the WHS. Users of the WHS would also have greater access to the WHS as a result of the provision of PRow proposed by the Bored Tunnel Extension. Overall, a significant beneficial effect is anticipated.

Cumulative effects with other development

- 4.12.4 The majority of the cumulative developments identified by the environmental information for the DCO Scheme are not of a type, and are too distant from the Bored Tunnel Extension, to interact.
- 4.12.5 The environmental information identifies utility works comprising the water pipeline and power cable. The scale of these works is such that in the context of the construction works associated with the Bored Tunnel Extension, any cumulative effects are not considered to be significant.
- 4.12.6 Overall, significant effects resulting from interaction between the Bored Tunnel Extension and the cumulative developments identified in the environmental information are not anticipated.

5 Comparison with the DCO Scheme

5.1 Methodology

5.1.1 This section provides a comparison between the impacts of the Bored Tunnel Extension identified in Section 4 and the impacts of the DCO Scheme reported in the environmental information. A Red-Pink-Amber-Green (RPAG) scoring system has been used to categorise the findings of the comparison:

- **Red** – the impacts of the Bored Tunnel Extension are likely to result in new adverse significant effects⁵ when compared to the DCO Scheme.
- **Pink** – the impacts of the Bored Tunnel Extension are likely to provide new non-significant adverse effects, increase the level of adverse effects when compared to the DCO Scheme, or reduce the level of beneficial effects when compared to the DCO Scheme. For example:
 - where the Bored Tunnel Extension results in an adverse effect of slight significance, where previously there was no adverse effect, for the DCO Scheme, this is not deemed a significant effect in accordance with the methodology set out in the environmental information and confirmed in the Scoping Opinion; or
 - where an effect of the DCO Scheme has been identified as of moderate (beneficial or adverse) significance, it is deemed to be significant, so if the effect of the Bored Tunnel Extension is of large significance, while the level of effect has been increased, it remains a significant effect.
- **Amber** – the impacts of the Bored Tunnel Extension are likely to provide equivalent effects when compared to the DCO Scheme.
- **Green** – the impacts of the Bored Tunnel Extension are likely to result in new beneficial effects, increase in the level of significant and non-significant beneficial effects, or reduce adverse effects while not removing significant effects, when compared to the DCO Scheme.

5.1.2 No new significant beneficial effects have been identified by this report.

5.1.3 Each environmental topic has been considered against the design features of the Bored Tunnel Extension listed below:

- Retention of the A360 western re-alignment (but with reduced infrastructure when compared to the DCO Scheme);
- Extended bored tunnel compared to the DCO Scheme;

⁵ Significant effects are defined in the environmental information, which is consistent with the approach set out in using topic specific DMRB standards and LA 104, i.e. significant effects can be considered likely to be material to any future decision-making. LA 104 is available at:

<https://www.standardsforhighways.co.uk/prod/attachments/0f6e0b6a-d08e-4673-8691-cab564d4a60a?inline=true>

- More western location of Longbarrow Junction compared to the DCO Scheme;
- Changes to journeys on local roads to those predicted for the DCO Scheme; and
- Changes to PRoW and affected users.

5.1.4 Table 5.1 provides a visual representation of the RPAG scores discussed below set out against the design features listed under 5.1.3.

5.2 Appraisal

Air Quality

Construction

5.2.1 During construction, temporary adverse air quality impacts associated with the removal of the A360 and Longbarrow roundabout directly adjacent to the WHS, along with the A303 west of the A360, and the construction of the A360 re-alignment would remain comparable to the DCO Scheme. Impacts associated with the open cut of the A303 within the WHS would be removed.

5.2.2 The location of the Alternative Longbarrow Junction may introduce new construction dust impacts for receptors at Hill Farm Cottages compared to the DCO Scheme. However these are not anticipated to be significant. Impacts at Winterbourne Stoke would remain unchanged from the DCO Scheme.

5.2.3 Construction traffic impacts are anticipated to be comparable to the DCO Scheme.

Operation

5.2.4 In comparison to the DCO Scheme, the more westerly location of the Alternative Longbarrow Junction is anticipated to increase journey times for road users travelling westbound on the A303 to Shrewton via the A360, as well as for users travelling in the opposite direction. This is anticipated to encourage some road users to use the section of the B3083 north from Winterbourne Stoke to Shrewton as a shorter alternative. This would result in new adverse impacts at human receptors along B3083 and to Parsonage Down NNR and CWS, although in light of the existing good air quality in the area, these impacts are not anticipated to result in significant effects.

5.2.5 Operational impacts associated with the extended tunnel and the A360 western re-alignment are anticipated to be comparable to that of the DCO Scheme.

Cultural Heritage

5.2.6 Please refer to cultural heritage documentation provided separately (Re-determination documents 4.3, 4.4, 4.5 and 4.6).

Landscape and Visual

Construction

Landscape

- 5.2.7 In comparison to the DCO Scheme, the Bored Tunnel Extension would not require open cut works within the WHS and has the potential to result in reduced impacts to the Landscape Character of the WHS. Indirect adverse impacts to the Landscape Character of the WHS from construction activities to the west are still likely. Overall, the significant adverse effects reported in the environmental information would remain significant for the Bored Tunnel Extension.
- 5.2.8 Landscape impacts as a result of the A360 re-alignment and the more western location of the Alternative Longbarrow Junction are anticipated to be greater within LLCA 04. Overall, the significant effects reported in the environmental information would be comparable for the Bored Tunnel Extension.

Visual

- 5.2.9 In comparison to the DCO Scheme, the Bored Tunnel Extension would remove visible construction activity from within the WHS. This is anticipated to reduce impacts to receptors within the WHS when compared to the DCO Scheme. The Bored Tunnel Extension would also have the potential for visual impacts during construction due to the presence of construction plant both at the A360 realignment and the Alternative Longbarrow Junction. The combination of the A360 realignment and the Alternative Longbarrow Junction are of a greater scale than the DCO Scheme. Consequently, although the scale of the adverse impact within the WHS would be reduced, the significant effects reported in the environmental information would likely remain for the Bored Tunnel Extension.
- 5.2.10 Works at the Alternative Longbarrow Junction are likely to result in greater visual impacts to receptors within Winterbourne Stoke and users of the local PRow network when compared to the DCO Scheme, due to relocation of the junction further west. The environmental information for the DCO Scheme reports significant effects for these receptors, with some predicted to experience the highest level of significance. Therefore, the number of significant effects reported in the environmental information would be comparable for the Bored Tunnel Extension, but with increased levels of adverse effect.
- 5.2.11 As a result of the proposed location of the Alternative Longbarrow Junction, the location of the Slurry Treatment Plant may have to be different to that proposed by the DCO Scheme. The alternative location may be more visible for sensitive receptors within the WHS. The effect of construction works for receptors in the WHS is reported as a Very Large Adverse in the environmental information for the DCO Scheme. Moving the Slurry Treatment Plant could potentially worsen this temporary effect, but the level of significance would remain comparable to the DCO Scheme.

Operation

Landscape

- 5.2.12 In comparison to the DCO Scheme, the Bored Tunnel Extension has the potential for further benefits to the landscape character of the WHS through the removal of the cutting within the WHS, and further improved landscape restoration opportunities through the downgrading of the existing A303 to a restricted byway, removing traffic from the WHS. Indirect adverse impacts to the Landscape Character of the WHS are still likely. Overall, the significant beneficial effects reported in the environmental information would be strengthened for both LLCA 14 and 15 for the Bored Tunnel Extension.
- 5.2.13 Landscape impacts as a result of the A360 re-alignment and the more western location of the Alternative Longbarrow Junction are anticipated to be greater within LLCA 04. Overall, the significant effects reported in the environmental information would be comparable for the Bored Tunnel Extension.

Visual

- 5.2.14 The DCO Scheme and the Bored Tunnel Extension have the potential for visual impacts to sensitive receptors within the WHS to improve as a result of the A360 re-alignment and removal of the existing highways infrastructure. In addition, the Bored Tunnel Extension has the benefit of an extended tunnel compared to the DCO Scheme.
- 5.2.15 The combination of the A360 realignment and the Alternative Longbarrow Junction for Bored Tunnel Extension, although further from the WHS, are of a greater scale than the DCO Scheme. Visual impacts of the Bored Tunnel Extension are therefore likely to be at least comparable to the DCO Scheme for visual receptors within the WHS.
- 5.2.16 Compared to the DCO Scheme, the Alternative Longbarrow Junction would likely result in greater visual impacts to receptors within Winterbourne Stoke, due to its proximity to receptors and the inclusion of lighting, potentially introducing a new adverse significant effect.
- 5.2.17 Users of the local PRow network are also likely to be impacted more by the Alternative Longbarrow Junction when compared to the DCO Scheme.

Biodiversity

Construction

- 5.2.18 In comparison to the DCO Scheme, the Bored Tunnel Extension would result in less surface land take within the WHS as a result of the longer tunnel. However, retention of the A360 western re-alignment within the Bored Tunnel Extension proposals, as well as a further location for the Alternative Longbarrow Junction, results in more land take than the DCO Scheme. Overall the adverse impacts caused by the removal of the existing habitat and disturbance to species as a result of the Bored Tunnel Extension are anticipated to be comparable to the DCO Scheme.

- 5.2.19 Construction dust impacts to designated sites are likely to result in an equivalent effect to the DCO Scheme.

Operation

- 5.2.20 In comparison to the DCO Scheme, the Bored Tunnel Extension would allow for a greater degree of north south biodiversity connectivity within the WHS as a result of the longer tunnel.
- 5.2.21 Impacts related to the A360 re-alignment and the Alternative Longbarrow Junction during the operational phase are likely to result in equivalent effects when compared to those for the DCO Scheme reported in the environmental information.
- 5.2.22 Impacts to the River Avon SAC as a result of air quality change are anticipated to be comparable to that of the DCO Scheme (see paragraph 5.2.5). Changes to groundwater flow at the River Till (and River Avon and River Wylye) are anticipated to be comparable to those of the DCO Scheme (see paragraph 5.2.36). Impacts to the Salisbury Plain SAC are also anticipated to be comparable to the DCO Scheme. Overall, effects experienced by these designated sites are anticipated to be comparable to the DCO Scheme and not significant. Section 5.4 discusses implications for the Habitat Regulations Assessment undertaken for the DCO Scheme.

Noise and Vibration

Construction

- 5.2.23 During construction, temporary noise associated with the removal of the A360 and Longbarrow roundabout directly adjacent to the WHS, along with the A303 west of the A360, and the construction of the A360 re-alignment would remain. Construction noise associated with the open cut of the A303 within the WHS would be removed.
- 5.2.24 The environmental information for the DCO Scheme reported that for receptors at Hill Farm Cottages daytime construction noise levels were at the trigger level for a potentially significant adverse effect but did not exceed it, therefore only a small increase in construction noise would be expected to trigger an exceedance. The Bored Tunnel Extension locates Longbarrow Junction closer to these receptors likely resulting in a new significant adverse effect. The significant adverse effect at the closest approach of Winterbourne Stoke to the River Till viaduct identified in the environmental information would remain.
- 5.2.25 Construction traffic noise impacts are anticipated to be comparable to the DCO Scheme.
- 5.2.26 Impacts to PRow users as a result of the Bored Tunnel Extension would be comparable to the DCO Scheme.

Operation

- 5.2.27 Compared to the DCO Scheme, the longer tunnel provided by the Bored Tunnel Extension would extend the area shielded from traffic noise and be beneficial for users of the affected area of the WHS.
- 5.2.28 The location of the Alternative Longbarrow Junction is anticipated to increase journey times for road users travelling westbound on the A303 to Shrewton via the A360, as well for users travelling in the opposite direction. This is anticipated to encourage some drivers to use the section of the B3083 north Winterbourne Stoke to Shrewton as a shorter alternative. Due to the existing low traffic flows, this is likely to result in a significant adverse effect for residential receptors in Shrewton along the B3083 which was not reported in the environmental information.
- 5.2.29 The location of the Alternative Longbarrow Junction further west is likely to increase traffic noise levels at Hill Farm Cottages and in Winterbourne Stoke compared to the DCO Scheme. However, these receptors will still experience a large reduction in traffic noise from the old A303, although the reduction in traffic noise is not as large as for the DCO Scheme. New significant adverse effects are unlikely, though the beneficial effects in this area are likely to be reduced. The significant adverse effect at Foredown House on the north-east edge of Winterbourne Stoke as reported in the environmental information would remain.
- 5.2.30 Impacts to PRoW users as a result of the Bored Tunnel Extension would be comparable to the DCO Scheme.

Geology and Soils

Construction

- 5.2.31 As a result of the longer tunnel, ground contamination that may be present at the current pig farm (CL034) and former Larkhill military light railway (dismantled) (CL025), located east of Longbarrow roundabout, would be avoided.
- 5.2.32 Other likely impacts associated with the A360 re-alignment and the Alternative Longbarrow Junction location are anticipated to provide equivalent effects when compared to those reported in the environmental information for the DCO Scheme.

Operation

- 5.2.33 Likely operational impacts of the Bored Tunnel Extension are anticipated to provide equivalent effects when compared to those reported in the environmental information for the DCO Scheme.

Road Drainage and the Water Environment

Construction

- 5.2.34 The location of the Alternative Longbarrow Junction is within an area vulnerable to a Low risk of surface flooding, whereas the DCO Scheme Longbarrow Junction is not, potentially introducing new impacts. It is

anticipated that drainage proposals would be developed to mitigate this impact, such that there would be no significant effects.

- 5.2.35 Other likely impacts associated with the A360 realignment and extended tunnel are anticipated to provide equivalent effects when compared to those reported in the environmental information for the DCO Scheme.

Operation

- 5.2.36 When compared to the DCO Scheme, the impact of the Bored Tunnel Extension on groundwater flow at the River Till is anticipated to be no more significant than the DCO Scheme. As for the DCO Scheme, changes in groundwater flow impacting the River Avon and River Wylfe are considered unlikely.

- 5.2.37 Other likely impacts associated with the A360 realignment and the Alternative Longbarrow Junction location are anticipated to provide equivalent effects when compared to those reported in the environmental information for the DCO Scheme.

Materials and Waste

Construction

- 5.2.38 The longer tunnel proposed by the Bored Tunnel Extension will generate more tunnel spoil than the tunnel defined within the DCO Scheme. As for the DCO Scheme, it is assumed that there is capacity within the area to the east of Parsonage Down for the additional spoil generated by the Bored Tunnel Extension to be re-used on site, thereby avoiding further impacts to waste facilities. The longer tunnel proposed by the Bored Tunnel Extension also removes the requirement for the open cut within the WHS, thereby reducing available material for landscaping. It has been assumed that a materials balance can be achieved by treating tunnel arisings as appropriate to enable their use in earthworks. Significant effects are not anticipated.
- 5.2.39 Other likely impacts of the Bored Tunnel Extension are anticipated to provide equivalent effects when compared to those reported in the environmental information for the DCO Scheme.

Operation

- 5.2.40 Likely operational impacts of the Bored Tunnel Extension are anticipated to provide equivalent effects when compared to those reported in the environmental information for the DCO Scheme.

People and Communities

Construction

- 5.2.41 Retention of the A360 western re-alignment within the Bored Tunnel Extension proposals, as well as a further location for the Alternative Longbarrow Junction, results in more land take than the DCO Scheme. This has the potential to result in a greater permanent loss in Grade 2, Subgrade 3a and Subgrade 3b best and most versatile land, and impact agricultural

holdings through severance and land loss. However, it is anticipated that effects are likely to be comparable to DCO Scheme.

- 5.2.42 The location of the Alternative Longbarrow Junction would also require WSTO6B to be permanently diverted, which is not required to the same extent for the DCO Scheme. The diversion of byway WSTO6B proposed by the Bored Tunnel Extension has the potential to result in a significant effect not reported in the environmental information for the DCO Scheme.
- 5.2.43 Impacts to human health as a result of the Bored Tunnel Extension are anticipated to be comparable to the DCO Scheme.

Operation

- 5.2.44 The Bored Tunnel Extension will provide new PRow equivalent to the DCO Scheme allowing NMU to benefit from greater access to and through the WHS. This will provide the same significant benefit as the DCO Scheme.
- 5.2.45 Impacts to human health as a result of the Bored Tunnel Extension are anticipated to be comparable to the DCO Scheme.

Climate

Construction

- 5.2.46 The impacts of the Bored Tunnel Extension are likely to result in equivalent effects when compared to the DCO Scheme during the construction phase with regard to compliance with the NPSNN. However, the increased length of tunnelling and the duration of the construction period would result in an increase in construction stage GHG emissions compared to the DCO Scheme.

Operation

- 5.2.47 In comparison to the DCO Scheme, moving Longbarrow Junction westwards may also increase journey times for people using it to access the A303. This may encourage some road users to use local roads, such as the B3083, instead of the Alternative Longbarrow Junction and the A303. Increased journey times may increase greenhouse gas emissions for the Bored Tunnel Extension compared to the DCO Scheme but they are likely to remain broadly comparable overall.
- 5.2.48 Other operational impacts of the Bored Tunnel Extension are likely to provide equivalent effects when compared to the DCO Scheme.

Assessment of Cumulative Effects

Combined effects of the Bored Tunnel Extension in comparison to the DCO Scheme

Construction

- 5.2.49 Table 4.8 sets out the combined effects anticipated as a result of the Bored Tunnel Extension during construction.

5.2.50 The receptors listed below are identified by this report and the environmental information as likely to experience significant adverse effects as a result of combined impacts. The Bored Tunnel Extension is therefore likely to result in comparable cumulative effects for these receptors during construction:

- Recreational users of PRoW within the River Till floodplain; and
- Residents of Winterbourne Stoke.

5.2.51 The receptors at Hill Farm Cottages are identified by this report as likely to experience significant adverse effects as a result of combined impacts, which have not been identified by the environmental information. The Bored Tunnel Extension is therefore likely to result in new significant adverse cumulative effect for receptors at Hill Farm Cottages during construction.

5.2.52 As for the DCO Scheme, cumulative impacts to the River Till and chalk aquifer as a result of the Bored Tunnel Extension are not anticipated to result in significant cumulative effects.

Operation

5.2.53 Table 4.9 sets out the combined effects anticipated as a result of the Bored Tunnel Extension during operation.

5.2.54 Recreational users of PRoW within the River Till floodplain are identified by this report and the environmental information as likely to experience significant adverse effects as a result of combined impacts. The Bored Tunnel Extension is therefore likely to result in comparable cumulative effects for these receptors during operation.

5.2.55 The receptors at Hill Farm Cottages are identified by this report as likely to experience significant adverse effects as a result of combined impacts, but have not been identified by the environmental information. The Bored Tunnel Extension is therefore likely to result in new significant adverse cumulative effect for receptors at Hill Farm Cottages during operation.

5.2.56 During operation, the residents of Winterbourne Stoke are predicted to experience a large beneficial effect in the environmental information for the DCO Scheme as a result of combined improvements in air quality, traffic noise and the visual impact of reduced traffic. The Bored Tunnel Extension is anticipated to lessen the benefit anticipated for the DCO Scheme as the location of the Alternative Longbarrow Junction would encourage some drivers to use the B3083 north of Winterbourne Stoke. The location of the Alternative Longbarrow Junction is also anticipated to introduce a new significant adverse visual effect for residents of Winterbourne Stoke when compared to the DCO Scheme. Overall, the Bored Tunnel Extension is likely to reduce the large beneficial effect predicted by the environmental information for the DCO Scheme, but the significant beneficial effect would remain.

- 5.2.57 In addition, further journeys on the B3083 may result in combined air quality and noise impacts to residents in the south of Shrewton, resulting in a combined significant effect not predicted by the DCO Scheme.
- 5.2.58 The environmental information for the DCO Scheme predicts a large beneficial effect for users of the WHS, due to the removal of a large proportion of the A303 from the WHS. This results in beneficial impacts for noise, visual and heritage. The Bored Tunnel Extension would remove the A303 from the WHS completely resulting in a greater benefit to users of the WHS, with the significant beneficial effect remaining.

Cumulative effects with other development

- 5.2.59 Due to the similarity of the DCO Scheme and the Bored Tunnel Extension, no new significant effects as a result of interactions with other developments are anticipated.

5.3 Order Limits Boundary

- 5.3.1 Compared to the DCO Scheme, the Bored Tunnel Extension extends marginally beyond the DCO Scheme Order Limits boundary at the southern arm and northern edge of the Alternative Longbarrow Junction. No likely significant effects are a direct result of these areas of marginal additional land take and as such the requisite changes to the Order Limits would have no materially different environmental impacts compared to the DCO Scheme.

5.4 Habitats Regulations Assessment

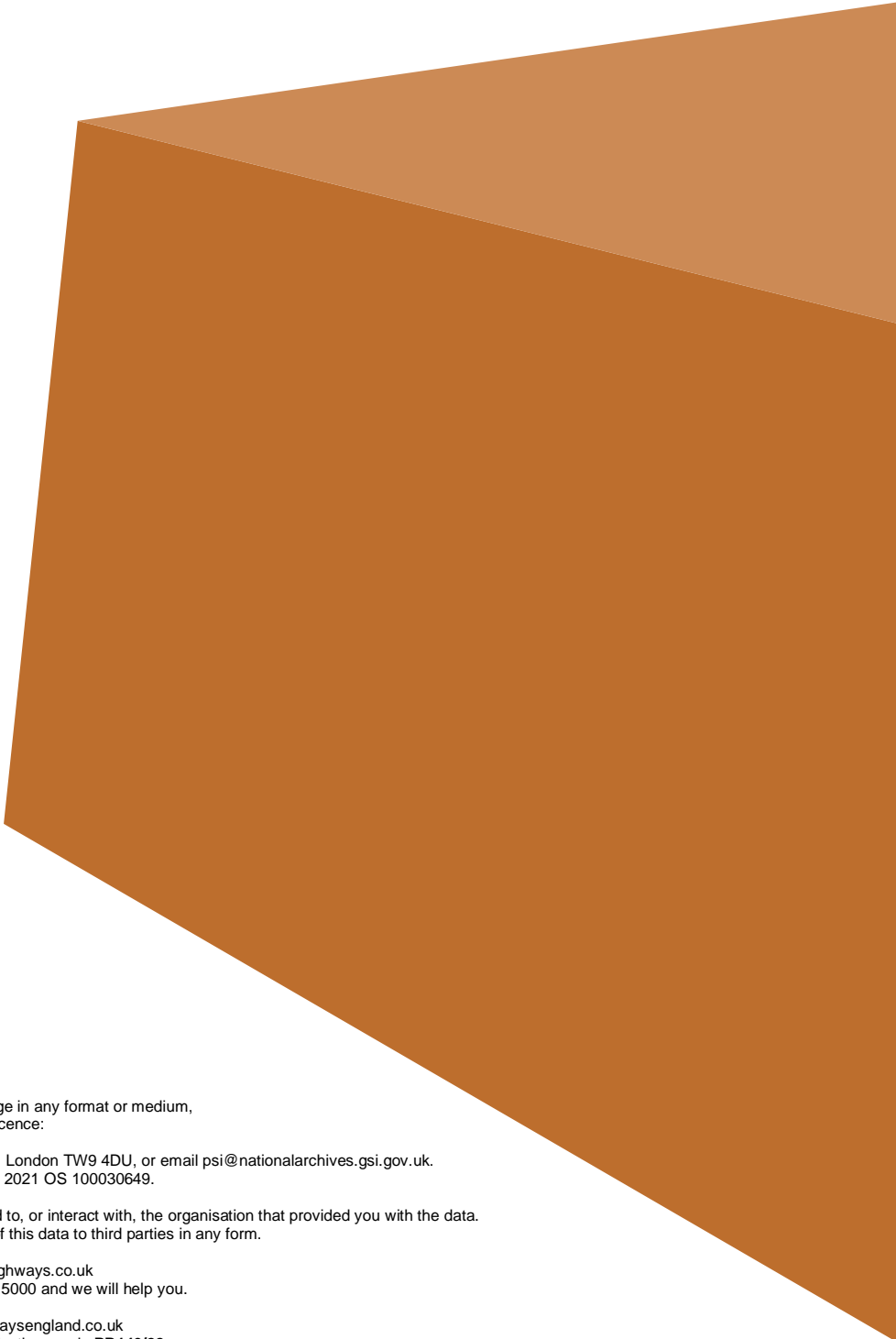
- 5.4.1 ES Appendix 8.24 – Habitat Regulations Assessment Likely Significant Effects Report [APP-265] identifies where the development of the DCO Scheme is likely to lead to significant effects for sites afforded protection under the Conservation of Habitats and Species Regulations 2017. If likely significant effects cannot be dismissed then these sites were further explored in a statement to inform ‘appropriate assessment’ (ES Appendix 8.25 – Habitat Regulations Assessment [APP-266]). Both the River Avon and Salisbury Plain SAC considered by this report were screened into the appropriate assessment but only for certain impact pathways (dust impacts on the SAC and shading impacts on the River Till). Other impact pathways considered were concluded not to result in likely significant effects, due to being imperceptible even in combination with other plans and projects, including impacts on air quality, water quality and water levels and flows. The Bored Tunnel Extension would not alter that assessment.
- 5.4.2 ES Appendix 8.25 identifies dust deposition during construction as the impact pathway which may affect the Salisbury Plain SAC. As discussed in Sections 4 and 5 of this report, construction dust impacts as a result of the Bored Tunnel Extension are not anticipated to result in significant effects, with the application of mitigation measures contained within the OEMP.
- 5.4.3 ES Appendix 8.25 identifies shading of the River Till as a result of viaduct construction which may affect River Avon SAC. This is not relevant to this report as the Bored Tunnel Extension does not change the River Till

viaduct. In addition, Sections 4 and 5 of this report confirm that effects related to groundwater flow at the River Till are anticipated not to be significant.

Table 5.1 The DCO Scheme and the Bored Tunnel Extension comparison

Aspect Compared (refer to para 4.1.2)	Air Quality	Landscape	Visual	Biodiversity	Noise and Vibration	Geology and Soils	Road Drainage and the Water Environment	Materials and Waste	People and Communities	Climate	Cumulative Effects Assessment
Construction											
Retention of the A360 western re-alignment with reduced infrastructure											
Extended tunnel											
More western location of Longbarrow Junction											
Changes to journeys on local roads		n/a	n/a	n/a		n/a	n/a	n/a	n/a		
Public Rights of Ways	n/a	n/a		n/a		n/a	n/a	n/a		n/a	
Operation											
Retention of the A360 western re-alignment with reduced infrastructure											
Extended tunnel											
More western location of Longbarrow Junction											
Changes to journeys on local roads		n/a	n/a	n/a		n/a	n/a	n/a	n/a		
Public Rights of Ways	n/a	n/a		n/a		n/a	n/a	n/a		n/a	
Key											
	The impacts of the Bored Tunnel Extension are likely to result in new adverse significant effects when compared to the DCO Scheme										

	<p>The impacts of the Bored Tunnel Extension are likely to provide new non-significant adverse effects, increase the level of adverse effects when compared to the DCO Scheme, or reduce the level of beneficial effects when compared to the DCO Scheme. For example:</p> <ul style="list-style-type: none"> ○ where the Bored Tunnel Extension results in an adverse effect of slight significance, where previously there was no adverse effect, for the DCO Scheme, this is not deemed a significant effect in accordance with the methodology set out in the environmental information and confirmed in the Scoping Opinion; or ○ where an effect of the DCO Scheme has been identified as of moderate (beneficial or adverse) significance, it is deemed to be significant, so if the effect of the Bored Tunnel Extension is of large significance, while the level of effect has been increased, it remains a significant effect.
	<p>The impacts of the Bored Tunnel Extension are likely to provide equivalent effects when compared to the DCO Scheme.</p>
	<p>The impacts of the Bored Tunnel Extension are likely to result in new beneficial effects, increase the level of significant and non-significant beneficial effects, or reduce adverse effects while not removing significant effects, when compared to the DCO Scheme.</p>
n/a	<p>Aspect not applicable to the topic.</p>



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