A303 Amesbury to Berwick Down

TR010025

Volume 6

6.3 Environmental Statement Appendices

Appendix 8.24: Habitat Regulations Assessment (HRA) Likely Significant Effects Report

APFP Regulation 5(2)(a)

Planning Act 2008

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

October 2018

Table of contents

Tables

Foreword

The A303 Amesbury to Berwick Down scheme (the Scheme) forms part of a package of improvements for upgrading the A303/A358 corridor, improving this vital connection between the South West and London and the South East and including the upgrade of remaining single carriageway sections on the route to dual carriageway. This investment is stated a priority project in the National Infrastructure Plan and Government's commitment is confirmed in the the Road Investment Strategy (2015-2020). Subject to achieving an approved Development Consent Order (DCO), preliminary works are planned to start in 2020 with the main construction works following in 2021, and the Scheme is due to open to traffic in 2026.

Objectives for the Scheme have been formulated both to address identified problems and to take advantage of the opportunities that new infrastructure would provide. The objectives are defined by the Department for Transport (DfT):

- **Transport** - To create a high quality route that resolves current and predicted traffic problems between the South East and the South West.
- **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 (WHS) and make it easier to reach and explore.
- **Environment and Community** - To improve biodiversity along the route and to provide a positive legacy to nearby communities.

The objectives would be achieved by providing a high quality, two lane dual carriageway on the A303 trunk road between Amesbury and Berwick Down in Wiltshire. The Scheme would resolve traffic problems and, at the same time, protect and enhance the Stonehenge, Avebury and Associated World Heritage Site (WHS). The Scheme would be approximately 8 miles (13km) long and comprise the following key components:

a) A northern bypass of Winterbourne Stoke with a viaduct over the River Till valley;

b) A new junction between the A303 and A360 to the west of and outside the WHS, replacing the existing Longbarrow Junction;

c) A twin-bore tunnel approximately 2 miles (3.3km) long, past Stonehenge; and

d) A new junction between the A303 and A345 at the existing Countess roundabout.

1 Introduction

1.1 Background

1.1.1 AmW has been appointed by Highways England to undertake the various assessments comprising the Habitats Regulations Assessment of the A303 Amesbury to Berwick Down scheme (hereafter called the Scheme). The screening assessment set out in this document provides information to enable the Secretary of State for Transport (and the Planning Inspectorate, acting on its behalf) to determine whether an appropriate assessment is required pursuant to Regulation 63(2) of the Conservation of Habitats and Species Regulations 2017. The A303 is a trunk road in Southern England, connecting the M3 and the A30. It is one of the main routes from London to South West England, and on the most direct strategic route from the South East to the South West for business and tourists. However, the existing A303 has a number of traffic bottle-necks limiting accessibility to the South West with consequential impact on the region's economy and growth.

1.1.2 The Scheme would be approximately 8 miles (nearly 13 kilometres) long and would comprise the construction of a new dual two-lane carriageway between Amesbury and Berwick Down with the following key features:

- a bypass to the north of Winterbourne Stoke with a viaduct over the River Till valley;
- grassland habitat creation that would complement the adjacent Parsonage Down NNR;
- a new Longbarrow junction with the A360 to the west of and outside the WHS, with the A303 passing under the junction;
- a section through the WHS with a twin-bore tunnel past Stonehenge at least 1.8 miles (approximately 3km) long;
- an upgraded junction with the A345 at Countess Roundabout to the north of Amesbury, with the A303 passing over the junction;
- the conversion of the existing A303 through the WHS into a route for walking, cycling and horse riding; and
- new 'green bridges' at various points along the length of the Scheme to connect existing habitats and allow the movement of wildlife, maintain existing agricultural access and provide crossings for existing and new bridleways and public footpaths.

1.1.3 The UK is bound by the terms of the Habitats Directive (92/43/EEC). Under Article 6(3) of the Habitats Directive, an appropriate assessment is required, where a plan or project is likely to have a significant effect upon a European Site, either individually or in combination with other projects. The Directive is implemented in the UK by the Conservation of Habitats and Species Regulations 2017 (the "Habitats Regulations").

1.1.4 The objective of this Report is to identify any aspects of the Scheme that would be likely to lead to significant effects upon any sites afforded protection under the Habitats Regulations. If likely significant effects cannot be dismissed then these will be explored further in a statement to inform 'appropriate assessment' (Appendix 8.25 of the Environmental Statement) in order to enable the Secretary of State to determine whether adverse effects on integrity of any European sites might result, and what mitigation or avoidance measures are needed to remove such effects. In

the UK, this comprises Special Areas of Conservation (SACs), candidate Special Areas of Conservation (cSACs), and Special Protection Areas (SPAs). In accordance with Government policy, assessment is applied to sites designated under the Ramsar Convention as Wetlands of International Importance (Ramsar sites) and potential SPAs (pSPAs). These sites are referred to collectively in this Report as "European Sites".

1.1.5 The Scheme requires a crossing of the River Till, north of Winterbourne Stoke. This River is a component of the European designated River Avon SAC. The Scheme also involves working adjacent to a second part of the River Avon SAC: the River Avon System Site of Special Scientific Interest (SSSI,) east of Amesbury. Salisbury Plain SAC is located immediately adjacent to the Scheme boundary near Bulford camp in the eastern part of the Scheme and is adjacent to the Scheme boundary at two locations: (i) at the Diversion Route to the north of the Scheme and (ii) at Parsonage Down near the western end of the Scheme. Salisbury Plain SPA is located adjacent to the Scheme boundary along the Diversion Route to the north of the Scheme.

1.2 Legislative Context

1.2.1 The need for Habitat Regulations Assessment is set out within Article 6 of the Habitats Directive, and transposed into UK law by the Conservation of Habitats and Species Regulations 2017. The ultimate aim of the Habitats Directive is to "*maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest*" (Article 2(2)). This aim relates to habitats and species, not the European Sites themselves, although the European Sites have a significant role in delivering favourable conservation status.

1.2.2 Under the Habitats Directive consent should only be granted for plans and projects once the relevant competent authority has ascertained that there will either be no likelihood of significant effects, or no adverse effect on the integrity of the European Site(s) in question. Where an Appropriate Assessment has been carried out and does not result in a finding that there is no such adverse effect, consent will only be granted if there are no alternative solutions and there are Imperative Reasons of Over-riding Public Interest (IROPI) for the development and compensatory measures have been secured.

1.2.3 In order to ascertain whether or not site integrity will be affected, an Appropriate Assessment should be undertaken of the plan or project in question. The competent authority is entitled to request the applicant to produce such information as the competent authority may reasonably require for the purposes of the assessment, or to enable it to determine whether an appropriate assessment is required. Plate 1 provides the legislative basis for an Appropriate Assessment.

Habitats Directive 1992

Article 6 (3) states that:

"*Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives."*

Conservation of Habitats and Species Regulations 2017

Regulation 63 states that:

"*A competent authority, before deciding to … give any consent … for, a plan or project which – (a) is likely to have a significant effect on a European site … must make an appropriate assessment of the implications for the plan or project in view of that site's conservation objectives…*

In light of the conclusions of the assessment, and subject to regulation 64 [IROPI where negative assessment], the competent authority may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site."

Plate 1. The legislative basis for Appropriate Assessment

1.2.4 Over the years, 'Habitats Regulations Assessment' has come into wide currency to describe the overall process set out in the Habitats Regulations, from screening through to identification of IROPI. This has arisen in order to distinguish the overall process from the individual stage of "Appropriate Assessment". Throughout this Report the term HRA is used for the overall process and restricts the use of Appropriate Assessment to the specific stage of that name.

1.2.5 In relation to Nationally Significant Infrastructure Projects, the Secretary of State acts as the competent authority with a duty to conduct an HRA.

1.3 Quality Assurance

1.3.1 All Ecologists working on this project are members of (at the appropriate level) the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow their code of professional conduct (CIEEM, 2017) when undertaking ecological work.

2 Methodology

2.1 Introduction

2.1.1 The HRA has been carried out with reference to the general EC guidance on HRA[1] and PINS Advice Note 10. This report has also been prepared in accordance with Highways England guidance on HRA as set out in Design Manual for Roads & Bridges, Volume 11 Section 4 Part 1 (HD44/09). Annex C of that document sets out the template for Likely Significant Effects assessment that should be completed. These form the bulk of this report (Tables 3.1 to 3.7). Appendix B of this document contains the PINS Screening Matrices that are required by PINS Advice Note 10.

2.1.2 PINS Advice Note Ten (Habitat Regulations Assessment relevant to Nationally Significant Infrastructure Projects, version 8, November 2017) requires an evaluation of the potential for the Scheme Project to require other consents which could also require Habitats Regulations Assessment by different competent authorities, and a statement as to whether the Scheme boundary overlaps with devolved administrations or other European Economic Area (EEA) States. It is confirmed that the Scheme boundary does not overlap with areas of devolved administrations or with those of other EEA States.

2.1.3 Highways England has its own HRA processes outlined in the Design Manual for Roads and Bridges. Annex D of HD44/09 of DMRB sets out a template for No Significant Effects Reports. This method was used to identify where, following the assessment in Tables 3.1 to 3.7 of the main report text, an entire European site can be screened out with regard to all potential pathways of impact. Following the analysis presented in this document, No Significant Effect Reports are possible for Chilmark Quarries SAC, Mottisfont Bats SAC and Mells Valley SAC. These No Significant Effect Reports are presented in Appendix C of this document.

2.1.4 Plate 2 outlines the stages of HRA according to the Design Manual for Roads and Bridges. This corresponds with that in PINS Advice Note 10.

[1] European Commission (2001): Assessment of plans and projects significantly affecting Natura 2000 Sites: Methodological Guidance on the Provisions of Article 6(3) and 6(4) of the Habitats Directive.

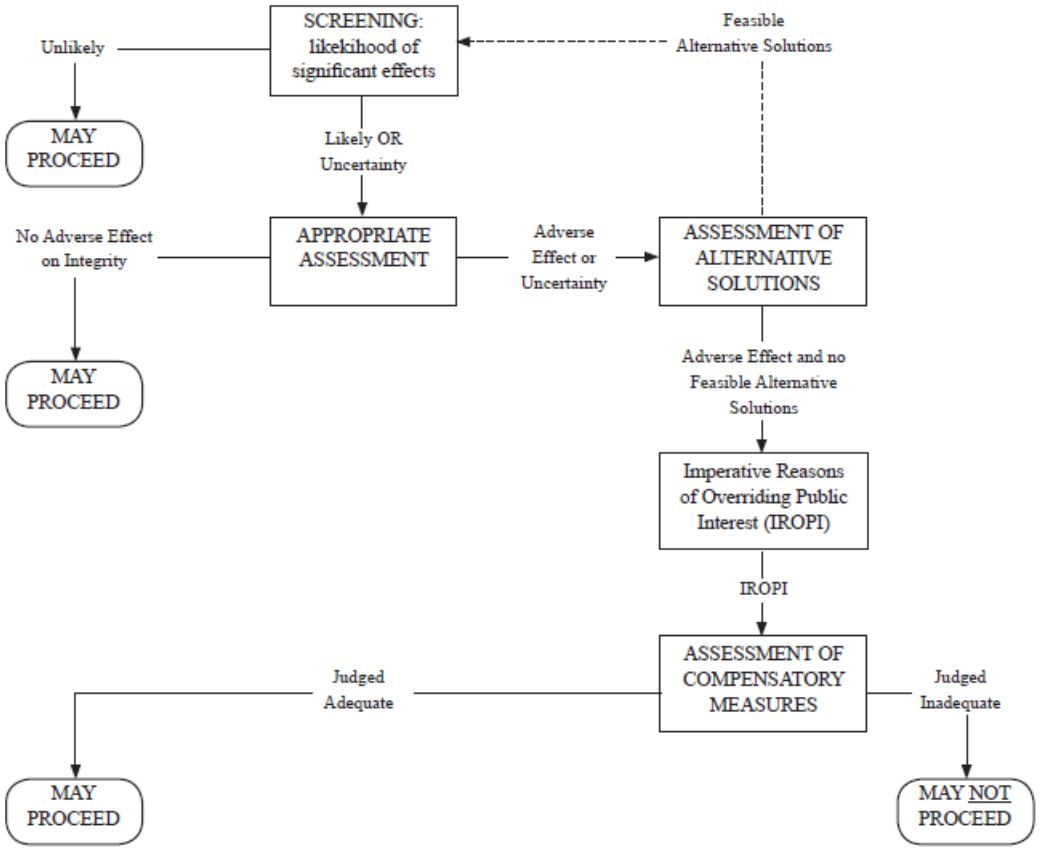

Plate 2. Generic Screening Process for Habitat Regulations Assessment. Source DMRB Vol 11, 2009[2].

2.2 Description of HRA Tasks

2.2.1 The HRA covers the construction and operation phases of the Scheme. The Scheme is not considered to have a decommissioning stage as it is expected to be in place in perpetuity. Therefore no decommissioning impacts are discussed in this report.

Likely Significant Effects (LSE)

2.2.2 Following evidence gathering, the first stage of any Habitats Regulations Assessment is a Likely Significant Effect (LSE) test - essentially a risk assessment to decide whether the full subsequent stage known as Appropriate Assessment is required. The essential question is:

2.2.3 "*Is the project, either alone or in combination with other relevant projects and plans, likely to result in a significant effect upon European sites?*"

2.2.4 The objective is to 'screen out' those plans and projects that can, without any detailed appraisal, be said to be unlikely to result in significant adverse effects upon European sites, usually because there is no mechanism for an adverse

[2] Design Manual for Roads and Bridges, Volume 11 Section 4 Part 1, HD 44/09. Assessment of Implications (of Highways and/or Roads Projects) on European Sites (including Appropriate Assessment)

interaction with European sites. This stage is undertaken in Chapters 4, 5 and 6 of this report.

2.2.5 Recently, the 'People Over Wind' European Court of Justice ruling[3] has determined that 'mitigation' (i.e. measures that are specifically introduced to avoid or reduce the harmful effects of the project on European sites) should not be taken into account when forming a view on likely significant effects during Task 1 screening. This report therefore reflects the implications of that judgment.

2.2.6 In evaluating significance, we have relied on our professional judgement as well as the results of previous stakeholder consultation regarding development impacts on the European sites.

2.2.7 The purpose of this report is to inform the competent authority's determination of likely significant effects.

2.2.8 A statement to inform the competent authority's appropriate assessment is in the subject of a subsequent report for those impact pathways and European sites where, in the opinion of the authors, a conclusion of No Likely Significant Effect cannot be drawn on the basis of existing data and analysis, or where sufficient uncertainty remains over effects.

2.3 Physical Scope of the Assessment

2.3.1 During the development of a project, an early assessment should be undertaken to confirm whether broadly defined route corridors or the project boundary are associated with any potential constraints on European Sites. The study area for the assessment should be defined on a case-by-case basis reflecting the project and the surrounding environment over which significant effects can reasonably be though to have the potential to occur, both from the project under consideration and also in combination with other projects.

2.3.2 As a general guide, consideration should be given to any European Sites within 2km of the route corridor or project boundary. In addition, consideration should be given to any SACs within 30km where bats are noted as one of the qualifying interests. Similarly, where a project will potentially cross or will lie adjacent to, upstream of, or downstream of, a watercourse which is designated in part or wholly as a SAC or SPA, consideration should be given to potential impacts on European Sites within the same river, lake or reservoir catchment, or at greater distance in an effect pathway exists (for example, in respect to flight paths or feeding areas of birds outside and SPA). Professional judgement should be exercised when considering the effect pathways on mobile species which occupy land outside of the designated site boundary but which are nonetheless, qualifying interests of the site. The potential presence of priority habitats or species should be noted at this stage to inform any subsequent consideration of Imperative Reasons of Overriding Public Interest (IROPI) if required.

2.3.3 Natural England has also confirmed that relevant SSSI risk zones (for the relevant European sites) can be used to screen sites in or out of assessment.

[3] People Over Wind and Sweetman v Coillte Teoranta (C-323/17)

2.3.4 The following European sites are those where pathways have been identified that could potentially have an adverse impact on the integrity of the European site and so are considered further within this HRA:

- River Avon SAC;
- Salisbury Plain SAC;
- Salisbury Plain SPA;
- Chilmark Quarries SAC;
- Mottisfont Bats SAC; and
- Mells Valley SAC.

2.3.5 Citations for the SACs and SPAs discussed in this report are included in Appendix A. A plan indicating the locations of the above listed European sites is provided in Annex A of this report.

2.4 Principal Other Plans and Projects that May Act 'In Combination'

2.4.1 PINS Advice Note Ten: Habitat Regulations Assessment relevant to Nationally Significant Infrastructure Projects states that in assessing in-combination effects the following projects should be considered:

- Projects that are under construction;
- Permitted application(s) not yet implemented;
- Submitted application(s) not yet determined;
- All refusals subject to appeal procedures not yet determined;
- Projects on the National Infrastructure's programme of projects; and
- Projects identified in emerging development plans (e.g. Wiltshire Core Strategy) recognising that much information on relevant proposals will be limited and the degree of uncertainty which may be present.

2.4.2 In order to inform fully the screening process, a number of surrounding plans and projects have been consulted to determine likely significant effects that could arise from the Scheme in combination with these other plans and projects. These were selected because they were the main land use plans and projects that are located within, or surrounding the Scheme, and may interact with the European sites discussed in this report. They are:

- Wiltshire Core Strategy (Adopted 2015);
- Local Transport Plan 3: Joint Strategy for South Hampshire (to 2031);
- Wiltshire Local Transport Plan (2011 – 2026);
- Draft Devizes Neighbourhood plan (2014);
- Winchester District Local Plan Part 1 (Adopted 2013);
- Winchester District Joint Core Strategy DPD (Adopted 2013);
- Southampton Adopted Core Strategy (amended 2015);
- Warminster Neighbourhood Plan (2015 – 2026);
- New Forest District Local Plan (2016 – 2036);
- Test Valley Borough Revised Local Plan (Adopted 2016); and
- Army Basing Programme (announced 2015).

2.4.3 The remainder of this report consists of a series of matrices which set out the analysis of likely significant effects for each European site. The presentational

format follows that of the Design Manual for Roads and Bridges. An appendix to this report contains the screening matrices required by PINS Advice Note 10.

3 Likely Significant Effect Matrices

Table 3.1 Screening Matrix: River Avon SAC (UK0013016)

Project Name:	A303 Amesbury to Berwick Down	
Natura 2000 Site under Consideration:	River Avon SAC (UK0013016)	
Date:	**Author (Name / Organisation):**	**Verified (Name / Organisation):**
23/08/18	Ashley Welch/AECOM Milly Kent/AECOM	James Riley/AECOM
Description of Project *Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the European Site by virtue of*:		
Size and scale (road type and probable traffic volume)	1)	Improvements are proposed to the A303 between Amesbury and Berwick Down. The following route has been selected: 13.2km overall in length of dual carriageway including an approximately 3.3km tunnel with a bypass to the north of Winterbourne Stoke, the eastern portal to the east of 'The Avenue' and the western tunnel portal located to the south of Normanton Gorse.
Land-take	2) 3) 4) 5)	There will be no direct habitat loss associated with the proposed works. The River Till (part of the SAC) will be crossed by a new viaduct, which will involve the construction of the viaduct itself, extensive embankments approaching the viaduct and a temporary haul road across the valley. Each deck of the viaduct will be supported by five columns, with spans over 40m wide. There is an 8m easement between built works and the bank top. This is a requirement for all watercourses designated as 'main river' in order to ensure that the Environment Agency has full access to these features for maintenance and inspection purposes to ensure flood risk is not exacerbated. For the same reasons, the temporary haul road will also have its abutments outside the SAC. The crossing of the River Avon itself will involve re-surfacing and maintenance works on the existing bridge rather than creating any new crossing, although there are likely to be works on existing embankments near the bridge.
Distance from the European Site or key features of the site (from edge of the project assessment corridor)	6)	0km. The new viaduct over the River Till will involve construction across the River Avon SAC. Key features of the site (notably water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation) are present within this location and will therefore be crossed by the project corridor.
Resource requirements (from the European Site or from areas in proximity to the site, where of relevance to consideration of impacts)	7)	None required

Emissions (e.g. polluted surface water runoff – both soluble and insoluble pollutants, atmospheric pollution)	**Water quality** 8) Measures are embedded into the Scheme to comply with the Environmental Damage (Prevention and Remediation) (England) Regulations 2015 and Environmental Permitting (England and Wales) Regulations 2010 during both construction and operation to ensure pollution will not arise. The measures are derived from the Pollution Prevention Guidelines (PPG5) Works or Maintenance In or Near Water and the Design Manual for Roads and Bridges (Volume 11, Section 3, Part 10: Road Drainage and the Water Environment). More details of all measures are provided in Chapter 11 of the Environmental Statement (Road Drainage and Water Environment). 9) Construction period measures are incorporated into an Outline Environment Management Plan (OEMP) submitted as part of the application. The measures in the OEMP will then be applied in practice by the appointed contractors who will incorporate them as contractual requirements in the Construction Environmental Management Plan that will be implemented and audited on site. Operational measures have been physically incorporated into the Scheme engineering design. **Air quality** 10) The Scheme has the potential to affect local air quality at the SAC through changes in traffic flows during construction, as a result of temporary traffic management measures and/or additional vehicles travelling to and from the construction site transporting materials, plant and labour. There would also be the potential for localised emissions during construction work around junctions along the diversion route or during the closure of minor roads east of the River Avon. 11) During operation, the Scheme has the potential to affect local air quality. The Winterbourne Stoke bypass viaduct at the River Till will introduce road NOx emissions to a location which is not currently subject to them, although it will also reduce NOx emissions on the current route of the A303 across the River Till.
Excavation requirements (e.g. impacts of local hydrogeology)	12) Common law requires that property or land is not used in such a way that it increases the risk of flooding. To comply with these requirements: i. the road is designed to minimise the risk of it flooding by incorporating current design standards and future climate change allowances to improve its resilience; ii. the road and its drainage measures are designed to minimise the risk of causing flooding elsewhere through the use of drainage features to detain and infiltrate runoff from all events expected to occur with 1% annual probability or more frequently. 13) The River Till viaduct is designed to be a five span structure with the location and orientation of the piers and foundations optimised to place them as far away from the River Till as possible and to minimise obstruction of water flows over the floodplain and comply with common law requirements not to increase flood risk.

	14) The temporary crossing for construction will be a bailey bridge-type structure high enough to avoid causing any flood risk, but not so high that it would require extensive embankments through the floodplain. 15) Construction of the route will involve tunnel construction below ground level. Tunnel construction techniques (such as the use of a Tunnel Boring Machine) are adopted to limit the requirement for dewatering during construction in order to comply with the Water Abstraction and Impounding (Exemptions) Regulations 2017. 16) Cuttings and/or embankments will be required for above ground elements.
Transportation requirements	17) A temporary haul road will need to be constructed for plant traffic during the construction phase. This will be located outside of the River Avon SAC as referenced earlier.
Duration of construction, operation, etc.	18) Construction of the tunnel has been estimated at between 45 to 54 months depending on the construction methodology. A working assumption is therefore that the construction of the Scheme may take in the region of 5 years.
Other	**Vibration and noise** 19) Fish species within the River Avon SAC may be adversely affected by vibration and noise during construction. This is potentially true of all Annex II species for which the site is designated: sea lamprey (*Petromyzon marinus*), brook lamprey (*Lampetra planeri*), Atlantic salmon (*Salmo salar*) and bullhead (*Cottus gobio*). 20) With regard to piling noise, the scheme will use a low noise piling method (bored piling) for purposes of noise attenuation reasons to avoid disturbance to residents of Winterbourne Stoke. This has the incidental benefit of also avoiding piling noise or vibration impacts on fish. **Shading** 21) Localised shading from new permanent river crossing could lead to a reduction in plant growth (depending on extent of shading) and adversely affect the qualifying features of the SAC. Shading impacts may directly affect floral species, such as those associated with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation. Shading may also adversely affect species that depend on specific vegetation communities, such as Desmoulin's whorl snail (*Vertigo moulinsiana*). Changes in vegetation may also affect the habitats on which fish species depend. **Non-native species** 22) In order to comply with the Wildlife & Countryside Act 1981 (as amended) which make it illegal to spread certain non-native species (listed in Schedule 9 of the Act) the contractor will implement control measures as necessary to prevent introduction or spread of invasive species.

Description of Avoidance and/or Mitigation Measures: Describe any assumed (plainly established and uncontroversial) mitigation measures, including information on:

Nature of proposals	23) No specific mitigation measures intended to address potential effects on the River Avon SAC are taken into account in this likely significant effects assessment, in line with case law.
Location	N/A
Evidence for effectiveness	N/A
Mechanism for delivery (legal conditions, restrictions or other legally enforceable obligations)	N/A

Characteristics of European Site(s) A brief description of the European Site should be produced, including information on:	
Name of European Site and its EU code	24) River Avon SAC (UK0013016)
Location and distance of the European Site from the proposed works	25) 0m
European Site size	26) 416.57 ha
Key features of the European Site including the primary reasons for selection and any other qualifying interests	27) Annex I habitats that are a primary reason for selection: i. Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation 28) Annex II species that are a primary reason for selection: *i.* Desmoulin`s whorl snail ii. Sea lamprey *iii.* Brook lamprey iv. Atlantic salmon v. Bullhead
Vulnerability of the European Site – any information available from the standard data forms on potential effect pathways	29) The following threats and pressures are taken from the Natural England Site Improvement Plan for the SAC[4]: i. Physical modification ii. Siltation iii. Water pollution iv. Water abstraction v. Changes in species distributions vi. Invasive species vii. Hydrological changes viii. Inappropriate weed control ix. Change in land management x. Habitat fragmentation
European Site conservation objectives – where these are readily available	30) The Conservation Objectives for the SAC state: i. Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring: ii. The extent and distribution of qualifying natural habitats and habitats of the qualifying species;

[4] Public access/disturbance is also listed; however, the SIP covers the Avon Valley SPA and the public access pressure relates to SPA interest features not the SAC

	iii. The structure and function (including typical species) of qualifying natural habitats; iv. The structure and function of the habitats of qualifying species; v. The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely; vi. The populations of qualifying species; and vii. The distribution of qualifying species within the site.

Assessment Criteria

Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the European Site.

31) No other plans and projects have been identified which would act 'in combination' with this Scheme.

32) For each individual element, reference is made to the threats and pressures outlined in the River Avon SACs Site Improvement Plan[5]. The scheme will not spread invasive species as there are none present in the section of the River Till SAC where works will take place and the contractor will implement control measures as necessary to prevent introduction or spread of invasive species in order to comply with the Wildlife & Countryside Act 1981. The scheme will not cause changes in land management.

Water quality

33) Construction and operation of the Scheme theoretically carries the risk of effects on water quality including: surface water run-off; siltation downstream due to excavation of materials and the subsequent deposition of soils, sediments and other construction materials; spillage of fuels or other contaminating substances and the mobilisation of contamination following disturbance of contaminated ground or groundwater, release or leaching of substances (e.g. cement or grout) used in the tunnelling process, which may negatively impact groundwater quality.

Water levels/flows

34) Dewatering activities during construction, if required, could cause drawdown of the local water table. Water abstraction is considered a pressure/threat to the SAC and could potentially adversely affect rivers with floating vegetation often dominated by water-crowfoot (H3260), or with populations of sea lamprey (S1095), brook lamprey (S1095), Atlantic salmon (S1106) or bullhead (S1163).

35) The presence of underground structures (piers) for the River Till viaduct during operation could theoretically cause interference to groundwater flow in close proximity to the internationally designated groundwater-fed Rivers Avon and Till that could affect habitats and/or species. Physical modification of the river has the potential to affect floating vegetation often dominated by water-crowfoot (H3260), sea lamprey (S1095), brook lamprey (S1095), Atlantic salmon (S1106), bullhead (S1163) and Desmoulin's whorl snail (S1016). However, changes to river hydrology are a potential threat to Desmoulin's whorl snail only.

Disturbance to key species (blocking of fish passage)

36) Any placement of new construction within the River Till or River Avon could prove a blockage to fish passage, as could works to install such features (such as 'in river' piling, which can create an acoustic barrier across the watercourse). Works that produce significant 'in river' noise can also result in direct harm to fish species in the vicinity at the time the works take place. Not only do these activities have the potential to result in physical modification and hydrological changes of the SAC, affecting the fish species already identified under the elements listed above, but also have the potential to change the distribution of Atlantic salmon (S1106). In addition, any barrier could potentially lead to fragmentation of habitat use by migratory fish. This could affect sea lamprey (S1095), brook lamprey (S1095), Atlantic salmon (S1106) and bullhead (S1163).

Shading causing habitat fragmentation

37) The route will require a new river crossing of the River Till and altered crossing over the River

[5] http://publications.naturalengland.org.uk/file/6247102287970304

Avon, which may result in impacts on floodplain habitat, marginal and in channel habitats through shading effects. A haul road will also be required to cross the SAC. Shading could cause physical modification which through soil erosion could result in sedimentation, habitat fragmentation and changes in species distributions downstream. These potential threats and pressures may lead to an impact on rivers with floating vegetation often dominated by water-crowfoot (H3260), sea lamprey (S1095), brook lamprey (S1095), Atlantic salmon (S1106) and bullhead (S1163). In addition, water pollution has the potential to also adversely impact the population of Desmoulin's whorl snail (S1016).

38) No public access to the site is, or will be available. Therefore, recreational disturbance due to public access does not need to be considered.

Air quality

39) During construction and operation NOx emissions of construction traffic and operation of the realigned A303 may result in increased NOx concentrations on roads that lie within 200m of the SAC and constitute part of the Affected Road Network. In particular, the Winterbourne Stoke bypass viaduct at the River Till will introduce road NOx emissions to a location which is not currently subject to them, although it will also reduce NOx emissions on the current route of the A303 across the River Till.

40) There are grounds to conclude that the interest features of the SAC are not vulnerable to atmospheric NOx emissions, or resulting nitrogen deposition. On the Site Relevant Critical Loads page for the SAC the Air Pollution Information System (APIS) website references the general NOx critical level for vegetation of 30 μm^{-3}. However, for all interest features the analysis on APIS then states '*Site specific advice should be sought'* and/or '*Decision to be taken at a site specific level since habitat sensitivity depends on N or P limitation'.* This is because the principal role of NOx is as a source of nitrogen and therefore it is only a concern if the specific system is nitrogen limited (i.e. nitrogen is the principal growth limiting nutrient) rather than phosphorus limited. Similarly, although APIS provides a simple '*yes*' in response to the question '*habitat sensitive to nitrogen?'* there is no critical load available for any of the SAC interest features and APIS adds that '*These systems are often P limited (or N/P co-limiting), therefore decisions should be taken at a site specific level...*' Natural England has agreed in discussions over this project that, like most freshwater systems, the River Avon SAC is P-limited rather than N-limited. This matches the Site Improvement Plan for the SAC in which atmospheric pollution is not identified as a concern. The interest features depend on aspects of the SAC that are either not affected by nitrogen deposition (e.g. the hydro-morphological characteristics of the river) or on vegetation that is emergent or submerged and for which phosphorus is the key growth-limiting nutrient.

41) Nonetheless, for the purposes of completeness, air quality modelling has been undertaken and is discussed in the Initial Assessment below.

Initial Assessment in relation to River Avon SAC

The key characteristics of the site and the details of the European Site should be considered in identifying potential impacts.

Describe any likely changes to the site arising as a result of:

Reduction of habitat area	42)	None. The crossing of the River Avon is an existing structure. The crossing of the River Till will be a clear span bridge without 'in channel' piers. No impact on the SAC will arise.
Disturbance to key species	43)	No impact on the SAC will arise for the following reasons:
	44)	No works will in fact be required within the channel so there will be no risk of physical blockage of fish passage. Each of the decks will span the Till valley on four pairs of supporting columns, with spans over 40m wide and with none of the supports within 8m of the river channel to comply with aforementioned Environment Agency requirements on main rivers. They will therefore be entirely outside the SAC.
	45)	The River Till is the only part of the SAC where earthworks and potential piling will take place close enough to the SAC for these impacts to arise. The stretch of the River Till crossed by the Scheme does not have suitable habitat for spawning of Atlantic salmon, which were not recorded in the survey. The habitat is poor for spawning of brown trout and bullhead. Whilst there is gravel substrate present, much of the channel is seasonally overgrown by emergent

		vegetation such as fool's watercress (*Apium nodiflorum*) and there are few areas of cobble suitable for bullhead. Parts of the channel are silted and both the banks and channel are grazed as part of the adjacent improved pasture. Baseline survey in late May 2017 showed that, even when there was flow present, fish were present at only very low density (1.3/100m^2). In the section to be crossed by the viaduct, the River Till dries seasonally and only flows for approximately three to six months per year over winter to spring. For any bullhead spawning in spring (February to June) fry would not be able to remain in the section while the river dried out. Therefore noise and vibration, would not affect fish at all when carried out during the dry period. In addition, construction work would be at least 8m from the River Till to comply with aforementioned Environment Agency requirements on main rivers and the bored piling construction method would render insignificant noise and vibration even if undertaken during a time when there was flow in the river.
	46)	The temporary haul road over the River Till would cross on a temporary bridge raised above the valley floor with supports located outside of the river (at least 8m from the banks in line with the aforementioned Environment Agency requirements for main rivers) and outside the designated area of the SAC.
Habitat or species fragmentation	47)	The Scheme will involve a new crossing of the River Till, north of Winterbourne Stoke. The River Till is a component SSSI of the River Avon SAC designated for supporting 'Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation' listed on Annex I of the Habitats Directive.
	48)	The proposed viaduct over the River Till SSSI has the potential to result in impacts on the SAC, due to the permanent shading associated with the River Till viaduct. If not mitigated, the shading would be expected to result in an area of reduced terrestrial and aquatic vegetation coverage within the SSSI and adjacent river valley. If bare ground persisted under the bridge it would be susceptible to erosion, leading to potential siltation downstream and hence indirect impacts on aquatic vegetation within the SAC/ SSSI downstream and on spawning sites for fish. The erosion would be expected to continue as long as there was soil or other fine substrate that could be eroded.
	49)	The degree of shading would depend on the detailed design of the viaduct, specifically the width and the height of the viaduct and its orientation.
	50)	Due to its size and permanence, the permanent viaduct could have an adverse effect on vegetation in the River Till through shading, and thus on habitat fragmentation depending on the detailed design. The design (including separation between the bridge decks) is specifically with a view to protecting the vegetation in the River Till and is therefore considered mitigation. In line with the People over Wind judgement it cannot therefore be used to screen out likely significant effects. Therefore a likely significant effect exists due to shading from the permanent viaduct.
	51)	There would be a bailey bridge which would cross the River Till for a period of approximately two years for purposes of construction. This structure could also have an effect of shading and although temporary it cannot be screened out at this stage.
Reduction in species density	52)	There are potential impacts on spawning areas for SAC fish species downstream if vegetation dieback and soil erosion occurs on the River Till due to aforementioned shading from the viaduct. This could in turn reduce species density for all SAC fish species and for SAC *Ranunculus* vegetation.
	53)	No direct or indirect impacts will arise on Desmoulin's whorl snail, an Annex II species of the SAC designation. This is because no construction works will occur within suitable habitat adjacent to the River Avon where Desmoulin's whorl snail has been recorded, and because Desmoulin's whorl snail is absent from the section of the River Till within the Scheme boundary due to lack of suitable habitat in the 2km stretch around the proposed crossing. There were no Desmoulin's whorl snail recorded when the stretch was surveyed in 2001 and in

	2017[6].
Changes in key indicators of conservation value (*water quality etc.*)	**Water quality** 54) Construction and operation of the scheme poses a theoretical risk of effects on water quality. However, in practice there will be no effect since the scheme has been designed such that it complies with the water quality protection requirements of the Environmental Damage (Prevention and Remediation) (England) Regulations 2015 and Environmental Permitting (England and Wales) Regulations 2010. **Water levels/flows** 55) Operation of the Scheme adjacent to the SAC carries the potential risk of effects on water levels and flows. However, there will be no effect on water levels or flows in practice due to the measures that have been included in the road design to comply with common law requirements to avoid increasing flood risk. 56) Dewatering activities during construction, if required, could cause drawdown of the local water table. However, this is considered unlikely to arise in practice due to application of tunnel construction techniques (such as the use of a Tunnel Boring Machine) that limit the requirement for dewatering during construction in order to comply with the Water Abstraction and Impounding (Exemptions) Regulations 2017. This will minimise any changes to groundwater levels and flows in the chalk aquifer that could otherwise adversely alter the hydrological regime of the rivers, springs and other surface water features dependent on groundwater discharge. Groundwater modelling (in ES Appendix 11.4 Groundwater Risk Assessment) predicted negligible changes in flow (0.1% to 0.2% of base flow). Dewatering would not be required for the installation of bridge pier foundations. 57) The presence of underground structures (piers) for the River Till viaduct could theoretically cause interference to groundwater flow in close proximity to the internationally designated groundwater-fed Rivers Avon and Till that could affect all the SAC habitats and/ or species. However, this is considered unlikely to occur because the River Till viaduct is designed to be a five span structure with the location and orientation of the piers and foundations optimised to place them as far away from the River Till as possible and to minimise obstruction of water flows over the floodplain and comply with common law requirements not to increase flood risk. **Air quality** 58) The Design Manual for Roads & Bridges (Volume 11, Section 3, Part 1, HA 207/07, Annex F) sets out the steps required in local air quality impact assessment for designated wildlife sites. The first step is to determine the Affected Road Network (ARN). Criteria for this include road alignment will change by 5 m or more; or daily traffic flows will change by 1,000 AADT or more; or Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more; or daily average speed will change by 10km/hr or more; or peak hour speed will change by 20km/hr or more. Traffic modelling undertaken for the EIA has confirmed that roads within 200m of River Avon SAC are part of the Affected Road Network: i. The A303 at the existing crossing of the River Till (transect E9) and at the proposed new viaduct over the River Till (transects E14 north from the viaduct and E15 south from the viaduct); ii. The A303 at Wylye (transect E5); iii. The A345 at Countess Roundabout (transect E6); iv. The A36 at Codford-St-Mary (transect E7); and v. The A360 at Shrewton (transect E10). 59) These transects are shown on mapping accompanying the air quality chapter of

[6] Willing MJ. June 2017, amended August 2017. River Avon and River Till Desmoulin's Whorl Snail Surveys. Highway England report HE551506-AA-SGN-SWI-SU-YE-000001 P02

the Environmental Statement. The only in-combination effects identified for River Avon SAC relate to housing growth associated with the implementation of the Army Basing Programme at Salisbury Plain (in the Bulford Camp area and associated with the other camps around the SAC) and housing and employment growth in surrounding authorities (as set out in the Wiltshire Core Strategy and other strategic plans).

60) The air quality modelling undertaken for this project follows DMRB Vol 11 Section 3 Part 1: Air Quality (HA207/07) and specifically Annex F (Assessment of Designated Sites). It also follows Interim Advice Note 174/13 (Updated advice for evaluating significant local air quality effects for users of DMRB Volume 11, Section 3, Part 1 'Air Quality (HA207/07)) and particularly section 6 regarding designated sites. A key excerpt from the methodology set out in that guidance is as follows:

> *'Where NOx concentrations are assessed to be below their objective* [30 µgm^{-3}] *then significant effects are not anticipated. If the objective is exceeded, then significant effects may occur, and further consideration should be given to the magnitude of change. The exception to this is where changes are less than 0.4µg/m³; then effects are considered to be imperceptible and unlikely to be significant. Where changes* [increases] *in NOx concentrations are greater than 0.4µg/m³ then this information along with changes in nutrient nitrogen deposition should be provided to the Scheme ecologist to determine the significance of effects based on their professional judgement'.*

61) The data on which this analysis is based are presented in Appendix D. Using the IAN 174/13 criteria there is only a single point on one modelled transect where NOx concentrations are forecast to exceed 30 µgm^{-3} **and** the change in concentrations due to the Scheme is forecast to be greater than imperceptible. At all other modelled transect locations total NOx concentrations will either be below 30 µgm^{-3} in all assessment years (2021, 2024 and 2026) or the contribution of the Scheme will be imperceptible (less than 0.4 µgm^{-3}) or will be positive (i.e. causing a reduction in NOx concentrations compared to the DM scenario). At these locations it can therefore be concluded that (quoting from IAN 174/13) *'significant effects are not anticipated*'.

62) At the closest part of the SAC to the A345 at Countess Roundabout (transect E6) during Phase 1 of construction (2021) NOx concentrations are forecast to be 32.6 µgm^{-3} (thus exceeding the critical level) and the change in NOx concentrations due to the Scheme will be a small magnitude increase of 0.7 µgm^{-3} and therefore greater than imperceptible. By 5m into the SAC, NOx concentrations are forecast to have fallen below 30 µgm^{-3} such that '*significant effects are not anticipated*'. Following IAN 174/13, the closest part of the SAC to the A345 at Countess Roundabout is therefore the only location at which nitrogen deposition needs to be investigated.

63) There are no nitrogen critical loads available on the Air Pollution Information System for the interest features of the River Avon SAC and there is good reason to conclude that phosphate (rather than nitrogen) is the relevant growth-limiting nutrient for the interest features of the SAC. The most sensitive habitat within the SAC boundary adjacent to the A345 at Countess Roundabout is woodland (although this is not an SAC interest feature). This habitat has a minimum critical load of 10 kgN/ha/yr. At this location nitrogen deposition is forecast to be 16.8 kgN/ha/yr by 2021. This is above the critical load for woodland. However, the contribution of the Scheme to nitrogen deposition at this location is too small to appear in the model such that the modelled deposition rate with and without the Scheme is identical (16.8kgN/ha/yr). It can therefore be concluded that, even using the critical load for the most sensitive habitat present in the absence of a critical load for the SAC interest features, the Scheme will make an imperceptible contribution to nitrogen deposition at this location. Therefore no

	likely significant effect will arise.
Climate change	64) Reduced congestion will have no effect on climate change. Bridge design takes account of effects of climate change on rainfall patterns and intensity.
Describe any likely impacts on the European Site as a whole in terms of:	
Interference with the key relationships that define the structure of the site	65) Shading from River Till viaduct and temporary construction bailey-bridge
Interference with key relationships that define the function of the site	66) Water quality impacts during construction without an Outline Environment Management Plan
Indicate the significance as a result of the identification of impacts set out above in terms of:	
Reduction of habitat area	67) No Likely Significant Effect
Disturbance to key species	68) No Likely Significant Effect
Habitat or species fragmentation	69) Likely Significant Effects through shading
Disruption	70) No Likely Significant Effect
Disturbance	71) No Likely Significant Effect
Change to key elements of the site (*e.g. water quality, hydrological regime etc.)*	72) No Likely Significant Effect
Describe from the above those elements of the project, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known:	
73) Without mitigation, the proposed route is likely to cause significant effects on the habitats and species for which the River Avon SAC is designated through shading of the River Till from the new viaduct crossing and temporary construction bailey bridge.	
Outcome of screening stage	74) Significant Effects are Likely
Are the appropriate statutory environmental bodies in agreement with this conclusion?	75) Natural England was informally consulted on an alternative format version of this assessment 15/05/18. They will be consulted again during the Pre-Examination period.

Table 3.2: Screening Matrix: Salisbury Plain SAC (UK0012683)

Project Name:	A303 Amesbury to Berwick Down	
Natura 2000 Site under Consideration:	Salisbury Plain SAC (UK0012683)	
Date:	**Author (Name / Organisation):**	**Verified (Name / Organisation):**
23/08/18	Ashley Welch/AECOM Milly Kent/AECOM	James Riley/AECOM
Description of Project Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the European Site by virtue of:		
Size and scale (road type and probable traffic volume)	1) Improvements are proposed to the A303 between Amesbury and Berwick Down. The following route has been selected: 13.2km overall in length of dual carriageway including an approx. 3.3km tunnel with a bypass to the north of Winterbourne Stoke, the eastern portal to the east of 'The Avenue' and the western tunnel portal located to the south of Normanton Gorse.	
Land-take	2) None within the SAC.	
Distance from the European Site or key features of the site (from edge of the project assessment corridor)	3) The bypass route runs north of Winterbourne Stoke before re-joining the A303 carriageway bringing the re-aligned A303 within 60m of the SAC (specifically, the Parsonage Down SSSI component). 4) Part of the SAC is directly adjacent to the Scheme boundary on both sides of the A303 near Bulford Camp; however, the only works in this location would be within the highway boundary.	
Resource requirements (from the European Site or from areas in proximity to the site, where of relevance to consideration of impacts)	5) None.	
Emissions (e.g. polluted surface water runoff – both soluble and insoluble pollutants, atmospheric pollution)	6) The Scheme has the potential to affect local air quality at the SAC during construction in the following ways: i. Increased emissions of dust during construction of the Scheme from dust-raising activities associated with topsoil stripping and bypass construction within 60-200m of the Parsonage Bank part of the SAC. This would have the potential for temporary, localised impacts on plant growth in the calcareous habitats that are the primary reason for the designation of the site; ii. air quality could be affected by changes in traffic flows during construction, as a result of temporary traffic management measures, diversions and/or additional vehicles travelling to and from the construction site transporting materials, plant and labour. 7) During operation, the Scheme has the potential to affect local air quality. The realignment of the A303 takes the road closer to the SAC at Parsonage Down SSSI than its current alignment, which could potentially result in increased nitrogen deposition on the SSSI/SAC, thereby potentially altering the existing chalk grassland community.	

Excavation requirements (e.g. impacts of local hydrogeology)	8) No impacts on Salisbury Plain SAC are anticipated.
Transportation requirements	9) No impacts on Salisbury Plain SAC are anticipated.
Duration of construction, operation, etc.	10) Construction of the tunnel associated with the route has been estimated at between 45 to 54 months depending on the construction methodology. A working assumption is therefore that the construction of the Scheme may take in the region of 5 years.
Other	11) No other impacts on Salisbury Plain SAC are anticipated.

Description of Avoidance and/or Mitigation Measures: Describe any assumed (plainly established and uncontroversial) mitigation measures, including information on:	
Nature of proposals	12) No specific mitigation measures intended to address potential effects on Salisbury Plain SAC are taken into account in this likely significant effects assessment, in line with case law.
Location	N/A
Evidence for effectiveness	N/A
Mechanism for delivery (legal conditions, restrictions or other legally enforceable obligations)	N/A

Characteristics of European Site(s) A brief description of the European Site should be produced, including information on:	
Name of European Site and its EU code	13) Salisbury Plain SAC (UK0012683)
Location and distance of the European Site from the proposed works	14) The bypass route runs north of Winterbourne Stoke before re-joining the A303 carriageway bringing the re-aligned A303 within 60m of the SAC (specifically, the Parsonage Down SSSI component). 15) Part of the SAC is directly adjacent to the Scheme boundary on both sides of the A303 near Bulford Camp; however, works in this location would be within the highway boundary.
European Site size	16) 21465.94 ha
Key features of the European Site including the primary reasons for selection and any other qualifying interests	17) Annex I habitats that are a primary reason for designation: i. Common juniper (*Juniperus communis*) formations on heaths or calcareous grasslands ii. Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (*important orchid sites) 18) Annex II species that are a primary reason for site selection: i. Marsh fritillary butterfly *Euphydryas (Eurodryas, Hypodryas) aurinia*
Vulnerability of the European Site – any information available from the standard data forms on potential effect pathways	19) The Natural England Site Improvement Plan states that the following threats and pressures have a high impact on the SAC: i. Changes in species distributions ii. Air Pollution: risk of atmospheric nitrogen deposition

European Site conservation objectives – where these are readily available	20) The Conservation Objectives for the SAC state: i. Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring: • *The extent and distribution of qualifying natural habitats and habitats of qualifying species;* • *The structure and function (including typical species) of qualifying natural habitats;* • *The structure and function of the habitats of qualifying species;* • *The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;* • *The population of qualifying species; and* • *The distribution of qualifying species within the site.*

Assessment Criteria

Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the European Site.

21) The only in-combination effects identified for Salisbury Plain SAC relate to housing growth associated with the implementation of the Army Basing Programme at Salisbury Plain (in the Bulford Camp area and associated with the other camps around the SAC) and housing and employment growth in surrounding authorities (as set out in the Wiltshire Core Strategy and other strategic plans). These could combine with the Scheme to result changes in NOx concentrations within 200m of the roadside.

22) For each individual element, reference is made to the threats and pressures outlined in the Salisbury Plain SACs' Site Improvement Plan[7].

23) Construction of the Winterbourne Stoke bypass within 60-200m of Parsonage Bank (particularly during the initial topsoil strip) could result in dust deposition with the potential to adversely affect calcareous grassland (H6210) and species distribution of marsh fritillary (S1065) using that grassland.

24) The route bypasses north of Winterbourne Stoke and runs adjacent to the SAC. This carries a risk in relation to exposing the SAC to increased atmospheric pollution, specifically oxides of nitrogen (NOx) leading to nitrogen deposition. As indicated by the Site Relevant Critical Load tab for the SAC on the Air Pollution Information System website, nitrogen deposition has the potential to adversely affect calcareous grassland (H6210) leading to an increase in tall grasses, decline in diversity, increased mineralization, nitrogen leaching and surface acidification. Nitrogen deposition can also change the species distributions marsh fritillary butterfly (S1065) by affecting its habitat structure. H5130 Juniper on heaths or calcareous grasslands are theoretically vulnerable but would not be affected as stands are not located within 200m of the Scheme.

25) There is a potential in-combination effect associated with housing and employment growth in Wiltshire and surrounding authorities. This growth is likely to result in a greater volume of traffic using the A303 and could also result in a change to the NOx concentrations (and thus nitrogen deposition) within 200m of the Scheme.

Initial Assessment in relation to Salisbury Plain SAC

The key characteristics of the site and the details of the European Site should be considered in identifying potential impacts.

[7] Joint Nature Conservation Committee. 2007. *Second Report by the UK under Article 17 on the implementation of the Habitats Directive from January 2001 to December 2006*. Peterborough: JNCC. Available from: www.jncc.gov.uk/article17

Describe any likely changes to the site arising as a result of:	
Reduction of habitat area	26) No impact on SAC.
Disturbance to key species	27) No impact on SAC, the only key species for which the SAC is designated is marsh fritillary butterfly. Due to the distance of the works from Parsonage Down there is no potential for disturbance of this species.
Habitat or species fragmentation	28) No impact on SAC; the only impact pathway would be one that may affect habitat quality (air quality).
Reduction in species density	**Dust deposition** 29) There is potential for dust deposition during construction of the Winterbourne Stoke bypass within 60-200m of Parsonage Bank (particularly the topsoil strip) to adversely affect the habitats and species of the SAC by coating vegetation to such an extent that it disrupts photosynthesis, changing the botanical composition of the sward within 200m of the works area. This could, in turn, affect the marsh fritillary population which relies on chalk grasslands. **Vehicle exhaust emissions** 30) During operation, the Scheme has the potential to affect local air quality, during operation as realignment of the A303 would take the road closer to the Salisbury Plain SAC at the location of Parsonage Down SSSI than its current alignment. This would have the potential to result in localised increases in NOx concentrations and thus nitrogen deposition on the SSSI/SAC, which would have the potential to change vegetation, such as by encouraging growth of tall grasses at the expense of other plant species, as with agricultural fertilisers 31) The Design Manual for Roads & Bridges (Volume 11, Section 3, Part 1, HA 207/07, Annex F) sets out the steps required in local air quality impact assessment for designated wildlife sites. The first step is to determine the Affected Road Network (ARN). Criteria for this include road alignment will change by 5m or more; or daily traffic flows will change by 1,000 AADT or more; or Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more; or daily average speed will change by 10km/hr or more; or peak hour speed will change by 20km/hr or more. Traffic modelling undertaken for the EIA has confirmed that roads within 200m of Salisbury Plain SAC are part of the Affected Road Network: i. B390 at Chitterne Down (immediately south of the SAC; transect E1) ii. The Packway between Rollestone Camp and Larkhill (immediately south of the SAC; transects E2 and E11) iii. The A303 at Parsonage Down (transects E12 and E13) and immediately east of Bulford Camp (transect E3) 32) These transects are shown on mapping accompanying the air quality chapter of the Environmental Statement. The only in-combination effects identified for Salisbury Plain SAC relate to housing growth associated with the implementation of the Army Basing Programme at Salisbury Plain (in the Bulford Camp area and associated with the other camps around the SAC) and housing and employment growth in surrounding authorities (as set out in the Wiltshire Core Strategy and other strategic plans). 33) The air quality modelling undertaken for this project follows DMRB Vol 11 Section 3 Part 1: Air Quality (HA207/07) and specifically Annex F (Assessment of Designated Sites). It also follows Interim Advice Note 174/13 (Updated advice for evaluating significant local air quality effects for users of DMRB Volume 11, Section 3, Part 1 'Air Quality (HA207/07)) and particularly section 6 regarding designated sites. A key excerpt from the methodology set out in that guidance is as follows: *'Where NOx concentrations are assessed to be below their objective [30 µgm^{-3}] then significant effects are not anticipated. If the*

	objective is exceeded, then significant effects may occur, and further consideration should be given to the magnitude of change. The exception to this is where changes are less than 0.4µg/m³; then effects are considered to be imperceptible and unlikely to be significant. Where changes [increases] in NOx concentrations are greater than 0.4µg/m³ then this information along with changes in nutrient nitrogen deposition should be provided to the Scheme ecologist to determine the significance of effects based on their professional judgement'. 34) The data on which this analysis is based are presented in Appendix D. Using the IAN 174/13 criteria there is no location on any modelled transect where NOx concentrations are forecast to exceed 30 µgm^{-3} **and** the change in concentrations due to the Scheme is forecast to be greater than imperceptible. On all modelled transect locations total NOx concentrations will either be below 30 µgm^{-3} in all assessment years (2021, 2024 and 2026) or the contribution of the Scheme will be imperceptible (i.e. less than 0.4 µgm^{-3}) or will be positive (i.e. causing a reduction in NOx concentrations). It can therefore be concluded that (quoting from IAN 174/13) '*significant effects are not anticipated*'.
Changes in key indicators of conservation value (*water quality etc.*)	35) There is potential for dust deposition to adversely affect the habitats and species of the SAC by changing botanical composition of the sward within 200m of the Winterbourne Stoke bypass construction at Parsonage Bank. This could, in turn, affect marsh fritillary butterflies (if present) should their main larval food plant, devil's bit scabious (*Succisa pratensis*), be present in sufficient amounts. 36) Moving the road closer to the SAC exposes an area of the SAC to potentially greater NOx concentrations and nitrogen deposition than that to which it is currently subjected rendering it less favourable to chalk grassland plant species. However, aforementioned modelling for the Scheme indicates that no likely significant effect will arise.
Climate change	37) Reduced congestion will have no effect on climate change.
Describe any likely impacts on the European Site as a whole in terms of:	
Interference with the key relationships that define the structure of the site	38) No impact on SAC.
Interference with key relationships that define the function of the site	39) There is potential for dust deposition during construction of the Winterbourne Stoke bypass within 60-200m of Parsonage Bank (particularly the initial topsoil strip) to adversely affect the habitats and species of the SAC by changing botanical composition of the sward within 200m of the works area.
Indicate the significance as a result of the identification of impacts set out above in terms of:	
Reduction of habitat area	40) No Likely Significant Effect
Disturbance to key species	41) No Likely Significant Effect
Habitat or species fragmentation	42) No Likely Significant Effect
Disruption	43) No Likely Significant Effect
Change to key	44) Likely Significant Effect. Dust impacts from construction have the potential to

elements of the site (*e.g. water quality, hydrological regime etc.)*	reduce the conservation status of qualifying habitats by changing botanical composition of the sward within 200m of the Winterbourne Stoke bypass construction in the vicinity of Parsonage Bank.
Describe from the above those elements of the project, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known:	
Dust deposition 45) Dust emissions during construction of the Winterbourne Stoke bypass within 60-200m of Parsonage Bank (particularly the topsoil strip) could result in heavy soiling of vegetation and thus affecting evapotranspiration and photosynthesis. This is due to a combination of the sensitivity of the vegetation, the proximity of the works, the topography and prevailing wind direction (Parsonage Bank is downslope of construction and downwind relative to the prevailing south-westerly wind such that dust would readily blow onto the SAC) and the potential scale of dust generating activities. 46) This could, in turn, affect marsh fritillary butterflies (if present) should their main larval food plant, devil's bit scabious, be present in sufficient amounts. This species has recently been recorded at Parsonage Down for the first time in many years[8]. Plant communities near short-term works are likely to recover within a year of the dust soiling stress ceasing[9]. Moreover, the thin chalk soils of the general area mean that chalk dust can be generally found in the atmosphere in small quantities. Nonetheless, in the absence of controlling measures, heavy coating of chalk dust on vegetation close to the works area would potentially result in a negative impact. No dust generation is expected during road operation.	
Outcome of screening stage	47) Significant Effects are Likely
Are the appropriate statutory environmental bodies in agreement with this conclusion?	48) Natural England was informally consulted on an alternative format version of this assessment 15/05/18. They will be consulted again during the Pre-Examination period.

Table 3.3: Screening Matrix: Salisbury Plain SPA (UK9011102)

Project Name:	A303 Amesbury to Berwick Down	
Natura 2000 Site under Consideration:	Salisbury Plain SPA (UK9011102)	
Date:	**Author (Name/ Organisation):**	**Verified (Name/ Organisation):**
23/08/18	Ashley Welch/ AECOM Milly Kent/ AECOM	James Riley/ AECOM
Description of Project Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the European Site by virtue of:		

[8] Stuart Hales, Senior Reserve Manager Wiltshire National Nature Reserves; personal communication
[9] Institute of Air Quality Management. (2014). *Guidance on the Assessment of Dust from Demolition and Construction.* Accessed at http://www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf on 25/04/18

Size and scale (road type and probable traffic volume)	1)	Improvements are proposed to the A303 between Amesbury and Berwick Down. The following route has been selected: 13.2km overall in length of dual carriageway including an approx 3.3km tunnel with a bypass to the north of Winterbourne Stoke, the eastern portal to the east of 'The Avenue' and the western tunnel portal located to the south of Normanton Gorse.
Land-take	2)	All options are located outside of the SPA. There will be no impacts through land-take.
Distance from the European Site or key features of the site (from edge of the project assessment corridor)	3)	Approximately 2km from SPA boundary. Qualifying features of the SPA, stone curlew (Burhinus oedicnemus), hobby (*Falco subbuteo*) and quail (*Coturnix coturnix*) are known to be present within habitats along alignment.
Resource requirements (from the European Site or from areas in proximity to the site, where of relevance to consideration of impacts)	4)	No resource requirements from SPA.
Emissions (e.g. polluted surface water runoff – both soluble and insoluble pollutants, atmospheric pollution)	5)	No impacts on Salisbury Plain SPA from emissions are anticipated due to the distance between the route and this designated site and the fact that the interest features of the SPA are not sensitive to effects of nitrogen deposition on their broad habitat[10].
Excavation requirements (e.g. impacts of local hydrogeology)	6)	No impacts on Salisbury Plain SPA from excavation are anticipated due to the distance between the route and this designated site.
Transportation requirements	7) 8)	Temporary roads may need to be constructed to maintain traffic flow during the construction phase. However, these will be located outside of the Salisbury Plain SPA. No impacts on Salisbury Plain SPA from transportation are anticipated due to the distance between the route and this designated site.
Duration of construction, operation, etc.	9)	Construction of the tunnel has been estimated at between 45 to 54 months depending on the construction methodology. A working assumption is therefore that the construction of the Scheme may take in the region of 5 years.
Other	10) 11) 12)	Displacement of stone curlew from functionally-linked nesting plots outside the SPA itself. Disturbance to qualifying species of the SPA through noise, vibration and visual disturbance resulting from construction and operation of the Scheme. Additional recreational disturbance of stone curlew plots at Normanton Down as a consequence of the A303 tunnel opening the landscape for wider recreational use.

Description of Avoidance and/or Mitigation Measures: Describe any assumed (plainly established and uncontroversial) mitigation measures, including information on:		
Nature of proposals	13)	No specific mitigation measures intended to address

[10] Information taken from the Site Relevant Critical Load function on the UK Air Pollution Information System (www.apis.ac.uk). While stone curlew is theoretically vulnerable, in the Salisbury Plain area within 200m of the Scheme only managed arable nesting plots are present and management is the most significant influence on plot suitability for breeding. Moreover, these plots are outside the SPA itself.

	potential effects on Salisbury Plain SPA are taken into account in this likely significant effects assessment, in line with case law.
Location	N/A
Evidence for effectiveness	N/A
Mechanism for delivery (legal conditions, restrictions or other legally enforceable obligations)	N/A

Characteristics of European Site(s) A brief description of the European Site should be produced, including information on:	
Name of European Site and its EU code	14) Salisbury Plain SPA (UK9011102)
Location and distance of the European Site from the proposed works	15) Approximately 2km from SPA boundary. Qualifying features of the SPA may be present.
European Site size	16) 19688.88 ha
Key features of the European Site including the primary reasons for selection and any other qualifying interests	17) This site qualifies under Article 4.1 of the Directive (79/409/EEC) on the Conservation of Wild Birds by supporting populations of European importance of the following species listed on Annex I of the Directive: 18) During the breeding season: i. Stone curlew, site supports 22 pairs representing at least 11.6% of the breeding population in Great Britain (Count as at 1998) ii. Eurasian hobby[11], site supports1% of the British population iii. Common quail[4], site supports 20% of the British population 19) Over winter: i. Hen harrier (*Circus cyaneus*), 14 individuals representing at least 1.9% of the wintering population in Great Britain (RSPB 1996/7)
Vulnerability of the European Site – any information available from the standard data forms on potential effect pathways	20) The Natura 2000 site Standard Data Form states that the following threats and pressures have a high impact on the SPA: i. changes in biotic conditions 21) The relatively low levels of disturbance on Salisbury Plain are one of the reasons why the site has continued to support breeding stone curlew while it has gone extinct elsewhere across much of its range. Changes to recreational pressure could cause certain nesting plots to become unviable. Such nesting sites are limited within the SPA and this may be reducing the overall carrying capacity.

[11] A review of the UK network of SPAs was undertaken (by JNCC and other country agencies) and a report published by Stroud *et. al* in 2001 (http://jncc.defra.gov.uk/page-1412). It is understood that it is taking some time to revise all the relevant SPA citations in light of the review. As part of our desk study, we have noted that quail and hobby are included in the latest Natura 2000 Standard Data Form for Salisbury Plain SPA (http://jncc.defra.gov.uk/pdf/SPA/UK9011102.pdf), but are not currently listed in the SPA citation (http://jncc.defra.gov.uk/page-2040-theme=default). However, Natural England have confirmed that these species should be regarded as interest features of the SPA.

European Site conservation objectives – where these are readily available	22) The Conservation Objectives for the SPA state: *Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:* • *The extent and distribution of the habitats of the qualifying features;* • *The structure and function of the habitats of the qualifying features;* • *The supporting processes on which the habitats of the qualifying features rely;* • *The population of each of the qualifying features; and* • *The distribution of the qualifying features within the site.*
Assessment Criteria Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the European Site.	
23) The route could negatively affect qualifying species of the Salisbury Plain SPA e.g. stone-curlew, through loss of breeding habitat (functionally-linked nesting plots outside the SPA itself). Construction and operation of the Scheme could negatively affect qualifying species of the SPA through noise, vibration and visual disturbance, as well as concomitant recreational disturbance of stone curlew plots at Normanton Down through placement of A303 in tunnel thus opening up the landscape to wider recreational use.	
Initial Assessment in relation to Salisbury Plain SPA The key characteristics of the site and the details of the European Site should be considered in identifying potential impacts. Describe any likely changes to the site arising as a result of:	
Reduction of habitat area	24) No direct loss of habitat within the SPA but the route could result in the loss of habitats that could support SPA species (stone curlew nest plots) outside the SPA. 25) Data on stone curlew nesting records dating back to 2006 were obtained for an area up to 4km from the A303. Following examination of these data and discussion with RSPB it was agreed that one successful stone curlew breeding plot outside the SPA (south-east of Parsonage Down) is expected to be rendered unusable as a direct result of the Scheme due to land-take for the Winterbourne Stoke by-pass.[12] Although this plot is outside the SPA it is used by the same population of stone curlew that nest within the SPA and a net reduction in the number of successful stone curlew plots will result in a net reduction in breeding opportunities for the species, which could affect the ability of Salisbury Plain SPA to achieve its conservation objectives. 26) Quail was not identified during the 2016 and 2017 surveys, but there have been sightings in 2018. Suitable nesting grassland and arable edge habitat are considered abundant throughout the study area and the Scheme is

[12] There are also records of stone curlew nesting on four other plots within 1.5km of the current or realigned A303. However, the closest of these (within a few hundred metres of the A303) is further west of the affected plot and the road alignment will not be altered in that location. The remaining three are in locations where the A303 will either be moved further away from the plots due to Winterbourne Stoke bypass, or will be removed entirely by being placed in tunnel (in the vicinity of Normanton Down).

	within the normal breeding distribution for this species. As the number of quail that arrive in the UK on spring migration varies considerably between years, it is possible that quail could breed in suitable habitats within the Scheme boundary. The loss of limited areas of suitable nesting habitat within the Scheme boundary is unlikely to have an impact on any quail visitors considering the extent of suitable nesting habitat within areas surrounding the Scheme boundary. Therefore, no likely significant effect is expected on this species. 27) A known historically active hobby breeding site is located approximately 200m south of the Scheme boundary. No further possible breeding sites were identified during the 2016 and 2017 surveys. Therefore, no likely significant effect is expected on this species. 28) Hen harrier does not breed on the SPA. Its overwintering roosting locations on the SPA are well known and are more than 10km from the Scheme.
Disturbance to key species	29) The route has the potential to cause noise, visual or vibration disturbance to SPA species, specifically stone curlew. Disturbance could arise through construction activities, operation of the new road, or increase recreation caused by reconnection of the landscape. 30) Specifically, stone curlews breed outside the SPA in proximity to the Scheme at Normanton Downs RSPB reserve and at other locations known to historically support breeding stone curlew. Stone curlew using these plots at time of construction would have the potential to be disturbed by increased vehicular movements and human disturbance. Such disturbance impacts would have the potential to cause stress, which may result in a reduction in their resilience and breeding success. In extreme cases disturbance impacts may result in the abandonment of breeding plots. 31) The operation of the A303 may also facilitate recreational disturbance of stone curlew at Normanton Down. The placement of the A303 in tunnel at this location will open up the area to recreational activity, potentially resulting in recreational users on the footpath through the Downs crossing the fence-line and disturbing the stone curlew plots. 32) No impacts are anticipated on the SPA itself during the operational phase. On the rare occasions when traffic is diverted away from the tunnel on to the diversion route, which runs along the southern edge of the SPA along the Packway, the increased levels of traffic may result in increased levels of light spill from vehicle movements. However this is unlikely to impact the designated features of the SPA as the site is bordered by a large swathe of scrub that shields the SPA from traffic.
Habitat or species fragmentation	33) None
Reduction in species density	34) The route has the potential to reduce the species density of stone curlew through displacement of breeding pairs.
Changes in key indicators of conservation value (*water quality etc.*)	35) The route has the potential to reduce numbers of SPA species.

Climate change	36) Reduced congestion will have no effect on climate change.
Describe any likely impacts on the European Site as a whole in terms of:	
Interference with the key relationships that define the structure of the site	37) No impacts identified that would affect the structure of the SPA.
Interference with key relationships that define the function of the site	38) There will be no direct impacts to the SPA. However, the route has the potential to negatively affect SPA species (stone curlew) outside the SPA.
Indicate the significance as a result of the identification of impacts set out above in terms of:	
Reduction of habitat area	39) Potentially significant in terms of loss of a single confirmed stone curlew breeding plot outside the SPA.
Disturbance to key species	40) Potentially significant due to noise and disturbance during the construction phase. Operational impacts from traffic noise and changes to visitor use of the site.
Habitat or species fragmentation	41) Not significant
Disruption	42) Potentially significant although could be mitigated through provision of alternative breeding habitat.
Change to key elements of the site (*e.g. water quality, hydrological regime etc.)*	43) Not significant

Describe from the above those elements of the project, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known:

44) The only 'in combination' effect identified is recreational disturbance of the plots at Normanton Down, when the removal of the old A303 is coupled with increased tourism and population growth associated with the Army Basing Programme, Wiltshire Local Plan and those of surrounding authorities.

45) The selected route option will cause impacts through habitat loss of functionally-linked land, and potential disturbance and fragmentation to qualifying species of Salisbury Plain SPA using that functionally-linked land. Specifically, this will occur through the loss of a known successful stone curlew breeding plot in the vicinity of Parsonage Down and the potential for increased recreational disturbance to stone curlew plots at Normanton Down. Moreover, disturbance of nesting stone curlews outside the SPA in proximity to the Scheme at Normanton Downs RSPB reserve and at other locations known to historically support breeding stone curlew could occur during construction as a result of increased vehicular movements and human disturbance.

46) Stone curlews are ground nesting birds which breed on downland, heathland and arable farmland in the south and east of England. Within the Wessex area, the birds prefer areas of short, sparse vegetation on light, stony soils. Within and around the Salisbury Plain SPA this has been achieved by the establishment of stone-curlew plots, which are 1-2 ha areas of cultivated land within arable crops or grassland and which are kept free of crops and other vegetation before the arrival of the stone-curlew in March. There are several stone-curlew plots to the south and north of the Scheme close to Parsonage Down and within Normanton Down RSPB Reserve; these have been monitored and are recorded as active nest sites.

47) Stone curlews are highly vulnerable to disturbance by walkers and dogs. They show an active response to a disturbance agent, even at large distances. For stone curlews this can be in excess of 500m for a person with a dog[13]. In contrast they are generally much less affected by individual vehicles in proximity to their nest sites (although research in the Breckland area suggests that they do nest at lower densities within 2km of major roads). A disturbance event is a light, noise or visual cue that disrupts the bird's activities. This could be flushing them from a nest or flushing from feeding, causing them to expend extra energy flying away from this disturbance. The effects this

[13] Taylor, E.C., Green, R.E., Perrins, J., 2007. *Stone-curlews Burhinus oedicnemus and recreational disturbance: developing a management tool for access.* RSPB. Ibis (2007), 149 (Suppl. 1), 37–44. http://www.avibirds.com/pdf/G/Griel2.pdf

	can have on birds include; disrupting birds from incubating eggs on a nest which can lead to abandonment and spoiling of the eggs and or leaves the nest more vulnerable to egg predation, therefore decreasing breeding success.	
	48) The PRoW immediately adjacent to the RSPB reserve is within 500m of the active stone-curlew plots. At present the A303 separates the public visiting the World Heritage Site (WHS) Stonehenge and the RSPB reserve at Normanton Down; therefore, the foot traffic passing the reserve is limited by the road. At completion of the Scheme the section of road between the WHS and Normanton Down reserve will be in a deep cutting from the WHS boundary to the western portal, then in tunnel for approximately 3.3km, hence none of the A303 and associated traffic will be visible from Normanton Down and the reserve will be quieter. However, this means that the original A303 road will cease to function as a barrier to pedestrians which will open up the land to the south of the WHS to the public. The removal of the old A303 as a barrier to foot traffic will allow visitors from the WHS to explore the Public Rights of Way (PRoW) to the south of the A303 which pass directly adjacent to the Normanton Down RSPB reserve. The Scheme would not provide unrestricted access to farmland south of the A303 and public access is expected to continue to be on the existing byways. However, this could operate in combination with an increase in the local population due to increased housing growth (such as that set out in the Wiltshire Core Strategy) and with increased tourism to increase the risk of disturbance of some stone curlew plots in the area. There is uncertainty as to whether such recreational disturbance events would actually arise but if they did this may result in greater long-term disturbance on breeding stone curlew and an indirect adverse permanent effect on nesting success locally. Quail and hobby are not tied to breeding plots and are much less sensitive than stone curlew and therefore not vulnerable to recreational pressure.	
	49) Therefore, due to the uncertainty regarding recreational disturbance at Normanton Down, likely significant effects ‘in combination’ cannot be screened out for the Salisbury Plain SPA. Therefore, it is not possible to conclude no likely significant effect on the SPA as a result of a reduction in nesting opportunities for stone curlew.	
Outcome of screening stage	50)	Significant Effects are Likely
Are the appropriate statutory environmental bodies in agreement with this conclusion?	51)	Natural England was informally consulted on an alternative format version of this assessment 15/05/18 and concurred with those effects on Salisbury Plain SPA that required appropriate assessment. They will be consulted again during the Pre-Examination period.

Table 3.4 Screening Matrix: Chilmark Quarries SAC (UK0016373)

Project Name:	A303 Amesbury to Berwick Down	
Natura 2000 Site under Consideration:	Chilmark Quarries SAC (UK0016373)	
Date:	**Author (Name/ Organisation):**	**Verified (Name/ Organisation):**
23/08/18	Ashley Welch/ AECOM Milly Kent/ AECOM	James Riley/ AECOM
Description of Project Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the European Site by virtue of:		
Size and scale (road type and probable traffic volume)	1)	Improvements are proposed to the A303 between Amesbury and Berwick Down. The following route has been selected: 13.2km overall in length of dual carriageway including an approximately 3.3km tunnel with a bypass to the north of Winterbourne Stoke, the eastern portal to the east of 'The Avenue' and the western tunnel portal located to the south of Normanton Gorse.
Land-take	2)	All land required is located outside the SAC. There will be no impacts through land-take.
Distance from the European Site or key features of the site (from edge of the project assessment corridor)	3)	The closest point (western extent) is approximately 11km from the SAC boundary. Qualifying features of the SAC are known to be present in habitats along route alignment.
Resource requirements (from the European Site or from areas in proximity to the site, where of relevance to consideration of impacts)	4)	Surveys for the EIA have identified that barbastelle bat (*Barbastella barbastellus*), greater horseshoe bat (*Rhinolophus ferrumequinum*) and lesser horseshoe bat (*Rhinolophus hipposideros*) (all of which are interest features of the SAC) use habitat within the footprint of the Scheme for foraging and/or commuting.
Emissions (e.g. polluted surface water runoff – both soluble and insoluble pollutants, atmospheric pollution)	5)	No impacts on Chilmark Quarries SAC from emissions are anticipated due to the distance between the route and this designated site. No roads within 200m of the SAC are part of the Affected Road Network.
Excavation requirements (e.g. impacts of local hydrogeology)	6)	No impacts on Chilmark Quarries SAC from excavation are anticipated due to the distance between the Scheme and this designated site.
Transportation requirements	7) 8)	Temporary roads may need to be constructed to maintain traffic flow during the construction phase. These will be located outside of the Chilmark Quarries SAC. No impacts on the SAC from transportation are anticipated due to the distance between the Scheme and this designated site. No roads within 200m of the SAC are part of the Affected Road Network.
Duration of construction, operation, etc.	9)	Construction of the tunnel has been estimated at between 45 to 54 months depending on the construction methodology. A working assumption is therefore that the construction of the Scheme may take in the region of 5 years.
Other	10)	Impacts to qualifying species of Chilmark Quarries SAC present within the route could theoretically arise through loss of foraging and commuting habitat outside the SAC.

Description of Avoidance and/or Mitigation Measures: Describe any assumed (plainly established and uncontroversial) mitigation measures, including information on:	
Nature of proposals	11) No specific mitigation measures intended to address potential effects on Chillmark Quarries SAC are taken into account in this likely significant effects assessment, in line with case law.
Location	N/A
Evidence for effectiveness	N/A
Mechanism for delivery (legal conditions, restrictions or other legally enforceable obligations)	N/A

Characteristics of European Site(s) A brief description of the European Site should be produced, including information on:	
Name of European Site and its EU code	12) Chilmark Quarries SAC (UK0016373)
Location and distance of the European Site from the proposed works	13) The closest point (western extent) is approximately 11km from the SAC boundary. Qualifying features of the SAC likely to be present in habitats along Option alignment.
European Site size	14) 10.16ha
Key features of the European Site including the primary reasons for selection and any other qualifying interests	15) Chilmark Quarries SAC includes Chilmark Quarries SSSI and Fonthill Grottoes SSSI. It is a complex of abandoned stone mines which provides suitable hibernation conditions for a range of bat species. 16) Annex II species present as primary reasons for designation: i. Greater horseshoe bat ii. Barbastelle bat iii. Bechstein's bat (*Myotis bechsteinii*) 17) Annex II species present as a qualifying feature, but not a primary reason for site selection: i. Lesser horseshoe bat (*Rhinolophus hipposideros*)
Vulnerability of the European Site – any information available from the standard data forms on potential effect pathways	18) The Site Improvement Plan[14] states that the following threats and pressures have a high impact on the SAC: i. Public access/disturbance ii. Natural changes to the site conditions iii. Offsite habitat availability/management iv. Planning Permission: general v. Air pollution: impact of atmospheric nitrogen deposition 19) The threats referring to public access/disturbance, planning permission and natural changes to the site conditions only affect the SAC itself and therefore are not considered further for the purpose of this assessment. Moreover, as the Scheme is approximately 11km from the SAC, nitrogen deposition resulting from atmospheric pollution created from road traffic will not directly or indirectly affect the qualifying features within the SAC. 20) The Scheme is over 11km from the SAC and lies outside

[14] Natural England (2015) Site Improvement Plan: Chilmark Quarries (SIP044)
http://publications.naturalengland.org.uk/publication/5962539112333312

	the core zones for the SAC as identified by Wiltshire Council[15]. However, small numbers of barbastelle bat, greater horseshoe bat and lesser horseshoe bat have been recorded foraging/commuting across the A303 during surveys for the EIA. These may conceivably be part of the SAC population given the following research: i. A study in 2012 by Zeale *et. al*[16] found that individual home ranges of the barbastelle bat varied considerably, with bats travelling between 1km and 20km to reach foraging areas (averaging at 6.8km +/- 4.8km). ii. There are some known greater horseshoe bat movements from Gloucestershire to Purbeck in Dorset, as well as between Bath/Bradford-on-Avon and Chilmark (pers. comm.) iii. Radio tracking of lesser horseshoe bats from the Glynllifon SAC undertaken as part of the A487 Llanwnda to south of Llanllyfni scheme found them travelling at least 11km to hibernation sites in disused mines in the Nantlle Valley[17].
European Site conservation objectives – where these are readily available	21) The Conservation Objectives for the SAC state: *Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:* • *The extent and distribution of qualifying natural habitats and habitats of qualifying species;* • *The structure and function (including typical species) of qualifying natural habitats;* • *The structure and function of the habitats of qualifying species;* • *The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;* • *The population of qualifying species; and* • *The distribution of qualifying species within the site.*
Assessment Criteria Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the European Site.	
22) No other plans and projects have been identified which would act 'in combination' with this Scheme. 23) Where relevant, reference is made to the threats and pressures outlined in the Chilmark Quarries	

[15] Bat Special Areas of Conservation (SAC) Planning Guidance for Wiltshire, available at http://www.wiltshire.gov.uk/bat-special-areas-of-conservation-planning-guidance-for-wilthshire.pdf
[16] Zeale, M., Davidson-Watts, I., and Jones, G., (2012); Home range use and habitat selection by barbastelle bats (Barbastella barbastellus): implications for conservation, Journal of Mammalogy, vol. 93(4): 1110-1118
[17] Bickmore, C., (2003). Review of work carried out on trunk road network in Wales for bats. A report produced on behalf of the Transport Directive, Welsh Assembly Government & Countryside Council for Wales.

SAC Site Improvement Plan[14].	
24) The Scheme has the potential to result in the loss and disturbance (light, air and noise pollution) of habitats that could provide potential supporting features to three of the four species of bats which are found within the SAC (foraging or commuting habitat). Offsite habitat availability is considered a threat to the SAC and could potentially adversely affect the SACs population of lesser horseshoe bat (S1303), greater horseshoe bat (S1304), barbastelle bat (S1323) and Bechstein's bat (S1323).	
25) Operational impacts through the creation of a new dual carriageway could result in reduction in the size of the local bat populations (through loss of habitat), inaccessibility of foraging grounds or roost sites (through the barrier effect), increase in mortality (through collision), and reduction of genetic exchange between bat populations.	
Initial Assessment in relation to Chilmark Quarries SAC The key characteristics of the site and the details of the European Site should be considered in identifying potential impacts. Describe any likely changes to the site arising as a result of:	
Reduction of habitat area	26) No impact on SAC.
Disturbance to key species	27) No impact on the SAC compared to the existing A303.
Habitat or species fragmentation	28) Potential net positive impact on the SAC which would alleviate some of the threat regarding a lack of offsite habitat availability for the qualifying bat species. 29) All three species (barbastelle bat, greater horseshoe bat and lesser horseshoe bat) are already recorded crossing the A303 to access habitat either side of the road and they do this without using strong landscape features that would be removed due to the Scheme. Due to the distance (11km) separating the Scheme area from the SAC, any foraging or commuting routes present are not considered part of the core roost resource zone for the SAC. The western Scheme extent at Yarnbury Castle (the closest part to the SAC) lies nearly 4km north east of the 6km buffer established by Wiltshire Council[18] for the SAC regarding barbastelle bat and 6km north east of the 4km buffer established for horseshoe bats. As such, any effect that did arise through loss of foraging/commuting features would be of sufficiently small magnitude that it would not affect the ability of the SAC to support barbastelle bat, greater horseshoe bat and lesser horseshoe bat. 30) Although it was not designed for mitigation of impacts on the SAC, north to south connectivity would be retained by the Scheme through four green bridges that will form part of an ecological network. This would be in addition to the existing A303 at Normanton Down being converted to a restricted byway, effectively removing about 3.3km of the A303 entirely from a section of the landscape. 31) Green bridge one (Parsonage Down) and green bridge two (east of Till) include bunds and planting. These bridges would offer sheltered crossing features and connectivity to existing habitat features to aid crossing by bats, whilst the River Till viaduct would maintain an unimpeded unlit route along the Till valley under the A303. Additionally, the B3083 underbridge has been widened to provide an access for farm use, without lighting, in addition to the road for local traffic and this is

[18] Plan 3 on page 10 of Bat Special Areas of Conservation (SAC) Planning Guidance for Wiltshire, available at http://www.wiltshire.gov.uk/bat-special-areas-of-conservation-planning-guidance-for-wilthshire.pdf

	expected to facilitate the movement of bats beneath the bridge. The hedgerows leading to the B3083 underbridge will be enhanced and linked to existing suitable woodland habitat to provide a connective feature between habitats. The proposed scheme will also include extensive woodland planting for visual screening for Winterbourne Stoke and landscape integration, as well as adjacent creation of chalk grassland, with its associated benefits for invertebrates and hence potential for bat foraging. These measures were not designed to protect the SAC, since the habitat at this part of the A303 is considered peripheral to the ability of the SAC to support its populations of barbastelle bat, greater horseshoe bat and lesser horseshoe bat. Nonetheless, these measures mean that the Scheme will have a net positive effect for bats traversing the A303, and thus on the SAC. In addition, whilst no bat roosts will be lost to the Scheme, two underground bat structures are included, which will have the potential to provide new hibernation sites for bats, including species for which the SAC is designated.
Reduction in species density	32) None anticipated.
Changes in key indicators of conservation value (*water quality etc.*)	33) None anticipated.
Climate change	34) Reduced congestion will have no effect on climate change.
Describe any likely impacts on the European Site as a whole in terms of:	
Interference with the key relationships that define the structure of the site	35) No impact identified that would interfere with the structure of the site.
Interference with key relationships that define the function of the site	36) There will be no direct impacts to the SAC. The Scheme has the potential to positively affect SAC species.
Indicate the significance as a result of the identification of impacts set out above in terms of:	
Reduction of habitat area	37) Not significant
Disturbance to key species	38) Not significant
Habitat or species fragmentation	39) Not significant
Disruption	40) Not significant
Change to key elements of the site (*e.g. water quality, hydrological regime etc.)*	41) Not significant
Describe from the above those elements of the project, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known:	
42) None	
Outcome of screening stage	43) Not likely to be Significant Effects
Are the appropriate statutory environmental bodies in agreement with this conclusion?	44) Natural England informally commented on an earlier format version of the HRA and did not raise concerns over Chilmark Quarries SAC. Further engagement with Natural England on the assessment is planned during Pre-Examination.

Table 3.5 Screening Matrix: Mottisfont Bats SAC (UK0030334)

Project Name:	A303 Amesbury to Berwick Down	
Natura 2000 Site under Consideration:	Mottisfont Bats SAC (UK0030334)	
Date:	**Author (Name / Organisation):**	**Verified (Name / Organisation):**
23/08/18	Ashley Welch/AECOM Milly Kent/AECOM	James Riley/AECOM
Description of Project *Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the European Site by virtue of*:		
Size and scale (*road type and probable traffic volume*)	1)	Improvements are proposed to the A303 between Amesbury and Berwick Down. The following route has been selected: 13.2km overall in length of dual carriageway including an approx 3.3km tunnel with a bypass to the north of Winterbourne Stoke, the eastern portal to the east of 'The Avenue' and the western tunnel portal located to the south of Normanton Gorse.
Land-take	2)	The route is located outside of the SAC. There will be no impacts through land-take.
Distance from the European Site or key features of the site (*from edge of the project assessment corridor*)	3)	The closest point (eastern extent) is approximately 20km from the SAC boundary. Qualifying features of the SAC likely to be present in habitats along Option alignment.
Resource requirements (*from the European Site or from areas in proximity to the site, where of relevance to consideration of impacts*)	4) 5) 6)	Studies undertaken by the National Trust at Mottisfont SAC indicate that the maximum overall distances flown by the bats typically occurs in August (16.51km in 2004 and 10.12km in 2005), with maximum distances in other months varying between 1.12km and 8.65km[19]. On this basis, a distance of 7.5km from the SAC has been adopted in which to identify plans and projects likely to have an impact upon habitats used by barbastelle bats from the Mottisfont Bats SAC[20]. Based on this and the distance between the SAC and the Scheme (20km), resource requirements are not anticipated.
Emissions (*e.g. polluted surface water runoff – both soluble and insoluble pollutants, atmospheric pollution*)	7)	No impacts on Mottisfont Bats SAC from emissions are anticipated due to the distance between the route and this designated site. No roads within 200m of the SAC are part of the Affected Road Network.
Excavation requirements (*e.g. impacts of local hydrogeology*)	8)	No impacts on Mottisfont Bats SAC from emissions are anticipated due to the distance between the route and this designated site.
Transportation requirements	9)	Temporary roads may need to be constructed to maintain traffic flow during the construction phase. These will be located outside of the Mottisfont Bats SAC.

[19] National Trust/Ian Davidson-Watts and Ailsa Mckenzie (ID Wildlife Ltd) (2006). *Habitat use and Ranging of Barbastelle Bats of the Mottisfont Estate*, Hampshire.
[20] Jonathan Cox Associates (2010). *Mottisfont Bats Special Area of Conservation (SAC) Protocol for Planning Officers* Report to Natural England June 2010. http://www.wiltshire.gov.uk/corestrategydocument?directory=Studies%2C%20Surveys%20and%20Assessments&fileref=132

	10) No impacts on the SAC from transportation are anticipated due to the distance between the route and this designated site. No roads within 200m of the SAC are part of the Affected Road Network.
Duration of construction, operation, etc.	11) Construction of the tunnel has been estimated at between 45 to 54 months depending on the construction methodology. A working assumption is therefore that the construction of the Scheme may take in the region of 5 years.
Other	12) None anticipated due to the distance between the options and this designated site.

Description of Avoidance and/or Mitigation Measures: Describe any assumed (plainly established and uncontroversial) mitigation measures, including information on:	
Nature of proposals	13) No specific mitigation measures intended to address potential effects on Mottisfont Bats SAC are taken into account in this likely significant effects assessment, in line with case law.
Location	N/A
Evidence for effectiveness	N/A
Mechanism for delivery (legal conditions, restrictions or other legally enforceable obligations)	N/A

Characteristics of European Site(s) *A brief description of the European Site should be produced, including information on:*	
Name of European Site and its EU code	14) Mottisfont Bats SAC (UK0030334)
Location and distance of the European Site from the proposed works	15) The closest point (eastern extent) is approximately 20km from the SAC boundary. Species that are qualifying features of the SAC are present in habitats within the Scheme.
European Site size	16) 196.55 ha
Key features of the European Site including the primary reasons for selection and any other qualifying interests	17) Annex II species present as primary reasons for designation: i. Barbastelle bat 18) Mottisfont Bats SAC contains a mix of woodland types including hazel coppice with standards, broadleaved plantation and coniferous plantation which barbastelles use for breeding, roosting, commuting and feeding.
Vulnerability of the European Site – any information available from the standard data forms on potential effect pathways	19) The Site Improvement Plan[21] states that the following threats and pressures have a high impact on the SAC: i. Forestry and woodland management ii. Offsite habitat availability /management 20) The threats referring to forest and woodland management only affects the SAC itself and is therefore not considered further for the purpose of this assessment.

[21] Natural England (2015) Site Improvement Plan: Mottisfont Bats (SIP144) http://publications.naturalengland.org.uk/file/6413456100032512

European Site conservation objectives – where these are readily available	21) The Conservation Objectives for the SAC state: *Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:* *The extent and distribution of qualifying natural habitats and habitats of qualifying species;* *The structure and function (including typical species) of qualifying natural habitats;* *The structure and function of the habitats of qualifying species;* *The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;* *The population of qualifying species; and* *The distribution of qualifying species within the site.*

Assessment Criteria

Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the European Site.

22) No other plans and projects have been identified which would act 'in combination' with this Scheme.

23) Where relevant, reference is made to the threats and pressures outlined in the Mottisfont Bats SAC Site Improvement Plan[21].

24) The proposed would result in the loss and disturbance (light, air and noise pollution) of habitats that could provide potential supporting features to barbastelle bats which is a species that is found within the SAC (roosts, foraging or commuting habitat). Offsite habitat availability is considered a threat to the SAC and could potentially adversely affect the SACs population of barbastelle bats (S1308).

25) Operational impacts through the creation of a new dual carriageway could result in reduction in size of the local bat populations (through loss of habitat), inaccessibility of foraging grounds or roost sites (through the barrier effect), increase in mortality (through collision), and reduction genetic exchange between bat populations.

Initial Assessment in relation to Mottisfont Bats SAC

The key characteristics of the site and the details of the European Site should be considered in identifying potential impacts.

Describe any likely changes to the site arising as a result of:

Reduction of habitat area	26) No impact on SAC
Disturbance to key species	27) No impact on the SAC compared to the existing A303
Habitat or species fragmentation	28) No impact on the SAC. The population of the SAC is not

	likely to be dependent on the habitats affected by the Scheme, although barbastelle bats have been recorded within the study area. 29) However, the simple fact that habitat is used by barbastelle bats does not mean that the habitat is of particular importance to the bat population of this SAC as barbastelle bats are found across the countryside. Habitat areas of relevance to supporting this SAC are identified by the core zone. Given the distance separating the Scheme from the identified core zone within which likely significant effects on the SAC may arise (20km vs 7.5km core zone), no likely significant effects on the SAC are expected. 30) Nonetheless, as a lack of offsite habitat availability has been identified as a potential threat, the provisions of habitat as part of the Scheme have the potential to provide benefits for barbastelle bats. Although it was not designed for this purpose, north to south connectivity would be retained by the Scheme through four green bridges that will form part of an ecological network. This would be in addition to the existing A303 at Normanton Down being converted to a restricted byway, effectively removing about 3.3km of the A303 entirely from a section of the landscape. Green bridge one (Parsonage Down) and green bridge two (east of Till) include bunds and planting. These bridges would offer sheltered crossing features and connectivity to existing habitat features to aid crossing by bats, whilst the River Till viaduct would maintain an unimpeded unlit route along the Till valley under the A303. Additionally, the B3083 underbridge has been widened to provide an access for farm use, without lighting, in addition to the road for local traffic and this is expected to facilitate the movement of bats beneath the bridge. The hedgerows leading to the B3083 underbridge will be enhanced and linked to existing suitable woodland habitat to provide a connective feature between habitats. The Scheme will also include extensive woodland planting for visual screening for Winterbourne Stoke and landscape integration, as well as adjacent creation of chalk grassland, with its associated benefits for invertebrates and hence potential for bat foraging. These measures were not designed to protect the SAC, since the habitat at this part of the A303 is considered peripheral to the ability of the SAC to support its populations of barbastelle. In addition, whilst no bat roosts will be lost to the Scheme, two underground bat structures are included, which will have the potential to provide new hibernation sites for bats. Hence, these measures mean that the Scheme is expected to have a net positive effect for bats.
Reduction in species density	31) None anticipated.
Changes in key indicators of conservation value (*water quality etc.*)	32) None anticipated.
Climate change	33) Reduced congestion will have no effect on climate change.

Describe any likely impacts on the European Site as a whole in terms of:	
Interference with the key relationships that define the structure of the site	34) No impact identified that would interfere with the structure of the site.
Interference with key relationships that define the function of the site	35) There will be no direct impacts to the SAC. The Scheme has the potential to positively affect SAC species.
Indicate the significance as a result of the identification of impacts set out above in terms of:	
Reduction of habitat area	36) Not significant
Disturbance to key species	37) Not significant
Habitat or species fragmentation	38) Not significant
Disruption	39) Not significant
Change to key elements of the site (*e.g. water quality, hydrological regime etc.)*	40) Not significant
Describe from the above those elements of the project, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known:	
1) None	
Outcome of screening stage	41) Not likely to be Significant Effects
Are the appropriate statutory environmental bodies in agreement with this conclusion?	42) Natural England informally commented on an earlier format version of the HRA and did not raise concerns over Mottisfont Bats SAC. Further engagement with Natural England on the assessment is planned during Pre-Examination.

Table 3.6 Screening Matrix: Mells Valley SAC (UK0012658)

Project Name:	A303 Amesbury to Berwick Down	
Natura 2000 Site under Consideration:	Mells Valley SAC (UK0012658)	
Date:	**Author (Name / Organisation):**	**Verified (Name / Organisation):**
23/08/18	Ashley Welch/AECOM Milly Kent/AECOM	James Riley/AECOM
Description of Project *Describe any likely direct, indirect or secondary impacts of the project (either alone or in combination with other plans or projects) on the European Site by virtue of*:		
Size and scale (*road type and probable traffic volume*)	1)	Improvements are proposed to the A303 between Amesbury and Berwick Down. The following route has been selected: 13.2km overall in length of dual carriageway including an approx. 3.3km tunnel with a bypass to the north of Winterbourne Stoke, the eastern portal to the east of 'The Avenue' and the western tunnel portal located to the south of Normanton Gorse.
Land-take	2)	The Scheme is located outside of the SAC. There will be no impacts through land-take.
Distance from the European Site or key features of the site (*from edge of the project assessment corridor*)	3)	The closest point (eastern extent) is approximately 29.3km from the SAC boundary. Qualifying features of the SAC likely to be present in habitats within the SAC.
Resource requirements (*from the European Site or from areas in proximity to the site, where of relevance to consideration of impacts*)	4)	None
Emissions (*e.g. polluted surface water runoff – both soluble and insoluble pollutants, atmospheric pollution*)	5)	No impacts on Mells Valley SAC from emissions are anticipated due to the distance between the route and this designated site. No roads within 200m of the SAC are part of the Affected Road Network.
Excavation requirements (*e.g. impacts of local hydrogeology*)	6)	No impacts on Mells Valley SAC from emissions are anticipated due to the distance between the Scheme and this designated site.
Transportation requirements	7) 8)	Temporary roads may need to be constructed to maintain traffic flow during the construction phase. These will be located outside of the Mells Valley SAC. No impacts on the SAC from transportation are anticipated due to the distance between the route and this designated site. No roads within 200m of the SAC are part of the Affected Road Network.
Duration of construction, operation, etc.	9)	Construction of the tunnel has been estimated at between 45 to 54 months depending on the construction methodology. A working assumption is therefore that the construction of the Scheme may take in the region of 5 years.
Other	10)	None anticipated due to the distance between the options and this designated site.
Description of Avoidance and/or Mitigation Measures: Describe any assumed (plainly established and uncontroversial) mitigation measures, including information on:		

Nature of proposals	11) No specific mitigation measures intended to address potential effects on Mells Valley SAC are taken into account in this likely significant effects assessment, in line with case law.
Location	N/A
Evidence for effectiveness	N/A
Mechanism for delivery (legal conditions, restrictions or other legally enforceable obligations)	N/A

Characteristics of European Site(s) *A brief description of the European Site should be produced, including information on:*	
Name of European Site and its EU code	12) Mells Valley SAC (UK0012658)
Location and distance of the European Site from the proposed works	13) The closest point (eastern extent) is approximately 29.3km from the SAC boundary. Qualifying features of the SAC likely to be present in habitats along Option alignment.
European Site size	14) 28.77 ha
Key features of the European Site including the primary reasons for selection and any other qualifying interests	15) Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: i. Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometailia*)(*important orchid sites) ii. Caves not open to the public 16) Annex II species present as primary reasons for designation: i. Greater horseshoe bat 17) The qualifying Annex I habitats for the Site are not considered further for the purpose of this assessment due to the distance of the SAC from the Scheme location (29.3km).
Vulnerability of the European Site – any information available from the standard data forms on potential effect pathways	18) The Site Improvement Plan[22] states that the following threats and pressures have a high impact on the SAC: i. Public access/disturbance ii. Wildlife/arson iii. Direct impact from third party iv. Undergrazing v. Inappropriate designation boundary vi. Air pollution: impact of atmospheric nitrogen deposition 19) All threats only affect the SAC itself and are therefore not considered further for the purpose of this assessment.
European Site conservation objectives – where these are readily available	20) The Conservation Objectives for the SAC state: *Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving*

[22] Natural England (2015) Site Improvement Plan: Mells Valley (SIP135) http://publications.naturalengland.org.uk/file/4896385117716480

	the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring: *The extent and distribution of qualifying natural habitats and habitats of qualifying species;* *The structure and function (including typical species) of qualifying natural habitats;* *The structure and function of the habitats of qualifying species;* *The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;* *The population of qualifying species; and* *The distribution of qualifying species within the site.*

Assessment Criteria *Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the European Site.*
21) No other plans and projects have been identified which would act 'in combination' with this Scheme. 22) Where relevant, reference is made to the threats and pressures outlined in the Mells Valley SAC Site Improvement Plan[22]. 23) The route would result in the loss and disturbance (light, air and noise pollution) of habitats that could provide potential supporting features to barbastelle bats which is a species that is found within the SAC (roosts, foraging or commuting habitat). 24) Operational impacts through the creation of a new dual carriageway could result in reduction in size of the local bat populations (through loss of habitat), inaccessibility of foraging grounds or roost sites (through the barrier effect), increase in mortality (through collision), and reduction genetic exchange between bat populations.

Initial Assessment in relation to Mells Valley SAC *The key characteristics of the site and the details of the European Site should be considered in identifying potential impacts.* *Describe any likely changes to the site arising as a result of:*	
Reduction of habitat area	25) No impact on SAC
Disturbance to key species	26) No impact on the SAC compared to the existing A303
Habitat or species fragmentation	27) No impact on the SAC. 28) Studies undertaken by Billington (2000)[23] indicate the importance of high overgrown hedgerows, next to meadows and grazed pasture, areas of scrub and tree lines or woodland edges often near water as primary

[23] Billington, G., (2000). *Radio tracking study of greater horseshoe bats at Mells, near Frome, Somerset*. English Nature Research Report 403: 1 – 24.

	foraging habitat. Bats were shown to be commuting, mostly within 3 kilometres of the roost site and up to 3.5 kilometres from the roost site to Kingsdown Wood, Ammerdown. A route that one male traversed from Wadbury to there was 7km. 29) The study also found that adult bats were commuted 6km to feeding areas, whereas juveniles stayed within 4km of the roost. 30) Based on this and the distance between the SAC and the route (29.3km), resource requirements are not anticipated. However, greater horseshoe are already recorded crossing the A303 to access habitat either side of the road and they do this without using strong landscape features that would be removed due to the Scheme. Due to the distance (29.3km) separating the Scheme area from the SAC, any foraging or commuting routes present are not considered part of the Ecological Zone of Influence for greater horseshoe[23]. 31) Provisions for maintenance and enhancement of ecological network including green bridges and extensive habitat creation were not designed to protect the SAC, since the habitat at this part of the A303 is considered peripheral to the ability of the SAC to support its populations of greater horseshoe. Nonetheless, these measures mean that the Scheme is expected to have a net positive effect for bats even though there are not expected to be any positive or negative impacts on the bats within the SAC due to the distance from the site.
Reduction in species density	32) None anticipated.
Changes in key indicators of conservation value (*water quality etc.*)	33) None anticipated.
Climate change	34) Reduced congestion will have no effect on climate change.
Describe any likely impacts on the European Site as a whole in terms of:	
Interference with the key relationships that define the structure of the site	35) No impact identified that would interfere with the structure of the site.
Interference with key relationships that define the function of the site	36) There will be no direct impacts to the SAC. The Scheme has the potential to positively affect SAC species.
Indicate the significance as a result of the identification of impacts set out above in terms of:	
Reduction of habitat area	37) Not significant
Disturbance to key species	38) Not significant
Habitat or species fragmentation	39) Not significant
Disruption	40) Not significant
Change to key elements of the site (*e.g. water quality, hydrological regime etc.)*	41) Not significant
Describe from the above those elements of the project, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known:	
2) None	

Outcome of screening stage	42)	Not likely to be Significant Effects
Are the appropriate statutory environmental bodies in agreement with this conclusion?	43)	Natural England informally commented on an earlier format version of the HRA and did not raise concerns over Mells Valley SAC. Further engagement with Natural England on the assessment is planned during Pre-Examination.

4 Summary of Conclusions

4.1 Salisbury Plain SAC

4.1.1 **It is not possible at this point to conclude no likely significant effects exist with regard to dust deposition. This is due to a combination of the sensitivity of the vegetation, the proximity of the works, the topography and prevailing wind direction (Parsonage Bank is downslope of construction and downwind relative to the prevailing south-westerly wind such that dust would readily blow onto the SAC) and the potential scale of dust generating activities.**

4.1.2 However, there are effective methods (such as sheeting of vehicles and wetting of dust generating activities) that are routinely deployed on construction projects where dust generation is a concern; they are listed in Institute of Air Quality Management guidance on assessment of dust from demolition and construction. These are usually incorporated into an Outline Environment Management Plan (incorporate a Dust Management Plan where necessary) produced by the contractor. In the vast majority of cases this results in dust generating activities being controlled and significant dust soiling of vegetation being avoided. These will therefore be taken into consideration during the appropriate assessment.

4.2 Salisbury Plain SPA

4.2.1 It is known that a stone curlew plot outside the SPA itself is likely to be rendered unusable due to the Scheme. In addition, construction work close to existing nest plots could result in disturbance. **As such, it is not possible to conclude no likely significant effects from the Scheme at this stage due to a net loss of stone curlew breeding opportunities or to construction disturbance.** These impact pathways will be further investigated in the appropriate assessment.

4.2.2 It is also known that placing the A303 in tunnel will remove an existing barrier to human visitor dispersal from Stonehenge across the wider landscape. In combination with increased tourism and an increase in the population of Wiltshire and surrounding authorities (as per the Wiltshire Core Strategy and other strategic plans) this could result in exacerbated disturbance to some stone curlew plots outside the SPA. **It is not possible to screen out likely significant effects on the SPA from the Scheme in combination with other plans and projects due to increased visitor-related disturbance of stone curlew.**

4.3 River Avon SAC

4.3.1 **It is not possible to conclude that no likely significant effects exist with regard to shading and its consequent effects on siltation, habitat connectivity and fish spawning.**

4.3.2 The creation of a new bridge across the River Till could result in vegetation loss within the SAC due to shading (which in turn could result in erosion during periods of high flow) and subsequent siltation downstream. The degree of shading would depend on the detailed design of the viaduct, specifically the width and the height of the viaduct. **As a result, likely significant effects due to shading cannot be screened out.**

4.4 Chilmark Quarries SAC

4.4.1 Although all Annex II species (barbastelle, greater horseshoe and lesser horseshoe) have been recorded within the Scheme area, these species cross the existing A303 to access habitat either side of the road. In addition to this, the SAC is approximately 11km away from the Scheme. Therefore, any foraging and commuting routes present are not considered part of the core roost resource zone for the SAC. Several green bridges and a tunnel are proposed as part of the Scheme which, coupled with the extensive provision of new habitats and hibernation features, will potentially result in a net positive impact for bats.

4.4.2 **It is therefore possible to conclude that no likely significant effects exist in relation to Chilmark Quarries SAC. As a result, all likely significant effects can be screened out at this stage.**

4.5 Mottisfont Bats SAC

4.5.1 Although barbastelle bats have been recorded within the Scheme area, these species cross the existing A303 to access habitat either side of the road. Under the Mottisfont Bats SAC protocol, a 7.5km core zone was adopted in which to identify projects and plans likely to impact on habitats used by barbastelle bats from the SAC. As the route is located approximately 20km away from the SAC, beyond the core zone, no actual effects on the SAC are expected. In addition, several green bridges and a tunnel are proposed as part of the Scheme which, coupled with the extensive provision of new habitats and hibernation features, will potentially result in a net positive impact for bats.

4.5.2 **It is therefore possible to conclude that no likely significant effects exist in relation to Mottisfont Bats SAC. As a result, all likely significant effects can be screened out at this stage.**

4.6 Mells Valley SAC

4.6.1 Although greater horseshoe bats (Annex II species) have been recorded within the scheme area, this species crosses the existing A303 to access habitat either side of the road. In addition to this, the SAC is approximately 29.3km away from the Scheme. Therefore, any foraging and commuting routes present are not considered part of the Ecological Zone of Influence for the SAC.

4.6.2 **It is therefore possible to conclude that no likely significant effects exist in relation to Mells Valley SAC. As a result, all likely significant effects can be screened out at this stage.**

Appendices

Appendix A European Designated Sites Background

A.1 Salisbury Plain SAC

A.1.1 Introduction

A.1.1.1 Largest remaining area of chalk grassland in north-west Europe that supports several important habitats and associated species, including calcareous grasslands and juniper scrub on these grasslands or heaths. The ancient grasslands and scrubland support important assemblages of invertebrates, particularly butterflies, moths, flies and bees.

A.1.1.2 The SAC encompasses Salisbury Plain SPA along with their respective SSSIs. Salisbury Plain SAC also includes Pasonage Down SSSI.

A.1.2 Reasons for Designation

A.1.2.1 Salisbury Plain SAC qualifies as a SAC through its habitats and species. The SAC contains the Habitats Directive Annex I habitats:

- *Juniperus communis* formations on heaths and calcareous grasslands
- Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (*important orchid sites)

A.1.2.2 The SAC also supports the following Habitats Directive Annex II qualifying species:

- Marsh fritillary butterfly (*Euphydryas aurinia*)

A.1.3 Current Pressures and Threats[24]

- Changes in species distributions
- Air pollution: risk of atmospheric nitrogen deposition

A.1.4 Conservation Objectives[25]

A.1.4.1 With regard to the SAC and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features'), and subject to natural change;

A.1.4.2 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats an habitats of qualifying species
- The structure and function (including typical species) of the qualifying natural habitats
- The structure and function of the habitats of qualifying species

[24] http://publications.naturalengland.org.uk/publication/5745803545018368 [accessed 29/03/2018]
[25] http://publications.naturalengland.org.uk/publication/4786217489006592 [accessed 29/03/2018]

- The supporting processes on which qualifying habitats and the habitats of the qualifying species rely
- The population of each of the qualifying species, and,
- The distribution of the qualifying species within the site.

A.2 Salisbury Plain SPA

A.2.1 Introduction

A.2.1.1 Largest remaining area of chalk grassland in north-west Europe that supports rare plants such as tuberous thistle (*Cirsium tuberosum*) and meadow clary (*Salvia pratensis*). The site also supports important scrub communities which include juniper (*Juniperus communis*), buckthorn (*Rhamnus cathartica*), hawthorn (*Crataegus monogyna*), yew (*Taxus baccata*) and wayfaring-tree (*Viburnum lantana*). Breeding stone curlew and other birds are dependent upon the extensive areas of short grassland and scrubland, and wintering birds forage across these habitats.

A.2.1.2 Salisbury Plain is a composite site comprised of three large sections. Although the A303 is between 2.5km and 3.6km away from the sites north-west of Amesbury, the east section of the SPA is traversed by the road just south of Bulford Camp. Salisbury Plain SSSI is encompassed within the SPA area.

A.2.2 Reasons for Designation

A.2.2.1 The site qualifies under Article 4.1 of the Directive (79/409/EEC) supporting populations of European importance of the following species listed on Annex I of the Directive, during the breeding season:

- Stone curlew (*Burhinus oedicnemus*) – 20 breeding pairs (approximately 10.5% of the population in Great Britain)[26]

A.2.2.2 The site also qualifies as it supports the following over wintering populations:

- Hen harrier (*Circus cyaneus*) – 14 individuals (approximately 1.9% of Great Britain's wintering population)[27]

A.2.2.3 Qualifying species not listed in Annex I of the Wild Birds Directive (Article 4.2) include the following species during the breeding season:

- Eurasian hobby (*Falco subbuteo*)
- Common quail (*Coturnix coturnix*)

A.2.3 Current Pressures and Threats[28]

- Changes in species distributions
- Air pollution: risk of atmospheric nitrogen deposition

[26] http://jncc.defra.gov.uk/page-2039-theme=default [accessed 28/03/2018]
[27] http://jncc.defra.gov.uk/page-2040-theme=default [accessed 29/03/2018]
[28] http://publications.naturalengland.org.uk/publication/5745803545018368 [accessed 29/03/2018]

A.2.4 Conservation Objectives[29]

A.2.4.1 With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features'), and subject to natural change;

A.2.4.2 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- The extent and distribution of the habitats of the qualifying features
- The structure and function of the habitats of the qualifying features
- The supporting processes on which the habitats of the qualifying features rely
- The population of each of the qualifying species, and,
- The distribution of the qualifying species within the site.

A.3 River Avon SAC

A.3.1 Introduction

A.3.1.1 The River Avon begins in Wiltshire as two separate rivers, rising east of Devizes and east of Pewsey adjacent to the Avon and Kennet Canal. The confluence of occurs at Upavon, with the river flowing south through Salisbury Plain, through Amesbury and Salisbury, continuing through the New Forest until it enters the sea at Christchurch.

A.3.1.2 The River Avon runs through several areas of chalk and clay, which supports five aquatic *Ranunculus* species. Stream water-crowfoot (*Ranunculus penicillatus* ssp. *pseudofluitans*) and river water-crowfoot (*R. fluitans*) are the main dominants; however, some winterbourne reaches where pond water-crowfoot (*R. peltatus*) are also present.

A.3.1.3 The River Avon SAC consists of three Sites of Special Scientific Interest, River Avon System SSSI, Lower Woodford Water Meadows SSSI and River Till SSSI.

A.3.2 Reasons for Designation

A.3.2.1 River Avon SAC qualifies as a SAC through its habitats and species. The SAC contains the Habitats Directive Annex I habitat:

- Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation communities.

A.3.2.2 The SAC also supports the following Habitats Directive Annex II qualifying species:

- Desmoulin's whorl snail (*Vertigo moulinsiana*);
- sea lamprey (*Petromyzon marinus*);
- brook lamprey (*Lampetra planeri*);
- Atlantic salmon (*Salmo salar*); and
- bullhead (*Cottus gobio*).

[29] http://publications.naturalengland.org.uk/file/5230260905836544 [accessed 28/03/2018]

A.3.3 Current Pressures and Threats[30]

- Physical modification;
- Siltation;
- Water pollution;
- Water abstraction;
- Changes in species distributions;
- Invasive species;
- Public access/disturbance;
- Hydrological changes;
- Inappropriate weed control;
- Change in land management; and
- Habitat fragmentation.

A.3.4 Conservation Objectives[31]

A.3.4.1 With regard to the SAC and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features'), and subject to natural change;

A.3.4.2 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats an habitats of qualifying species;
- The structure and function (including typical species) of the qualifying natural habitats;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which qualifying habitats and the habitats of the qualifying species rely;
- The population of each of the qualifying species, and
- The distribution of the qualifying species within the site.

A.4 Chilmark Quarries SAC

A.4.1 Introduction

A.4.1.1 Chilmark Quarries is situated within Gloucestershire, Wiltshire and the Bristol/Bath area. It consists predominantly of mixed woodland with towns, villages, roads, waste places, mines and industrial sites interspersed throughout.

A.4.1.2 The site covers a 10.16ha area and is designated due to the presence of several bat species. Chilmark Quarries SAC includes Chilmark Quarries SSSI and Fonthill Grottoes SSSI.

[30] http://publications.naturalengland.org.uk/file/6247102287970304 [accessed 28/03/2018]
[31] http://publications.naturalengland.org.uk/publication/6048472272732160 [accessed 28/03/2018]

A.4.2 Reasons for Designation

A.4.2.1 Chilmark Quarries SAC qualifies as a SAC through its species. The SAC supports the following Habitats Directive Annex II qualifying species:

- Greater horseshoe bat (*Rhinolophus ferrumequinum*) – complex of abandoned stone mines provide suitable hibernation conditions;
- Barbastelle (*Barbastella barbastellus*) - complex of abandoned stone mines provide suitable hibernation conditions; and
- Bechstein's bat (*Myotis bechsteinii*) - complex of abandoned stone mines provide suitable hibernation conditions

In addition the SAC supports the following Annex II species present as a qualifying feature:

- Lesser horseshoe bat (*Rhinolophus hipposideros*)

A.4.3 Current Pressures and Threats[32]

- Public Access/Disturbance;
- Natural changes to site conditions;
- Offsite habitat availability/management;
- Planning Permission: general; and
- Air Pollution: impact of atmospheric nitrogen deposition.

A.4.4 Conservation Objectives[33]

A.4.4.1 With regard to the SAC and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features'), and subject to natural change;

A.4.4.2 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of habitats of qualifying species;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which the habitats of the qualifying species rely;
- The population of each of the qualifying specie; and
- The distribution of the qualifying species within the site.

A.5 Mottisfont Bats SAC

A.5.1 Introduction

A.5.1.1 Mottifont Bats SAC is situated between Salisbury and Winchester within the county of Hampshire. It consists primarily of broad-leaved deciduous woodland with smaller sections of coniferous woodland, which support an important population of bats.

[32] http://publications.naturalengland.org.uk/file/4524295369785344 [accessed 17/07/2018]
[33] http://publications.naturalengland.org.uk/publication/4553200514367488 [accessed 17/07/2018]

A.5.2 Reasons for Designation

A.5.2.1 Mottisfont Bats SAC qualifies as a SAC through its species. The SAC supports the following Habitats Directive Annex II qualifying species:

- Barbastelle (*Barbastella barbastellus*) – one of six known sites which support maternity roosts in the UK (2002 data) and the only one in Hampshire.

A.5.3 Current Pressures and Threats[34]

- Feature location/ extent/ condition unknown;
- Forestry and woodland management; and
- Offsite habitat availability/ management.

A.5.4 Conservation Objectives[35]

A.5.4.1 With regard to the SAC and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features'), and subject to natural change;

A.5.4.2 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of habitats of qualifying species;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which the habitats of the qualifying species rely;
- The population of each of the qualifying species; and
- The distribution of the qualifying species within the site.

A.6 Mells Valley SAC

A.6.1 Introduction

A.6.1.1 Mells Valley SAC is situated between Bath and Yeovil within the county of Somerset. It consists primarily of improved grassland with smaller sections of humid grassland, mesophile grassland and broadleaved deciduous woodland, which support an important population of bats.

A.6.2 Reasons for Designation

A.6.2.1 Mells Valley SAC qualifies as a SAC through its habitats and species. The SAC contains the following Habitats Directive Annex I habitats as qualifying features:

- Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (important orchid sites); and
- Caves not open to the public.

A.6.2.2 The SAC also supports the following Habitats Directive Annex II qualifying species:

[34] http://publications.naturalengland.org.uk/file/6413456100032512 [accessed 17/07/2018]
[35] http://publications.naturalengland.org.uk/file/6608981963309056 [accessed 17/07/2018]

- Greater horseshoe bat (*Rhinolophus ferrumequinum*) – the site contains a population comprising about 12% of the UK population.

A.6.3 Current Pressures and Threats[36]

- Public access/disturbance;
- Wildfire/arson;
- Direct impact from third party;
- Undergrazing;
- Inappropriate designation boundary; and
- Air pollution: impact of atmospheric nitrogen deposition.

A.6.4 Conservation Objectives[37]

A.6.4.1 With regard to the SAC and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features'), and subject to natural change;

A.6.4.2 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and the habitats of the qualifying species rely;
- The population of each of the qualifying species; and
- The distribution of the qualifying species within the site.

[36] http://publications.naturalengland.org.uk/file/4896385117716480 [accessed 22/08/2018]
[37] http://publications.naturalengland.org.uk/file/5706414299283456 [accessed 22/08/2018]

Appendix B PINS Screening Matrices

4.6.3 Potential effects upon the European site(s) which are considered within the submitted HRA screening report (Appendix 8.24 of the Environmental Statement) are provided in the table below.

Effects considered within the screening matrices

Designation	Effects described in submission information	Presented in screening matrices as
River Avon SAC	• Disturbance to SAC species due to construction adjacent to River Till • Habitat or species fragmentation due to shading of the River Till from new viaduct and construction crossing • Deterioration in water quality in the SAC due to construction • Deterioration in water quality in the SAC during operation • Effects on water levels in the River Till and adjacent floodplain function during construction of viaduct • Pollution through increased vehicle exhaust emissions during construction and operation • Introduction and spread of invasive species	Water quality Shading of the River Till Fish passage Changes to water level Disturbance e.g. vibration and noise Invasive species Vehicle exhaust emissions (in combination effect)
Salisbury Plain SAC	• Dust deposition to habitats during construction within 200m of Parsonage Down, and resulting	Dust

	effects on marsh fritillary	
	• Pollution through increased vehicle exhaust emissions during construction and operation	Vehicle exhaust emissions (in combination effect)
Salisbury Plain SPA	• Loss of stone curlew nesting habitat	Loss of breeding plots
	• Disturbance of nesting stone curlew due to construction or operation	Non-recreational disturbance
	• Recreational disturbance of nesting stone curlew during operation due to removal of barrier of old A303	Recreational pressure (in combination effect)
Chilmark Quarries SAC	• Functionally-linked habitat fragmentation during construction • Population fragmentation and road collision	Loss of connecting habitat Operational impacts e.g. fragmentation of populations, road collisions
Mottisfont Bats SAC	• Functionally-linked habitat fragmentation during construction • Population fragmentation and road collision	Loss of connecting habitat Operational impacts e.g. fragmentation of populations, road collisions
Mells Valley SAC	• Functionally-linked habitat fragmentation during construction • Population fragmentation and road collision	Loss of connecting habitat Operational impacts e.g. fragmentation of populations, road collisions

4.6.4 The European sites included within the screening assessment are:

- River Avon SAC;
- Salisbury Plain SAC;

- Salisbury Plain SPA;
- Chilmark Quarries SAC;
- Mottisfont Bats SAC; and
- Mells Valley SAC.

4.6.5 Evidence for, or against, likely significant effects on the European site(s) and its qualifying feature(s) is detailed within the footnotes to the screening matrices below.

Matrix Key:

✓ = Likely significant effect **cannot** be excluded

✖ = Likely significant effect **can** be excluded

C = construction

O = operation

D = decommissioning

HRA Screening Matrix 1: Salisbury Plain SAC

	Name of European site and designation: Salisbury Plain SAC					
	EU Code: UK0012683					
	Distance to NSIP: 0m					
European site features	**Likely effects of NSIP**					
Effect	Dust			In combination effects (vehicle exhaust emissions)		
Stage of Development	C	O	D	C	O	D
Juniperus communis formations on heaths and calcareous grasslands	Not present in affected area	Not present in affected area		Not present in affected area	Not present in affected area	
Semi-natural dry grasslands and scrubland facies on calcareous substrates (*hey*) (*important orchid sites)	✓a i	X b		X b	X b	
Marsh fritillary	✓a ii	X b		X b	X b	

a. i. Dust emissions during construction of the Winterbourne Stoke bypass within 60-200m of Parsonage Down (particularly the initial topsoil strip) could affect those parts of the SAC that lie relatively close to the works (i.e. within 200m), by coating vegetation and thus affecting evapotranspiration and

photosynthesis. Plant communities near short-term works are likely to recover within a year of the dust soiling stress ceasing. Moreover, the thin chalk soils of the general area mean that chalk dust can be generally found in the atmosphere in small quantities. Nonetheless, in the absence of controlling measures, heavy coating of chalk dust on vegetation close to the works area would potentially result in a negative impact. No dust generation is expected from road operation (Table 3.2 paragraph 45 on page 27).

a. ii. Heavy dust deposition could affect marsh fritillary butterflies (if present) should their main larval food plant, devil's bit scabious, be present in sufficient amounts. This species has recently been recorded at Parsonage Down for the first time in many years (Table 3.2 paragraph 46 on page 27).

b. The only in-combination effects identified for Salisbury Plain SAC relate to housing growth associated with the implementation of the Army Basing Programme at Salisbury Plain (in the Bulford Camp area and associated with the other camps around the SAC) and housing and employment growth in surrounding authorities (as set out in the Wiltshire Core Strategy and other strategic plans). These may result in an increase in the volume of vehicles using the A303 and other roads within the Affected Road Network. Coupled with the Scheme this could result in a change to the NOx concentrations (and thus nitrogen deposition). However, this has been modelled and a conclusion of no likely significant effect can be drawn as either the critical level for NOx will not be exceeded under any modelled future scenario including the Scheme, at any modelled transect, or where it is exceeded the Scheme will result in either a negligible change in NOx or a net improvement (Table 3.2 paragraphs 30-34 page 26).

HRA Screening Matrix 2: Salisbury Plain SPA

	Name of European site and designation: Salisbury Plain SPA								
	EU Code: UK9011102								
	Distance to NSIP: 2.8km								
European site features	**Likely effects of NSIP**								
Effect	Non-recreational disturbance			Loss of breeding plots			In combination effects (recreational pressure)		
Stage of Development	C	O	D	C	O	D	C	O	D
Stone curlew	✓c	X d		✓e i				✓f	
Hen harrier	X e ii	X e ii		X e ii				X f	
Common quail	X e iii	X e iii		X e iii				X f	
Hobby	X e iv	X e iv		X e iv				X f	

c. Stone curlews breed outside the SPA in proximity to the Scheme at Normanton Downs RSPB reserve and at other locations known to historically support breeding stone curlew. Stone curlew using these plots at time of construction would have the potential to be disturbed by increased vehicular movements and human disturbance. Such disturbance impacts would have the potential to cause stress, which may result in a reduction in their resilience and breeding success. In extreme cases disturbance impacts may result in the abandonment of breeding plots (Table 3.3 paragraph 30, page 31 and paragraph 45, page 32).

d. On rare occasions when traffic is diverted away from the tunnel on to the diversion route, which runs along the southern edge of the SPA along the Packway, the increased levels of traffic may result in increased levels of light spill from vehicle movements. However this is unlikely to impact the designated features of the SPA as the site is bordered by a large swathe of scrub that shields the SPA from traffic (Table 3.3 paragraph 32, page 31).

e. i. Data on stone curlew nesting records dating back to 2006 were obtained for an area up to 4km from the A303. Following examination of these data and discussion with RSPB it was agreed that one successful stone curlew breeding plot outside the SPA (south-east of Parsonage Down) is expected to be rendered unusable as a direct result of the Scheme due to land-take for the Winterbourne Stoke by-pass (Table 3.3 paragraph 25, page 30).

e. ii. Hen harrier does not breed on the SPA. Its overwintering roosting locations on the SPA are well known and are more than 10km from the Scheme. (Table 3.3 paragraph 28 page 31)

e. iii. The loss of limited areas of suitable nesting habitat within the Scheme boundary is unlikely to have an impact on any quail visitors considering the extent of suitable nesting habitat within areas surrounding the Scheme boundary. Quail and hobby are not tied to breeding plots and are much less sensitive than stone curlew and therefore not vulnerable to recreational pressure (Table 3.3 paragraph 48 page 33)

e. iv. A known historically active hobby breeding site is located approximately 200m south of the Scheme boundary. No further possible breeding sites were identified during the 2016 and 2017 surveys (Table 3.3 paragraph 27 page 31).

f. Once the Scheme opens, the closure of the old A303 could operate in combination with an increase in the local population due to increased housing growth (such as that set out in the Wiltshire Core Strategy) and with increased tourism to increase the risk of disturbance of some stone curlew plots in the area, particularly at Normanton Down due to the removal of the barrier (the old A303) to recreational users crossing from Stonehenge onto the Public Rights of Way either side of the RSPB reserve. This may result in greater long-term disturbance on breeding stone curlew and an indirect adverse permanent effect on nesting success locally. Quail and hobby are not tied to breeding plots and are much less sensitive than stone curlew and therefore not vulnerable to recreational pressure (Table 3.3 paragraphs 44-49, page 32-33).

HRA Screening Matrix 3: River Avon SAC

		Name of European site and designation: River Avon SAC																				
		EU Code: UK9011102																				
		Distance to NSIP: 0km (Scheme crosses river)																				
European site features		**Likely effects of NSIP**																				
Effect	Water quality			Shading of the River Till			Blockage of fish passage			Changes to water level and flow			Disturbance e.g. vibration and noise			Spread of invasive species			In combination effects (vehicle exhaust emissions)		
Stage of development	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	X g	X g		✓h	✓ h					X j	X j					XI			Xm	Xm	
Desmoulin's whorl snail	X g	X g		X h	X h					X j	X j		Not present in affected area	Not present in affected area		XI			Xm	Xm	
Sea lamprey	X g	X g		✓h	✓h		X i	X i		X j	X j		X k	X k		XI			Xm	Xm	

Brook lamprey	X g	X g		✓h	✓h		X i	X i		X j	X j		X k	X k		Xl			Xm	Xm	
Atlantic salmon	X g	X g		✓h	✓h		X i	X i		X j	X j		X k	X k		Xl			Xm	Xm	
Bullhead	X g	X g		✓ h	✓ h		X i	X i		X j	X j		X k	X k		Xl			Xm	Xm	

g. Construction and operation of the Scheme theoretically carries the risk of effects on water quality including: surface water run-off; siltation downstream due to excavation of materials and the subsequent deposition of soils, sediments and other construction materials; spillage of fuels or other contaminating substances and the mobilisation of contamination following disturbance of contaminated ground or groundwater, release or leaching of substances (e.g. cement or grout) used in the tunnelling process, which may negatively impact groundwater quality. However, there will be no effect on water quality as a result of construction or operation of this Scheme due to measures already required to ensure scheme compliance with the Environmental Damage (Prevention and Remediation) (England) Regulations 2015 and Environmental Permitting (England and Wales) Regulations 2010 (Table 3.1, paragraph 32, page 16).

h. The permanent viaduct could have an adverse effect on vegetation in the River Till through shading, depending on the detailed design, as could the temporary construction crossing. The design of both is specifically with a view to protecting the vegetation in the River Till and is therefore considered mitigation. In line with the People over Wind judgement it cannot therefore be used to screen out likely significant effects (Table 3.1 paragraphs 48-51 page 18). Potential impacts could arise on spawning areas for SAC fish species downstream if vegetation dieback and soil erosion occurs on the River Till due to shading (Table 3.1, paragraph 52, page 18). No direct or indirect impacts are anticipated on Desmoulin's whorl snail, an Annex II species of the SAC designation. This is because no construction works are anticipated within suitable habitat adjacent to the River Avon where Desmoulin's whorl snail has been recorded (Table 3.1, paragraph 53, page 18).

i. Any placement of new construction within the River Till or River Avon could prove a blockage to fish passage, as could works to install such features (such as 'in river' piling), which can create an acoustic barrier across the watercourse. However, no features will be constructed within the SAC or within 8m of its banks (Table 3.1 paragraph 44, page 17).

j. The presence of underground structures (piers) for the River Till viaduct could theoretically cause interference to groundwater flow in close proximity to the internationally designated groundwater-fed Rivers Avon and Till that could affect habitats and/or species. However, this is considered unlikely to occur because the River Till viaduct is designed to be a five span structure with the location and orientation of the piers and foundations optimised to place them as far away from the River Till as possible and to minimise obstruction of water flows over the floodplain and comply with common law requirements not to increase flood risk (Table 3.1 paragraph 57, page 19).

k. The River Till viaduct will require construction of supports for the viaduct. Short-term disturbance during construction of the supports is not likely to affect spawning of salmon or other SAC fish species because the stretch of the River Till crossed by the Scheme does not have suitable spawning habitat. In the section to be crossed by the viaduct, the River Till dries seasonally and only flows for approximately three to six months per year over

winter to spring. Therefore noise and vibration would not affect fish at all when carried out during the dry period. In addition, construction work would be at least 8m from the River Till to comply with aforementioned Environment Agency requirements on main rivers and the bored piling construction method would render insignificant noise and vibration even if undertaken during a time when there was flow in the river. (Table 3.1 paragraph 45, page 17).

l. The scheme will not spread invasive species as there are none present in the section of the River Till SAC where works will take place and the contractor will implement control measures as necessary to prevent introduction or spread of invasive species in order to comply with the Wildlife & Countryside Act 1981 (paragraph 31, page 16)

m. The only in-combination effects identified for River Avon SAC relate to housing growth associated with the implementation of the Army Basing Programme at Salisbury Plain (in the Bulford Camp area and associated with the other camps around the SAC) and housing and employment growth in surrounding authorities (as set out in the Wiltshire Core Strategy and other strategic plans). These may result in an increase in the volume of vehicles using the A303 and other roads within the Affected Road Network. Coupled with the Scheme this could result in a change to the NOx concentrations (and thus nitrogen deposition). However, this has been modelled and a conclusion of no likely significant effect can be drawn as either the critical level for NOx will not be exceeded under any modelled future scenario including the Scheme, at any modelled transect, or where it is exceeded the Scheme will result in either a negligible change in NOx/nitrogen deposition or a net improvement. (Table 3.1 paragraphs 58-63, page 19-20). Moreover, there are grounds to conclude that the interest features of the SAC are not vulnerable to atmospheric NOx emissions, or resulting nitrogen deposition (Table 3.1, paragraph 40 page 17).

HRA Screening Matrix 4: Chilmark Quarries SAC

	Name of European site and designation: Chilmark Quarries SAC								
	EU Code: UK0016373								
	Distance to NSIP: 11km (Scheme crosses river)								
European site features	**Likely effects of NSIP**								
Effect	Loss of connecting habitat			Operational impacts e.g. fragmentation of populations, road collisions			In combination effects **(none identified)**		
Stage of development	C	O	D	C	O	D	C	O	D
Greater horseshoe bat	X n	X n		X n	X n				
Barbastelle bat	X n	X n		X n	X n				
Bechstein's bat	X n	X n		X n	X n				
Lesser horseshoe bat	X n	X n		X n	X n				

n. All three species (barbastelle, greater horseshoe and lesser horseshoe) are already recorded crossing the A303 to access habitat either side of the road and they do this without using strong landscape features that would be removed due to the Scheme. Due to the distance (11km) separating the Scheme area from the SAC, any foraging or commuting routes present are not considered part of the core roost resource zone for the SAC (Table 3.4 paragraph 28-30, page 37).

HRA Screening Matrix 5: Mottisfont Bats SAC

	Name of European site and designation: Mottisfont Bats SAC								
	EU Code: UK0030334								
	Distance to NSIP: 11km (Scheme crosses river)								
European site features	**Likely effects of NSIP**								
Effect	Loss of connecting habitat			Operational impacts e.g. fragmentation of populations, road collisions			In combination effects **(none identified)**		
Stage of development	C	O	D	C	O	D	C	O	D
Barbastelle bat	X o	X o		X o	X o				

o. Given the distances involved relative to the identified core zone within which likely significant effects on the SAC may arise (20km vs 7.5km core zone), no actual effects on the SAC are expected (Table 3.5 paragraph 28-30, page 43).

HRA Screening Matrix 6: Mells Valley SAC

	Name of European site and designation: Mells Valley SAC								
	EU Code: UK0012658								
	Distance to NSIP: 29.3km (Scheme crosses river)								
European site features	**Likely effects of NSIP**								
Effect	Loss of connecting habitat			Operational impacts e.g. fragmentation of populations, road collisions			In combination effects **(none identified)**		
Stage of development	C	O	D	C	O	D	C	O	D
Barbastelle bat	X p	X p		X p	X p				

p. Given the distances involved relative to the Ecological Zone of Influence within which likely significant effects on the SAC may arise (6km from maternity roost), no actual effects on the SAC are expected (Table 3.6 paragraph 27-31, pages 47-48).

Appendix C DMRB: Finding of No Significant Effects Reports Matrices for Chilmark Quarries SAC, Mottisfont Bats SAC and Mells Valley SAC

Project Name:		A303 Amesbury-Berwick Down
Natura 2000 Site under Consideration		Chilmark Quarries SAC Mottisfont Bats SAC Mells Valley SAC
Date	**Author (Name/Organisation)**	**Verified (Name/ Organisation)**
16/07/18	James Riley/ AECOM	
Name and location of European Site	Chilmark Quarries SAC, and Mottisfont Bats SAC The closest point (western extent) of the Scheme to the European designations is as follows: • Chilmark Quarries SAC - approximately 11km • Mottisfont Bats SAC - approximately 20km The closest point of the Scheme is approximately 29.3km from Mells Valley SAC.	
Description of the project	Improvements are proposed to the A303 between Amesbury and Berwick Down. The following route has been selected: Option 1Na Approx. 13km overall in length of dual carriageway including an approx. 3.3km tunnel with a bypass to the north of Winterbourne Stoke, the eastern portal to the east of the Avenue and the western tunnel portal located to the south of Normanton Gorse.	
Is the project directly connected with or necessary to the management of the site (provide details)?	No	
Are there other projects or plans that together with the project being assessed could affect the site (provide details)?	None	
The Assessment of Significance of Effects		
Describe how long the project (alone or in combination) is likely to	N/A – it will not affect the European site	

affect the European Site	
Explain why these effects are not considered significant	Chilmark Quarries SAC and Mottifont Bats SAC: Studies undertaken by the National Trust at Mottisfont SAC indicate that the maximum overall distances flown by the bats typically occurs in August (16.51km in 2004 and 10.12km in 2005), with maximum distances in other months varying between 1.12km and 8.65km[38]. On this basis, a distance of 7.5km from the SAC has been adopted in which to identify plans and projects likely to have an impact upon habitats used by barbastelle bats from the Mottisfont Bats SAC[39]. Based on this and the distance between the SAC and the route (20km), likely significant effects are not anticipated. Due to the distance (11km) separating the Scheme area from the Chilmark Quarries SAC, any foraging or commuting routes present are not considered part of the core roost resource zone for the SAC. The western Scheme extent at Yarnbury Castle (the closest part to the SAC) lies nearly 4km north east of the 6km buffer established by Wiltshire Council[40] for the SAC regarding barbastelle and 6km north east of the 4km buffer established for horseshoe bats. As such, any effect that did arise through loss of foraging/commuting features would be of sufficiently small magnitude that it would not affect the ability of the SAC to support barbastelle, greater horseshoe and lesser horseshoe. Finally, although it was not designed for this purpose, north to south connectivity would be retained by the Scheme through four green bridges that will form part of an ecological network. This would be in addition to the existing A303 at Normanton Down being converted to a restricted byway, effectively removing the A303 entirely from a section of the landscape. Green bridge one (Parsonage Down) and green bridge two (east of Till) include bunds and planting. These bridges would offer sheltered crossing features and connectivity to existing habitat features to aid crossing by bats. Additionally, the B3083 underbridge has been widened to provide an unlit access for farm use and some local traffic and this is expected to facilitate the movement of bats through the underpass. The hedgerows leading to the underpass will be enhanced and linked to existing suitable woodland habitat to provide a connective feature between important habitats. The Scheme will also include

[38] National Trust/Ian Davidson-Watts and Ailsa Mckenzie (ID Wildlife Ltd) (2006), *Habitat use and Ranging of Barbastelle Bats of the Mottisfont Estate, Hampshire*.
[39] Jonathan Cox Associates. Mottisfont Bats Special Area of Conservation (SAC) Protocol for Planning Officers Report to Natural England June 2010. http://www.wiltshire.gov.uk/corestrategydocument?directory=Studies%2C%20Surveys%20and%20Assessments&fileref=132
[40] Plan 3 on page 10 of Bat Special Areas of Conservation (SAC) Planning Guidance for Wiltshire, available at http://www.wiltshire.gov.uk/bat-special-areas-of-conservation-planning-guidance-for-wilthshire.pdf

	extensive woodland planting. These measures were not designed to protect the SAC, since the habitat at this part of the A303 is considered peripheral to the ability of the SAC to support its populations of barbastelle, greater horseshoe and lesser horseshoe. Nonetheless, these measures mean that the Scheme will have a net positive effect for bats traversing the A303. Mells Valley SAC: Greater horseshoe bats are already recorded crossing the A303 to access habitat either side of the road and they do this without using strong landscape features that would be removed due to the Scheme. Due to the distance (29.3km) separating the Scheme area from the SAC, any foraging or commuting routes present are not considered part of the Ecological Zone of Influence for greater horseshoe41. Green bridge one (Parsonage Down) and green bridge two (east of Till) include bunds and planting. These bridges would offer sheltered crossing features and connectivity to existing habitat features to aid crossing by bats. Additionally, the B3083 underbridge has been widened to provide an unlit access for farm use and for some local traffic and this is expected to facilitate the movement of bats through the underpass. The hedgerows leading to the underpass will be enhanced and linked to existing suitable woodland habitat to provide a connective feature between important habitats. The Scheme will also include extensive woodland planting. These measures were not designed to protect the SAC, since the habitat at this part of the A303 is considered peripheral to the ability of the SAC to support its populations of greater horseshoe. Nonetheless, these measures mean that the Scheme will have a net positive effect for bats traversing the A303.
List of agencies consulted: provide contact name and telephone or email address	None consulted as yet
Response to consultation	N/A

Data collected to carry out the Assessment			
Who carried out the assessment?	Sources of data	Level of assessment completed	Where can the full results of the assessment be accessed and

[41] Billington (2000) Radio tracking study of Greater Horseshoe bats at Mells, Near Frome, Somerset. Peterborough: English Nature.

			viewed?
James Riley	Main source is Jonathan Cox Associates. Mottisfont Bats Special Area of Conservation (SAC) Protocol for Planning Officers Report to Natural England June 2010. Bat Special Areas of Conservation (SAC) Planning Guidance for Wiltshire, available at http://www.wiltshire.gov.uk/bat-special-areas-of-conservation-planning-guidance-for-wilthshire.pdf Billington, G. (2000) Radio tracking study of greater horseshoe bats at Mells, near Frome, Somerset in June 2000. English Nature Research Reports No. 403, 1-24.	Likely Significant Effects test	In this report

Appendix D Air Quality Modelling Data for River Avon SAC and Salisbury Plain SAC

The air quality modelling presents data for the baseline year (2017), the assessment year Do Minimum DM (i.e. without the Scheme but including other Highways England schemes and expected traffic growth arising from a combination of organic growth and increased housing and employment provision) and the assessment year Do Something DS (i.e. same as Do Minimum but with the addition of the Scheme). The model outputs are presented for the construction phase in 2021 (Tables D1.1 and D2.1), construction phase in 2024 (Tables D1.2 and D2.2) and during operation in 2026, the expected year of opening (Tables D1.3 and D2.3). NOx concentrations are expressed as micrograms per cubic metre (μgm^{-3}) while nitrogen deposition is expressed as kilograms of nitrogen per hectare per year (kgN/ha/yr).

D.1 River Avon SAC

D.1.1 Construction Phase 1 (2021)

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E5_0m	34.6	31.5	30.1	-1.4	-4.5	18.1	16.8	16.7	-0.1	-1.4
E5_5m	27.4	24.6	23.7	-1.0	-3.7	17.7	16.5	16.4	-0.1	-1.3
E5_10m	23.7	21.1	20.4	-0.8	-3.3	17.5	16.3	16.2	0.0	-1.3
E5_15m	21.4	18.9	18.3	-0.6	-3.1	17.4	16.1	16.1	0.0	-1.3
E5_20m	19.8	17.4	16.9	-0.5	-2.9	17.3	16.1	16.0	0.0	-1.3
E5_30m	17.8	15.5	15.1	-0.4	-2.7	17.2	15.9	15.9	0.0	-1.3
E5_40m	16.5	14.3	13.9	-0.3	-2.6	17.2	15.9	15.9	0.0	-1.3
E5_50m	15.6	13.4	13.1	-0.3	-2.5	17.1	15.8	15.8	0.0	-1.3
E5_60m	15.0	12.8	12.6	-0.3	-2.4	17.1	15.8	15.8	0.0	-1.3
E5_70m	14.5	12.4	12.1	-0.2	-2.4	17.1	15.8	15.8	0.0	-1.3
E5_80m	14.1	12.0	11.8	-0.2	-2.3	17.0	15.7	15.7	0.0	-1.3
E5_90m	13.8	11.7	11.5	-0.2	-2.3	17.0	15.7	15.7	0.0	-1.3

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E5_100m	13.6	11.5	11.3	-0.2	-2.3	17.0	15.7	15.7	0.0	-1.3
E5_125m	13.1	11.0	10.9	-0.2	-2.2	17.0	15.7	15.7	0.0	-1.3
E5_150m	12.8	10.8	10.7	-0.1	-2.2	17.0	15.7	15.7	0.0	-1.3
E5_175m	13.7	11.6	11.5	-0.1	-2.2	17.0	15.7	15.7	0.0	-1.3
E6_0m	34.1	31.9	32.6	0.7	-1.5	18.0	16.8	16.8	0.0	-1.2
E6_5m	28.9	26.6	27.2	0.6	-1.7	17.7	16.5	16.5	0.0	-1.2
E6_10m	26.2	23.8	24.3	0.5	-1.9	17.6	16.3	16.3	0.0	-1.2
E6_15m	24.4	22.0	22.4	0.4	-2.0	17.5	16.2	16.2	0.0	-1.3
E6_20m	23.2	20.8	21.1	0.4	-2.0	17.4	16.1	16.2	0.0	-1.3
E6_30m	21.5	19.1	19.4	0.3	-2.1	17.3	16.1	16.1	0.0	-1.3
E6_40m	20.4	18.0	18.3	0.3	-2.2	17.3	16.0	16.0	0.0	-1.3
E6_50m	19.7	17.2	17.5	0.3	-2.2	17.2	15.9	16.0	0.0	-1.3
E6_60m	19.1	16.7	16.9	0.2	-2.2	17.2	15.9	15.9	0.0	-1.3
E6_70m	18.7	16.2	16.4	0.2	-2.2	17.2	15.9	15.9	0.0	-1.3
E6_80m	18.3	15.9	16.1	0.2	-2.3	17.2	15.9	15.9	0.0	-1.3
E6_90m	18.1	15.6	15.8	0.2	-2.3	17.2	15.9	15.9	0.0	-1.3
E6_100m	17.8	15.3	15.6	0.2	-2.3	17.1	15.8	15.9	0.0	-1.3
E6_125m	17.4	14.9	15.1	0.2	-2.3	17.1	15.8	15.8	0.0	-1.3
E6_150m	17.0	14.5	14.7	0.2	-2.3	17.1	15.8	15.8	0.0	-1.3
E6_175m	16.7	14.2	14.4	0.2	-2.3	17.1	15.8	15.8	0.0	-1.3
E6_200m	16.4	14.0	14.1	0.1	-2.3	17.1	15.8	15.8	0.0	-1.3
E7_0m	16.5	14.1	13.2	-0.9	-3.3	17.2	15.9	15.8	-0.1	-1.4
E7_5m	15.8	13.5	12.7	-0.8	-3.2	17.2	15.9	15.8	0.0	-1.4
E7_10m	15.4	13.1	12.3	-0.7	-3.1	17.2	15.8	15.8	0.0	-1.4
E7_15m	15.0	12.7	12.0	-0.7	-3.0	17.1	15.8	15.8	0.0	-1.4
E7_20m	14.7	12.5	11.8	-0.7	-2.9	17.1	15.8	15.8	0.0	-1.4

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E7_30m	14.3	12.0	11.5	-0.6	-2.8	17.1	15.8	15.7	0.0	-1.3
E7_40m	13.9	11.7	11.2	-0.5	-2.7	17.1	15.8	15.7	0.0	-1.3
E7_50m	13.6	11.4	10.9	-0.5	-2.6	17.1	15.7	15.7	0.0	-1.3
E7_60m	13.3	11.2	10.7	-0.4	-2.6	17.0	15.7	15.7	0.0	-1.3
E7_70m	13.1	11.0	10.6	-0.4	-2.5	17.0	15.7	15.7	0.0	-1.3
E7_80m	12.9	10.8	10.4	-0.4	-2.5	17.0	15.7	15.7	0.0	-1.3
E7_90m	12.8	10.7	10.3	-0.3	-2.5	17.0	15.7	15.7	0.0	-1.3
E7_100m	12.6	10.5	10.2	-0.3	-2.4	17.0	15.7	15.7	0.0	-1.3
E7_125m	12.4	10.3	10.0	-0.3	-2.4	17.0	15.7	15.7	0.0	-1.3
E7_150m	12.1	10.1	9.8	-0.2	-2.3	17.0	15.7	15.7	0.0	-1.3
E7_175m	11.9	9.9	9.7	-0.2	-2.3	17.0	15.7	15.6	0.0	-1.3
E7_200m	11.8	9.8	9.6	-0.2	-2.2	17.0	15.6	15.6	0.0	-1.3
E9_0m	48.1	43.6	36.6	-6.9	-11.5	21.4	19.8	19.5	-0.4	-1.9
E9_5m	32.5	29.0	25.1	-3.9	-7.4	20.6	19.1	18.9	-0.2	-1.7
E9_10m	26.0	23.0	20.3	-2.7	-5.7	20.3	18.7	18.6	-0.1	-1.7
E9_15m	22.5	19.7	17.7	-2.0	-4.8	20.1	18.6	18.5	-0.1	-1.6
E9_20m	20.2	17.6	16.0	-1.6	-4.2	20.0	18.4	18.4	-0.1	-1.6
E9_30m	17.5	15.1	14.0	-1.1	-3.5	19.8	18.3	18.2	-0.1	-1.6
E9_40m	15.9	13.7	12.8	-0.8	-3.1	19.7	18.2	18.2	0.0	-1.6
E9_50m	14.9	12.7	12.1	-0.7	-2.8	19.7	18.2	18.1	0.0	-1.5
E9_60m	14.2	12.1	11.5	-0.5	-2.7	19.6	18.1	18.1	0.0	-1.5
E9_70m	13.7	11.6	11.1	-0.5	-2.5	19.6	18.1	18.1	0.0	-1.5
E9_80m	13.3	11.2	10.8	-0.4	-2.4	19.6	18.1	18.1	0.0	-1.5
E9_90m	12.8	10.8	10.5	-0.3	-2.3	19.6	18.1	18.0	0.0	-1.5
E9_100m	12.5	10.6	10.3	-0.3	-2.3	19.5	18.0	18.0	0.0	-1.5
E9_125m	12.0	10.1	9.8	-0.2	-2.2	19.5	18.0	18.0	0.0	-1.5

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E9_150m	11.7	9.8	9.5	-0.2	-2.1	19.5	18.0	18.0	0.0	-1.5
E9_175m	11.4	9.5	9.3	-0.2	-2.1	19.5	18.0	18.0	0.0	-1.5
E10_0m	24.2	21.0	23.8	2.8	-0.5	20.2	18.6	18.8	0.2	-1.4
E10_5m	20.0	17.2	19.1	1.9	-0.9	19.9	18.4	18.5	0.1	-1.4
E10_10m	17.7	15.1	16.5	1.4	-1.1	19.8	18.3	18.4	0.1	-1.4

D.1.2 Construction Phase 2 (2024)

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E5_0m	34.6	28.5	22.9	-5.6	-11.7	18.1	15.8	15.5	-0.3	-2.6
E5_5m	27.4	22.3	18.4	-3.9	-9.0	17.7	15.5	15.3	-0.2	-2.5
E5_10m	23.7	19.1	16.0	-3.0	-7.7	17.5	15.3	15.1	-0.2	-2.4
E5_15m	21.4	17.1	14.6	-2.5	-6.8	17.4	15.2	15.1	-0.1	-2.4
E5_20m	19.8	15.7	13.6	-2.1	-6.2	17.3	15.1	15.0	-0.1	-2.3
E5_30m	17.8	14.0	12.3	-1.7	-5.5	17.2	15.0	14.9	-0.1	-2.3
E5_40m	16.5	12.9	11.5	-1.4	-5.0	17.2	15.0	14.9	-0.1	-2.3
E5_50m	15.6	12.1	11.0	-1.2	-4.7	17.1	14.9	14.8	-0.1	-2.3
E5_60m	15.0	11.6	10.6	-1.0	-4.4	17.1	14.9	14.8	-0.1	-2.3
E5_70m	14.5	11.2	10.2	-0.9	-4.3	17.1	14.9	14.8	-0.1	-2.3
E5_80m	14.1	10.8	10.0	-0.8	-4.1	17.0	14.8	14.8	-0.1	-2.2
E5_90m	13.8	10.6	9.8	-0.8	-4.0	17.0	14.8	14.8	0.0	-2.2
E5_100m	13.6	10.4	9.7	-0.7	-3.9	17.0	14.8	14.8	0.0	-2.2
E5_125m	13.1	10.0	9.4	-0.6	-3.7	17.0	14.8	14.7	0.0	-2.2

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E5_150m	12.8	9.7	9.2	-0.5	-3.7	17.0	14.8	14.7	0.0	-2.2
E5_175m	13.7	10.4	9.8	-0.7	-4.0	17.0	14.8	14.8	0.0	-2.2
E6_0m	34.1	28.9	23.5	-5.3	-10.6	18.0	15.8	15.5	-0.3	-2.5
E6_5m	28.9	24.1	19.8	-4.3	-9.1	17.7	15.5	15.3	-0.2	-2.4
E6_10m	26.2	21.6	17.9	-3.7	-8.3	17.6	15.4	15.2	-0.2	-2.4
E6_15m	24.4	20.0	16.6	-3.3	-7.8	17.5	15.3	15.1	-0.2	-2.4
E6_20m	23.2	18.8	15.8	-3.0	-7.4	17.4	15.2	15.0	-0.2	-2.4
E6_30m	21.5	17.3	14.7	-2.6	-6.8	17.3	15.1	15.0	-0.2	-2.4
E6_40m	20.4	16.3	14.0	-2.3	-6.5	17.3	15.1	14.9	-0.1	-2.3
E6_50m	19.7	15.6	13.5	-2.1	-6.2	17.2	15.0	14.9	-0.1	-2.3
E6_60m	19.1	15.1	13.2	-1.9	-6.0	17.2	15.0	14.9	-0.1	-2.3
E6_70m	18.7	14.7	12.9	-1.8	-5.8	17.2	15.0	14.9	-0.1	-2.3
E6_80m	18.3	14.3	12.7	-1.7	-5.7	17.2	15.0	14.9	-0.1	-2.3
E6_90m	18.1	14.1	12.5	-1.6	-5.5	17.2	14.9	14.9	-0.1	-2.3
E6_100m	17.8	13.9	12.4	-1.5	-5.5	17.1	14.9	14.8	-0.1	-2.3
E6_125m	17.4	13.4	12.1	-1.3	-5.3	17.1	14.9	14.8	-0.1	-2.3
E6_150m	17.0	13.1	11.9	-1.2	-5.1	17.1	14.9	14.8	-0.1	-2.3
E6_175m	16.7	12.9	11.7	-1.1	-5.0	17.1	14.9	14.8	-0.1	-2.3
E6_200m	16.4	12.6	11.6	-1.0	-4.9	17.1	14.9	14.8	-0.1	-2.3
E7_0m	16.5	12.7	11.3	-1.4	-5.2	17.2	15.0	14.9	-0.1	-2.3
E7_5m	15.8	12.2	10.9	-1.3	-4.9	17.2	14.9	14.9	-0.1	-2.3
E7_10m	15.4	11.8	10.6	-1.2	-4.8	17.2	14.9	14.9	-0.1	-2.3
E7_15m	15.0	11.5	10.4	-1.1	-4.6	17.1	14.9	14.8	-0.1	-2.3
E7_20m	14.7	11.3	10.2	-1.0	-4.5	17.1	14.9	14.8	-0.1	-2.3
E7_30m	14.3	10.9	9.9	-0.9	-4.3	17.1	14.9	14.8	-0.1	-2.3
E7_40m	13.9	10.5	9.7	-0.8	-4.2	17.1	14.8	14.8	-0.1	-2.3

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E7_50m	13.6	10.3	9.5	-0.8	-4.1	17.1	14.8	14.8	0.0	-2.3
E7_60m	13.3	10.1	9.4	-0.7	-4.0	17.0	14.8	14.8	0.0	-2.3
E7_70m	13.1	9.9	9.2	-0.7	-3.9	17.0	14.8	14.8	0.0	-2.3
E7_80m	12.9	9.7	9.1	-0.6	-3.8	17.0	14.8	14.8	0.0	-2.3
E7_90m	12.8	9.6	9.0	-0.6	-3.8	17.0	14.8	14.8	0.0	-2.3
E7_100m	12.6	9.5	8.9	-0.6	-3.7	17.0	14.8	14.7	0.0	-2.3
E7_125m	12.4	9.3	8.8	-0.5	-3.6	17.0	14.8	14.7	0.0	-2.2
E7_150m	12.1	9.1	8.6	-0.5	-3.5	17.0	14.8	14.7	0.0	-2.2
E7_175m	11.9	8.9	8.5	-0.4	-3.4	17.0	14.7	14.7	0.0	-2.2
E7_200m	11.8	8.8	8.4	-0.4	-3.4	17.0	14.7	14.7	0.0	-2.2
E9_0m	48.1	39.4	9.7	-29.6	-38.4	21.4	18.7	17.0	-1.7	-4.4
E9_5m	32.5	26.2	9.1	-17.1	-23.4	20.6	18.0	17.0	-1.0	-3.6
E9_10m	26.0	20.8	8.8	-12.0	-17.2	20.3	17.7	17.0	-0.7	-3.3
E9_15m	22.5	17.8	8.6	-9.2	-13.8	20.1	17.5	17.0	-0.5	-3.1
E9_20m	20.2	15.9	8.5	-7.4	-11.7	20.0	17.4	16.9	-0.4	-3.0
E9_30m	17.5	13.7	8.3	-5.3	-9.2	19.8	17.2	16.9	-0.3	-2.9
E9_40m	15.9	12.4	8.2	-4.1	-7.7	19.7	17.2	16.9	-0.2	-2.8
E9_50m	14.9	11.5	8.1	-3.4	-6.8	19.7	17.1	16.9	-0.2	-2.8
E9_60m	14.2	10.9	8.1	-2.9	-6.1	19.6	17.1	16.9	-0.2	-2.7
E9_70m	13.7	10.5	8.0	-2.5	-5.7	19.6	17.1	16.9	-0.1	-2.7
E9_80m	13.3	10.1	8.0	-2.2	-5.3	19.6	17.0	16.9	-0.1	-2.7
E9_90m	12.8	9.8	7.8	-1.9	-5.0	19.6	17.0	16.9	-0.1	-2.7
E9_100m	12.5	9.5	7.8	-1.7	-4.7	19.5	17.0	16.9	-0.1	-2.6
E9_125m	12.0	9.1	7.7	-1.4	-4.3	19.5	17.0	16.9	-0.1	-2.6
E9_150m	11.7	8.8	7.7	-1.1	-4.0	19.5	17.0	16.9	-0.1	-2.6
E9_175m	11.4	8.6	7.6	-1.0	-3.8	19.5	16.9	16.9	-0.1	-2.6

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E10_0m	24.2	18.9	16.3	-2.6	-7.9	20.2	17.6	17.4	-0.2	-2.8
E10_5m	20.0	15.5	13.6	-1.9	-6.3	19.9	17.4	17.2	-0.1	-2.7
E10_10m	17.7	13.6	12.2	-1.5	-5.5	19.8	17.2	17.2	-0.1	-2.7
E14_0m	9.5	7	27.4	20.5	17.9	19.4	16.8	18	1.2	-1.3
E14_5m	9.5	7	18.4	11.4	8.9	19.4	16.8	17.5	0.7	-1.8
E14_10m	9.5	7	15.3	8.3	5.8	19.4	16.8	17.3	0.5	-2
E14_15m	9.5	7	13.6	6.6	4.1	19.4	16.8	17.2	0.4	-2.1
E14_20m	9.5	7	12.5	5.5	3	19.4	16.8	17.2	0.3	-2.2
E14_30m	9.5	7	11.2	4.2	1.7	19.4	16.8	17.1	0.3	-2.3
E14_40m	9.5	7	10.4	3.4	0.9	19.4	16.8	17.1	0.2	-2.3
E14_50m	9.5	7	9.9	2.9	0.4	19.4	16.8	17	0.2	-2.3
E14_60m	9.5	7	9.5	2.5	0	19.4	16.8	17	0.2	-2.4
E14_70m	9.5	7	9.2	2.2	-0.3	19.4	16.8	17	0.1	-2.4
E14_80m	9.5	7	9	2	-0.5	19.4	16.8	17	0.1	-2.4
E14_90m	9.5	7	8.8	1.8	-0.7	19.4	16.8	17	0.1	-2.4
E14_100m	9.5	7	8.7	1.7	-0.8	19.4	16.8	16.9	0.1	-2.4
E14_125m	9.5	7	8.4	1.4	-1.1	19.4	16.8	16.9	0.1	-2.4
E14_150m	9.5	7	8.2	1.2	-1.3	19.4	16.8	16.9	0.1	-2.5
E14_175m	9.5	7	8.1	1.1	-1.4	19.4	16.8	16.9	0.1	-2.5
E14_200m	9.5	7	8	1	-1.5	19.4	16.8	16.9	0.1	-2.5
E15_0m	9.5	7	22.9	15.9	13.4	19.4	16.8	17.8	0.9	-1.6
E15_5m	9.5	7	16.2	9.2	6.7	19.4	16.8	17.4	0.6	-2
E15_10m	9.5	7	13.8	6.8	4.3	19.4	16.8	17.3	0.4	-2.1
E15_15m	9.5	7	12.4	5.5	2.9	19.4	16.8	17.2	0.3	-2.2
E15_20m	9.5	7	11.6	4.6	2.1	19.4	16.8	17.1	0.3	-2.2
E15_30m	9.5	7	10.5	3.5	1	19.4	16.8	17.1	0.2	-2.3

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E15_40m	9.5	7	9.9	2.9	0.4	19.4	16.8	17	0.2	-2.3
E15_50m	9.5	7	9.5	2.5	0	19.4	16.8	17	0.2	-2.4
E15_60m	9.5	7	9.2	2.2	-0.3	19.4	16.8	17	0.1	-2.4
E15_70m	9.5	7	8.9	2	-0.6	19.4	16.8	17	0.1	-2.4
E15_80m	9.5	7	8.8	1.8	-0.7	19.4	16.8	17	0.1	-2.4
E15_90m	9.5	7	8.6	1.6	-0.9	19.4	16.8	16.9	0.1	-2.4
E15_100m	9.5	7	8.5	1.5	-1	19.4	16.8	16.9	0.1	-2.4
E15_125m	9.5	7	8.3	1.3	-1.2	19.4	16.8	16.9	0.1	-2.4
E15_150m	9.5	7	8.1	1.1	-1.4	19.4	16.8	16.9	0.1	-2.5
E15_175m	9.5	7	8	1	-1.5	19.4	16.8	16.9	0.1	-2.5
E15_200m	9.5	7	7.9	1	-1.6	19.4	16.8	16.9	0.1	-2.5

D.1.3 Operation (2026)

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E5_0m	34.6	17.8	18.7	0.8	-15.9	18.1	15.2	15.3	0.08	-2.8
E5_5m	27.4	14.5	15.1	0.6	-12.3	17.7	14.9	14.9	0.06	-2.8
E5_10m	23.7	12.8	13.2	0.5	-10.5	17.5	14.7	14.8	0.05	-2.8
E5_15m	21.4	11.6	12.0	0.4	-9.4	17.4	14.6	14.6	0.0	-2.8
E5_20m	19.8	10.9	11.2	0.3	-8.6	17.3	14.5	14.6	0.0	-2.8
E5_30m	17.8	9.9	10.1	0.2	-7.6	17.2	14.4	14.5	0.0	-2.8
E5_40m	16.5	9.3	9.5	0.2	-7.0	17.2	14.4	14.4	0.0	-2.8
E5_50m	15.6	8.9	9.0	0.2	-6.6	17.1	14.3	14.3	0.0	-2.8

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E5_60m	15.0	8.6	8.7	0.1	-6.3	17.1	14.3	14.3	0.0	-2.8
E5_70m	14.5	8.3	8.5	0.1	-6.1	17.1	14.3	14.3	0.0	-2.8
E5_80m	14.1	8.1	8.2	0.1	-5.9	17.0	14.3	14.3	0.0	-2.8
E5_90m	13.8	8.0	8.1	0.1	-5.7	17.0	14.2	14.2	0.0	-2.8
E5_100m	13.6	7.9	7.9	0.1	-5.6	17.0	14.2	14.2	0.0	-2.8
E5_125m	13.1	7.6	7.7	0.1	-5.4	17.0	14.2	14.2	0.0	-2.8
E5_150m	12.8	7.5	7.6	0.1	-5.3	17.0	14.2	14.2	0.0	-2.8
E5_175m	13.7	7.9	7.9	0.0	-5.8	17.0	14.2	14.2	0.0	-2.8
E6_0m	34.1	18.2	18.7	0.5	-15.4	18.0	15.2	15.2	0.05	-2.8
E6_5m	28.9	15.6	15.9	0.3	-13.0	17.7	14.9	14.9	0.0	-2.8
E6_10m	26.2	14.3	14.4	0.1	-11.7	17.6	14.8	14.8	0.0	-2.8
E6_15m	24.4	13.4	13.5	0.1	-10.9	17.5	14.7	14.7	0.0	-2.8
E6_20m	23.2	12.8	12.9	0.1	-10.3	17.4	14.6	14.6	0.0	-2.8
E6_30m	21.5	12.0	12.0	0.1	-9.5	17.3	14.5	14.5	0.0	-2.8
E6_40m	20.4	11.4	11.5	0.1	-8.9	17.3	14.5	14.5	0.0	-2.8
E6_50m	19.7	11.0	11.1	0.1	-8.5	17.2	14.4	14.5	0.0	-2.8
E6_60m	19.1	10.7	10.9	0.1	-8.3	17.2	14.4	14.4	0.0	-2.8
E6_70m	18.7	10.5	10.7	0.1	-8.0	17.2	14.4	14.4	0.0	-2.8
E6_80m	18.3	10.4	10.5	0.1	-7.8	17.2	14.4	14.4	0.0	-2.8
E6_90m	18.1	10.2	10.4	0.2	-7.7	17.2	14.4	14.4	0.0	-2.8
E6_100m	17.8	10.1	10.3	0.2	-7.6	17.1	14.4	14.4	0.0	-2.8
E6_125m	17.4	9.8	10.0	0.2	-7.3	17.1	14.3	14.3	0.0	-2.8
E6_150m	17.0	9.7	9.9	0.2	-7.2	17.1	14.3	14.3	0.0	-2.8
E6_175m	16.7	9.5	9.7	0.2	-7.0	17.1	14.3	14.3	0.0	-2.8
E6_200m	16.4	9.4	9.6	0.2	-6.9	17.1	14.3	14.3	0.0	-2.8
E7_0m	16.5	9.1	9.3	0.3	-7.2	17.2	14.4	14.4	0.0	-2.8

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E7_5m	15.8	8.8	9.0	0.3	-6.8	17.2	14.4	14.4	0.0	-2.8
E7_10m	15.4	8.5	8.8	0.3	-6.6	17.2	14.3	14.4	0.0	-2.8
E7_15m	15.0	8.4	8.6	0.3	-6.4	17.1	14.3	14.3	0.0	-2.8
E7_20m	14.7	8.2	8.5	0.3	-6.3	17.1	14.3	14.3	0.0	-2.8
E7_30m	14.3	8.0	8.2	0.2	-6.0	17.1	14.3	14.3	0.0	-2.8
E7_40m	13.9	7.8	8.1	0.2	-5.8	17.1	14.3	14.3	0.0	-2.8
E7_50m	13.6	7.7	7.9	0.2	-5.7	17.1	14.3	14.3	0.0	-2.8
E7_60m	13.3	7.6	7.8	0.2	-5.6	17.0	14.2	14.3	0.0	-2.8
E7_70m	13.1	7.5	7.6	0.2	-5.5	17.0	14.2	14.2	0.0	-2.8
E7_80m	12.9	7.4	7.5	0.2	-5.4	17.0	14.2	14.2	0.0	-2.8
E7_90m	12.8	7.3	7.5	0.2	-5.3	17.0	14.2	14.2	0.0	-2.8
E7_100m	12.6	7.2	7.4	0.2	-5.3	17.0	14.2	14.2	0.0	-2.8
E7_125m	12.4	7.1	7.2	0.1	-5.1	17.0	14.2	14.2	0.0	-2.8
E7_150m	12.1	7.0	7.1	0.1	-5.0	17.0	14.2	14.2	0.0	-2.8
E7_175m	11.9	6.9	7.0	0.1	-4.9	17.0	14.2	14.2	0.0	-2.8
E7_200m	11.8	6.8	6.9	0.1	-4.8	17.0	14.2	14.2	0.0	-2.8
E9_0m	48.1	23.4	9.9	-13.5	-38.3	21.4	18.0	16.6	-1.3	-4.8
E9_5m	32.5	16.5	9.0	-7.5	-23.5	20.6	17.3	16.5	-0.8	-4.1
E9_10m	26.0	13.6	8.5	-5.1	-17.5	20.3	17.0	16.5	-0.5	-3.8
E9_15m	22.5	12.0	8.1	-3.8	-14.3	20.1	16.8	16.4	-0.4	-3.7
E9_20m	20.2	10.9	7.9	-3.0	-12.3	20.0	16.7	16.4	-0.3	-3.6
E9_30m	17.5	9.6	7.5	-2.1	-9.9	19.8	16.6	16.4	-0.2	-3.4
E9_40m	15.9	8.9	7.3	-1.6	-8.6	19.7	16.5	16.3	-0.2	-3.4
E9_50m	14.9	8.4	7.2	-1.2	-7.8	19.7	16.5	16.3	-0.1	-3.3
E9_60m	14.2	8.1	7.0	-1.0	-7.2	19.6	16.4	16.3	-0.1	-3.3
E9_70m	13.7	7.8	7.0	-0.8	-6.7	19.6	16.4	16.3	-0.1	-3.3

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E9_80m	13.3	7.6	6.9	-0.7	-6.4	19.6	16.4	16.3	-0.1	-3.3
E9_90m	12.8	7.4	6.7	-0.6	-6.1	19.6	16.4	16.3	-0.1	-3.3
E9_100m	12.5	7.3	6.7	-0.6	-5.8	19.5	16.3	16.3	-0.1	-3.3
E9_125m	12.0	7.0	6.6	-0.4	-5.4	19.5	16.3	16.3	0.0	-3.2
E9_150m	11.7	6.8	6.5	-0.3	-5.2	19.5	16.3	16.3	0.0	-3.2
E9_175m	11.4	6.7	6.4	-0.3	-5.0	19.5	16.3	16.3	0.0	-3.2
E10_0m	24.2	12.6	12.1	-0.6	-12.2	20.2	16.9	16.8	-0.1	-3.4
E10_5m	20.0	10.7	10.3	-0.4	-9.7	19.9	16.7	16.6	0.0	-3.3
E10_10m	17.7	9.6	9.3	-0.3	-8.3	19.8	16.6	16.5	0.0	-3.3
E14_0m	9.5	6.6	29.3	22.7	19.8	19.4	16.2	17.5	1.3	-1.9
E14_5m	9.5	6.6	19.3	12.7	9.8	19.4	16.2	17	0.8	-2.4
E14_10m	9.5	6.6	15.8	9.2	6.3	19.4	16.2	16.8	0.6	-2.6
E14_15m	9.5	6.6	13.9	7.3	4.4	19.4	16.2	16.6	0.4	-2.8
E14_20m	9.5	6.6	12.7	6.1	3.2	19.4	16.2	16.6	0.4	-2.8
E14_30m	9.5	6.6	11.2	4.6	1.7	19.4	16.2	16.5	0.3	-2.9
E14_40m	9.5	6.6	10.3	3.7	0.8	19.4	16.2	16.4	0.2	-3
E14_50m	9.5	6.6	9.8	3.2	0.3	19.4	16.2	16.4	0.2	-3
E14_60m	9.5	6.6	9.3	2.7	-0.2	19.4	16.2	16.4	0.2	-3
E14_70m	9.5	6.6	9	2.4	-0.5	19.4	16.2	16.3	0.1	-3.1
E14_80m	9.5	6.6	8.8	2.2	-0.7	19.4	16.2	16.3	0.1	-3.1
E14_90m	9.5	6.6	8.6	2	-0.9	19.4	16.2	16.3	0.1	-3.1
E14_100m	9.5	6.6	8.4	1.8	-1.1	19.4	16.2	16.3	0.1	-3.1
E14_125m	9.5	6.6	8.1	1.5	-1.4	19.4	16.2	16.3	0.1	-3.1
E14_150m	9.5	6.6	7.9	1.3	-1.6	19.4	16.2	16.3	0.1	-3.1
E14_175m	9.5	6.6	7.7	1.1	-1.8	19.4	16.2	16.3	0.1	-3.1
E14_200m	9.5	6.6	7.6	1	-1.9	19.4	16.2	16.3	0.1	-3.1

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E15_0m	9.5	6.6	24.6	18	15.1	19.4	16.2	17.3	1.1	-2.1
E15_5m	9.5	6.6	16.9	10.3	7.4	19.4	16.2	16.8	0.6	-2.6
E15_10m	9.5	6.6	14.2	7.6	4.7	19.4	16.2	16.7	0.5	-2.7
E15_15m	9.5	6.6	12.7	6.1	3.2	19.4	16.2	16.6	0.4	-2.8
E15_20m	9.5	6.6	11.7	5.1	2.2	19.4	16.2	16.5	0.3	-2.9
E15_30m	9.5	6.6	10.5	3.9	1	19.4	16.2	16.4	0.2	-3
E15_40m	9.5	6.6	9.8	3.2	0.3	19.4	16.2	16.4	0.2	-3
E15_50m	9.5	6.6	9.3	2.7	-0.2	19.4	16.2	16.4	0.2	-3
E15_60m	9.5	6.6	9	2.4	-0.5	19.4	16.2	16.3	0.1	-3.1
E15_70m	9.5	6.6	8.7	2.1	-0.8	19.4	16.2	16.3	0.1	-3.1
E15_80m	9.5	6.6	8.5	1.9	-1	19.4	16.2	16.3	0.1	-3.1
E15_90m	9.5	6.6	8.4	1.8	-1.1	19.4	16.2	16.3	0.1	-3.1
E15_100m	9.5	6.6	8.2	1.6	-1.3	19.4	16.2	16.3	0.1	-3.1
E15_125m	9.5	6.6	8	1.4	-1.5	19.4	16.2	16.3	0.1	-3.1
E15_150m	9.5	6.6	7.8	1.2	-1.7	19.4	16.2	16.3	0.1	-3.1
E15_175m	9.5	6.6	7.7	1.1	-1.8	19.4	16.2	16.3	0.1	-3.1
E15_200m	9.5	6.6	7.6	1	-1.9	19.4	16.2	16.3	0.1	-3.1

D.2 Salisbury Plain SAC

D.2.1 Construction Phase 1 (2021)

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E1_0m	13.7	12.0	15.2	3.2	1.5	16.6	15.3	15.5	0.18	-1.1
E1_5m	11.9	10.3	12.2	1.9	0.3	16.5	15.2	15.3	0.1	-1.1
E1_10m	11.1	9.5	10.9	1.4	-0.3	16.4	15.2	15.3	0.1	-1.2
E1_15m	10.6	9.0	10.1	1.1	-0.6	16.4	15.1	15.2	0.1	-1.2
E1_20m	10.3	8.7	9.6	0.9	-0.8	16.4	15.1	15.2	0.1	-1.2
E1_30m	10.0	8.3	9.0	0.6	-1.0	16.4	15.1	15.1	0.0	-1.2
E1_40m	9.8	8.1	8.6	0.5	-1.1	16.4	15.1	15.1	0.0	-1.2
E1_50m	9.6	8.0	8.4	0.4	-1.2	16.4	15.1	15.1	0.0	-1.2
E1_60m	9.5	7.9	8.2	0.4	-1.3	16.3	15.1	15.1	0.0	-1.2
E1_70m	9.4	7.8	8.1	0.3	-1.3	16.3	15.1	15.1	0.0	-1.2
E1_80m	9.4	7.8	8.0	0.3	-1.3	16.3	15.1	15.1	0.0	-1.2
E1_90m	9.3	7.7	8.0	0.2	-1.4	16.3	15.1	15.1	0.0	-1.2
E1_100m	9.3	7.7	7.9	0.2	-1.4	16.3	15.1	15.1	0.0	-1.3
E1_125m	9.2	7.6	7.8	0.2	-1.4	16.3	15.1	15.1	0.0	-1.3
E1_150m	9.2	7.6	7.7	0.1	-1.5	16.3	15.1	15.1	0.0	-1.3
E1_175m	9.1	7.5	7.7	0.1	-1.5	16.3	15.1	15.1	0.0	-1.3
E2_0m	22.1	22.2	21.2	-1.0	-0.9	17.0	15.9	15.8	-0.1	-1.2
E2_5m	16.2	15.5	14.9	-0.5	-1.3	16.7	15.5	15.5	0.0	-1.2
E2_10m	14.0	12.9	12.6	-0.4	-1.4	16.6	15.4	15.3	0.0	-1.2
E2_15m	12.9	11.6	11.3	-0.3	-1.5	16.5	15.3	15.3	0.0	-1.2
E2_20m	12.2	10.8	10.6	-0.2	-1.5	16.5	15.2	15.2	0.0	-1.2
E2_30m	11.4	9.9	9.8	-0.2	-1.6	16.4	15.2	15.2	0.0	-1.3
E2_40m	10.9	9.4	9.3	-0.1	-1.6	16.4	15.2	15.2	0.0	-1.3
E2_50m	10.6	9.1	9.0	-0.1	-1.6	16.4	15.1	15.1	0.0	-1.3
E2_60m	10.4	8.9	8.8	-0.1	-1.6	16.4	15.1	15.1	0.0	-1.3
E2_70m	10.3	8.7	8.6	-0.1	-1.6	16.4	15.1	15.1	0.0	-1.3

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E2_80m	10.2	8.6	8.5	-0.1	-1.7	16.4	15.1	15.1	0.0	-1.3
E2_90m	10.1	8.5	8.4	-0.1	-1.7	16.4	15.1	15.1	0.0	-1.3
E2_100m	10.0	8.4	8.4	-0.1	-1.7	16.4	15.1	15.1	0.0	-1.3
E2_125m	9.9	8.3	8.2	0.0	-1.7	16.3	15.1	15.1	0.0	-1.3
E2_150m	9.8	8.2	8.1	0.0	-1.7	16.3	15.1	15.1	0.0	-1.3
E2_175m	9.7	8.1	8.1	0.0	-1.7	16.3	15.1	15.1	0.0	-1.3
E3_0m	47.1	44.4	42.1	-2.2	-5.0	18.2	16.9	16.8	-0.1	-1.3
E3_5m	37.8	35.1	33.5	-1.6	-4.3	17.7	16.5	16.4	-0.1	-1.3
E3_10m	32.4	29.9	28.6	-1.3	-3.9	17.4	16.2	16.1	-0.1	-1.3
E3_15m	29.0	26.4	25.3	-1.1	-3.6	17.3	16.0	16.0	-0.1	-1.3
E3_20m	26.5	24.0	23.1	-0.9	-3.4	17.1	15.9	15.8	0.0	-1.3
E3_30m	23.2	20.8	20.0	-0.7	-3.1	16.9	15.7	15.7	0.0	-1.3
E3_40m	21.1	18.7	18.1	-0.6	-3.0	16.8	15.6	15.6	0.0	-1.3
E3_50m	19.7	17.3	16.8	-0.5	-2.8	16.8	15.5	15.5	0.0	-1.3
E3_60m	18.6	16.3	15.8	-0.4	-2.7	16.7	15.5	15.4	0.0	-1.3
E3_70m	17.8	15.5	15.1	-0.4	-2.7	16.7	15.4	15.4	0.0	-1.3
E3_80m	17.1	14.9	14.5	-0.3	-2.6	16.6	15.4	15.4	0.0	-1.3
E3_90m	16.6	14.4	14.1	-0.3	-2.6	16.6	15.3	15.3	0.0	-1.3
E3_100m	16.2	13.9	13.7	-0.3	-2.5	16.6	15.3	15.3	0.0	-1.3
E3_125m	15.4	13.2	12.9	-0.2	-2.5	16.5	15.3	15.3	0.0	-1.3
E3_150m	14.8	12.6	12.4	-0.2	-2.4	16.5	15.2	15.2	0.0	-1.3
E3_175m	14.4	12.2	12.0	-0.2	-2.4	16.5	15.2	15.2	0.0	-1.3
E11_0m	19.2	17.9	15.0	-2.8	-4.1	16.8	15.6	15.5	-0.2	-1.4
E11_5m	16.7	15.3	13.1	-2.2	-3.6	16.7	15.5	15.4	-0.1	-1.3
E11_10m	15.2	13.8	12.0	-1.7	-3.2	16.6	15.4	15.3	-0.1	-1.3
E11_15m	14.3	12.7	11.3	-1.4	-2.9	16.6	15.3	15.3	-0.1	-1.3

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E11_20m	13.6	12.0	10.8	-1.2	-2.7	16.5	15.3	15.2	-0.1	-1.3
E11_30m	12.7	11.1	10.2	-0.9	-2.5	16.5	15.2	15.2	-0.1	-1.3
E11_40m	12.1	10.5	9.8	-0.7	-2.3	16.5	15.2	15.2	0.0	-1.3
E11_50m	11.7	10.1	9.5	-0.5	-2.2	16.4	15.2	15.2	0.0	-1.3
E11_60m	11.4	9.8	9.3	-0.4	-2.1	16.4	15.2	15.1	0.0	-1.3
E11_70m	11.2	9.5	9.2	-0.3	-2.0	16.4	15.2	15.1	0.0	-1.3
E11_80m	11.0	9.3	9.1	-0.3	-2.0	16.4	15.1	15.1	0.0	-1.3
E11_90m	10.9	9.2	9.0	-0.2	-1.9	16.4	15.1	15.1	0.0	-1.3
E11_100m	10.8	9.1	8.9	-0.2	-1.9	16.4	15.1	15.1	0.0	-1.3
E11_125m	10.5	8.9	8.7	-0.1	-1.8	16.4	15.1	15.1	0.0	-1.3
E11_150m	10.4	8.7	8.6	-0.1	-1.8	16.4	15.1	15.1	0.0	-1.3
E11_175m	10.3	8.6	8.5	-0.1	-1.8	16.4	15.1	15.1	0.0	-1.3
E11_200m	10.2	8.5	8.4	-0.1	-1.8	16.4	15.1	15.1	0.0	-1.3
E12_0m	10.2	8.5	8.3	-0.2	-1.9	19.1	17.6	17.6	0.0	-1.5
E12_5m	10.2	8.4	8.3	-0.2	-1.9	19.1	17.6	17.6	0.0	-1.5
E12_10m	10.2	8.4	8.3	-0.1	-1.9	19.1	17.6	17.6	0.0	-1.5
E12_15m	10.2	8.4	8.3	-0.1	-1.9	19.1	17.6	17.6	0.0	-1.5
E12_20m	10.2	8.4	8.3	-0.1	-1.9	19.1	17.6	17.6	0.0	-1.5
E12_30m	10.2	8.4	8.3	-0.1	-1.9	19.1	17.6	17.6	0.0	-1.5
E12_40m	10.1	8.4	8.2	-0.1	-1.9	19.1	17.6	17.6	0.0	-1.5
E12_50m	10.1	8.4	8.2	-0.1	-1.9	19.1	17.6	17.6	0.0	-1.5
E12_60m	10.1	8.3	8.2	-0.1	-1.9	19.1	17.6	17.6	0.0	-1.5
E12_70m	10.1	8.3	8.2	-0.1	-1.9	19.1	17.6	17.6	0.0	-1.5
E12_80m	10.1	8.3	8.2	-0.1	-1.9	19.1	17.6	17.6	0.0	-1.5
E12_90m	10.1	8.3	8.2	-0.1	-1.9	19.1	17.6	17.6	0.0	-1.5
E12_100m	10.0	8.3	8.2	-0.1	-1.9	19.1	17.6	17.6	0.0	-1.5

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E12_125m	10.0	8.3	8.1	-0.1	-1.9	19.1	17.6	17.6	0.0	-1.5
E12_150m	10.0	8.2	8.1	-0.1	-1.9	19.1	17.6	17.6	0.0	-1.5
E12_175m	9.9	8.2	8.1	-0.1	-1.9	19.1	17.6	17.6	0.0	-1.5
E12_200m	9.9	8.2	8.1	-0.1	-1.8	19.1	17.6	17.6	0.0	-1.5
E13_0m	10.5	8.7	8.5	-0.2	-2.0	19.1	17.7	17.7	0.0	-1.5
E13_5m	10.5	8.7	8.5	-0.2	-2.0	19.1	17.7	17.7	0.0	-1.5
E13_10m	10.5	8.7	8.5	-0.2	-2.0	19.1	17.7	17.7	0.0	-1.5
E13_15m	10.4	8.7	8.4	-0.2	-2.0	19.1	17.7	17.7	0.0	-1.5
E13_20m	10.4	8.6	8.4	-0.2	-2.0	19.1	17.7	17.7	0.0	-1.5
E13_30m	10.3	8.6	8.4	-0.2	-2.0	19.1	17.7	17.6	0.0	-1.5

D.2.2 Construction Phase 2 (2024)

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E1_0m	13.7	10.9	10.1	-0.8	-3.6	16.6	14.4	14.4	0.0	-2.2
E1_5m	11.9	9.3	8.8	-0.5	-3.2	16.5	14.3	14.3	0.0	-2.2
E1_10m	11.1	8.5	8.2	-0.4	-2.9	16.4	14.3	14.3	0.0	-2.2
E1_15m	10.6	8.1	7.8	-0.3	-2.8	16.4	14.3	14.3	0.0	-2.2
E1_20m	10.3	7.9	7.6	-0.3	-2.7	16.4	14.3	14.2	0.0	-2.2
E1_30m	10.0	7.5	7.3	-0.2	-2.7	16.4	14.2	14.2	0.0	-2.1
E1_40m	9.8	7.3	7.2	-0.2	-2.6	16.4	14.2	14.2	0.0	-2.1
E1_50m	9.6	7.2	7.1	-0.2	-2.6	16.4	14.2	14.2	0.0	-2.1
E1_60m	9.5	7.1	7.0	-0.1	-2.5	16.3	14.2	14.2	0.0	-2.1

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E1_70m	9.4	7.1	6.9	-0.1	-2.5	16.3	14.2	14.2	0.0	-2.1
E1_80m	9.4	7.0	6.9	-0.1	-2.5	16.3	14.2	14.2	0.0	-2.1
E1_90m	9.3	7.0	6.8	-0.1	-2.5	16.3	14.2	14.2	0.0	-2.1
E1_100m	9.3	6.9	6.8	-0.1	-2.5	16.3	14.2	14.2	0.0	-2.1
E1_125m	9.2	6.9	6.8	-0.1	-2.5	16.3	14.2	14.2	0.0	-2.1
E1_150m	9.2	6.8	6.7	-0.1	-2.5	16.3	14.2	14.2	0.0	-2.1
E1_175m	9.1	6.8	6.7	-0.1	-2.4	16.3	14.2	14.2	0.0	-2.1
E2_0m	22.1	20.1	16.1	-4.1	-6.0	17.0	15.0	14.7	-0.2	-2.3
E2_5m	16.2	14.1	11.8	-2.2	-4.4	16.7	14.6	14.5	-0.1	-2.2
E2_10m	14.0	11.7	10.2	-1.5	-3.8	16.6	14.5	14.4	-0.1	-2.2
E2_15m	12.9	10.5	9.4	-1.2	-3.5	16.5	14.4	14.3	-0.1	-2.2
E2_20m	12.2	9.8	8.9	-0.9	-3.3	16.5	14.4	14.3	-0.1	-2.2
E2_30m	11.4	9.0	8.3	-0.7	-3.1	16.4	14.3	14.3	0.0	-2.2
E2_40m	10.9	8.5	8.0	-0.5	-2.9	16.4	14.3	14.3	0.0	-2.2
E2_50m	10.6	8.2	7.8	-0.5	-2.9	16.4	14.3	14.2	0.0	-2.1
E2_60m	10.4	8.0	7.6	-0.4	-2.8	16.4	14.3	14.2	0.0	-2.1
E2_70m	10.3	7.9	7.5	-0.4	-2.8	16.4	14.2	14.2	0.0	-2.1
E2_80m	10.2	7.8	7.4	-0.3	-2.7	16.4	14.2	14.2	0.0	-2.1
E2_90m	10.1	7.7	7.4	-0.3	-2.7	16.4	14.2	14.2	0.0	-2.1
E2_100m	10.0	7.6	7.3	-0.3	-2.7	16.4	14.2	14.2	0.0	-2.1
E2_125m	9.9	7.5	7.2	-0.2	-2.7	16.3	14.2	14.2	0.0	-2.1
E2_150m	9.8	7.4	7.2	-0.2	-2.6	16.3	14.2	14.2	0.0	-2.1
E2_175m	9.7	7.3	7.1	-0.2	-2.6	16.3	14.2	14.2	0.0	-2.1
E3_0m	47.1	40.1	31.7	-8.4	-15.4	18.2	16.0	15.5	-0.4	-2.6
E3_5m	37.8	31.8	25.6	-6.2	-12.2	17.7	15.5	15.2	-0.3	-2.5
E3_10m	32.4	27.0	22.1	-4.9	-10.3	17.4	15.3	15.0	-0.3	-2.4

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E3_15m	29.0	23.9	19.8	-4.1	-9.1	17.3	15.1	14.9	-0.2	-2.4
E3_20m	26.5	21.7	18.2	-3.5	-8.3	17.1	15.0	14.8	-0.2	-2.3
E3_30m	23.2	18.8	16.1	-2.7	-7.1	16.9	14.8	14.7	-0.2	-2.3
E3_40m	21.1	16.9	14.7	-2.2	-6.4	16.8	14.7	14.6	-0.1	-2.3
E3_50m	19.7	15.7	13.8	-1.9	-5.9	16.8	14.6	14.5	-0.1	-2.2
E3_60m	18.6	14.7	13.1	-1.6	-5.5	16.7	14.6	14.5	-0.1	-2.2
E3_70m	17.8	14.0	12.5	-1.5	-5.2	16.7	14.5	14.4	-0.1	-2.2
E3_80m	17.1	13.4	12.1	-1.3	-5.0	16.6	14.5	14.4	-0.1	-2.2
E3_90m	16.6	13.0	11.8	-1.2	-4.8	16.6	14.5	14.4	-0.1	-2.2
E3_100m	16.2	12.6	11.5	-1.1	-4.7	16.6	14.4	14.4	-0.1	-2.2
E3_125m	15.4	11.9	11.0	-0.9	-4.4	16.5	14.4	14.3	-0.1	-2.2
E3_150m	14.8	11.4	10.6	-0.8	-4.2	16.5	14.4	14.3	0.0	-2.2
E3_175m	14.4	11.0	10.4	-0.7	-4.1	16.5	14.4	14.3	0.0	-2.2
E11_0m	19.2	16.2	11.8	-4.4	-7.4	16.8	14.7	14.5	-0.3	-2.4
E11_5m	16.7	13.9	10.5	-3.4	-6.2	16.7	14.6	14.4	-0.2	-2.3
E11_10m	15.2	12.5	9.8	-2.7	-5.5	16.6	14.5	14.4	-0.2	-2.3
E11_15m	14.3	11.6	9.3	-2.2	-4.9	16.6	14.5	14.3	-0.1	-2.2
E11_20m	13.6	10.9	9.0	-1.9	-4.6	16.5	14.4	14.3	-0.1	-2.2
E11_30m	12.7	10.0	8.6	-1.4	-4.1	16.5	14.4	14.3	-0.1	-2.2
E11_40m	12.1	9.5	8.3	-1.1	-3.8	16.5	14.3	14.3	-0.1	-2.2
E11_50m	11.7	9.1	8.2	-0.9	-3.6	16.4	14.3	14.3	-0.1	-2.2
E11_60m	11.4	8.8	8.0	-0.8	-3.4	16.4	14.3	14.3	0.0	-2.2
E11_70m	11.2	8.6	7.9	-0.7	-3.3	16.4	14.3	14.2	0.0	-2.2
E11_80m	11.0	8.4	7.8	-0.6	-3.2	16.4	14.3	14.2	0.0	-2.2
E11_90m	10.9	8.3	7.8	-0.5	-3.1	16.4	14.3	14.2	0.0	-2.2
E11_100m	10.8	8.2	7.7	-0.5	-3.1	16.4	14.3	14.2	0.0	-2.2

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E11_125m	10.5	8.0	7.6	-0.4	-2.9	16.4	14.2	14.2	0.0	-2.1
E11_150m	10.4	7.9	7.5	-0.3	-2.9	16.4	14.2	14.2	0.0	-2.1
E11_175m	10.3	7.7	7.5	-0.3	-2.8	16.4	14.2	14.2	0.0	-2.1
E11_200m	10.2	7.7	7.4	-0.2	-2.8	16.4	14.2	14.2	0.0	-2.1
E12_0m	10.2	7.6	9.1	1.4	-1.2	19.1	16.6	16.7	0.1	-2.4
E12_5m	10.2	7.6	8.9	1.3	-1.3	19.1	16.6	16.7	0.1	-2.4
E12_10m	10.2	7.6	8.8	1.2	-1.4	19.1	16.6	16.7	0.1	-2.4
E12_15m	10.2	7.6	8.7	1.1	-1.5	19.1	16.6	16.7	0.1	-2.4
E12_20m	10.2	7.6	8.6	1.0	-1.6	19.1	16.6	16.7	0.1	-2.4
E12_30m	10.2	7.6	8.4	0.8	-1.8	19.1	16.6	16.7	0.1	-2.4
E12_40m	10.1	7.6	8.3	0.7	-1.9	19.1	16.6	16.7	0.0	-2.4
E12_50m	10.1	7.5	8.2	0.6	-2.0	19.1	16.6	16.7	0.0	-2.5
E12_60m	10.1	7.5	8.1	0.5	-2.0	19.1	16.6	16.7	0.0	-2.5
E12_70m	10.1	7.5	8.0	0.5	-2.1	19.1	16.6	16.7	0.0	-2.5
E12_80m	10.1	7.5	7.9	0.4	-2.2	19.1	16.6	16.6	0.0	-2.5
E12_90m	10.1	7.5	7.8	0.4	-2.2	19.1	16.6	16.6	0.0	-2.5
E12_100m	10.0	7.5	7.8	0.3	-2.3	19.1	16.6	16.6	0.0	-2.5
E12_125m	10.0	7.5	7.7	0.2	-2.3	19.1	16.6	16.6	0.0	-2.5
E12_150m	10.0	7.4	7.6	0.2	-2.4	19.1	16.6	16.6	0.0	-2.5
E12_175m	9.9	7.4	7.5	0.1	-2.4	19.1	16.6	16.6	0.0	-2.5
E12_200m	9.9	7.4	7.4	0.1	-2.5	19.1	16.6	16.6	0.0	-2.5
E13_0m	10.5	7.9	7.7	-0.2	-2.8	19.1	16.7	16.6	0.0	-2.5
E13_5m	10.5	7.9	7.7	-0.2	-2.8	19.1	16.6	16.6	0.0	-2.5
E13_10m	10.5	7.8	7.7	-0.2	-2.8	19.1	16.6	16.6	0.0	-2.5
E13_15m	10.4	7.8	7.7	-0.2	-2.8	19.1	16.6	16.6	0.0	-2.5
E13_20m	10.4	7.8	7.6	-0.2	-2.8	19.1	16.6	16.6	0.0	-2.5

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E13_30m	10.3	7.7	7.6	-0.2	-2.8	19.1	16.6	16.6	0.0	-2.5

D.2.3 Operation (2026)

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E1_0m	13.7	7.9	7.2	-0.7	-6.5	16.6	13.9	13.8	-0.1	-2.8
E1_5m	11.9	7.0	6.5	-0.4	-5.4	16.5	13.8	13.7	0.0	-2.7
E1_10m	11.1	6.5	6.2	-0.3	-4.9	16.4	13.7	13.7	0.0	-2.7
E1_15m	10.6	6.3	6.1	-0.2	-4.6	16.4	13.7	13.7	0.0	-2.7
E1_20m	10.3	6.2	6.0	-0.2	-4.4	16.4	13.7	13.7	0.0	-2.7
E1_30m	10.0	6.0	5.8	-0.1	-4.1	16.4	13.7	13.7	0.0	-2.7
E1_40m	9.8	5.9	5.7	-0.1	-4.0	16.4	13.7	13.7	0.0	-2.7
E1_50m	9.6	5.8	5.7	-0.1	-3.9	16.4	13.7	13.7	0.0	-2.7
E1_60m	9.5	5.7	5.7	-0.1	-3.9	16.3	13.7	13.7	0.0	-2.7
E1_70m	9.4	5.7	5.6	-0.1	-3.8	16.3	13.7	13.6	0.0	-2.7
E1_80m	9.4	5.7	5.6	-0.1	-3.8	16.3	13.7	13.6	0.0	-2.7
E1_90m	9.3	5.6	5.6	0.0	-3.7	16.3	13.6	13.6	0.0	-2.7
E1_100m	9.3	5.6	5.6	0.0	-3.7	16.3	13.6	13.6	0.0	-2.7
E1_125m	9.2	5.6	5.6	0.0	-3.7	16.3	13.6	13.6	0.0	-2.7
E1_150m	9.2	5.6	5.5	0.0	-3.6	16.3	13.6	13.6	0.0	-2.7
E1_175m	9.1	5.6	5.5	0.0	-3.6	16.3	13.6	13.6	0.0	-2.7
E2_0m	22.1	12.9	10.7	-2.3	-11.4	17.0	14.4	14.1	-0.2	-2.9
E2_5m	16.2	9.6	8.4	-1.2	-7.8	16.7	14.0	13.9	-0.1	-2.8

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E2_10m	14.0	8.3	7.5	-0.8	-6.5	16.6	13.9	13.8	-0.1	-2.8
E2_15m	12.9	7.7	7.1	-0.6	-5.8	16.5	13.8	13.8	-0.1	-2.7
E2_20m	12.2	7.3	6.8	-0.5	-5.3	16.5	13.8	13.8	0.0	-2.7
E2_30m	11.4	6.8	6.5	-0.3	-4.9	16.4	13.8	13.7	0.0	-2.7
E2_40m	10.9	6.6	6.3	-0.2	-4.6	16.4	13.7	13.7	0.0	-2.7
E2_50m	10.6	6.4	6.2	-0.2	-4.4	16.4	13.7	13.7	0.0	-2.7
E2_60m	10.4	6.3	6.1	-0.2	-4.3	16.4	13.7	13.7	0.0	-2.7
E2_70m	10.3	6.2	6.1	-0.1	-4.2	16.4	13.7	13.7	0.0	-2.7
E2_80m	10.2	6.1	6.0	-0.1	-4.2	16.4	13.7	13.7	0.0	-2.7
E2_90m	10.1	6.1	6.0	-0.1	-4.1	16.4	13.7	13.7	0.0	-2.7
E2_100m	10.0	6.1	6.0	-0.1	-4.1	16.4	13.7	13.7	0.0	-2.7
E2_125m	9.9	6.0	5.9	-0.1	-4.0	16.3	13.7	13.7	0.0	-2.7
E2_150m	9.8	5.9	5.9	-0.1	-3.9	16.3	13.7	13.7	0.0	-2.7
E2_175m	9.7	5.9	5.8	-0.1	-3.9	16.3	13.7	13.7	0.0	-2.7
E3_0m	47.1	24.0	25.2	1.3	-21.9	18.2	15.4	15.5	0.1	-2.7
E3_5m	37.8	19.7	20.6	0.9	-17.2	17.7	14.9	15.0	0.1	-2.7
E3_10m	32.4	17.2	17.9	0.7	-14.5	17.4	14.7	14.7	0.1	-2.7
E3_15m	29.0	15.5	16.1	0.6	-12.8	17.3	14.5	14.6	0.1	-2.7
E3_20m	26.5	14.3	14.8	0.5	-11.7	17.1	14.4	14.4	0.1	-2.7
E3_30m	23.2	12.7	13.1	0.4	-10.1	16.9	14.2	14.3	0.0	-2.7
E3_40m	21.1	11.7	12.0	0.3	-9.1	16.8	14.1	14.2	0.0	-2.7
E3_50m	19.7	11.0	11.2	0.3	-8.4	16.8	14.1	14.1	0.0	-2.7
E3_60m	18.6	10.5	10.7	0.2	-7.9	16.7	14.0	14.0	0.0	-2.7
E3_70m	17.8	10.1	10.3	0.2	-7.5	16.7	14.0	14.0	0.0	-2.7
E3_80m	17.1	9.7	9.9	0.2	-7.2	16.6	13.9	13.9	0.0	-2.7
E3_90m	16.6	9.5	9.6	0.2	-7.0	16.6	13.9	13.9	0.0	-2.7

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E3_100m	16.2	9.3	9.4	0.1	-6.8	16.6	13.9	13.9	0.0	-2.7
E3_125m	15.4	8.9	9.0	0.1	-6.4	16.5	13.8	13.9	0.0	-2.7
E3_150m	14.8	8.6	8.7	0.1	-6.1	16.5	13.8	13.8	0.0	-2.7
E3_175m	14.4	8.4	8.5	0.1	-5.9	16.5	13.8	13.8	0.0	-2.7
E11_0m	19.2	10.9	9.2	-1.7	-9.9	16.8	14.2	14.0	-0.2	-2.9
E11_5m	16.7	9.6	8.3	-1.3	-8.4	16.7	14.0	13.9	-0.1	-2.8
E11_10m	15.2	8.8	7.8	-1.0	-7.5	16.6	13.9	13.8	-0.1	-2.8
E11_15m	14.3	8.3	7.5	-0.9	-6.8	16.6	13.9	13.8	-0.1	-2.8
E11_20m	13.6	8.0	7.2	-0.7	-6.4	16.5	13.9	13.8	-0.1	-2.8
E11_30m	12.7	7.5	6.9	-0.5	-5.7	16.5	13.8	13.8	-0.1	-2.7
E11_40m	12.1	7.2	6.7	-0.4	-5.4	16.5	13.8	13.7	0.0	-2.7
E11_50m	11.7	6.9	6.6	-0.3	-5.1	16.4	13.8	13.7	0.0	-2.7
E11_60m	11.4	6.8	6.5	-0.3	-4.9	16.4	13.7	13.7	0.0	-2.7
E11_70m	11.2	6.7	6.4	-0.2	-4.8	16.4	13.7	13.7	0.0	-2.7
E11_80m	11.0	6.6	6.4	-0.2	-4.7	16.4	13.7	13.7	0.0	-2.7
E11_90m	10.9	6.5	6.3	-0.2	-4.6	16.4	13.7	13.7	0.0	-2.7
E11_100m	10.8	6.4	6.3	-0.2	-4.5	16.4	13.7	13.7	0.0	-2.7
E11_125m	10.5	6.3	6.2	-0.1	-4.3	16.4	13.7	13.7	0.0	-2.7
E11_150m	10.4	6.3	6.2	-0.1	-4.2	16.4	13.7	13.7	0.0	-2.7
E11_175m	10.3	6.2	6.1	-0.1	-4.2	16.4	13.7	13.7	0.0	-2.7
E11_200m	10.2	6.1	6.1	-0.1	-4.1	16.4	13.7	13.7	0.0	-2.7
E12_0m	10.2	6.1	7.4	1.3	-2.9	19.1	16.0	16.1	0.1	-3.0
E12_5m	10.2	6.1	7.3	1.2	-3.0	19.1	16.0	16.1	0.1	-3.0
E12_10m	10.2	6.1	7.2	1.1	-3.0	19.1	16.0	16.1	0.1	-3.0
E12_15m	10.2	6.1	7.1	1.0	-3.1	19.1	16.0	16.1	0.1	-3.0
E12_20m	10.2	6.1	7.0	0.9	-3.2	19.1	16.0	16.1	0.1	-3.0

Modelled transect (distance into SAC)	Baseline Total NOx concentration	DM Total NOx concentration	DS Total NOx concentration	Change in Total NOx concentration between DS and DM (role of Scheme)	Change in Total NOx concentration between DS and Base	Total Baseline Nitrogen deposition	Total DM Nitrogen deposition	Total DS Nitrogen deposition	Change in Nitrogen deposition between DS and DM (role of Scheme)	Change in Nitrogen deposition between DS and Base
E12_30m	10.2	6.1	6.9	0.8	-3.3	19.1	16.0	16.1	0.1	-3.1
E12_40m	10.1	6.1	6.8	0.7	-3.3	19.1	16.0	16.1	0.1	-3.1
E12_50m	10.1	6.1	6.7	0.7	-3.4	19.1	16.0	16.0	0.1	-3.1
E12_60m	10.1	6.0	6.6	0.6	-3.5	19.1	16.0	16.0	0.1	-3.1
E12_70m	10.1	6.0	6.6	0.5	-3.5	19.1	16.0	16.0	0.1	-3.1
E12_80m	10.1	6.0	6.5	0.5	-3.6	19.1	16.0	16.0	0.1	-3.1
E12_90m	10.1	6.0	6.5	0.5	-3.6	19.1	16.0	16.0	0.0	-3.1
E12_100m	10.0	6.0	6.4	0.4	-3.6	19.1	16.0	16.0	0.0	-3.1
E12_125m	10.0	6.0	6.3	0.3	-3.7	19.1	16.0	16.0	0.0	-3.1
E12_150m	10.0	6.0	6.3	0.3	-3.7	19.1	16.0	16.0	0.0	-3.1
E12_175m	9.9	6.0	6.2	0.3	-3.7	19.1	16.0	16.0	0.0	-3.1
E12_200m	9.9	5.9	6.2	0.2	-3.7	19.1	16.0	16.0	0.0	-3.1
E13_0m	10.5	6.2	6.5	0.2	-4.1	19.1	16.0	16.0	0.0	-3.1
E13_5m	10.5	6.2	6.4	0.2	-4.1	19.1	16.0	16.0	0.0	-3.1
E13_10m	10.5	6.2	6.4	0.2	-4.0	19.1	16.0	16.0	0.0	-3.1
E13_15m	10.4	6.2	6.4	0.2	-4.0	19.1	16.0	16.0	0.0	-3.1
E13_20m	10.4	6.2	6.4	0.2	-4.0	19.1	16.0	16.0	0.0	-3.1
E13_30m	10.3	6.1	6.3	0.2	-4.0	19.1	16.0	16.0	0.0	-3.1

If you need help accessing this or any other Highways England information, please call **0300 123 5000** and we will help you.

This document is also available on our website at **www.gov.uk/highways**

If you have any enquiries about this document email **info@a303stonehenge.co.uk** or call **0300 123 5000***.

*Calls to 03 numbers cost no more than a national rate call to an 01 or 02 number and must count towards any inclusive minutes in the same way as 01 and 02 calls.
These rules apply to calls from any type of line including mobile, BT, other fixed line or payphone. Calls may be recorded or monitored.

Registered office Bridge House, 1 Walnut Tree Close, Guildford GU1 4LZ
Highways England Company Limited registered in England and Wales number 09346363