

A19/A184 Testos Junction Improvement Preliminary Environmental Information

ECI Document Ref: B0140300/OD/109
September 2014

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PREFACE

The Highways Agency is responsible for the maintenance and improvement of the trunk road and motorway network in England. The Highways Agency's key objectives are to achieve safe roads and reliable journeys for informed travellers.

In early 2014, the Highways Agency appointed consultants Costain as the Designer for the A19 Testos Junction Improvement. Costain appointed Jacobs as their Design Partner.

The roles of the Designer and Design Partner include preparation of the preliminary design of the proposed scheme, carrying out the environmental impact assessment (EIA) and preparation of the application to the Secretary of State through the Planning Inspectorate (as responsible agency) for a Development Consent Order (DCO). The Secretary of State for Transport will make the final decision on whether or not a DCO is granted for the scheme.

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1 INTRODUCTION

1.1 The preliminary environmental information

1.1.1 This report sets out the preliminary results of the Highways Agency's investigations into the potential environmental effects of a proposed improvement to the junction of the A19 and A184 at Testos Roundabout, near West Boldon in South Tyneside.

1.2 Environmental impact assessment

1.2.1 Environmental Impact Assessment (EIA) is a statutory process required for the proposed scheme.¹ It is a systematic process to identify, predict and evaluate the environmental effects of a proposed project. Its primary purpose is to inform the decision as to whether a project should go ahead. However, the EIA process will also have an important influence on the design of the proposed scheme since it enables environmental impacts to be identified and, where possible, to be avoided through sensitive design. In addition it identifies enhancement opportunities that can be incorporated in the design, where appropriate.

1.2.2 The EIA for Nationally Significant Infrastructure Projects (NSIPs) is reported in two stages, as follows:

- a "preliminary environmental information" (PEI) report is prepared, to inform consultation of the public about the proposed scheme; and
- following consultation with the public, an Environmental Statement (ES) is prepared to accompany the application for a DCO.

1.3 Purpose of this report

1.3.1 This PEI report provides a statement of the main environmental information available for the study area, a preliminary indication

of the likely environmental effects and potential mitigation measures envisaged for the proposed scheme.

1.3.2 This document is intended to give members of the public and stakeholders an understanding of the key issues, and enable them to prepare well-informed responses to consultation on the scheme and the proposed scope of the EIA.

1.3.3 It should be noted that at this stage, the information provided is **preliminary**, and is based mostly on the scheme design that was put forward at a very early stage in the scheme's development. Further EIA work is being undertaken in accordance with the proposed scope and methods set out in the Scoping Report (2014), and in parallel with ongoing development of the design. This assessment work will confirm the scale and significance of predicted environmental effects arising from the proposed scheme design, and the mitigation proposed in order to address those effects, where appropriate and achievable. The final EIA work will be reported within an ES, which will accompany the DCO application to be made in summer 2015.

1.3.4 The main body of this report has been prepared for a non-technical audience. It is supported by appendices which contain technical detail about the proposed scope of the EIA, where this has been considered necessary.

1.3.5 This report is organised into a number of chapters which set out the main environmental topics being considered in the EIA. Since the proposed scheme is a highway project, the design and assessment is guided by the Department for Transport's Design Manual for Roads and Bridges (DMRB)², and supplemented by Interim Advice Notes (IANs). Guidance on EIA in volume 11 of the DMRB and relevant IANs sets out the main environmental topic areas considered as part of a highway scheme EIA, which are:

¹ In accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (the EIA Regulations) and the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended).

² The Highways Agency et al. (1993). Design Manual for Roads and Bridges.

- air quality;
 - cultural heritage;
 - landscape and visual amenity;
 - ecology and nature conservation;
 - geology and soils;
 - materials;
 - noise and vibration;
 - effects on all travellers;
 - communities and private assets; and
 - road drainage and the water environment.
- 1.3.6 Each environmental topic section (Chapters 5-16) in this report describes the local environment, the likely effects that the scheme would have on that environmental aspect, as well as the types of mitigation that are under consideration to seek to minimise any effects of the proposed scheme.
- 1.3.7 In addition to supporting the consultation of the local community and general public, this PEI report will be used to consult a range of stakeholders, including:
- local land owners and land interests,
 - local businesses,
 - external statutory bodies, such as Natural England, English Heritage and the Environment Agency,
 - relevant local planning authorities (for the Testos scheme this is South Tyneside Council, Sunderland City Council, and Gateshead Council),
 - neighbouring local authorities (this includes Newcastle City Council and North Tyneside Council), and
 - non-statutory key stakeholders.
- 1.3.8 The scope of the EIA will be agreed through consultation with external statutory bodies and local planning authorities.

2 SCHEME DESCRIPTION

2.1 Location of the scheme

- 2.1.1 The location of Testos Junction is illustrated in Figure 2.1. It is located in South Tyneside, approximately 4 km south of the Tyne Tunnel entrance at Jarrow. It lies in a narrow belt of countryside that separates the urban areas of South Tyneside and Sunderland. The next junction is 1 km to the south at Downhill Lane.
- 2.1.2 Residential areas lie close by, at Fellgate and Hedworth to the northwest, and Boldon Colliery to the northeast. A business park lies adjacent to the scheme to the east. Two farms (West House Farm and Make-Me-Rich Farm) lie just west of the A19. Southeast of Downhill Lane Junction is the residential area of Town End Farm.
- 2.1.3 All the adjacent land to the west is agricultural. To the east, in addition to the business park, there are two nature conservation / community sites, an electricity sub-station and agricultural land.

2.2 Background to the project

- 2.2.1 The A19 is a strategic route running from Doncaster to north of Newcastle via York. More locally, it links the Tyne and Wear conurbation with Teesside. From the south, together with the A168, it connects the A1 at Dishforth and areas in between (including Middlesbrough and Sunderland) to South Tyneside, and then on via the Tyne Tunnel to North Tyneside, Newcastle and Northumberland. From Testos Junction northwards, it also forms part of a Tyneside eastern orbital route, crossing the River Tyne via the Tyne Tunnel and meeting the A1 again at Seaton Burn Interchange.

- 2.2.2 The roundabout at Testos Junction is the last remaining significant at-grade³ junction on this strategic north-south route.
- 2.2.3 Heavy congestion frequently occurs at Testos Junction, leading to increased driver stress and inhibiting economic growth in the area. The proposed scheme would involve replacing the existing at-grade roundabout with a new grade-separated⁴ junction.
- 2.2.4 The proposed junction improvement at Testos Junction is one of a package of highway improvements that were recommended by the 'Tyneside Area Multi-Modal Study' (TAMMS), involving a strategic reassessment of the region's transport needs completed in 2002. The objectives of the study were to identify ways to:
- reduce congestion on the A1 in Tyneside;
 - reduce congestion on the A19 approaches to the Tyne Tunnel;
 - improve safety on the A19 in Tyneside; and
 - achieve these aims without causing unacceptable problems on other transport networks in the area.
- 2.2.5 TAMMS considered existing and future transportation problems in Tyneside up to 2031, based on traffic growth projections. Strategies that were considered were based either on investment in highway improvements or in public transport and road user charging. The outcome of the study was a suite of recommendations for highway improvements, including construction of a second Tyne Tunnel and improvements on the A1 and at specific junctions on the A19, including Testos Junction.

³ 'At-grade': a term meaning "on the same level" – i.e. the roundabout and all the roads joining it are at ground level, and all traffic goes around the roundabout.

⁴ 'Grade-separated': as opposed to 'at-grade', this refers to a junction where one road has been elevated or lowered to a different level such that the main flow of traffic is separated.

2.2.6 The second Tyne Tunnel has since been built and opened, whilst some other elements of the strategy have also been either built or are at various stages of development.

2.3 Scheme history

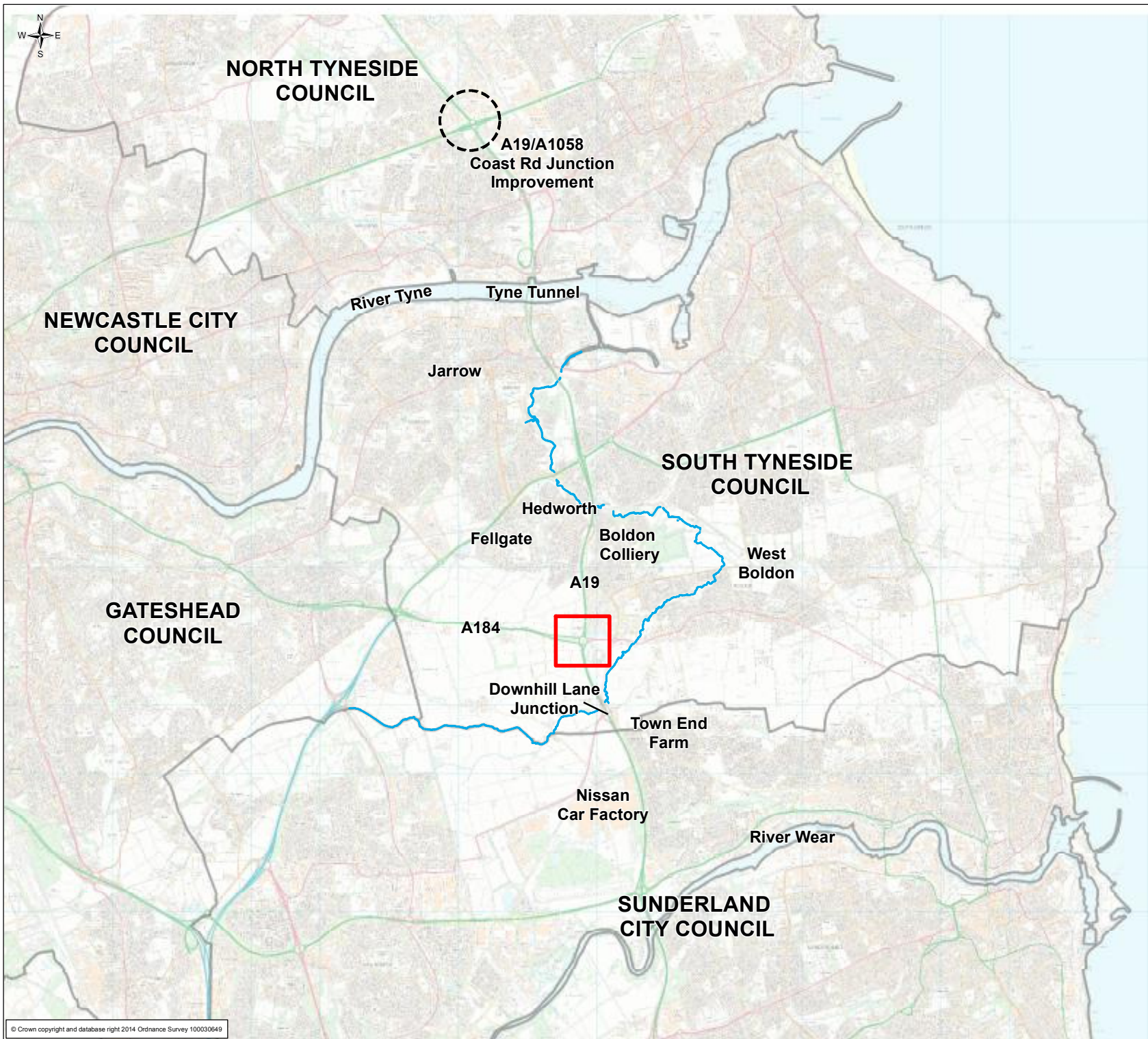
2.3.1 Following the recommendation from TAMMS that Testos Junction should be improved, the Highways Agency prepared an initial study of options for improving the junction in 2004. Between 2006 and 2007 more detailed design work and environmental studies were carried out for an online improvement option. In 2008-9, further consideration of alternative designs for the scheme was undertaken⁵, leading to a Public Consultation in March 2009. This considered both an 'on-line' option (following the line of the existing A19) and two 'off-line' options (to the west of the existing A19).

2.3.2 As a result of the impacts of the recession, before a preferred route announcement was made, the Government's spending review of 2010 led to the postponement of a number of highways schemes, including the A19 Testos Junction Improvement.

2.3.3 In April 2014, the Government announced £36 billion of planned investment into infrastructure for 2014-2015, providing funding for a number of previously postponed highways schemes including Testos Junction.

2.3.4 The Preferred Route for the improvement was announced by the Secretary of State on 3rd June 2014, following a process of validating the outcome of the 2009 Public Consultation undertaken by the Highways Agency.

⁵ See the 'Options Identification Stage: Comparative Environmental Assessment' report (CEAR)



Legend

- A19 Testos Junction
- Local Authority Boundary
- River Don



Drawing Title

FIGURE 2.1
LOCATION OF TESTOS JUNCTION

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2.4 Proposed A19 junction design

- 2.4.1 An outline of the proposed scheme is provided in Figure 2.2, and the description given throughout this chapter is based primarily on the design as it had been developed up to 2009. Further design development is in progress and may result in some changes, but is at too early a stage to be reflected in this report.
- 2.4.2 The A19 would be raised on an embankment to pass over an enlarged roundabout on two bridges, and linked to it by slip roads. Traffic on the A19 would flow freely above the roundabout, while traffic using the A184 would still travel around the roundabout.
- 2.4.3 The proximity of Testos to another grade-separated junction at Downhill Lane (1 km to the south) means that the slip roads of two conventional grade-separated junctions cannot be safely accommodated. The existing northbound on-slip road and southbound off-slip road at Downhill Lane Junction would therefore be closed. Traffic to and from the north at Downhill Lane would be linked to the A19 at Testos Junction, via new connector roads running parallel to the A19 on either side.
- 2.4.4 The junction improvements are intended to improve journey time reliability and the quality of the traveller's experience, principally through reducing congestion. The proposed improvements would further improve safety at the junction, reducing the frequency of collisions to a level well below the national average.
- 2.4.5 Although the proposed scheme is an on-line improvement (i.e. the route of the A19 would not be changed), the nature of the proposals mean that the scheme cannot be built within the existing highway boundary. Some new land would therefore be acquired to build the scheme. Most of this land would be to the west of the existing road, with smaller quantities of land required to the east.

- 2.4.6 The A19 Testos Junction scheme comprises a total length of approximately 2 km. The proposed works (illustrated in Figure 2.2) would be within the Highways Agency operational boundary, except the temporary construction site compounds.

- 2.4.7 A summary of the proposed activities is presented below.

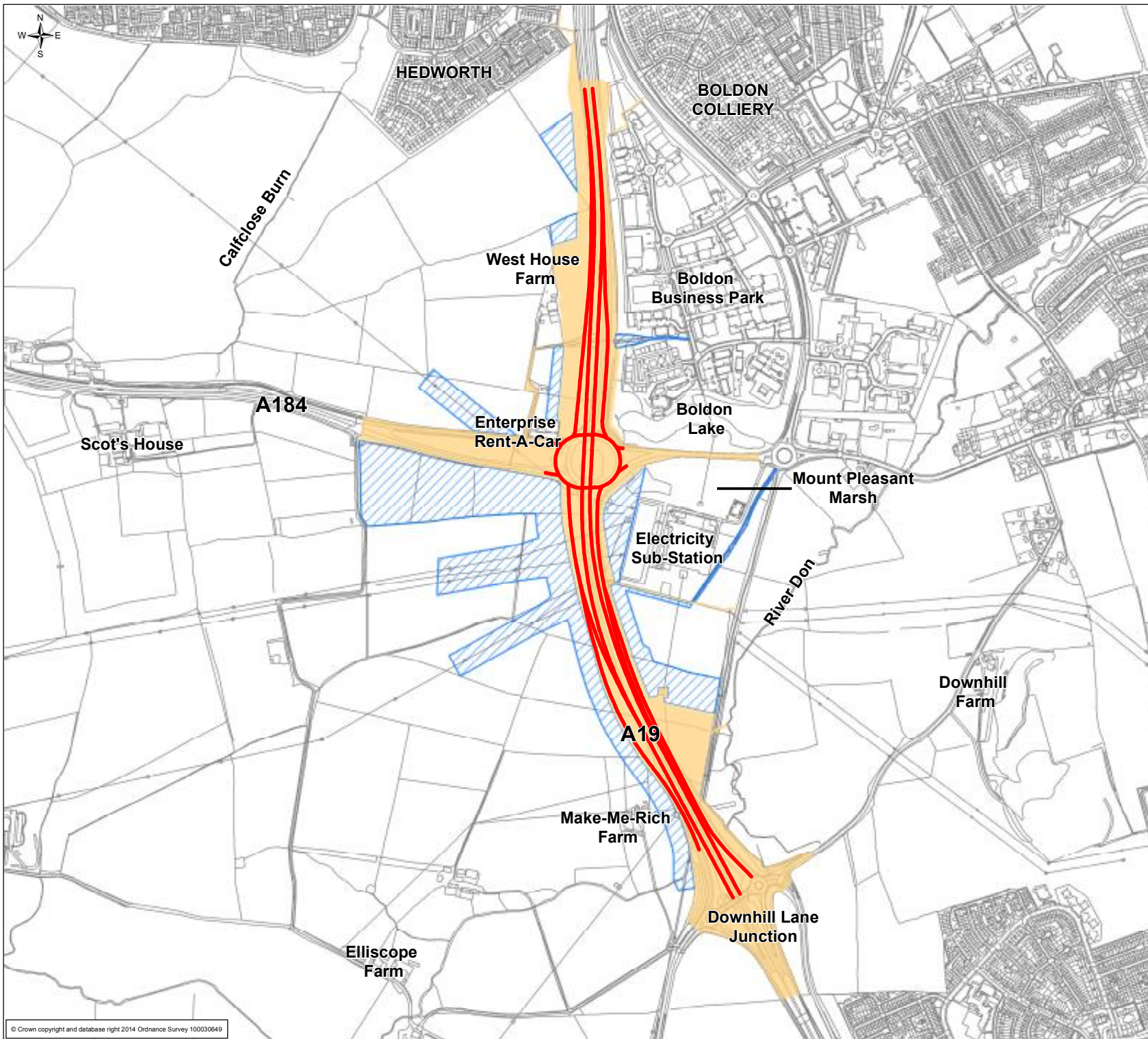
Structures

- 2.4.8 A new embankment will be required to carry the A19 across the junction at a height 7.5 m above existing ground level. Two new bridges would be required where the embankment crosses the roundabout.

Drainage strategy

- 2.4.9 The existing highway drainage is piped, and outfalls in three places, all to the River Don.
- 2.4.10 Two balancing ponds were included in the drainage design in 2009 to attenuate the rate of surface water run-off. The balancing ponds would also retain, and to a certain extent to treat, sediment and pollutants associated with the sediment fraction of drainage run-off.
- 2.4.11 Other forms of water storage (e.g. water tanks) can achieve similar benefits, and may be considered as part of scheme development.
- 2.4.12 One balancing pond is located at the south end of the scheme, near Downhill Lane Junction, and the other near the north end, adjacent to West House Farm. The southern balancing pond would have a new outfall into the River Don, replacing one of the existing outfalls. The northern pond would outfall back into existing highway drainage, and eventually into the River Don through an existing outfall 2 km to the north of Testos Junction. The third existing outfall would be retained as at present.
- 2.4.13 The drainage design (e.g. presence, location and number of balancing ponds) and attenuation requirement will be revisited as part of the EIA and scheme development.

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Legend

- Proposed Junction Improvement Outline
- Permanent Landtake
- Temporary Landtake

Drawing Title

FIGURE 2.2
OUTLINE PROPOSED SCHEME



1 City Walk, Leeds, LS11 9DX, UK
Tel: +44(0)113 242 6771 Fax: +44(0)113 389 1389
www.jacobs.com

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Lighting and other infrastructure

- 2.4.14 Existing highway lighting is restricted to the immediate area of the Testos Junction itself, along the A184 east of the junction, and the Downhill Lane Junction roundabouts.
- 2.4.15 It is assumed at this stage that the improved junction would need lighting at the roundabout and along the slip roads and connector roads, from Downhill Lane Junction to the northern limit of the works. This will include rows of lighting columns approximately 12 m high, to be positioned at existing ground level and at intervals of approximately 40 m.
- 2.4.16 There may also be changes to road signs and other information systems and other roadside infrastructure.
- 2.4.17 New or upgraded ground-level, signal-controlled crossings suitable for relevant non-motorised users (including horse-riders) are also being considered at specific locations, including over the A184 adjacent to Testos Junction.

Bridleways, footpaths and cycle paths

- 2.4.18 The junction improvement would require removal of an existing agricultural accommodation bridge carrying a bridleway over the A19 north of Testos Junction (Bridleway B28), and the stopping up of an existing at-grade footpath crossing of the A19 south of Testos Junction (footpath B27).
- 2.4.19 Three options are being considered for upgrading the network of rights of way around the junction. More information on these is provided separately as part of the consultation information, but in summary the options are as follows:

Option 1

- Relocate the bridge further north, close to Hedworth.
- Divert the bridleway to run parallel to the west side of the A19, cross the new bridge, and link to the north end of Brooklands Way and Abingdon Way.

- Provide an upgraded pedestrian/cyclist crossing of the A19 north of Testos Junction, linked to the existing cycle path on the north side of the A184 east of Testos Junction.
- Divert Footpath B27 northwards to Testos Junction on both sides of the A19.
- Provide a new signalised pedestrian crossing south of the junction.
- Provide a new footway on the south side of the A184 from the new pedestrian crossing of the A19 eastwards around the north side of Mount Pleasant Marsh.
- At the south end of Bridleway B46, provide a new ramp for cyclists parallel to but outside the A19 southbound off-slip linking the bridleway to Downhill Lane junction (this facility is to cater for an observed desire line particularly for Nissan shift workers commuting by bike).

Option 2

- Do not replace the agricultural bridge carrying the bridleway.
- Provide a new signalised crossing for pedestrians and cyclists across the A184 west of Testos Junction.
- Provide an upgraded pedestrian/cyclist crossing of the A19 north of Testos Junction, linked to the existing cycle path on the north side of the A184 east of Testos Junction.
- Provide a new signalised crossing south of the junction for pedestrians, cyclists and equestrians, segregated between cyclists and equestrians.
- Provide a new bridleway link from West Pastures lane (west of Testos Junction) to the B46 to the east of the junction by crossing the roundabout, including by:
 - using the new signalised bridleway crossing at the south side of the roundabout along the A184 and providing a visual screen that uses a 'tried and tested' design for equestrians;
 - creating a new segment of bridleway adjacent to the west (running north-south) of Mount Pleasant Marsh; and

- upgrading B27 east of the A19 to bridleway, which then links to bridleway B46.
- Divert Footpath B27 north to Testos Junction on the west side of the A19.
- Provide a new footway on the south side of the A184 from the new pedestrian crossing of the A19 eastwards around the north side of Mount Pleasant Marsh.
- At the south end of Bridleway B46, provide a new ramp for cyclists parallel to but outside the A19 southbound off-slip linking the bridleway to Downhill Lane junction.

Option 2a

- As for Option 2, except for:
 - No signalised crossing for pedestrians and cyclists across the A184 west of Testos Junction.
 - Instead, provide a new cycleway / footway along the north side of the A184 from opposite West Pastures lane to Testos Junction.
 - No segregated crossing for cyclists and equestrians south of Testos Junction, and therefore only the signalised pedestrian / equestrian shared crossing.

2.5 Construction proposals

- 2.5.1 The construction works would be undertaken as a rolling programme of activity over a period of approximately 18 months. Subject to Development Consent being granted, construction work could start in the winter of 2016/17 and complete in the spring/summer 2018. There is potential to work at the weekends as well as at night throughout the whole works programme, which could help to bring forward this estimated completion date. Further construction information, including working hours, will be stated in the forthcoming ES.
- 2.5.2 Prior to any construction work commencing, there would be a mobilisation period including traffic management installation and site enabling works. Traffic management would typically comprise lane closures, lane narrowing and speed restrictions

for the duration of the works, with supporting temporary CCTV cameras. Along the length of the A19 affected by the scheme, there would be narrow lanes for much of the duration of construction works.

- 2.5.3 The Contractor would produce and manage a Construction Environmental Management Plan (CEMP).

Accommodation works

- 2.5.4 Statutory services that would require diversion include gas pipes, water pipes and telecommunications equipment, all located underground and running through Testos Junction along the A184 and A19. It is intended that these would be diverted within the new highway boundary.

- 2.5.5 Overhead electrical power lines running westwards from a large sub-station in Mount Pleasant Marsh, crossing the A19, would also require diversion to new underground ducts. Three rows of pylons/overhead lines would be affected. A fourth set of power lines already crosses the A19 underground, transferring to an overhead route just to the west of the highway. This underground route would need to be extended to the west, and its first pylon west of the A19 would be relocated.

- 2.5.6 The works to divert the overhead cables comprise four key elements:

- civil engineering works to provide a new underground route;
- construction of three new pylons west of the A19 and installation of new cables in the underground route;
- connection of the new cables to the electricity distribution network; and
- removal of the redundant overhead cables and of six redundant pylons, including three within Mount Pleasant Marsh.

- 2.5.7 Conventional construction methods would involve placing the new cables in an open cut trench. After connection of the new cables to the electricity distribution network, the redundant

overhead cables would be disconnected and lowered to the ground.

- 2.5.8 However, it is being considered that the impact of the overhead line diversion works on Mount Pleasant Marsh could be reduced by adoption of an alternative construction method. The redundant cables could be removed using scaffolding towers with nets strung between them to reduce the amount of vegetation clearance required. Where vegetation clearance cannot be avoided, it should be possible to re-plant the majority of the cleared area, as the cables would be protected by robust plastic pipes.
- 2.5.9 In order to minimise potential impacts in Mount Pleasant Marsh or elsewhere, the drilling could potentially work from west to east, with the drilling plant and the entry pit located west of the A19. The terminal point would be in a pit within Mount Pleasant Marsh.
- 2.5.10 These alternative methods and impact reduction measures relating to the overhead line diversions would be subject to agreement with the statutory undertaker who would undertake the works.

Materials import

- 2.5.11 The Highways Agency has identified a potential material collaboration opportunity with the A19/A1058 Coast Road project. The Coast Road is currently at a similar stage of development, working towards submitting a draft Development Consent Order (DCO) application to the Planning Inspectorate in October 2014 (see Chapter 4). The Coast Road is expected to produce a surplus of excavated material which could be used for construction of the embankment at the Testos scheme.
- 2.5.12 Based on current programmes the schemes are due to be in construction at the same time. The schemes are only approximately 8 km apart, making bulk material transport between the sites a feasible proposition.

- 2.5.13 This proposal could offer a sustainable means of disposing of the Coast Road excavated material, and sourcing the material required for Testos Junction. Other import sources for Testos are not confirmed, but the three known closest alternative options are further than 10 km away.
- 2.5.14 As there is a delay between the start of the Coast Road construction and access to the Testos site, a suitable area or areas will need to be identified for material storage.

2.6 Changes in traffic

- 2.6.1 Testos Junction is currently a busy interchange for local traffic travelling to Boldon Business Park and the surrounding towns, as well as longer-distance traffic passing through on the main A19 and A184 trunk roads.
- 2.6.2 The 2006 traffic assessment indicated that most of the traffic using the junction (approximately 38%) is through-traffic staying on the A19, in both directions. A further 26% was found to be split between traffic travelling between the A184 west and the A19 south in both directions, and 17% was through-traffic on the A184 in both directions. The remaining traffic was made up of east-south (11%), west-north (4%) and east-north (nearly 4%) movements. This data will be updated as part of the 2014 traffic assessment.
- 2.6.3 The 2006 traffic assessment also indicated that the numbers of vehicles using the junction in the future would not change due to the proposed scheme, although speeds of journeys are likely to change due to a reduction in congestion.
- 2.6.4 Congestion would be reduced as through-traffic on the A19 would bypass the Testos Junction roundabout. With the junction improvements in place, it is estimated that over 50% of the A19 traffic would be removed from the roundabout.⁶

⁶ 2-way Annual Average Daily Traffic (AADT), assuming high growth and prior opening of the new Tyne Tunnel, which has since occurred.

- 2.6.5 Since the 2006 assessment was undertaken, no significant changes in junction operation have been implemented, however the installation of traffic signals in 2001, which were subsequently renewed in 2012 as an interim measure, has helped to improve safety and reduce some of the congestion.
- 2.6.6 A new traffic model is currently being developed in order to provide updated traffic forecasts for the scheme, which will be used within the relevant chapters of the ES. At this time therefore, anticipated changes to the wider A19 traffic network, including the Testos Junction, are currently unknown.
- 2.6.7 The 2014 model and assessment will take account of other projects in the area which could affect predictions of changing traffic flow. For example, the A19/A1058 Coast Road Junction Improvement Scheme.

2.7 Maintenance proposals

- 2.7.1 Operational maintenance of the A19 would experience relatively few changes as compared to the current situation. Existing maintenance activities include inspection and repair of barriers and signage, drain inspection and clearance, road repairs and road verge / vegetation maintenance (amongst other activities). For the Highways Agency and parties acting on their behalf, future maintenance activities would include these same tasks, plus the addition of inspection and maintenance of bridges and balancing bonds, including any oil interceptors.
- 2.7.2 National Grid would retain permanent access corridors for the maintenance of the buried services. The exact width of these access corridors is currently not determined, but it is likely to be less than 40 m wide. Tree planting within the access corridor would not be possible, although seeding and some scattered scrub planting would be possible.

3 SCHEME ALTERNATIVES

3.1 Design options examined

3.1.1 Options for improvement of the Testos Junction were first considered in 2004. Four options for improvement were examined, as follows:

Option 1 – A19 north-south grade separation – on-line scheme;

Option 2 – A184 east-west grade separation;

Option 3 – A19 north-south grade separation – off-line scheme;

Option 4 – A184 west to A19 south grade separation.

3.1.2 These are illustrated in Figure 3.1 on the following page.

3.1.3 Options 2 and 4 were discounted early, because they would not meet the objectives of the scheme as set by TAMMS, and for reasons of ‘buildability’ and environmental impact. Options 1 (‘the on-line scheme’) and 3 (‘the off-line scheme’) were assessed in more detail.

3.1.4 The Highways Agency subsequently rejected the off-line option, mainly on grounds of affordability, as the estimated cost would be higher than the budget available to fund construction.

3.1.5 In 2006-7 a single on-line improvement option was taken forward for development to ‘preliminary design’ level. This work included a detailed Environmental Impact Assessment for the on-line option. However, alternative options were then given more detailed consideration in 2008-9, to provide a robust test of the option selection process that led to the choice of the on-line option and determine whether that choice should be reconsidered.

3.1.6 Three options were considered in a new Comparative Environmental Appraisal Report and were presented at a Public Consultation in 2009. These options were as follows:

Option A - on-line grade-separation of the existing junction, carrying the A19 over the roundabout via two bridges and approach embankments, with the roundabout in the same location as at present but extended to the west;

Option B – off-line grade separation, with the roundabout relocated approximately 300 m further west, but otherwise very similar to option A; and

Option C – off-line grade separation, with the roundabout relocated approximately 300 m further west, with the A19 at-grade and passing beneath a raised roundabout.

3.1.7 These are illustrated in Figure 3.2.

3.1.8 For all options, all A184 traffic would pass around the roundabout, while the A19 would be linked to the roundabout via slip roads.

3.1.9 For Options A and B, the A184, roundabout and A19 slip roads would remain at-grade, while part of the A19 main carriageway would be raised on approach embankments to cross the roundabout on two bridges.

3.1.10 For Option C, the A19 would have remained at-grade, while the roundabout would be raised on embankments, crossing the A19 via two bridges. The A184 and the A19 slip roads would have been raised on embankments to reach the roundabout. The roundabout would be larger than the existing one to provide sufficient room for the slip road connections. All roundabout options would still have been signalised, but through-traffic on the A19 would bypass both the roundabout and the signals.

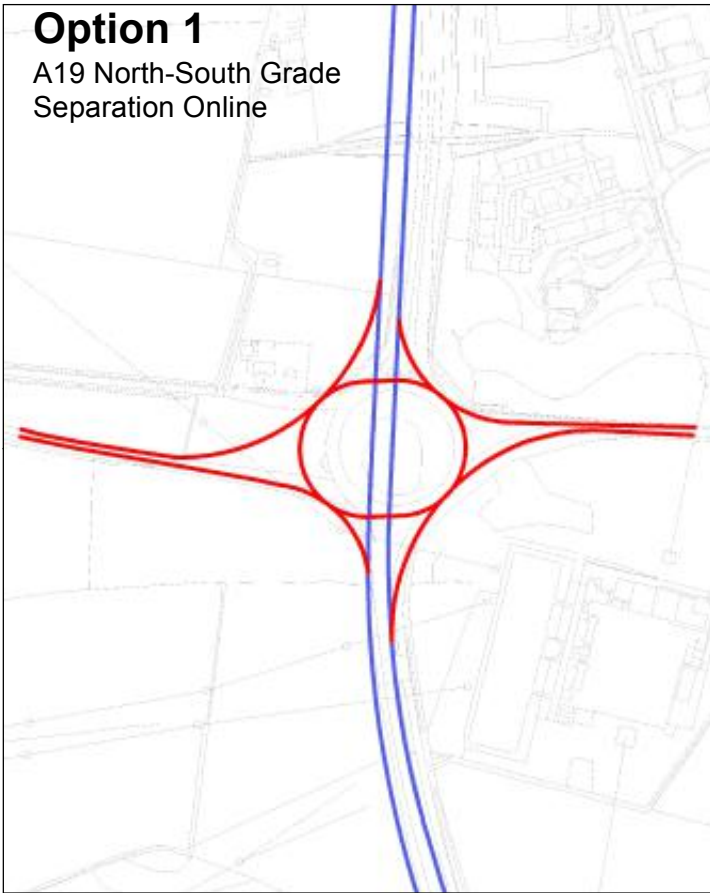
3.1.11 In relation to a wide range of environmental issues (including air quality, noise, the water environment, non-motorised users and communities), any differences between the options in the significance of either adverse or beneficial effects would have been marginal.

3.1.12 In relation to the effects on West Boldon Environmental Education Centre, Mount Pleasant Marsh and possibly the Great North Forest, the off-line options offered either slightly lower environmental impacts or the potential opportunity for greater benefits than the on-line option. However, these differences were small in scale.

- 3.1.13 Similar small-scale differences arose in favour of the on-line option in relation to vehicle travellers. However, more significant differences between the options arose in relation to Green Belt policy, the landscape, visual impacts, cultural heritage and land use, where the off-line options would have all caused greater adverse impacts than the on-line option. These environmental disadvantages of the off-line options outweighed their environmental advantages, when compared to the on-line option.
- 3.1.14 Overall, the balance of environmental impacts and benefits favoured the on-line option. This on-line option forms the basis of the current proposal.

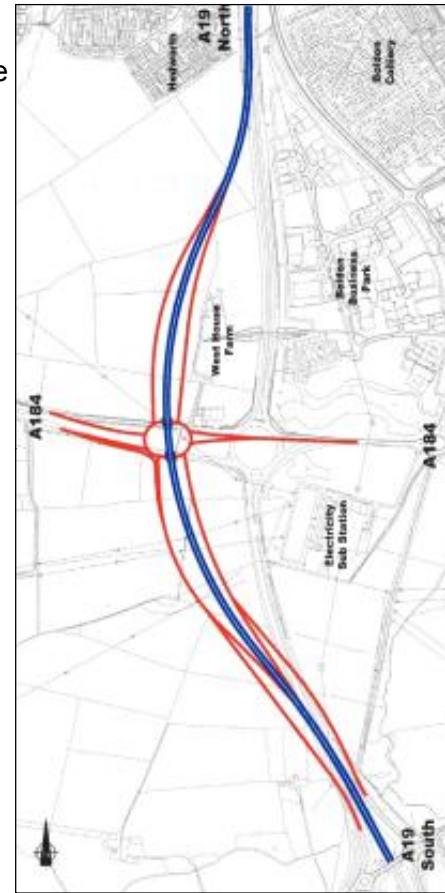
Option 1

A19 North-South Grade Separation Online



Option 3

A19 North-South Grade Separation Offline



Option 2

A184 East-West Grade Separation



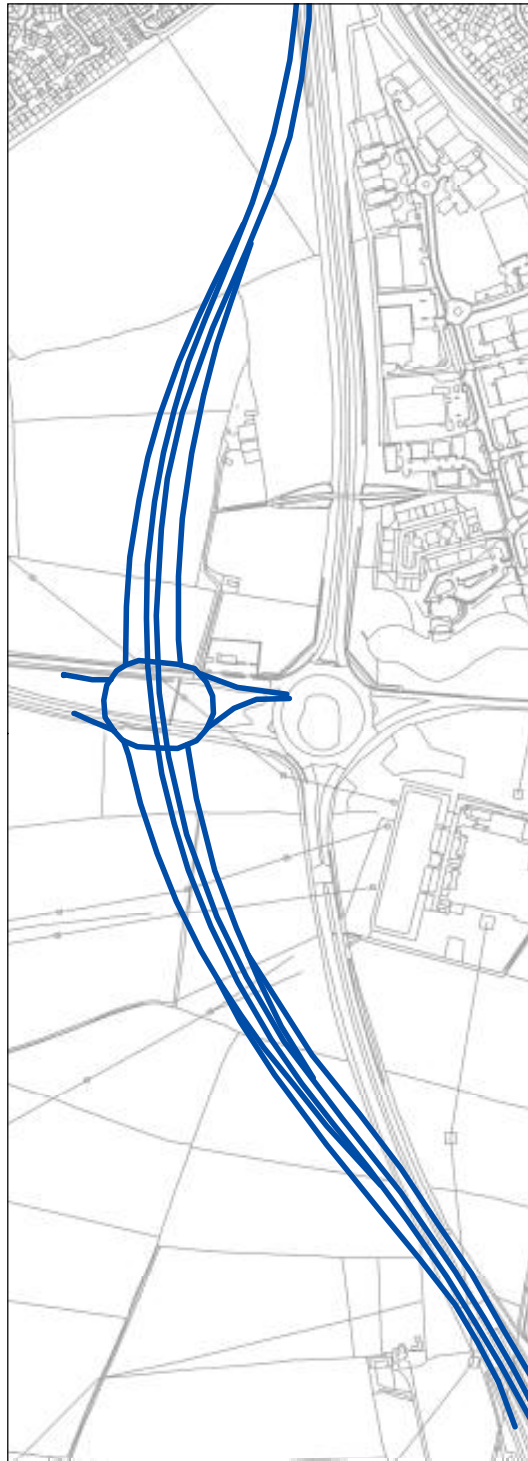
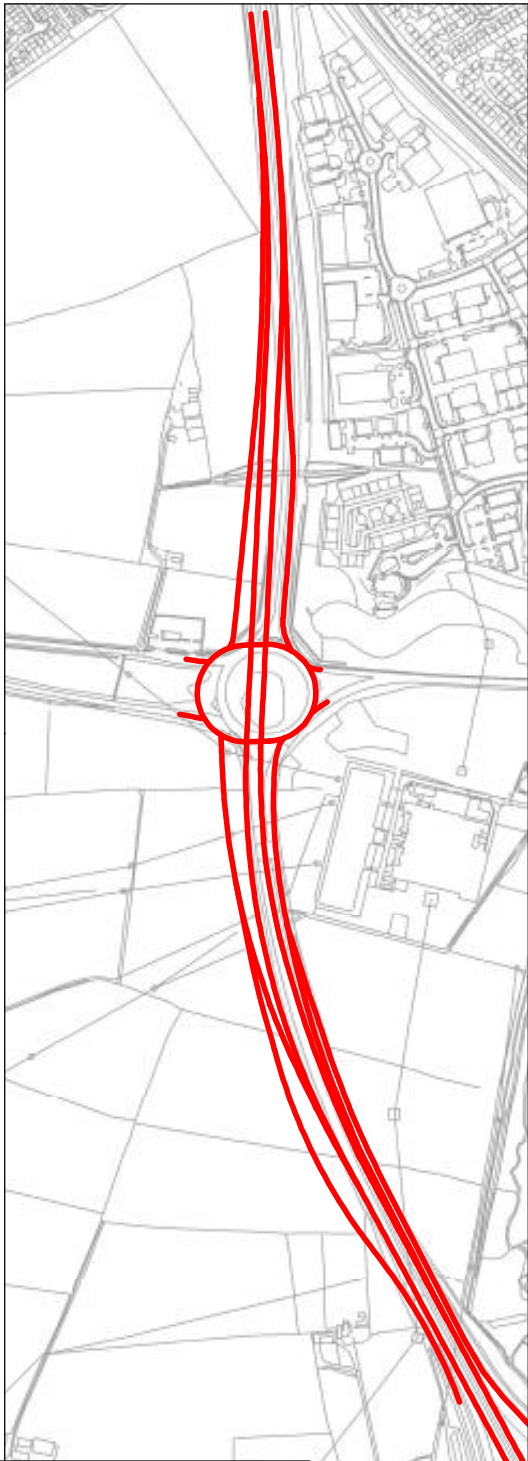
Option 4

A184 West-A19 South Grade Separation

Drawing Title

FIGURE 3.1
HIGH-LEVEL SCHEME
OPTIONS (2004)

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- Legend
- Option A
 - Option B
 - Option C

Drawing Title

FIGURE 3.2
DETAILED SCHEME
OPTIONS (2009)

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4 CONSULTATION

4.1 Introduction

DCO consultation requirements

- 4.1.1 The A19 Testos Junction Improvement scheme is being delivered under the Planning Act 2008. The Act requires the Highways Agency to submit an application for a Development Consent Order (DCO) to the Planning Inspectorate, who will examine the application and provide advice and a report to the Secretary of State, who will determine the application.
- 4.1.2 The DCO application has a number of statutory requirements regarding consultation. The key items are:
- Local authorities, land interests and other specified third parties must be consulted under Section 42 of the Planning Act;
 - The local community must be consulted under Section 47 of the Planning Act;
 - The community consultation arrangements must be publicised in the form of a Statement of Community Consultation (SoCC); and
 - A Consultation Report must be prepared and included as part of the application for a DCO.
- 4.1.3 This PEI is required to inform the consultation of the community under Section 47 of the Planning Act. It may also be used to inform consultation of third parties under Section 42.

4.2 Previous consultations (2004 – 2009)

- 4.2.1 Much of the consultation undertaken as part of the A19 Testos Junction Improvement Scheme has been in relation to specific environmental topics, although in some instances an individual was approached in relation to several different aspects of the environment.

Consultation with statutory bodies

- 4.2.2 As a matter of good practice, the following statutory organisations were consulted during the previous phases of scheme development:
- South Tyneside Council;
 - The Environment Agency;
 - The Countryside Agency;
 - English Nature (since combined with the Countryside Agency and parts of Defra to form 'Natural England');
 - Natural England (following the merger of the Countryside Agency and English Nature), and;
 - English Heritage.
- 4.2.3 Each statutory body was consulted in 2004, during the initial options appraisal, following reduction of the options to two (on-line and off-line grade separation; see Section 3.1).
- 4.2.4 Only English Nature expressed a preference for a specific option at this stage of consultation. They considered that the off-line option would be 'less acceptable' than an on-line scheme.
- #### Selective stakeholder consultation
- 4.2.5 Following the Stage 1 Scheme Appraisal Report process and the selection of the on-line option for further development, a selective stakeholder consultation was carried out by letter in March and April 2005. Consultation letters were issued to the following:
- statutory consultation bodies;
 - other institutional stakeholders, including national and local organisations with environmental and transport-related interests;
 - local elected representatives;

- business interests in the local area; and
- all land owners potentially affected.

4.2.6 A total of 208 letters were issued to organisations and individuals, outlining the on-line scheme. Thirty-four replies were received within the deadline. Twenty-seven of these responses were from organisations. Twelve replies were in support of the proposals, while 22 acknowledged receipt of the consultation letter but had no comment to make. None of the responses expressed any objection to the scheme.

Consultation at scoping report stage and during the environmental impact assessment (2006-7)

- 4.2.7 Each statutory consultation body was approached in June 2006, to invite their opinion on the scope of work required as part of the EIA, as well as to obtain baseline data. Their views were taken into account in preparing a Scoping Report, which they were then invited to comment on upon its completion. In addition, a draft Environmental Statement was prepared and circulated for comment to statutory environmental bodies. Comments were received and taken into account, but the Environmental Statement was not completed before the scheme returned to consideration of options.
- 4.2.8 These formal consultation processes were supplemented through the course of the EIA work by more informal exchanges of views and information by telephone and e-mail, and in some cases through face-to-face meetings.

South Tyneside Council

4.2.9 Ongoing consultation with South Tyneside Council included telephone calls, exchanges of letters and e-mails relating to specific environmental topics and meetings with officers of the Council relating to environmental issues or to aspects of scheme design.

Non-statutory key stakeholders

4.2.10 During 2006 and 2007, 33 non-statutory consultees were approached. Some organisations were approached only once, by letter, with a request for comment or for information. In some cases, however, there has been a more extensive exchange of correspondence by letter, e-mail and telephone.

4.2.11 In addition, consultation meetings were held with organisations, or groups of organisations, whose interests may be affected. Meetings were held to address potential effects on:

- **non-motorised users** – a site meeting and walkover survey was attended by the British Horse Society, Cyclists Touring Club, Ramblers Association, the Countryside Officer of South Tyneside Council, and Tyne and Wear Access Forum. The meeting addressed potential effects on the right-of-way network, and identified the facilities that these groups would like to see incorporated into the design. Two subsequent meetings were held to review and discuss the proposals as they were developed;
- **agricultural land** – all affected agricultural landowners and land occupiers (except one who did not wish to be consulted) were interviewed by an agricultural specialist at an early stage in the EIA. Selected landowners and occupiers were interviewed again prior to preparation of the Comparative Environmental Appraisal Report in 2009; and
- **community facilities** – three meetings were held with the manager of West Boldon Environmental Education Centre, located within Mount Pleasant Marsh Local Wildlife Site. The meetings were also attended by the Countryside and/or Public Rights of Way Officers of South Tyneside Council. Two meetings were attended by representatives of National Grid, who own the site.

4.3 On-going consultation

4.3.1 As indicated in Section 1.3, this document is written to inform a new consultation process planned for the autumn of 2014. The local community will be consulted under Section 47 of the Planning Act 2008. Relevant local authorities, land interests and other consultees required in accordance with the regulation will be consulted under Section 42 of the Act.

4.3.2 The approach to be taken to consultation of the community has been publicised in the SoCC, notice of which is being made in local newspapers, and which is available at [http://www.highways.gov.uk/roads/road-projects/a19-testos-junction-improvements/](http://www.highways.gov.uk/roads/road-projects/a19-testos-<u>junction-improvements/</u>). Methods of consultation that are planned include:

- exchanges of correspondence, meetings and workshops with local community groups and businesses;
- exchanges of correspondence, meetings and workshops with local groups representing walkers, cyclists and horse riders;
- publication of leaflets, reports and other information made available in the local area and online;
- public exhibitions at which members of the community can interact directly with members of the project team.

4.3.3 Consultation of third parties under Section 42 of the Planning Act 2008 will be undertaken through a combination of correspondence, telephone calls and meetings. Some of this consultation is likely to be iterative (i.e. we may speak to an individual consultee several times as the scheme develops).

4.3.4 In addition to these statutory consultation processes, informal non-statutory consultation/engagement with statutory bodies, other environmental bodies, local stakeholders and others with information or interests relevant to the EIA will continue throughout the period of working on the EIA.

4.3.5 To-date, we have held a consultation workshop in July 2014 in order to discuss with non-motorised user (NMU) groups and representatives a number of options related to the provision of walking, cycling and equestrian facilities as part of the scheme. The public right-of-way (PRoW) officers for South Tyneside, Gateshead and Sunderland City Councils were invited to attend, along with members of the Tyne and Wear Local Access Forum and local representatives of NMU groups such as Sustrans.

4.3.6 This workshop has led to the further development of the NMU options for the scheme. The revised options are being presented at public exhibitions as part of the current consultation. These options will be reviewed following this autumn 2014 consultation, taking account of public and stakeholder comments. They will inform decisions on scheme elements which may affect NMUs as part of the development of the scheme design.

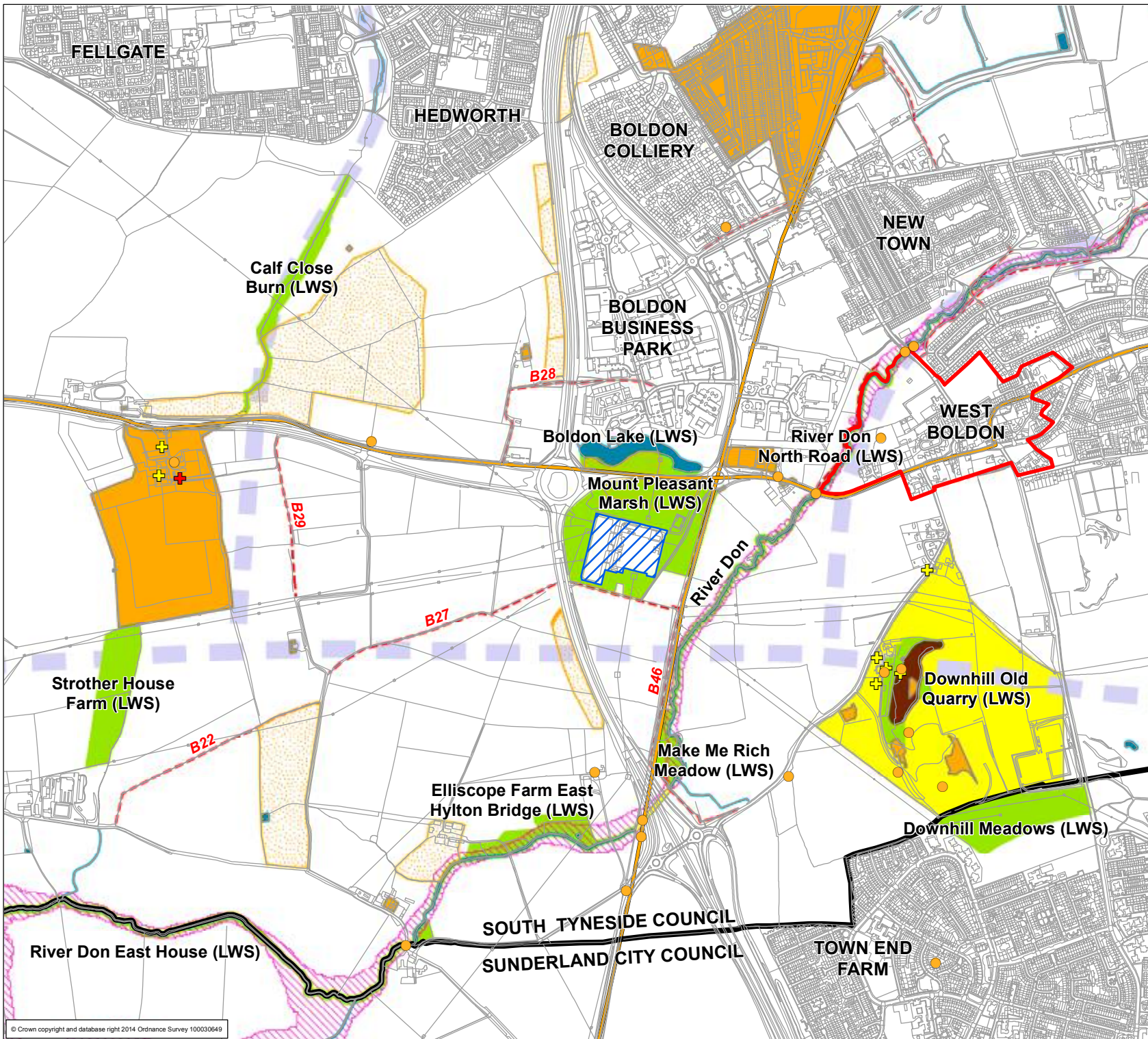
5 OVERVIEW OF THE ENVIRONMENT

5.1 Introduction

- 5.1.1 Figure 5.1 on the following page provides an overview of the environmental baseline and context for the scheme.
- 5.1.2 The scheme is located at the interface between countryside and the urban areas of South Tyneside. Most of the land required to build the scheme is farmland, mainly in arable use. However, residential areas lie close by, particularly at Hedworth to the northwest and Boldon Colliery to the northeast, while a business park lies adjacent to the scheme to the east. Two farms (West House Farm and Make-Me-Rich Farm) lie close to the A19 to the west, along with the site of an Enterprise Rent-A-Car.
- 5.1.3 Two Local Wildlife Sites (LWS), Boldon Lake and Mount Pleasant Marsh, lie immediately adjacent to the existing junction. Mount Pleasant Marsh hosts the West Boldon Environmental Education Centre. Several other LWSs lie close by. The River Don passes beneath the A19 in a long culvert near the south end of the proposed improvement scheme.
- 5.1.4 Mount Pleasant Marsh is wooded, and there are other small blocks of woodland in the surrounding area. The highway cutting slopes north of Testos Junction are also planted with trees. Most of the surrounding landscape comprises a pattern of rectilinear fields divided by hedgerows. To the east/southeast, the ground rises to the Boldon Hills.
- 5.1.5 Scots House, an historic Grade II* Listed Building, lies approximately 1 km to the west of Testos Junction, adjacent to the A184. Scots House sits in landscaped grounds, surrounded by mature trees. Several subsidiary buildings in the Scot's House complex are Grade II Listed Buildings.
- 5.1.6 There is a network of Public Rights of Way in the surrounding area, although it suffers from fragmentation and severance, created partly by the original construction of the A19. Two

rights of way cross the A19 within the area affected by the project.

- 5.1.7 One of these is a crossing at ground level which is considered dangerous and largely impassable. The second is a bridleway, which crosses the A19 via a former agricultural accommodation bridge north of Testos Junction.
- 5.1.8 Chapters 6 to 15 of this report are set out by environmental topic, and describe the main environmental information available for the study area and descriptions of the likely environmental effects and mitigation measures envisaged for the proposed scheme.
- 5.1.9 Each of the chapters on environmental topics follows a structure approximately as follows:
- An introduction which explains the topic itself and its study area;
 - a summary of existing and baseline knowledge;
 - potential impacts during construction of the scheme;
 - potential mitigation of construction impacts;
 - potential impacts during operation of the scheme;
 - potential mitigation of operational impacts.
- 5.1.10 The drainage design (e.g. presence, location and number of balancing ponds) and attenuation requirement will be revisited as part of the EIA and scheme development.



Legend

- Local Authority Boundary
- - - Public Right of Way
- Wildlife Corridor (indicative)
- Local Wildlife Site (LWS) or Candidate Local Wildlife Site (cLWS)
- Local Geological Site
- Electricity Sub-Station
- Surface Water Feature
- Extent of Potential River Flooding (Zones 2 & 3)
- Area of High Landscape Value
- Grade II* Listed Building
- Grade II Listed Building
- Conservation Area
- Cultural Heritage Assets**
- Agricultural / Earthwork Features
- Other Features

Drawing Title

FIGURE 5.1
ENVIRONMENTAL CONTEXT



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6 AIR QUALITY

6.1 Introduction

6.1.1 Air quality is a significant environmental issue, because poor air quality can affect human health and quality of life; it can affect the natural environment; and it can have economic impacts. The dominant long-term source of air pollution in the UK is exhaust emissions from road traffic.

6.1.2 This topic comprises both localised impacts on air quality arising from construction activities, in particular the generation of nuisance dust, in addition to three sub-topics which address the principal types of operational impact caused by road traffic at different geographic scales:

- local air quality, which is concerned principally with emissions of pollutants that are of concern in relation to human health and ecosystems, at a local level;
- regional air quality, which is concerned with emissions of pollutants that can disperse over longer distances, affecting both human health and ecosystems; and
- climate change, which is concerned with the emissions of greenhouse gases that can contribute to changes in the climate at a global level.

6.1.3 The understanding of the air quality environment on which this chapter is based has been derived from EIA work previously published in the A19 Testos Junction Comparative Environmental Assessment report (2009).

6.1.4 Construction and operational study areas for local and regional air quality will be defined once up-to-date traffic flow forecasts are available from the traffic model, in order to enable identification of relevant 'affected roads'.

6.1.5 The study area for local air quality assessment comprises all land within 200 m of affected roads, which for this purpose are those that meet any of the following criteria:

- the alignment would move by more than 5 m;
- daily traffic flows would change by 1,000 or more on an average day;
- heavy duty vehicle (HDV) flows would change by 200 or more on an average day;
- daily average speed would change by 10 km/hour or more; and
- peak hour speed would change by 20 km/hour or more.

6.1.6 The study area for regional air quality assessment takes into account all roads meeting the following criteria:

- a change of more than 10% in the total average daily traffic;
- a change of more than 10% in the number of HDVs on an average day; and
- a change in daily average speed of more than 20 km/hour.

6.1.7 Carbon emissions and their potential impact on climate change are included in the regional air quality assessment.

6.2 Existing and baseline knowledge

6.2.1 The existing environment surrounding the junction is predominantly rural. The EIA work between 2006 and 2009 identified a total of 33 residential properties within 200 m of the centreline of the proposed scheme. There are also a number of business properties, including Enterprise Rent-A-Car and the Quadrus Centre. This baseline will be reviewed as part of the next phase of EIA work, and updated as appropriate.

6.2.2 Also in the pre-2009 EIA work, five sample 'receptors' were chosen to form part of the basis of the assessment. The selected receptors were:

- 80 Foxhomes;
- 2 Romsey Drive;
- West House Farm;
- West Boldon Environmental Educational Centre; and

- Make Me Rich Farm.

- 6.2.3 Pollutant concentrations from traffic disperse rapidly away from a road, returning to background concentrations within 200 m. Receptor locations were therefore chosen where people susceptible to air pollution may be present within 200 m. These properties were chosen because they would be the worst affected properties, and an assessment based on them therefore represents a 'worst case scenario'.
- 6.2.4 The pre-2009 traffic assessment indicated that no other roads in the local network would experience changes in traffic flows as a result of the junction improvement. Therefore, the assessment only considered the effects on air quality of alignment changes and changes in traffic speeds on the A19 and new slip/connector roads. This will be reviewed using the new traffic model results when they become available.
- 6.2.5 The Air Quality Regulations set Air Quality Objectives (AQO) for various pollutants; these are health-based, and represent the concentrations of each pollutant below which health effects are unlikely to be experienced by even the most sensitive members of the population.
- 6.2.6 The pollutant of most concern in relation to the air quality effects of traffic is nitrogen dioxide (NO₂). The AQO for NO₂ is 40µg/m³ (milligrams per cubic metre of air). Data obtained from Defra shows that background annual mean concentrations of NO₂ in the 11 kilometre-squares surrounding Testos Junction vary from 16 µg/m³ to 20.8 µg/m³ in 2014, and have been declining at least since 2012. This is suggestive of good air quality and an improving situation.
- 6.2.7 The pre-2009 EIA work included data from roadside monitoring of NO₂ concentration by South Tyneside Council based at Boldon Colliery for the years 2004 – 2006. This data also supported the expectation of a declining trend in pollutant concentrations in the vicinity of Testos Junction.

6.3 Potential impacts during construction

- 6.3.1 During construction, the use of site equipment, vehicles and machinery would result in emission of exhaust gases to the atmosphere. However such emissions are unlikely to be significant, particularly when compared to levels of similar emissions from vehicles using the local road network. Emissions from such construction vehicles and plant can be minimised by using equipment which meets current emission control standards, operating well-maintained vehicles and effective planning to reduce the number of trips required.
- 6.3.2 From an air quality perspective, the construction-related activities most likely to have the greatest impact include:
- fugitive dust emissions from a variety of construction activities, including re-profiling of cuttings and embankments;
 - off-site disposal of excavated material during construction; and
 - HGV haulage of material to and from the construction site.
- 6.3.3 The pre-2009 EIA work identified that without mitigation (see the following section), there are over 1,500 properties in the vicinity of the scheme which could experience 'nuisance' as a result of construction dust emissions. However, following the implementation of best practice dust control measures, no statutory dust nuisance would be expected.

6.4 Potential mitigation for construction impacts

- 6.4.1 There are several standard and best practice mitigation measures that could be implemented during construction to help mitigate potential adverse effects upon air quality during construction. Typical examples include:
- dampening down site access roads as necessary using a water bowser to reduce airborne dust, to be monitored on a daily basis during hot, dry weather;

- locating internal haulage routes away from sensitive receptors where possible and dampening down the routes where necessary;
- re-vegetating or temporarily sealing completed earthworks as soon as is practicable; and
- sheeting vehicles carrying spoil, fill or earthworks material leaving the site to prevent loss of materials off-site.

6.4.2 In addition to these practices, the establishment of a public relations service would be encouraged to manage public dust complaints. The environmental health department of South Tyneside Council would be notified for verification purposes.

6.5 Potential impacts during operation

6.5.1 Any operational effects from the proposed scheme would relate to changes in pollutant concentrations as a result of changes in the traffic using the roads in the local area.

6.5.2 Changes to the pollutant concentrations would be dependent on a number of variables, including:

- changes in road alignment;
- changes in vehicle numbers;
- changes in vehicle speed;
- increased or reduced traffic congestion; and
- changes in the composition of the traffic, for instance the proportion of heavy duty vehicles.

6.5.3 While this is subject to a revised study and assessment, The pre-2009 EIA work identified only marginal differences between the scheme and a 'do minimum' (i.e. 'without scheme') scenario in the opening year for both NO₂ and PM₁₀ pollutant concentrations at the receptors noted in paragraph 6.2.2. The largest increase in pollutant concentrations due to the proposed scheme was predicted at West House Farm, due to an additional slip road bringing traffic closer to this property. The significance of these changes was considered 'negligible', as

concentrations of both pollutants remained below relevant Air Quality Objectives.

6.5.4 In the pre-2009 EIA work, neither of the Air Quality Management Areas (AQMAs) declared by South Tyneside Council were considered likely to be affected, as traffic on the local network was not predicted to increase due to the junction improvements.

6.5.5 For the regional assessment, the pre-2009 EIA work showed a reduction in emissions of pollutants along the main A19 carriageway, largely due to a reduction in queuing.

6.5.6 For the pollutants considered, a slight decrease in the total annual mass emissions was predicted when comparing the scheme against the 'do minimum' scenario. As such, the junction improvements were considered as having a slight beneficial impact.

6.5.7 Also undertaken as part of the pre-2009 EIA work, a greenhouse gases appraisal identified an increase in carbon emissions of approximately 12,000 tonnes over a 60-year appraisal period.

6.6 Potential mitigation for operational impacts

6.6.1 The EIA work between 2006 and 2009 concluded that as the impacts during the operational phase are considered to be negligible, no mitigation measures within the control of the scheme promoters were to be proposed for the operational phase.

7 CULTURAL HERITAGE

7.1 Introduction

7.1.1 The assessment of impacts upon cultural heritage considers three sub-topics:

- **archaeological remains** – the material remains of human activity from the earliest periods of human evolution to the present, which may be buried traces of human activities, sites visible above ground, or moveable artefacts;
- **historic buildings** – architectural or designed or other structures with a significant ‘historical value’, which may include structures that have no aesthetic appeal or structures not usually thought of as buildings’, such as milestones or bridges; and
- **historic landscape** – the current landscape, whose character is the result of the action and interaction of natural and/or human factors, and includes evidence of past human activities, which is a significant part of the historic landscape, and may derive both from archaeological remains and historic buildings within it.

7.1.2 The understanding of the historic environment expressed in this report has been derived from EIA work previously published in the A19 Testos Junction Comparative Environmental Assessment report (2009). Certain information has been reviewed through published information such as the National Heritage List and Historic Environment Record. However, the results of further research and survey, which were not available prior to the preparation of this report, will be reported in the forthcoming ES for the proposed scheme.

7.1.3 The study area adopted for cultural heritage during the pre-2009 EIA extended 1 km either side of the centre-line of the proposed scheme. This has been deemed well-above the minimum required, and as such a revised study area of 200 m will be used. If necessary, additional information will be gathered from a wider surrounding area to place relevant

baseline information in its regional context, and to ensure that any heritage sites with settings vulnerable to visual impacts are fully considered.

7.2 Existing and baseline knowledge

7.2.1 Existing and baseline knowledge has been obtained from the pre-2009 EIA work, which used the following sources:

- The National Heritage List for information on statutorily designated heritage assets (Scheduled Monuments, Listed Buildings, Registered Battlefields, and sites included on the Register of Historic Parks and Gardens);
- Tyne and Wear Historic Environment Record (HER);
- historic maps and plans held in the Tyne and Wear Archives;
- Ordnance Survey maps;
- published archaeological books and journals and unpublished reports;
- site inspections and a walkover survey, conducted in July and September 2006;
- a watching brief on geotechnical trial pits, during October 2006; and
- a geophysical survey of land to the west of the A19, during February 2007, which identified the presence of levelled ridge and furrow and field boundaries.

7.2.2 The online versions of the National Heritage List and HER have been consulted during preparation of this report to identify assets discovered since the pre-2009 assessment. No historic landscape information was available for the study area from existing public sources. As a result, definition of historic landscape units was undertaken using the “bottom up” methodology defined in DMRB.

Cultural heritage background

7.2.3 The cultural heritage of the study area is heavily dominated by Post-Medieval features (i.e. features that originate after AD1540

and before AD1900). There are 48 sites associated with this period, comprising a wide range of settlement, domestic, industrial, agricultural and transport-related features. This reflects the rapid expansion of settlement and economic diversification in the area during and after the Industrial Revolution. The site of the Civil War ‘battle of Boldon’ is located in the southeast of the study area.

7.2.4 The study area also shows evidence of:

- prehistoric remains (i.e. dating to before AD70, when the Romans invaded the region) – one group of flint artefacts found on Down Hill some distance to the southeast of the junction, and a ‘cist’ burial (i.e. a burial in a grave lined with stone slabs) at Nanny Cow Hill further away to the east of Testos Junction;
- Roman remains (those dating to between AD70 and AD410) – a single coin found on the fringes of Sunderland some distance to the south of the junction; and
- Medieval remains (between AD1066 and AD1540) – agricultural features, mainly ‘ridge-and-furrow’ earthworks and ground evidence indicating the presence of former ridge and furrow. These represent parts of the common fields belonging to Medieval villages in the wider surrounding area, including Boldon, all of which lie outside the study area.

7.2.5 There are no known Anglo-Saxon (AD410 to AD1066) remains in the study area. However, ‘the Boldons’ area which includes East Boldon, West Boldon and Boldon Colliery, is known to have been settled during this era, and possibly since pre-Roman times. The first written record of ‘Boldun’ is dated 1170.

7.2.6 Six cultural heritage assets dating to after AD1900 are found within the study area. Sunderland Aerodrome originated during the First World War, and became RAF Usworth during the Second World War. Several related structures lie in the study area, including aircraft obstructions, a bombing decoy and

searchlight. The precise location and layout of the former West Boldon prisoner of war camp are unknown.

Cultural heritage assets

7.2.7 Based on the data gathered from the sources identified above, a total of 72 cultural heritage assets have been identified, consisting of 39 archaeological remains and 24 Historic Buildings, while the area has been characterised into nine historic landscape types. Their locations/ extents and any designation are shown in Figure 5.1 and Figure 7.1.

7.2.8 There are no World Heritage Sites, Scheduled Ancient Monuments, Registered Parks and Gardens, Registered Battlefields or Conservation Areas within the study area.

7.2.9 There is one Grade II* Listed Building (Scots House) assessed to be of High Value, and seven Grade II Listed Buildings

7.2.10 West Boldon Conservation Area lies approximately 1 km to the east of the scheme, outside the cultural heritage study area. The Conservation Area is, however, within the visual envelope of the scheme and any visual impacts on it or its historic setting are addressed in Chapter 8.

7.2.11 Each of the 72 assets has been assessed for its potential sensitivity to any effects (should they occur), and placed into one of four standard sensitivity categories in line with the DMRB. The sensitivity of the 72 assets can be summarised as follows:

- one site (Scots House, a Grade II* Listed Building) is of High sensitivity;
- 11 sites are of Medium sensitivity, including 7 Grade II Listed Buildings;
- 28 sites are of Low and 30 of Negligible sensitivity; and
- 2 sites are of Unknown sensitivity.

Potential for unknown archaeological remains

7.2.12 Based on the sources consulted above, the potential for unknown archaeological remains within the study area has been assessed to be Low.

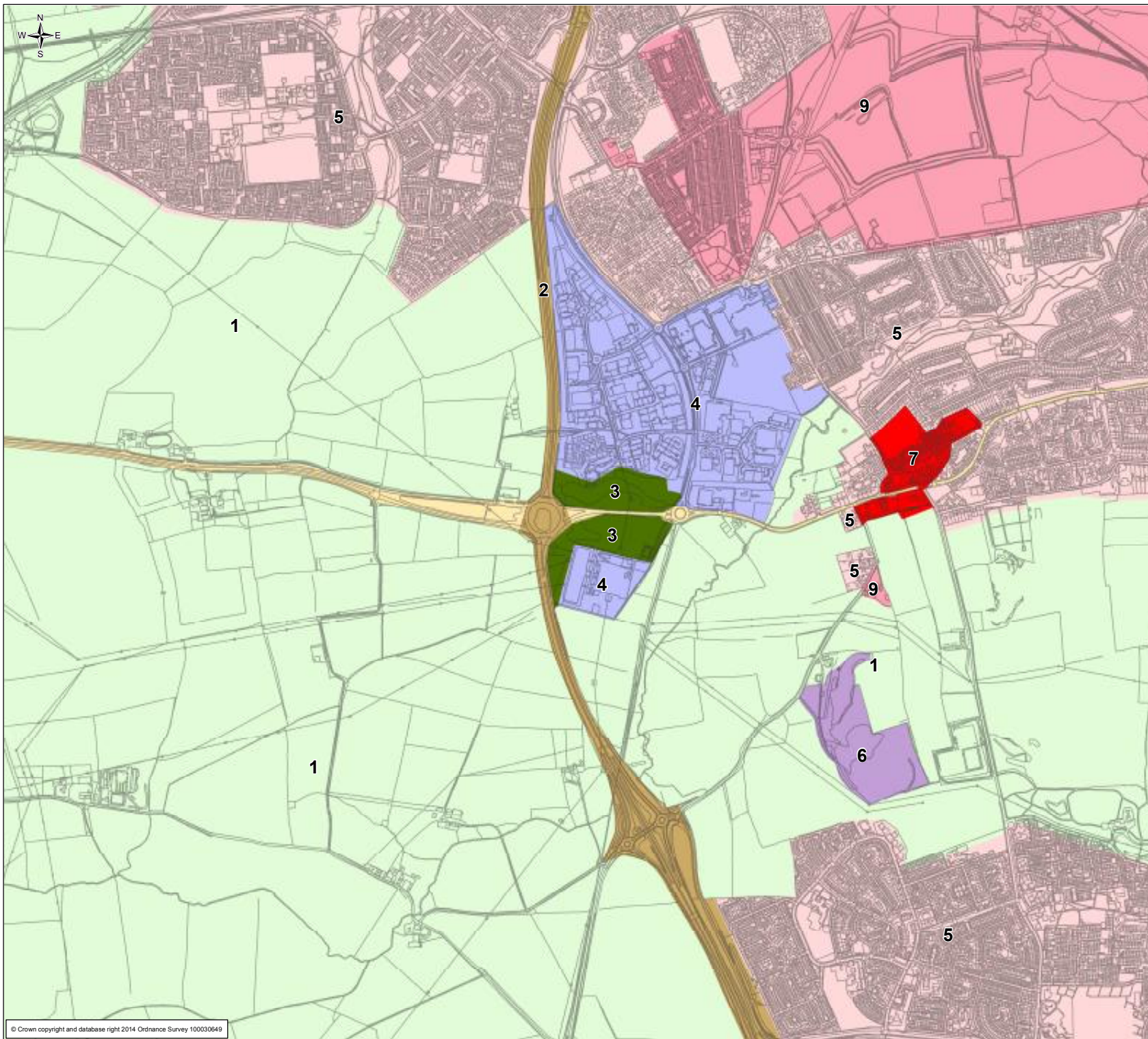
Historic landscape

7.2.13 The historic character of the landscape in and around the study area has been assessed, and it has been divided into nine 'historic landscape character areas'. These areas are summarised in Table 7.1 below and illustrated in Figure 7.1.

Table 7.1: Historic landscape character areas

Unit No.	Unit Name	Description
1	Parliamentary Enclosure Fields	Field systems of a type characteristic of the 18th-19th century 'Parliamentary' enclosure movement.
2	A19	A19 dual carriageway constructed in the late 1960s. The road does not replace any earlier north-south routes and divides elements of the pre-existing parliamentary enclosure field system.
3	Modern Wetland	This wetland is bisected by the modern A184, and includes Boldon Lake created in the 1980s and Mount Pleasant Marshes seemingly created via the construction of the original A19 and Boldon Lake.
4	Modern Industrial	Late 20th and early 21st century light industrial and commercial development.
5	Modern Residential	Late 20th century residential development.
6	Boldon Hill Historic Rural Industries	19th and 20th century limekiln, tannery and quarries on the western face of Boldon Hill.
7	West Boldon Historic core	Largely 19th century in date, but containing several pre-19th century structures and overlooked by 13th century church.

Unit No.	Unit Name	Description
8	A184 and A184	The line of an 18th century turnpike road within an enclosure period landscape. An OS map of 1862 shows a toll post adjacent to Scot's House. The A184 follows the line of the old road. The layout of field boundaries either side of the road suggests that the turnpike predates the enclosure field system.
9	Late 19th Century Housing	Late 19th century housing, mostly terraced, built in response to economic upturn in the area, immediately following the opening of Boldon Colliery.



Legend

Historic Landscape

- 1 Parliamentary Enclosure Fields
- 2 A19
- 3 Modern Wetland
- 4 Modern Industrial And Commercial
- 5 Modern Residential
- 6 Boldon Hill Historic Rural Industries
- 7 West Boldon Historic Core
- 8 A184
- 9 19th Century Housing

Drawing Title

FIGURE 7.1
HISTORIC LANDSCAPE AREAS



1 City Walk, Leeds, LS11 9DX, UK
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7.3 Potential impacts during construction

- 7.3.1 Construction of the proposed scheme has in principle the potential to affect heritage assets in the following ways:
- partial or total removal of heritage assets;
 - compaction of archaeological deposits by construction traffic and structures;
 - changes in groundwater levels leading to the extreme drying of previously waterlogged archaeological deposits;
 - effects on the setting of heritage assets including visual and noise intrusion; and
 - severance and adverse impacts on amenity as a result of construction works.
- 7.3.2 The first aim of the assessment is to determine the extent to which any of these effects would occur.
- 7.3.3 The proposed development crosses the Turnpike Road (Asset 14) where it follows the same route as the eastbound carriageway of the modern A184, and the route of the Stanhope and Tyne Railway close to its southern limit. As a result there is potential for archaeological remains associated with both assets to be removed during construction.
- 7.3.4 Construction may also remove archaeological remains associated with levelled ridge and furrow and trackways identified by geophysical survey.
- 7.3.5 Based on available information, it is considered that there is low potential for the presence of unknown archaeological remains within the study area. However construction of the proposed scheme could result in the removal of archaeological remains that may be present.
- 7.3.6 No physical impacts are predicted for any of the Historic Buildings. However, the Grade II* Listed Scots House, despite being located just under 1 km from the scheme, would

experience effects on its setting from construction and operation of raised elements such as junctions and signage.

- 7.3.7 Construction traffic and activity may temporarily interrupt distant views of West Boldon and the continuing the agricultural landscape beyond the A19.

7.4 Potential mitigation for construction impacts

- 7.4.1 Potential mitigation measures for effects on heritage assets include:
- detailed design of development proposals to avoid or reduce impacts on heritage assets;
 - installation of physical protection measures, or temporary removal of assets and for reinstatement following the completion of construction works;
 - archaeological investigations in advance of, or during, construction;
 - historic building recording and historic landscape recording in advance of construction to provide a permanent documentary record of assets in their current form and condition; and
 - dissemination of the results of all surveys in an appropriate format and supporting archive.
- 7.4.2 Based on the results of the pre-2009 EIA work, the physical impacts on archaeological remains described above are all likely to be of 'Neutral' or 'Slight' significance. At this stage, it is considered that the investigations undertaken to date, constitute sufficient recording works to mitigate the impact on these sites and no further mitigation works are proposed.
- ### 7.5 Potential impacts during operation
- 7.5.1 Operation of the Testos Junction Improvement scheme has the potential to result in impacts on the setting of heritage assets. In the majority of cases, these would be long-term in nature. These impacts would commence during construction of the

proposed scheme and continue during operation; however the degree of impact may vary between phases. Such impacts can include:

- changes to the surroundings of heritage assets or the general character of their setting;
- changes to access or the viability of heritage assets; and
- cumulative impacts on historic landscape elements as a result of operational maintenance through alteration of historic landscape elements.

7.5.2 The Grade II* Listed Scots House has views towards the proposed development, and its setting is considered to include elements of the wider surrounding landscape. The distance from the closest element of the proposed scheme to Scots House is approximately 1 km. Ground-level views will not be affected, as they are fully screened by existing trees and shrubs, and other features within the grounds. However, elevated elements of the proposed scheme, such as junctions and signage, are likely to be visible in views from the first-floor windows, although filtered to some extent by intervening hedgerows.

7.5.3 The historic landscape types identified within the study area are large, fairly common and are quite robust with a high ability to accept change without loss of historic legibility. The widening of the existing highway corridor required for the scheme would take land from a small portion of the Parliamentary Enclosure Fields type.

7.6 Potential mitigation for operational impacts

7.6.1 Adverse impacts on the setting of heritage assets resulting from operation of the proposed scheme can be mitigated through detailed design of the proposed scheme. This may include measures such as

- consideration of the horizontal or vertical alignment of the proposed scheme to reduce its visual prominence;

- careful siting of lighting or signage; and
- the use of noise fencing or maintenance of access routes to a historic building to maintain its viability.

7.6.2 Further mitigation can be provided through the use of landscape mitigation measures such as bunds, planting or cladding of highways structures. These measures can help to reduce the visual prominence of the scheme and aid its integration with the surrounding landscape.

7.6.3 The impacts of the scheme on the setting of Scots House are considered to be of 'Neutral' significance, and would therefore require no mitigation works in respect of its heritage value. Landscape planting is proposed to screen the road in views from Scots House, but this is intended reduce the visual intrusion of the road for residents.

7.6.4 The proposed scheme would not interrupt views of the continuing agricultural landscape beyond the A19, because views are interrupted by elements of industrial and commercial development close to the existing junction, and by existing woodland immediately east of the A19. This woodland forms an intermediate 'horizon' below the skyline ridge of West Boldon and Down Hill. When landscape planting has matured, most of the proposed elevated section would be hidden behind tree and shrub planting, restoring the woodland character of this intermediate horizon. The more distant view to West Boldon would still be available, largely unchanged.

7.6.5 Impacts on the historic landscape are also expected to be of neutral significance, and no further mitigation is proposed at this stage.

8 LANDSCAPE AND VISUAL EFFECTS

8.1 Introduction

- 8.1.1 Landscape and visual impact assessment are two separate but related concepts.
- 8.1.2 The landscape takes its character from a combination of elements, including topography, watercourses, land use and pattern, vegetation, public open space and cultural heritage influences. Landscapes vary considerably in character and quality, and they are a key component of the distinctiveness of any local area or region. The concept of 'townscape' applies the same principles to an urban context, with greater emphasis on the built environment. The assessment of impacts on landscape and townscape therefore addresses changes in any of these components.
- 8.1.3 To a large extent, human beings experience the landscape and townscape visually. The quality of views available in any given area can contribute to the quality of life. Visual Impact Assessment therefore assesses potential changes in the key components and character of existing views. It takes into account the extent to which the scheme would be visible from surrounding houses, farms, footpaths and bridleways, open spaces and offices.
- 8.1.4 The understanding of the landscape has been derived from EIA work previously published in the A19 Testos Junction Comparative Environmental Assessment report (2009). Certain information has been reviewed through the Natural England website and the South Tyneside Local Development Framework. However, the results of further research and survey, which were not available prior to the preparation of this report, will be reported in the forthcoming ES for the proposed scheme.
- 8.1.5 The study area is an irregularly-shaped area, limited by the built-up areas of Fellgate, Hedworth and Boldon Colliery around 500 m to the north, by the Boldon Hills in the east (1.5 km),

Downhill Lane Junction and the residential area of Town End Farm to the south (1 km), and the A194 area to the west (2 km).

8.2 Existing and baseline knowledge

- 8.2.1 Existing landscape and visual elements within the study area are summarised below. Key features in proximity to the A19 are illustrated in Figure 5.1, while landscape character units are shown in Figure 8.1.
- 8.2.2 In terms of topography, the distant southern horizon is defined by Penshaw Hill, which is 136 m above sea level⁷ and Carr Hill which is approximately 100 m above sea level, both of which are some 6 km to the south. The western horizon is defined by higher ground in Gateshead which is 150 m above sea level, and between 6 and 8 km to the west. West Boldon (60 m above sea level) and the Boldon Hills (90 m above sea level) form areas of higher ground to the eastern horizon. There is an Area of High Landscape Value⁸ (AHLV) on the west facing slopes of the Boldon Hills.
- 8.2.3 The topography of the area to the west of the A19 is mainly flat, with rolling fields and localised valleys created by sunken streams such as the River Don and Calf close Burn. Substantially modified landforms in the study area include the embankments, bridges and cuttings of the A19. Other locally common landform features include restored former open-cast mines to the west and east.
- 8.2.4 Watercourses include the River Don and its tributary, Calf close Burn. Both follow sinuous but generally north-south courses, within noticeable local valleys in generally flat, low-lying land. Open water can be found at Boldon Lake and in parts of Mount Pleasant Marsh, both of which are designated as Local Wildlife

⁷ AOD (above ordnance datum), whereby ordnance datum (OD) is an expression of average sea level.

⁸ South Tyneside Council – Site Specific Allocations Development Plan Document 2012.

Sites. There are also several disused local land drains amongst the fields.

- 8.2.5 The local landscape pattern comprises a corridor of predominantly arable agricultural land aligned east-west, linked to a similar corridor aligned north-south. These corridors are protected by designation as Greenbelt,⁹ in order to maintain the separation between the surrounding urban areas of Tyneside to the north, Wearside to the southeast and Washington to the southwest (3 km). The urban areas are linked by trunk roads, such as the A19, and minor roads, which subdivide the rural corridors.
- 8.2.6 Combined with some pastures, the agricultural fields are separated by gappy, moderately maintained hedgerows with some semi-mature trees. There are several small-to-medium-sized deciduous woodland areas, particularly near farmsteads, town edges and along the river/stream banks.
- 8.2.7 The east-west Greenbelt corridor is also designated by South Tyneside Council as a Wildlife Corridor, and is linked to two other designated Wildlife Corridors running north-south, in part following the River Don and Calfclose Burn valleys. Isolated farms and other properties are scattered within the rural areas (West House Farm, Scots House, Make-Me-Rich Farm and Elliscope Farm).
- 8.2.8 North of Testos Junction, the east side of the A19 is flanked by Boldon Business Park, still under active development. The A19 north of the existing Testos Junction is enclosed by trees on both sides, with tree and shrub boundary planting separating it from Boldon Business Park.
- 8.2.9 There is a network of Public Rights of Way (PRoW) within the rural landscape, fragmented by existing highways, but with some intact links into the urban fringe areas to the east.

- 8.2.10 Mount Pleasant Marsh comprises marshland and deciduous woodland surrounding a large electricity sub-station, southeast of Testos Junction. Boldon Lake and its associated marginal vegetation lies south of the Business Park.
- 8.2.11 Historic elements and characteristics of the landscape include Listed Buildings such as at Scots House, West Boldon historic village with a Conservation Area and Grade I Listed Church, the disused Stanhope and Tyne railway, the Penshaw Monument and the 18th / 19th century 'enclosure' period field system throughout the study area, superimposed on an earlier agricultural system with medieval origins.

Landscape character

- 8.2.12 The attributes of the landscape can be used to subdivide it into different landscape character areas, and this can be done at a variety of geographic scales (e.g. national and local).
- 8.2.13 On a national/regional scale, Natural England publishes a series of landscape character assessments. The site lies within the eastern part of National Character Area 14 (Tyne and Wear Lowlands), which has recently updated by Natural England, and is adjacent to the northernmost tip of Area 15 (Magnesian Limestone Escarpment).
- 8.2.14 At a local level, EIA work carried out for the scheme in 2006-7 defined 11 local landscape and townscape character units. The location and extent of these units are shown in Figure 8.1, and they are described in Table 8.1 below. Landscape quality and sensitivity scores were assigned to each unit in 2006/07. These are unlikely to change during the next phase of this EIA, and are presented in Table 8.1.

⁹ South Tyneside Council – Site Specific Allocations Development Plan Document 2012

Table 8.1: Local landscape and townscape character units

	Unit	Description	Landscape Quality	Sensitivity
Landscape	LCU1	Western Lowland Agricultural Land	Ordinary	Medium
	LCU3	Vegetated Corridor	Poor	Low
	LCU6	Boldon Ecological Wetlands	Good	High
	LCU7	River Don Scrubby Farmland	Ordinary	Low
	LCU9	Downhill Elevated Farmland	Very Attractive	High
	LCU11	Boldon Colliery Restored Land	Ordinary-Good	Low
Townscape	LCU2	Hedworth Modern Residential Edge	Ordinary	Low
	LCU4	New Town and Boldon Colliery	Ordinary	Low
	LCU5	Boldon Business Park Complex	Ordinary	Negligible
	LCU8	West Boldon Conservation Area	Good	Medium
	LCU10	Town End Farm Residential Edge	Ordinary	Low

8.2.15 Existing woodland planting largely screens views of the existing A19 from most of Boldon Business Park (except the Quadrus Centre), from Boldon Colliery, from West Boldon and from West Boldon Environmental Education Centre. Large commercial buildings in Boldon Business Park also screen views from some residential areas.

8.2.16 Views of the A19 from the Foxhomes estate in Hedworth are predominantly screened by an adjacent 7 m-high hedgerow, and by roadside tree and shrub planting. However, during the winter, there are glimpsed views of lorry traffic through gaps in the hedgerow. A similar 3 m-high hedge screens views from

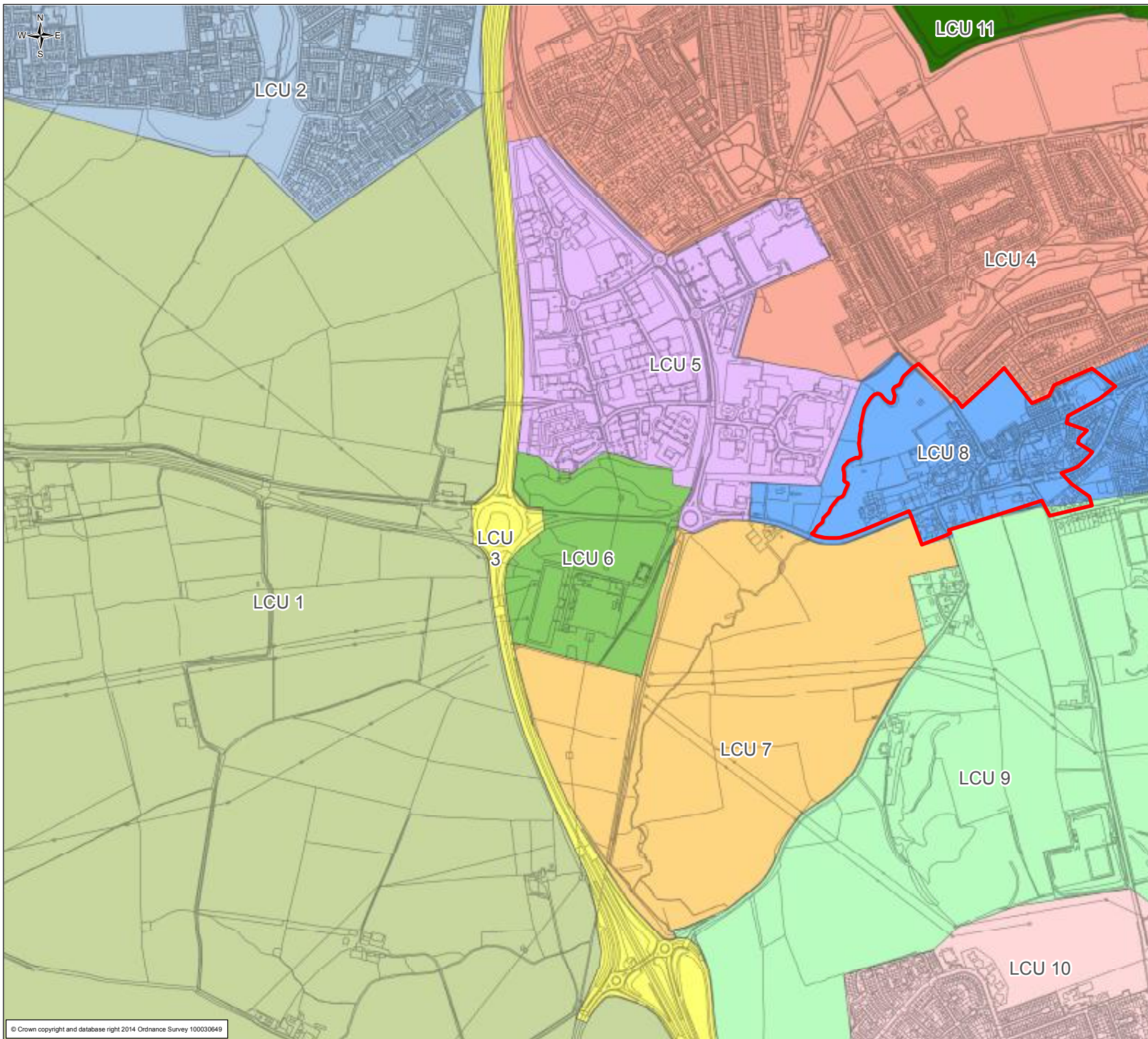
the newer Cedar Drive / Lavender Grove estate to the west of Foxhomes.

8.2.17 The highway between Downhill Lane Junction and Testos Junction, and traffic on it, are prominent in views from surrounding Public Rights of Way. However, woodland in Mount Pleasant Marsh screens views of the junction from the east and southeast (including views from Bridleway B46, the busiest PRow in the study area).

8.2.18 Night-time views in the surrounding area are dominated by light pollution independent of the highway. However, vehicle headlights between Downhill Lane Junction and Testos Junction are prominent in existing west-facing night-time views from the high ground on Down Hill (e.g. from Downhill Farm and the far southwest of West Boldon), where they are backed by dark areas of countryside.

8.2.19 Elements within the landscape that detract from visual amenity include the electricity substation within Mount Pleasant Marsh and the pylon network that extends out from it in all directions.

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Legend

Conservation Area

Landscape Character Units

Layer

- LCU 1 - Western Lowland Agricultural Land
- LCU 3 - A19 Vegetated Corridor
- LCU 6 - Boldon Ecological Wetlands
- LCU 7 - River Don Scrubby Farmland
- LCU 9 - Downhill Elevated Farmland
- LCU 11 - Boldon Colliery Restored Land

Townscape Character Units

Layer

- LCU 2 - Hedworth and Fellgate Modern Residential Edge
- LCU 4 - New Town and Boldon Colliery
- LCU 5 - Boldon Business Park Complex
- LCU 8 - West Boldon Conservation Area
- LCU 10 - Town End Farm Residential Edge

Drawing Title

FIGURE 8.1
LANDSCAPE CHARACTER UNITS



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8.3 Potential impacts during construction

Landscape impacts

8.3.1 The EIA work between 2006 and 2009 identified two categories of sources of impacts on the landscape during construction, as described below.

8.3.2 **Diversion of overhead power lines;** these works, if carried out by conventional construction methods, would result in the loss of (as measured in 2007) 0.8 hectares of woodland vegetation within Mount Pleasant Marsh Local Wildlife Site, as a result of site clearance operations. This clearance would create three broad 'corridors' (40 m wide) through the woodland, potentially allowing views into the electricity substation from the west. Additionally, it may open up short-range views from West Boldon Environmental Education Centre towards the new road embankments.

8.3.3 **Other construction impacts:** Construction of the scheme is likely to have an impact on the landscape in the following ways:

- temporary loss of agricultural land in the near vicinity of the A19 to accommodate a site construction compound, haulage routes, and topsoil/subsoil storage areas;
- permanent loss of the trees and shrubs on the existing roundabout;
- permanent loss of established hedgerow and tree belts along the western edge of the existing A19;
- permanent loss of a small part of the plantation woodland on the west edge of Mount Pleasant Marsh;
- permanent loss of a narrow strip of agricultural land on the west edge of the existing A19 north and south of the A184, and on the east edge south of Mount Pleasant Marsh;
- loss of the existing crossing points on the A19 or Bridleway B28 and Footpath B27; and

- introduction of new raised embankments rising to 7.5 m high on the approaches to the new bridge structures at the junction.

Visual impacts

8.3.4 There may be adverse visual impacts on all views focused towards the A19 and some towards the A184, where the site compound, temporary haulage routes and temporary storage bunds would increase the visibility of the construction works.

8.3.5 There may be greater adverse impacts upon visual receptors near the A19, as well as corresponding adverse effects upon local Landscape Character Units (LCUs), due to the proximity of construction activity and temporary structures (site compound, storage bunds and haulage routes).

8.4 Potential mitigation for construction impacts

8.4.1 Potential landscape and visual amenity effects during construction could be mitigated to some extent. Potential mitigation work considered to date includes:

- retain and protect existing vegetation during construction in accordance with best practice;
- where land would be used temporarily, such as for compounds, haul roads, re-grading areas, etc., then this would be returned to a condition suitable for the continuation of its original use, where possible; and
- replacement planting, where removal could not be avoided.

8.4.2 Some residual landscape and visual amenity effects during construction were identified as being likely to remain significant, despite mitigation. For example, this would be the case for visual amenity effects from highly sensitive receptors where views would be close at hand and impossible to screen effectively.

8.5 Potential impacts during operation

- 8.5.1 While it is unlikely that the AHLV on the Boldon Hills and the West Boldon Conservation Area would be directly affected by the scheme, the diversion of overhead power lines crossing the A19 to underground routes would result in the removal of three pylons within Mount Pleasant Marsh. This would result in a minor beneficial impact for longer-distance views across the countryside to the west, due to the reduced number and altered arrangement of electricity pylons around the junction.
- 8.5.2 A new raised carriageway at the junction would change the landform from a flat to a locally-raised profile, with embankments up to 7.5 m high at the overbridge locations.
- 8.5.3 Likely effects on views include:
- possible relocation of an agricultural accommodation bridge carrying a bridleway, which would be closer to residents, where it would be in the foreground of views from some properties;
 - height and extent of possible replacement bridge and approach ramps proposed to be less noticeable than those of the existing bridge;
 - embankment work (7.5 m) for the possible replacement bridge would require some loss of trees and therefore create narrow views from certain residents into Boldon Business Park; and
 - new and increased views of the new bridge structures and raised carriageway from nearby residents, in some cases only the upper floor windows.
- 8.5.4 In terms of night-time views (or in poor weather conditions), it was identified that vehicle headlights, and in some cases brake lights as well, on the elevated A19 would be noticeable from certain residential properties in the vicinity. These lights would also be visible in distant views towards the junction from the west, elevated above the existing road level.

- 8.5.5 Highway lighting and signage (especially gantries, which would be up to 10 m tall) would be visible from many visual receptors within the study area. These would be visible during the day and night, with some receptors seeing noticeable changes in night-time views towards rural areas where the existing views consist of dark areas with no noticeable street lighting.
- 8.5.6 Mitigation vegetation (landscape planting) would largely eliminate potential impacts on views from the West Boldon Conservation Area. However, there may be glimpses of larger vehicles using the A19 through gaps in existing vegetation and other visual barriers.
- 8.5.7 There may be a loss of amenity to users of certain parts of the bridleway / footpath network, due to increased journey length adjacent built-up area and/or the highway.

8.6 Potential mitigation for operational impacts

- 8.6.1 The following mitigation measures have previously been considered and will be reviewed as part of this EIA:
- tree and shrub planting to embankment slopes and along earth bunds to screen views and integrate the slopes with the surrounding vegetation. Maintain planting by controlling weed growth, replacing dead trees and ensuring adequate space for healthy tree growth;
 - woodland edge planting within and to the edge of Mount Pleasant Marsh Local Wildlife Site woodland to replace any lost vegetation;
 - tree planting to the highway boundaries south of the junction area to integrate the scheme into the surrounding vegetation and landscape character; and
 - woodland planting adjacent to proposed balancing ponds.

9 ECOLOGY AND NATURE CONSERVATION

9.1 Introduction

9.1.1 Ecology is the scientific study of living organisms and their relationships with each other and their environment. Nature conservation is concerned with maintaining a viable population of the country's characteristic fauna, flora and wildlife communities. Impacts on nature conservation are broadly split into two categories: habitats and species.

9.1.2 The construction and operation of highways can affect both site-specific receptors (locations or areas that provide habitats for wildlife or rare flora) and mobile receptors (populations of wildlife, especially species that are rare, declining or endangered).

9.1.3 The study area will vary for different aspects of the assessment, as follows:

- Statutory and non-statutory designated sites and records of protected species: 2 km from the centre-line of the scheme, with reference to DMRB guidance on assessing the effects on sites protected at a European level¹⁰ and Planning Inspectorate Guidance on Habitat Regulation Assessment (2013)¹¹;
- Extended Phase 1 habitat survey: 500 m to either side of the proposed improvements, in accordance with guidance contained in the Joint Nature Conservation Committee (JNCC) Handbook for Phase 1 Habitat Survey¹²; and

¹⁰ Highways Agency. Design Manual for Roads and Bridges: Assessing the effects on sites protected at a European level (DMRB Volume 11, Section 4) and IAN 141/11.

¹¹ Planning Inspectorate, 2013. Guidance on Habitat Regulation Assessment (Advice note ten, Version 5,).

¹² Joint Nature Conservation Committee (JNCC) (2010). *Handbook for Phase 1 Habitat Survey*. Available from: <http://jncc.defra.gov.uk/page-2468>

- Protected species and specific habitats: survey areas will be defined in accordance with standard survey methods for each species.

9.1.4 The understanding of the ecological environment expressed in this report has been derived from EIA work previously published in the A19 Testos Junction Comparative Environmental Assessment report (2009). The baseline ecological survey data used to prepare these documents will be updated through additional survey work undertaken in 2014. However, the results of these further surveys, which were not available prior to the preparation of this report, will be reported in the forthcoming ES for the proposed scheme.

9.1.5 In addition the following organisations/local wildlife groups have been contacted in 2014 to update any desk based records that would inform the scope of future surveys:

- Environmental Records Information Centre North East;
- Durham Bat Group;
- Durham County Badger Group;
- Durham Bird Club;
- Durham Local RSPB group, and;
- North East Reptile and Amphibian Group.

9.2 Existing and baseline knowledge

9.2.1 Figure 5.1 illustrates the indicative environmental constraints for the wider study area, including the locations of designated statutory and non-statutory sites for nature conservation.

9.2.2 There are 6 statutorily protected sites within 2 km of the scheme. These are

- West Farm Meadow Site of Special Scientific Interest (SSSI);
- Hyton Castle Cutting SSSI;
- Hyton Dene Local Nature Reserve (LNR);
- Tiledshed LNR;

- Primrose Nature Reserve LNR, and;
- Station Burn, Boldon Colliery LNR.

9.2.3 There are a total of 28 Local Wildlife Sites (LWS) located in the study area that spans two local authorities (South Tyneside and Sunderland). Table 9.1 below provides the details of these sites.

Table 9.1: Locally designated sites

Site Name	Description	Distance from the scheme
Boldon Lake	The site comprises a man-made lake (the largest body of open water in the borough) adjacent to the Quadrus building in West Boldon, together with species-rich damp grassland alongside. The lake was created in 1986 and has developed substantial areas of marginal vegetation including large stands of reedmace and common reed, and an area dominated by hard rush.	0 m
Mount Pleasant Marsh	Located southeast of Testos Junction, comprising open water, reedbeds, marshy grassland, scrub and woodland habitat (also hosting West Boldon Environmental Education Centre).	0 m
Elliscope Farm East / Hylton Bridge	The site consists of two small woodlands and the linking section of the River Don, leading east from Hylton Bridge Farm. Elliscope Farm East is a linear, mature broadleaf plantation dominated by sycamore, with ash and elder. Hylton Bridge is a small mature broadleaf plantation with a varied canopy of sycamore, ash, beech, horse chestnut, lime and crack willow.	80 m
Make-me-rich Meadow	The site is made up of an area of species-rich, damp, unimproved grassland, together with a section of the River Don between the A19 and the A184. The meadow was formerly grazed, but has not been intensively managed for some years. In the absence of grazing, large areas have become dominated by tall stands of meadowsweet, great	100 m

Site Name	Description	Distance from the scheme
	willowherb and tufted hairgrass.	
Downhill Old Quarry	Downhill is a Magnesian limestone 'outlier' which forms a prominent domed hill overlooking the low lying, open land north of the Nissan car plant. The former quarry base and paddock has a range of species-rich grassland types grading from Magnesian limestone grassland communities through to more neutral grasslands.	570 m
Calf Close Burn	Calf Close Burn is a linear site following the course of a small burn as it flows north across agricultural land towards the Fellgate Estate. The stream sides have abundant great hairy willowherb and there is a stand of common reed which extends into the channel of the burn.	600 m
River Don North Road	The site consists of a section of the River Don between North Road and Newcastle Road. In this stretch the Don has mostly unmodified riverbank with features such as meanders, eroding earth cliffs, riffles and pools, and dead wood.	730 m
Downhill Meadows	The site incorporates large areas of calcareous grassland with areas of tree planting, rank neutral grassland and small amounts of scattered scrub.	870 m
Station Burn, Boldon Colliery	The site, which is also designated as a Local Nature Reserve, is a section of the River Don valley north of Boldon Colliery. The majority of the site comprises grassland, ranging from tall neutral grassland to finer more species-rich grassland.	900 m
Hedworth dene	The site comprises a bowl-shaped area of land bounded by the A19 and railway line. On either side of the River Don there are semi natural neutral grasslands ranging from species rich to species poor.	942 m
Inverness Road Jarrow	Inverness Road is a bowl-shaped section of the River Don Valley bounded by the A19, to the west, and the railway line to the south. Much of the site	1000 m

Site Name	Description	Distance from the scheme
	consists of grassland, dominated by tall plants such as false oat-grass, hogweed and creeping thistle. Locally, the grassland becomes much more species rich, with herbs such as meadow cranesbill and great burnet.	
River Don west Boldon	This is a linear site and covers the banks of the River Don as it flows through West Boldon between North Road and New Road. The Don here has mostly unmodified riverbank with features such as meanders, eroding earth cliffs, riffles and pools, and dead wood.	1000 m
River Don East House	The site consists of a section of the River Don between East House Farm and Hylton Bridge Farm. In this stretch the Don has mostly unmodified riverbank with features such as meanders, eroding earth cliffs, riffles and pools, and dead wood.	1200 m
Boldon Colliery Former Railway Line	A length of disused railway embankment which supports unimproved neutral grassland, mature scrub, scattered trees and wet ditch communities. The site is also an important area for wintering long-eared owls.	1300 m
Newton Garths	Newton Garths includes several fields heavily grazed by horses, comprising species-rich, neutral, ridge and furrow pasture sloping down to the River Don.	1300 m
Strother House Farm	The site is situated to the north of Strother House Farm. It comprises an area of marshy ground approximately 0.3 ha in extent, bounded by a ditch to the south and east.	1400 m
Lakeside Inn Felling	The site centres on two small lakes created for angling purposes during the 1990s. Development of aquatic and marginal vegetation is controlled to provide optimum conditions for angling, but nevertheless a wide variety of species are present such as broad leaved pondweed, Canadian waterweed, curly pondweed, yellow iris and	1600 m

Site Name	Description	Distance from the scheme
	branched bur-reed	
Turner's Hill	Turner's Hill is an area of grassland on a small circular hillock within Boldon Golf Course, south east of Boldon Cemetery.	1600 m
Tillesheds	A varied site with a wooded area, wetlands and an area of open Magnesian Limestone grassland. Covers part of the same area as Hylton Dene LNR.	1700 m
Wardley Colliery	This is a former colliery site mostly comprising a large raised area of colliery spoil. It is the largest 'early successional "brown field" site in South Tyneside and its nature and size mean that it is considered to be the most valuable example of its type in South Tyneside.	1700 m
Hylton Castle Grassland	Hillside displays Magnesian Limestone grassland and scrub adjacent geological exposures of Ford Formation (reef facias) at Hylton Castle Cutting SSSI.	1840 m
Peepy Plantation	A mature plantation with interesting woodland flora and fauna is also notable for invertebrate assemblage and woodland birds.	1900 m
Black Plantation	Black Plantation is a small, rectangular, area of mature even-aged, broadleaved plantation woodland lying to the south of West Boldon. The canopy is dominated by sycamore, whilst other trees present include wych elm, beech, ash and hybrid poplar. The ground flora has no ancient woodland indicators, being dominated by plants such as bramble, stinging nettle, false oat-grass and umbellifers. A diverse bird life includes jays and breeding great spotted woodpecker, whilst barn owl have been recorded using the wider area.	1900 m
Monkton pond and Wood	This is a small pond, together with woodland, adjacent to the Metro line. The pond was created in around 1998 in association with the construction of Monkton Business Park. It acts as a 'balancing pond' in the management of the surface water	1900 m

Site Name	Description	Distance from the scheme
	drainage from the business park.	
Primrose Nature Reserve	Primrose is a mosaic of wetland habitats created on flood-prone former amenity grassland along the River Don in 1991. It was subsequently designated as a Local Nature Reserve.	1900 m
Follingsby Pond/ River Don Streambank	Pond and stream habitats of particular botanical interest exhibit luxuriant flora associated with steep clay river banks and overhanging crack willow.	2000 m
Hylton Plantation	A mixed plantation dominated by coniferous trees with scattered broad-leaved trees. Trees and scrub provide shelter for a thriving woodland bird community.	2000 m
River Don New Road	The site consists of a section of the River Don leading north from New Road. In this stretch the Don has mostly unmodified riverbank with features such as meanders, eroding earth cliffs, riffles and pools, and dead wood.	2000 m

- 9.2.4 Previous consultation with South Tyneside/Sunderland Councils led to all of the LWSs being assessed as being of Medium value (Regional importance) for nature conservation. This will be reviewed as part of the 2014 EIA.
- 9.2.5 The habitat types listed in Table 9.2 below are those identified in the study area during the Extended Phase 1 Habitat Survey for previous EIA work. Some particularly sensitive habitats or species are protected under specific legislation, or are listed as species or habitats of principal importance under the Section 41 List of the NERC (Natural Environment Research Council), or the Durham Local Biodiversity Action Plan (LBAP), which incorporates South Tyneside. The table identifies whether those identified are Section 41 or Durham LBAP habitats.

Table 9.2: Habitats identified in the study area in 2007

Habitat type	Section 41 Habitats of Principal Importance	LBAP priority habitat
Species poor semi-improved grassland		
Running Water (River Don),	✓	
Standing Water (Boldon Lake, Mount Pleasant Marsh)	✓	
Broad-leaved woodland (Elliscope Farm Copse LWS)	✓	
Marshy Grassland		
Species Poor Hedgerows		✓
Scattered Scrub		
Improved grassland/Arable		
Amenity grassland		
Invasive Weeds		

- 9.2.6 In surveys carried out in 2006-7 eight sections of hedgerow surveyed in the study area were dominated by hawthorn / blackthorn and species-poor. They did not exhibit features that would qualify them as 'important' under the Hedgerow Regulations 1997.
- 9.2.7 Table 9.3 below provides a summary of the protected species surveys undertaken to inform the pre-2009 EIA work.

Table 9.3: Protected species baseline summary

Receptor	Baseline Summary
Otter	Otter activity in the study area was concentrated on the River Don, both upstream and downstream of the A19, which is likely to be a main commuting corridor for otters between suitable habitat on the River Tyne in the north and the River Wear to the south. The River Don culvert at Downhill Junction is the only safe

Receptor	Baseline Summary
	crossing point under the A19 in the study area, and its length (160 m) and narrow diameter (c.2 m) are probably a deterrent to otters using it to cross the A19; it is likely that otters cross the road on the surface and are at risk of road traffic collisions.
Water Vole	Water vole activity was concentrated on the River Don downstream of the A19, with some signs seen on Boldon Lake LWS adjacent to the scheme, and also upstream of the A19, at Make Me Rich Farm.
Bats	Bats and trees with bat roost potential in the study area included two bat roosts (identified from a desk-based study) over 800 m away from the nearest point of the scheme. Trees with bat roost potential at Elliscope Farm LWS (approx. 180 m west of the A19) were identified in 2007. However no bat roost were recorded during targeted surveys undertaken in 2007. Common pipistrelle (<i>pipistrellus pipistrellus</i>) foraging and commuting was recorded during activity surveys undertaken in 2007 at: Boldon Lake LWS, Mount Pleasant Marsh LWS, the River Don corridor, Bridleway B46, roadside hedgerow west of the A19, and a hedgerow perpendicular to the A19 in the north of the study area.
Badger	Badger setts were recorded over 1 km away (identified from a desk-based study) from the proposed scheme. No evidence of badger activity within 500 m of the scheme was identified during surveys undertaken in 2007 and updates undertaken in 2010. It was concluded that badgers would not be affected by the scheme.
Breeding Birds	Breeding birds identified in the study area included a number of species listed on the JNCC "Red List" of birds that are of high conservation concern due to a decline in the UK by 50% or more in breeding population or breeding range over the last 25 years. These included grasshopper warbler (<i>Locustella naevia</i>) breeding on the central reservation of the A184 west of Testos Junction, grey partridge, song thrush, spotted flycatcher, marsh tit, willow tit, starling, house sparrow, tree sparrow, yellowhammer, reed bunting and linnet.

Receptor	Baseline Summary
White-clawed Crayfish	White-clawed crayfish were not identified in the study area, although the habitat looked suitable
Brown Hare	Brown hares were recorded in arable fields east and west of the A19, and likely to be using all suitable habitats in the study area.
Invasive Species	Japanese Knotweed was identified north of Testos Junction, on the side slopes of the approach ramps to the existing agricultural bridge carrying Bridleway B28 over the A19. As an invasive weed, it is subject to a number of statutes which prohibit activities that may cause it to spread to other areas and that control its proper disposal under a permit system.

9.2.8 Surveys for red squirrels were not undertaken as both the nature and the structure of the habitat in the study area is unsuitable for this species. Reptile surveys were not carried out because most species are dependent on a structured mixture of rough grassland and scrub, whereas the habitat around Testos Junction comprises mainly arable, pasture and plantation woodland.

9.2.9 A number of other species, including hedgehogs, polecat, deer and aquatic invertebrates etc. were not surveyed as their presence was not identified through either desk-based research or consultation, and even if they were present, they would be unaffected by the proposed scheme.

9.3 Potential impacts during construction

9.3.1 There are a number of ways in which a highways scheme can impact on ecology and nature conservation during construction. These include:

- **Habitat Loss** - is directly attributable to the change of use of the land from countryside to a highway. The offline sections of the proposed scheme to the west of the existing A19, including contractor's compounds, are where these effects are likely to be most significant as the land take is at its

greatest. Areas will be lost during construction but may be restored once construction has been completed.

- **Habitat Damage** - Habitats that extend from the construction footprint include aquatic habitats (River Don, Mount Pleasant Marsh LWS and Boldon Lake LWS) that are sensitive to pollution from fuel and chemicals spills, and from sediment run-off. While best practice construction techniques for pollution prevention and control would be used, there is always a risk that pollution could result while construction takes place. Indirect impacts may also arise on locally designated sites adjacent to the proposals where vegetation may be sensitive to elevated levels of airborne dust from the works.
- **Disturbance** - Disturbance resulting from construction can result in significant effects on sensitive species. This could lead, amongst other things, to abandonment of young, predation risk and use of critical energy reserves. It is assumed that there will already be a baseline of disturbance due to the presence of the existing A19.
- **Severance/fragmentation** - leads to isolation both within and between populations and from specific resources vital for survival. It would initially occur during the construction period through site clearance.
- **Species Mortality during Construction** - Less mobile species, or animals that are young or hibernating, are likely to be those most vulnerable to direct mortality during construction. The effects of individual mortality erode the population, which can lead to local extinctions once the population falls beneath a critical threshold.
- **Changes in Air Quality-** Vehicle emissions and nuisance dust may increase during construction due to the presence of construction traffic. This can be particularly damaging for sites of floristic importance which support the local ecosystem. It is assumed that there will already be a baseline of effect of air quality on habitats to the due to the presence of the existing A19.

9.4 Potential mitigation for construction impacts

- 9.4.1 As discussed in Section 2.5, it is being considered that the impact of the overhead line diversion works on Mount Pleasant Marsh could be reduced by adoption of an alternative construction method. The redundant cables could be removed using scaffolding towers with nets strung between them to reduce the amount of vegetation clearance required. Where vegetation clearance cannot be avoided, it should be possible to re-plant the majority of the cleared area, as the cables would be protected by robust plastic pipes.
- 9.4.2 In order to minimise potential impacts in Mount Pleasant Marsh or elsewhere, the drilling could potentially work from west to east, with the drilling plant and the entry pit located west of the A19. The terminal point would be in a pit within Mount Pleasant Marsh.
- 9.4.3 These alternative methods and impact reduction measures relating to the overhead line diversions would be subject to agreement with the statutory undertaker who would undertake the works.
- 9.4.4 The scheme would be designed to avoid direct or indirect impacts on sites designated for nature conservation importance, protected species or valued habitats where possible; mitigation or compensation for such impacts is considered a last resort only if avoidance is not possible.
- 9.4.5 Disturbance during construction is a temporary impact that would be mitigated through the instigation of working method statements that would address potential impacts on species, or where appropriate, Natural England licences that permit certain activities affecting protected species. This would for instance include removal of vegetation outside of bird nesting periods.

9.5 Potential impacts during operation

- 9.5.1 There are number of ways in which highway improvements can, in generic terms, affect ecology and nature conservation during operation. These include:

- **Habitat Loss** – As the scheme requires land-take because of the actual alignment of the proposals, there would be some permanent loss of habitat. This habitat loss will be likely to be most significant to the west of the existing A19.
- **Severance/fragmentation** - The effects of this could include reduced foraging success, increased competition, genetic isolation and inbreeding, which can lead to local extinctions. In the absence of mitigation the road acts as a barrier across the landscape to a range of species. It is assumed that there will already be a baseline of severance effect due to the existing highway network, and as this is an online scheme increased severance effects will be very limited.
- **Changes in Vehicle Emissions** - in the longer term overall vehicle emissions in some areas would increase and in other areas decrease as a result of the proposed scheme. Sites that are designated for their floristic importance, and any species that depend on them, are particularly sensitive to changes in air quality. Elevated NO_x concentrations are generally considered to be the main threat to vegetation from vehicle emissions, but normally only within close proximity to the road.
- **Species Mortality (vehicle collisions)** - Many animals are killed on UK roads each year and there is the potential for an increase in deaths due to the proposed scheme, before mitigation is taken into account. Most of these deaths are the result of collisions with vehicles. Animals that are at particular risk include otters, as a result of the severance of their wildlife corridors. There are some mitigation measures that can be employed to reduce the risk of collisions and these will be considered during the ongoing design of the proposed scheme. It is assumed that there will already be a baseline of effect of species mortality due to vehicle collisions given the existing highway network in the study area, and as this is an on-line scheme the potential for significant increases is limited.

- **Disturbance from Road Lighting** - Impacts from lighting are most likely to affect bat species along the alignment of the proposed scheme. The effects of road lighting are complex, but include roost disturbance and abandonment, severance and loss of foraging habitats through avoidance, and a decline in airborne invertebrate prey. Habitats where the impact of lighting can be particularly severe include habitats along river corridors, woodland edges and hedgerows.

9.6 Potential mitigation for operational impacts

9.6.1 A detailed mitigation strategy is being developed to avoid or reduce the impacts described above based on updated desk-based searches and field-based surveys undertaken in 2014. The strategy will seek to employ best-practice methods for dealing in particular with disturbance, habitat loss and habitat severance.

9.6.2 Mitigation measures are likely to include:

- maintaining key habitat and wildlife dispersal corridors north-south across the scheme corridor as far as is practicable, using structural planting (in conjunction with appropriate fencing and sensitive lighting to maximise effectiveness) within the design;
- maintaining river corridor habitat and wildlife dispersal along the River Don west-east near Downhill Lane Junction as far as is practicable, using both culverts and structural planting, in conjunction with appropriate fencing and sensitive lighting;
- seeking opportunities to maximise habitat connectivity along both sides of the proposed scheme with new landscaping using native, locally appropriate species; aim for no net loss of valued semi-natural habitats; seek to minimise culverting of watercourses and, where unavoidable, design culverts according to current best practice design;

- seeking to increase habitats for key species that are limited by low availability of suitable habitat / connectivity e.g. bats, otter, and water vole;
- adjustments to account for evolving design, including drainage, borrow pits, compounds and storage areas; and
- accounting for new ecological receptors as further surveys and survey analysis develops; adjustments to landscape , visual, noise and drainage mitigation where practicable to broaden habitat opportunities and biodiversity without compromising other mitigation provision.

10 GEOLOGY AND SOILS

10.1 Introduction

10.1.1 Geology and soils are key factors in determining the environmental character and quality of any given location or area. The rocks beneath the ground's surface have a major influence on the landform – i.e. the topography and other geographical features of an area. The physical and chemical properties of the rocks and the overlying soils influence the type and variety of vegetation that will grow, agricultural quality, flood risk and water storage capacity.

10.1.2 This topic considers the geological and hydrogeological (i.e. links between geology and ground and surface water) characteristics of the proposed route and the adjacent area. It addresses geology, hydrogeology, soils and soil quality, mineral resources, contaminated land / potential contamination, and designated geological sites. As discussed in Section 7.7, these issues will be considered in light of impacts to the resources themselves (as relevant), and also potential risks to the health of construction workers and future site users.

10.1.3 The understanding of the geological and soils environment expressed in this report has been derived from EIA work previously published in the A19 Testos Junction Comparative Environmental Assessment Report (2009). Enquiries to external bodies, such as local councils may need to be updated as part of the current environmental work.

10.1.4 The study area will extend to the footprint of the scheme and immediately adjacent land.

10.2 Existing and baseline knowledge

10.2.1 The site is underlain by a sequence of glacial deposits comprising Pelaw Clay, Tyne and Wear Complex (mainly laminated clay) and Durham Lower Boulder Clay. These superficial deposits overlie a sequence of siltstones, mudstones, sandstones and coals of the Middle and Upper Coal Measures.

10.2.2 There are no nationally designated geological or geomorphological sites in the vicinity of the scheme.

10.2.3 The site is underlain by a secondary A aquifer. The aquifer is probably made up of fractured rocks which do not have a high primary permeability. Although aquifers of this type will seldom produce large quantities of water for abstraction, they can be important both for local supplies and in supplying base flow to rivers. The secondary A aquifer is overlain by low permeability glacial deposits at the surface.

10.2.4 The surface soils are classified as soils of low leaching potential, where pollutants are unlikely to penetrate the soil layer either because water movement is largely horizontal or because the soils have the ability to attenuate diffuse pollutants (i.e. the pollutants will be retained within the soil structure and not pass into the underlying aquifer).

10.2.5 The site is believed to be underlain by mine workings in six seams at between 380 m and 610 m depth. The last recorded date of working of these seams is 1981, and consequent ground movement should have ceased. There are two recorded mine entries, both of which are located approximately 150 m northeast of the existing Testos Junction. Anecdotal accounts suggest that the wetlands at Mount Pleasant Marsh and Boldon Lake may have formed in hollows created by mining subsidence, although this is uncertain. Deep mining can give rise to such features within a short period during or after mining activity.

10.2.6 The following potential sources of contamination have been identified:

- electricity sub-station to the east of the A19;
- former garage on the site now occupied by Enterprise-Rent-A-Car to the west of the A19 / A184 junction;
- burnt shale incorporated into the existing highway earthworks, which is likely to contain high sulphates and sulphides;

- colliery and mine workings to the north of the site;
- former brickworks and quarries to the east, northeast and southeast; and
- a former mineral railway line crossed by the A19 north of Downhill Lane Junction.

10.2.7 The ground investigation carried out during the 2007 ground investigation¹³ generally encountered natural deposits, although some local surface materials gave evidence of being reworked and contained some inert man-made materials, particularly brick fragments. However, no evidence of burnt shale was encountered.

10.2.8 Exploratory holes adjacent to the former petrol station and the electricity sub-station did not reveal visual or other evidence of contamination. Concentrations of all relevant chemicals were found to be below levels which pose 'potentially unacceptable risk' (as per guidance).

10.2.9 Enquiries made to the state veterinary services indicated that there are no animal burial sites within the vicinity of the scheme. Enquiries may need to be updated as part of the current environmental assessment work.

10.3 Potential impacts during construction

10.3.1 Highway construction can affect geological and soil resources, while the nature and condition of soil and underlying rocks can be a key constraint on scheme design. Under some circumstances, construction work can also compound the environmental effects caused by previous activity, for instance by mobilising pollution left in the ground by former industrial activities.

10.3.2 Based on the baseline environment described above, potential impacts during construction may include:

- disturbance of potentially contaminated land;
- remobilisation of residual pollutants (i.e. pollutants that are already present, but stable and inactive in their present condition);
- creation of new pollution pathways (i.e. routes by which pollutants can reach environmental receptors that are vulnerable to their effects);
- contact with unrecorded mineshafts;
- alteration of the physical and chemical characteristics of the soil and in turn the potential to increase erosion and transfer of pollutants to surface water, restrict root growth and drainage, reduce recharge of aquifers and cause surface ponding of water; and
- disturbance of groundwater flow paths.

10.4 Potential mitigation for construction impacts

10.4.1 Potential mitigation measures for effects on geology and soils during construction include:

- protective measures put in place to deal with contaminated materials, should such material be encountered;
- good construction practice and proper disposal of contaminated arisings to minimise creation of pollution pathways;
- protective measures to prevent linkages between contaminants and ground and surface water;
- handle topsoil in a manner to retain its potential for plant growth including careful stripping, handling and placement; and
- defined access routes to prevent overrun of topsoil where possible.

¹³ Bullen Consultants (2004). A19 Testos Junction Stage 1 Scheme Appraisal Report.

10.5 Potential impacts during operation

10.5.1 Operational impacts can arise due to the permanent presence of the road improvement, as well as due to maintenance and use of the road. Potential impacts can include:

- alteration of the physical and chemical characteristics of the soil which can be on-going after construction, and in turn the potential to increase erosion and transfer of pollutants to surface water, restrict root growth and drainage, reduce recharge of aquifers and cause surface ponding of water;
- the benefit of any remediation of areas of existing contamination carried out during construction (i.e. a beneficial effect in future years); and
- disturbance of groundwater flow paths.

10.6 Potential mitigation for operational impacts

10.6.1 Potential mitigation measures for effects on geology and soils during operation include:

- design measures which use appropriate materials and construction methods to avoid impacts on hydrogeology;
- protective measures to prevent linkages between contaminants and ground and surface water; and
- seeding topsoil with grass to minimise risk of erosion.

11 MATERIALS

11.1 Introduction

Material resources

- 11.1.1 Material resources include both primary raw materials, such as aggregates and minerals, and secondary manufactured products.
- 11.1.2 Road schemes require significant quantities of both primary raw materials and secondary manufactured products. Many material resources originate off-site and some arise on-site, such as excavated soils or recycled road planings (old road surface materials removed from redundant carriageways or areas to be re-surfaced).
- 11.1.3 The production, sourcing, transport, handling, storage and use of these materials, as well as the disposal of any surplus, have the potential to affect the environment adversely. At the same time, the beneficial re-use of materials arising on site in construction prevents these materials from becoming waste that would require transport off-site for disposal elsewhere, and also prevents the need for the use of finite resources obtained from elsewhere.

Generation and management of waste

- 11.1.4 In considering material resources use and waste management, it is important to define when, under current legislation and understanding, a material is considered to be a waste. The Waste Framework Directive¹⁴ defines waste as any substance or object that the holder discards or is required to discard.
- 11.1.5 Once a material has become waste, it remains waste until it has been fully recovered and no longer poses a potential threat to the environment or to human health, at which point it is no longer subject to the controls and other measures required by the Directive.

- 11.1.6 The understanding of the material environment expressed in this report has been derived from EIA work previously carried out and from the Comparative Environmental Assessment report (2009). Certain information has been reviewed through published information¹⁵. However, the results of further research and survey, which were not available prior to the preparation of this report, will be reported in the forthcoming ES for the proposed scheme.
- 11.1.7 The management/ use of surplus materials and waste would be undertaken in accordance with the waste hierarchy, outlined in the Waste (England and Wales) regulations 2011.
- 11.1.8 The study area for this topic is limited to the boundaries of the construction site, within which materials would be used and wastes would be generated and managed (see Chapter 2) for detailed descriptions of the proposed works).
- 11.1.9 The construction site is deemed to include the full footprint of the A19 Junction Improvement, together with any land that would be used temporarily during construction. Such temporary land includes site compounds, temporary storage areas for soils and other materials, haul-roads, and potentially land for temporary construction site drainage.

11.2 Existing and baseline knowledge

- 11.2.1 As discussed in Section 2.4, the Testos scheme needs to import about 80,000 m³ to build embankments. The A19/A1058 Coast Road scheme to the north of Testos Junction will create a surplus of excavated material of approximately 130,000 m³.
- 11.2.2 Based on current programmes, the schemes are due to be in construction at the same time, therefore there is the potential for Testos to use some of the Coast Road surplus material. The

¹⁴ European Directive 2006/12/EC, as amended by Directive 2008/98/EC

¹⁵ Such information would include the Model of Waste Arisings and Waste Management Capacity for the North East of England Planning Authorities report (2012), in addition to the Sub-regional Tyne and Wear Waste Management Partnership- Joint Municipal Waste Management Strategy (2007) and review (2012).

schemes are only approximately 8 km apart, making bulk material transport between the sites a feasible proposition.

- 11.2.3 This proposal presents a sustainable alternative to both disposal of the Coast Road material, and other import options for Testos Junction, should it prove feasible. Other import sources for Testos are not confirmed, but the three known closest alternative options are further than 10 km away.
- 11.2.4 Identification of the baseline conditions for waste material disposal have been considered, where possible, according to conditions likely to be present at the commencement of construction (assumed for the purposes of this assessment to be in spring 2016) and up until the scheme is operational (assumed to be in summer 2018).

Local landfill capacity - South Tyneside waste planning authority

Non-hazardous

- 11.2.5 There is currently no landfill or waste treatment capacity in South Tyneside for non-hazardous waste. All such waste is exported to neighbouring local planning authorities. It is anticipated that this will remain the case in the construction year for the Testos Junction Improvements (2016) and up until opening (2018).

Hazardous

- 11.2.6 Although there is no local hazardous landfill capacity in South Tyneside, there is considerable capacity in nationally significant sites in the Tees Valley Sub-region.

Sub-regional landfill capacity - Tyne and Wear Waste Management Partnership

Non-hazardous

- 11.2.7 In 2011 the total waste arisings for the Tyne and Wear Sub-region was 697,000 tonnes. This compares to an existing

capacity in the same year of 740,000 tonnes, meaning there was an additional capacity of 43,000 tonnes.

- 11.2.8 For the year of construction (2016), the forecast for Total Waste Arisings is expected to fall, equating to an overcapacity of 359,000 tonnes.
- 11.2.9 In 2017, total waste arisings are forecasted to decrease slightly to 380,000 tonnes, however available capacity is also expected to decrease, resulting in a reduction in capacity surplus to 50,000 tonnes, down from 359,000 the previous year.
- 11.2.10 By the time the scheme is operational (assumed to be in 2018) the forecasts indicate a further reduced capacity surplus of 48,000 tonnes.

Regional landfill capacity - North East of England

Non-hazardous

- 11.2.11 In 2011 2.3 million tonnes of residual waste was generated in North East England, 1.34 million tonnes of which was landfilled and 0.6 million tonnes used to generate energy.
- 11.2.12 Estimates of existing landfill capacity in North East England were equivalent to 1.8 million tonnes in 2011 per annum, decreasing to 0.24 million tonnes per annum by 2030.
- 11.2.13 Adopting baseline forecasts given in the *Model of Waste Arisings and Waste Management Capacity for the North East of England Waste Planning Authorities* (2012), this translates to a shortfall of capacity equivalent to 49,000 tonnes per annum by 2018, increasing to 312,000 by 2021.

Hazardous

- 11.2.14 North East England has considerable capacity for the treatment and disposal of hazardous wastes and imports such wastes from various parts of the UK.
- 11.2.15 Arisings for north east England (ignoring waste water and related treatment) are some 157,000 tonnes per annum. These

arisings are not expected to change significantly over the forecast period which runs to 2030.

11.2.16 This compares to a regional hazardous landfill capacity of some 770,000 tonnes annually (2010) and 122,000 tonnes of treatment capacity, indicating sufficient capacity to cope with any hazardous waste that may arise through the A19 Testos Junction Scheme.

11.3 Potential impacts during construction

11.3.1 Construction of the proposed scheme is likely to require the production, procurement, transport and use of construction materials, including bulk materials for earthworks, concrete, steel and other structural material, pre-cast or prefabricated concrete, steel or other components, road surface material, timber used in temporary works (e.g. hoarding, shuttering) or in the permanent works (e.g. fencing), and other materials as required.

11.3.2 Construction work would also result in the production of construction wastes, including surplus topsoil or subsoil materials arising from the earthworks, surplus materials not used as intended, any hazardous or contaminated material found on site, vegetation and other above-ground materials produced by site clearance, and demolition wastes.

11.3.3 The proposed scheme is likely to require the placement of approximately 100,000 m³ of fill material, of which an estimated 20,000 m³ will be obtained from excavations carried out as part of the scheme. The remaining 80,000 m³ would have to be brought to the site from elsewhere ('imported').

11.3.4 The preferred material source for the scheme is the A19 / A1058 Coast Road Junction Improvement which is being carried out to the north of the Testos Junction at a distance of approximately 8.3 km (5.2) miles.

11.3.5 If material cannot be sourced from surplus excavated material produced by the Coast Road Improvement Scheme, then it is likely to be imported from further afield. This will have

additional environmental impacts associated with increased vehicle use and material storage. Other potential import sources for the Testos scheme are not yet confirmed, but the three known closest alternative options are all further than 10 km away.

11.3.6 In the pre-2009 scheme design the chosen material to be imported was 'pulverised fuel ash', which represents sustainable re-use of a waste material, but which also requires careful handling to prevent unintended environmental effects. At this stage the continued availability of this material is not yet confirmed.

11.3.7 Whatever the source, import of material would create additional heavy duty transport movements, including increased vehicle use, which could affect the local highway network. Similarly, if waste material cannot be reused and must be sent to a landfill further afield, this too will result in increased vehicle use and associated environmental consequences, including the depletion of landfill capacity, which is a finite resource in itself.

11.4 Potential mitigation for construction impacts

11.4.1 Mitigation may include designing slope angles along the scheme at the steepest angle possible (without using reinforced soil slopes) in order to minimise the quantities of imported material and the amount of land required to build the scheme.

11.4.2 It is recognised that there is a tension between the desire to design the scheme with the steepest possible slopes to reduce material import requirements and land-take, and the needs of other environmental disciplines. For instance, very steep slopes may limit or preclude planting and establishment of trees and shrubs or make them impracticable to maintain. Gentler slopes may therefore be required to allow the design and implementation of ecological, landscape and visual mitigation.

11.4.3 It is understood at this stage that the scheme is likely to generate a surplus of topsoil. Where possible, this will be re-used in the environmental mitigation design.

- 11.4.4 If used, the use and storage of Pulverised Fuel Ash requires care, especially in windy or wet conditions, to prevent environmental effects. Precautions would be put in place in the Construction Environmental Management Plan to address these issues.
- 11.4.5 Although it is not a legislative requirement, a Site Waste Management Plan (SWMP) will be produced to identify additional mitigation methods for mitigating material-related impacts.

11.5 Potential impacts during operation

- 11.5.1 No significant impacts are expected in relation to materials and waste during the operation of the scheme.

12 NOISE AND VIBRATION

12.1 Introduction

- 12.1.1 Noise in its widest sense can be defined as unwanted sound. Such sound can be associated with industrial, domestic and transportation sources. Vibration comprises oscillatory waves that propagate from a source through either the ground or the air to adjacent areas.
- 12.1.2 Sound consists of vibrations transmitted to the ear as rapid variations in air pressure. The more rapid the fluctuation the higher the frequency of the sound.
- 12.1.3 Sound is measured in decibels (dB). However, the sensitivity of the human ear varies with frequency. Therefore, most everyday noise is measured in decibels (dB(A)), the (A) indicating that the measured level has been modified to allow for this phenomenon.
- 12.1.4 To measure noise, the logarithmic decibel scale is used. Using the scale, a change in noise level of 10 dB(A) represents a halving or doubling in perceived loudness. Table 12.1 gives examples of typical sound levels.

Table 12.1: Typical sound levels found in the environment

Sound Level	Description of where found or threshold
0 dB(A)	Threshold of hearing
20 to 30 dB(A)	Quiet bedroom at night
30 to 40 dB(A)	Living room during the day
40 to 50 dB(A)	Typical office
50 to 60 dB(A)	Inside a car
60 to 70 dB(A)	Typical high street
70 to 90 dB(A)	Inside factory
100 to 110 dB(A)	Burglar alarm at 1 m away
110 to 130 dB(A)	Jet aircraft on take-off
140 dB(A)	Threshold of pain

- 12.1.5 The study area for the assessment of noise is primarily defined as 600 m around the proposed new or altered highways and sections of existing roads within 1 km of the proposed scheme that are predicted to be subject to a change in noise level of more than 1 decibel (dB(A)). The distance of 600 m is considered to be the distance that receptors are likely to be sensitive to traffic noise in accordance with the guidance in the DMRB. Beyond this distance, the noise levels are less discernible or are masked by other noises within the environment.
- 12.1.6 Existing roads subject to a change of 1db(A) or more will be identified from traffic forecasts that predict an increase in flow by at least 25% or decrease by 20% in the proposed scheme opening year (excluding those where the predicted traffic flow was less than 1000 vehicles per 18 hour day in both with-scheme and without-scheme scenarios). Collectively these are called “affected routes”.
- 12.1.7 The understanding of the noise environment expressed in this report has been derived from EIA work previously published in the A19 Testos Junction Comparative Environmental Assessment report (2009). The results of further research and survey, which were not available prior to the preparation of this report, will be reported in the forthcoming ES for the proposed scheme.

12.2 Existing and baseline knowledge

- 12.2.1 During the pre-2009 EIA work, the numbers of residential properties present within 300 m either side of the centre-line of the proposed scheme were estimated and divided into three distance bands. This was determined based on 2006 Ordnance Survey (OS) mapping. Given current knowledge, this is unlikely to have changed significantly, but will be reviewed and updated accordingly as part of the current EIA.

12.2.2 The number of properties in proximity to the scheme was estimated as:

- 0-100 m: 39
- 100-200 m: 208
- 200-300 m: 279

12.2.3 There are no highly sensitive receptors such as schools, nursing homes and hospitals within 300 m of the scheme.

12.2.4 During the pre-2009 EIA work, noise monitoring was undertaken in order to establish the existing noise environment in the area of the proposed scheme. This is likely to be indicative of the current noise environment, but certain characteristics of the study area may have changed in more recent years, which could affect existing noise levels. The baseline will be re-established as part of the current EIA.

12.2.5 In 2006, 12 sample 'receptors' were chosen for a noise assessment. Eight of the sample receptors were chosen to be representative of the communities within which they are situated. The remaining four included two isolated farms, a community facility and a commercial property. Together, all 12 represented a 'worst-case' scenario, on the basis of their proximity to the road, which meant they were likely to experience greater noise impacts than other receptors within 200 m of the scheme. These example receptors included:

- residential properties in Hedworth;
- residential properties in Boldon Colliery;
- West House Farm;
- Quadrus Centre at Boldon Business Park;
- West Boldon Environmental Education Centre; and
- Make Me Rich Farm.

12.2.6 As a form of verification, measured noise levels were compared with expected noise levels, calculated using NoiseMap 2000©, based on available traffic flow information. The match between

the measured and expected noise levels at the monitoring locations was fairly close, indicating that the measurements were likely to be reasonably representative.

12.2.7 The DMRB methodology for noise assessment considers noise levels with regard to the $L_{A10,18h}$ index. This value is the noise level exceeded for 10% of the time, averaged over a period between 06:00-24:00, and is widely considered to best represent the perceived traffic noise impact at a location.

12.2.8 The baseline noise measurements were:

- 52 – 71 dB(A) ($L_{A10,18hr}$) at the residential properties in Hedworth, with noise generally greater with proximity to the A19;
- 55 – 65 dB(A) ($L_{A10,18hr}$) at the residential properties in Boldon Colliery;
- approximately 65 dB(A) ($L_{A10,18hr}$) at West House Farm;
- approximately 65 dB(A) ($L_{A10,18hr}$) at the Quadrus Centre;
- approximately 65 dB(A) ($L_{A10,18hr}$) at the West Boldon Environmental Education Centre; and
- approximately 69 dB(A) ($L_{A10,18hr}$) at Make Me Rich Farm.

12.3 Potential impacts during construction

12.3.1 Potential noise impacts from transport schemes can relate to changes in road traffic or construction activities. While noise impacts derived from road traffic during operation of the scheme would continue in the long term, any impacts associated with construction would cease at the end of the construction period.

12.3.2 Although there is no evidence that traffic-induced airborne vibration could cause even minor damage to buildings, it could be a source of annoyance to local people, causing vibrations of doors, windows and, on occasions, floors of properties close to the route. Ground-borne vibration effects could potentially be produced during the construction phase if percussive piling or compaction techniques are used in close proximity to receptors and could be the source of annoyance to local residents.

12.3.3 Factors expected to influence noise levels perceived at nearby properties, as identified in the pre-2009 EIA work, include:

- existing noise levels;
- type and number of activities;
- type of plant;
- distance from noise sources;
- topography; and
- wind direction.

12.3.4 The previous EIA work identified that noise and vibration impacts would vary throughout the construction period, and would be dependent on the contractor's chosen method of working and on the timing and phasing of certain operations. Whilst there is the potential for relatively high noise levels at particular locations for short periods, the long, narrow nature of the site should ensure that the location of the main working areas changes on a regular basis. This would limit the duration of exposure of any one receptor to high levels of construction noise.

12.3.5 Vibration from construction projects is generally caused by general equipment operations and tends to be highest during soil compaction, earth-moving, piling and the use of jack-hammers. The pre-2009 EIA stated that there were no plans for any piling works as part of the project. The noisiest planned activities were considered to be sawing and jack-hammer work associated with cutting surface joints, and white-lining. Also, loop-cutting could also involve sawing and jack-hammer work.

12.3.6 The pre-2009 EIA work identified that the nearest individual residential properties to the proposed works would be Make-Me-Rich Farm and West House Farm farmhouse. However, construction works near Make-Me-Rich Farm would be very limited, and would take place in a number of separate short episodes. Therefore, it considered construction noise impacts to be very limited. The EIA found that larger-scale construction works would take place near West House Farm farmhouse, and

the potential for noise nuisance during construction needs to be considered in light of the potential mitigation measures available (see below).

12.4 Potential mitigation for construction impacts

12.4.1 Potential mitigation measures that could be employed on site to ensure that noise levels are attenuated as far as possible include:

- the use of 'best practicable means' during all construction activities;
- switching off plant and equipment when it is not in use for longer periods of time;
- establish agreement with the local authority on appropriate controls for undertaking significantly noisy works or vibration-causing operations close to receptors;
- programming works so that the requirement for working outside normal working hours is minimised (taking into account the highway authority's statutory duties under the Traffic Management Act 2004);
- use of low noise emission plant where possible;
- the use of temporary noise screens around particularly noisy activities; and
- regular plant maintenance.

12.5 Potential impacts during operation

12.5.1 Potential operational impacts include increased traffic noise. This could be caused by increased speeds, which follow from reductions in congestion. In addition, new slip and connector roads could take the traffic, and therefore noise, closer to some receptors.

12.5.2 The pre-2009 EIA work determined that the magnitude of change in noise levels at selected receptors was insignificant. It concluded that the introduction of the scheme would result in a number of properties experiencing increases in noise nuisance

in 20 years in comparison to the baseline scenario. However, none of these increases were found to signify 'significant' noise impacts. It also confirmed that noise insulation under the Noise Insulation Regulations 1975 is unlikely to be required at any of the receptor locations exposed to road traffic noise.

12.5.3 All residential properties were found to be located more than 40 m from the scheme. It was therefore assumed that there will be no impact from vibration.

12.6 Potential mitigation for operational impacts

12.6.1 Potential mitigation measures to prevent adverse noise and vibration impacts from road schemes during operation can include:

- environmental bunds and barriers;
- quieter road surfacing; and
- noise insulation.

12.6.2 However, the pre-2009 EIA work determined that there would not be any significant noise impacts or increases in noise nuisance; therefore, benefits from noise barriers would be small. As a result it was not considered necessary to provide any permanent noise barriers to reduce traffic noise impacts.

12.6.3 In addition, the pre-2009 EIA work concluded that noise insulation under the Noise Insulation Regulations 1975 would not be required at any receptor location exposed to road traffic noise.

12.6.4 Mitigation proposed in the scheme will be re-evaluated and amended where appropriate as part of the current EIA.

13 EFFECTS ON ALL TRAVELLERS

13.1 Introduction

- 13.1.1 Effects on human beings are amongst the core topics of EIA as required by European and UK law.
- 13.1.2 Pedestrians, equestrians and cyclists (collectively referred to as 'non-motorised users', or NMUs), together with vehicle travellers, are considered to be key groups of human beings potentially affected by changes to highway infrastructure.
- 13.1.3 The understanding of the existing environment for all travellers expressed in this report has been derived from EIA work previously published in the A19 Testos Junction Comparative Environmental Assessment report (2009), initial discussions with NMU representative groups in 2014, a site visit in June 2014 and an NMU survey in July 2014. The results of further research which were not available prior to the preparation of this report will be reported in the forthcoming ES for the proposed scheme.
- 13.1.4 In line with DMRB guidance, this chapter will assess the impact of the development on all travellers by focusing on four key aspects:
- impact of the proposed scheme on the journeys that people make on foot, bicycle or horseback, including journeys that use public rights of way as well as roads;
 - the impact of the proposed scheme on the amount of stress felt by drivers; and
 - the impact of the proposed scheme on travellers' views from the road within the study area.
- 13.1.5 The study area for non-motorised user travel patterns is defined by the local road network using the Testos Junction and between the Testos and Downhill Lane Junction junctions. This includes Public Rights of Way such as footpaths and bridleways.

- 13.1.6 The study area for travellers' views comprises those parts of the road network for which views will change, which in this case is users of the A19 and A184 through Testos and Downhill Lane Junction.

13.2 Existing and baseline knowledge

Non-motorised users

- 13.2.1 As part of current EIA research on NMUs, information on rights of way has been obtained through a desk-based assessment for an area extending to 500 m in all directions from the scheme.
- 13.2.2 This work was carried out in summer 2014, and builds upon site visits and surveys carried out in 2006 and 2007. A site visit in June 2014 identified any changes to baseline conditions. Further information on the use of the rights of way network in the study area was obtained from a survey of non-motorised traffic in July 2014, pre-2009 meetings with representatives of key user group organisations and the Countryside Officer for South Tyneside Council, and an NMU workshop in July 2014.
- 13.2.3 Public rights of way, cycle paths and roads in the vicinity of the proposed junction improvements are illustrated in Figure 14.1 (see Chapter 14) and described below.
- 13.2.4 **Footpath B27** runs eastward from a minor road known as 'West Pastures lane', crosses the A19 south of Mount Pleasant Marsh, and joins Bridleway B46.
- 13.2.5 Users of this footpath have to cross the A19 at-grade, via a gap in the central reservation safety fence, at a location approximately 240 m south of Testos Junction. The conflict between pedestrian and high-speed vehicular traffic appears to make pedestrians reluctant to use the route, and the crossing is certainly a significant safety hazard. This problem is compounded by the lack of any warning to motorists that there is a pedestrian crossing point.

- 13.2.6 The surveys undertaken in 2014 identified only low levels of usage of B27, with no crossings of the A19. The surveys of 2006 showed that despite the danger of crossing the road and the condition of the footpath, crossings of the A19 were occasionally made. Interviews from 2006 showed that these were mainly for recreational journeys, but there was no opportunity for interviews at this location in 2014.
- 13.2.7 **Bridleway B28** runs westwards from Boldon Business Park, crossing the A19 via an old accommodation bridge ('West House Accommodation Bridge') and turning south to reach the A184 west of Testos Junction. There are no facilities to allow pedestrians, horse riders or cyclists to safely cross the A184, to gain access to the quieter lanes and more desirable riding routes to the south.
- 13.2.8 The bridleway is in fairly good condition. However, there is very little room for users (particularly horse-riders) to manoeuvre at the junction with the A184, whether they wish to cross the dual carriageway or to travel westwards along the narrow and uninviting footway.
- 13.2.9 Although only pedestrians and cyclists were seen using the route during both the 2006 and 2014 surveys, there is evidence to suggest that it is regularly used by horse riders. The local representative of the British Horse Society has indicated that horse riders use the bridleway as part of a route that includes West Pastures lane, and that they therefore have to cross the dual carriageway. While most of the pedestrian/cyclist use recorded in the 2006 survey was recreational, most was for work purposes in 2014, but with majority recreational use during off-peak hours. The route has a low level of use, but to some extent serves multiple purposes.
- 13.2.10 **Bridleway B46** (the 'Don Valley Footpath') follows an old railway south from the A184 / B1298 roundabout (east of Testos Junction) to the eastern boundary of the A19, with a link onto Downhill Lane. The route is in good condition.
- 13.2.11 Both the 2006 and 2014 surveys have indicated that the bridleway is regularly used by pedestrians and cyclists for recreational purposes, and for commuting to the Nissan car plant in Sunderland. There is also some equestrian use.
- 13.2.12 Cyclists on the bridleway have been observed on several occasions taking a short-cut by climbing over the safety fence of the A19 southbound off-slip road and using the slip road to access the A1290 and the car plant. This clearly represents a desire line, as it is straighter and more direct than following the line of the bridleway to Downhill Lane. However, it is also a significant safety risk, and at least one collision involving a vehicle and a cyclist has been recorded at the top of this slip road.
- 13.2.13 **Roadside cycle paths:** A combined off-carriageway cycle path and footpath runs for a short distance along the north side of the A184, either side of the A184 / B1298 roundabout, but not linking to Testos Junction. It links with a cycle route running northwards along the B1298 (Abingdon Way).
- 13.2.14 **Roads:** The A184 runs east to west across the study area, meeting the A19 at Testos Junction. To the west of Testos Junction it is a trunk road and dual carriageway, while to the east it is a single-carriageway and is not a trunk road.
- 13.2.15 The cycle lane on the north side of the A184 does not continue to Testos Junction. However, consultation with Sustrans in 2006 indicated that the pedestrian crossing lights on the north side of the roundabout are heavily used by cyclists using the A184 as the main east-west link between Sunderland and Gateshead.
- 13.2.16 To the west of Testos Junction, there is a narrow footway alongside the north (eastbound) carriageway only, although there are bus stops on both sides and a junction where Bridleway B28 meets the A184. A narrow, surfaced path crosses the wide central reservation to provide access to and from the bus stop on the westbound carriageway, but there are no signals or signs to warn drivers of pedestrians crossing.

- 13.2.17 At least one elderly individual attending the 2009 public consultation described how although they regularly travelled by bus to Sunderland, on their return they felt unable to get off at Testos because of the need to cross the A184; instead, they stayed on the bus into Gateshead and returned by bus back to Testos so as to be able to get off on the north (eastbound) side of the road and walk into West Boldon without crossing the A184.
- 13.2.18 To the south of Testos Junction, the A19 leads to Downhill Lane and the A1290. Downhill Lane links north-eastwards back towards Boldon, while the A1290 leads south-westwards towards Washington and the Nissan factory. Downhill Lane itself is part of a recreational route known as 'the Great North Forest Trail'.

Effects on vehicle travellers

Driver stress

- 13.2.19 Testos Junction is currently a busy interchange carrying large volumes of traffic. In general, travellers making all of the major traffic movements experience moderate to high levels of stress on the majority of the links that they would use. Calculations made in 2007 as part of the previous EIA work suggest that, at present, traveller's frustration and fear of collisions are concentrated at the Testos Junction and on the northbound on-slip road from Downhill Lane Junction to the A19.
- 13.2.20 During the pre-2009 EIA work, stress levels with and without the junction were predicted for the year of opening and 15 years after opening, taking account of predicted traffic growth.
- 13.2.21 With no change to the junction, an increase in stress was predicted for at least one link on 16 out of 17 major traffic movements by 2011, with further increases in stress by 2026.
- 13.2.22 The 2014 traffic assessment will build upon existing data to provide an up-to-date assessment of the impacts on vehicle travellers in terms of driver stress.

Travellers' views

- 13.2.23 The pre-2009 assessment of the impact of the junction improvements on travellers' views was based on information taken from the landscape and visual impact assessment (Chapter 8). Information on views from vehicles, existing signage, locations of bus stops and bus routes was gathered through field surveys undertaken in September and November 2006, in parallel with the wider landscape and visual impact assessment survey.
- 13.2.24 In general, existing views on the A19 north of Testos Junction were found to be restricted by roadside vegetation and are focussed along the route of travel. Between Downhill Lane Junction and Testos Junction, views are filtered through vegetation within farmland to the east and west.
- 13.2.25 Downhill Lane Junction is elevated above the A19 and travellers using it have open, elevated views to the north and east towards Newcastle and the Boldon Hills.
- 13.2.26 The distant horizons formed by Penshaw Hill and high ground in Gateshead are noticeable for southbound and westbound travellers respectively. Eastbound travellers see a closer horizon formed by Downhill.
- 13.2.27 Mount Pleasant Marsh and Boldon Lake Local Wildlife Sites are noticeable areas of habitat adjacent to the Testos Junction and are visible when travelling east from Testos Junction into the local road network.
- 13.2.28 The Quadrus Centre building is a 'landmark' feature marking the location of Boldon Business Park. The building is visible from routes travelling from the west, south and east and on routes over higher ground.
- 13.2.29 Several sets of electricity pylons originate at the sub-station in Mount Pleasant Marsh, extending northwards into West Boldon and into the countryside to the east, west and south. These significantly detract from the quality of views available from

much of the road network, particularly those that open towards the eastern and western farmland.

- 13.2.30 Results of the 2014 landscape and visual impact assessment (Chapter 8) will be used to inform the assessment of the impacts on vehicle travellers in terms of driver views.

13.3 Potential impacts during construction

Impacts on non-motorised users

- 13.3.1 The communities within the study area are largely self-contained and the 2006 non-motorised user survey showed a relatively low level of use of the local rights of way, cycle routes and roads for commuting.
- 13.3.2 During construction, there are likely to be temporary impacts along the majority of the pedestrian, equestrian and cyclist routes in the vicinity of the proposed scheme, resulting in disruption and possible closures.
- 13.3.3 However, the largest effects on these routes would be on those that are used principally for recreational purposes and not those that contribute to community linkages.
- 13.3.4 Occupants of the permanent travellers' site at West Pastures are likely to use the verges of the A184 and Bridleway B28 to access facilities in West Boldon, Boldon Colliery and/or Fellgate and Hedworth. During the construction period, users are likely to find their access more difficult.
- 13.3.5 During construction, it would be necessary to temporarily close Footpath B27 and Bridleway B28 at the points where they cross the A19.
- 13.3.6 A short-term closure of Bridleway B46 (the 'Don Valley Footpath'), potentially for around one month, may be required to allow access to the site for plant, and to allow construction of the new ramp linking the bridleway to Downhill Lane.

- 13.3.7 Pedestrians and cyclists wishing to cross the A19 at Testos Junction to travel along the A184 would still be able to do so during the construction period.

Impacts on drivers

- 13.3.8 During the construction period, the need to travel through road-works is likely to result in short-term delays and route uncertainty.
- 13.3.9 Without mitigation, it is likely there would be deterioration in the quality of all travellers' views and increases in driver stress levels during the construction period.

13.4 Potential mitigation for construction impacts

- 13.4.1 A clearly organised traffic management plan would be implemented for traffic using the road network during the construction of the scheme in order to reduce the effect of the road works on all travellers' (vehicular and non-motorised) and reduce congestion that might otherwise arise.
- 13.4.2 The temporary closure of Bridleway B28 and Footpath B27 during construction is unavoidable, and no alternative off-road diversion routes are available. The construction programme would be arranged to minimise the duration of the closures as much as possible.
- 13.4.3 Programme solutions would also be sought to minimise the duration of any closures of Bridleway B46 during construction, and to time them so as to minimise disruption to non-motorised commuter traffic. These closures are in any case expected to be of short duration.

13.5 Potential impacts during operation

Impacts on non-motorised users

- 13.5.1 As described in Section 2.4, three options for NMU provision as part of scheme design are under consideration. The scheme will have certain impacts common to all NMU options.

- 13.5.2 One impact of the scheme common to all NMU options is with regard to traffic. After the scheme opens, through-traffic on the A19 would bypass Testos Junction, reducing traffic on the roundabout. This is expected to make any routes that go via the roundabout safer and more attractive to NMUs than they would otherwise be.
- 13.5.3 Another impact common to all three options would be a net increase in total bridleway length, providing overall more facilities for equestrians to use. However, the options would each achieve this differently – see the description under each option below.
- 13.5.4 All three NMU options would have the benefit of a new footpath along the south of the A184, connecting Testos Junction with the B46 to the east. This would be combined with new connections to the B27 both sides of the A19. This additional pedestrian provision, with signalised crossing at the south end of Testos Junction, would allow people to walk more safely between West Pastures lane and Abingdon Way. Although walking south and then east to use the new B27 would be a longer journey than walking north to cross the A184, this would be a potentially safer option for people of the West Pasture’s Travellers Site who access services and facilities in the Boldon Colliery and West Boldon area.
- 13.5.5 Although journey length for users of B27 would increase by around 500 m, the diversion of B27 to a signalised crossing would increase safety for these users. The new segments of B27 extending to the roundabout would also increase connectivity with the rest of the PRow network, benefiting longer-distance recreational walkers.
- 13.5.6 For cyclists, all three NMU options include for the provision of a new segment of cycleway between Testos Junction and the Abingdon Way / A184 roundabout, connecting into existing cycleway there. In addition to segregating cyclists from traffic, this would reduce the potential for pedestrian / cyclist conflict on

the footpath in this area, potentially increasing safety for both pedestrians and cyclists.

- 13.5.7 In addition, the three NMU options include a new ramp for cyclists linking bridleway B46 to Downhill Lane Junction. This would allow safe use of the existing desire line currently served by unsafe use of the southbound off-slip road, and reduce the potential for conflict between cyclists and others in this area, while also improving journey times for cyclists using the B46.
- 13.5.8 Other impacts on NMUs vary by option, as described in the following paragraphs.

Option 1

- 13.5.9 The replacement of the B28 overbridge with a new overbridge over 600 m to the north of its existing position would increase journey length by around 1.2 km, if measured from the two ends of the diversion. Half of this would be on road and the other half on bridleway adjacent to fields.
- 13.5.10 Given equestrians generally start and finish in the same location, the impact on the attractiveness of journeys would vary, depending upon riders’ origins and preferred riding distances. For example, it may make certain circular journeys longer and therefore render users less able to complete them within a desired time. However, a linear route to the A184 and back may be more desirable due to the increased length of this path specifically.
- 13.5.11 With Option 1’s replacement overbridge, there would be a new link from Hedworth (footpath only) and Abingdon Way to the relocated bridge. This would lead to some journeys (e.g. between Hedworth / Fellgate and Boldon Business Park) being significantly shorter. This would increase the accessibility of nearby jobs, services and facilities for these residents.
- 13.5.12 Also, the extended bridleway would better connect Hedworth and Fellgate into the wider PRow network in the countryside, although still severed (e.g. from footpath B27) by the busy A184. It would also enable direct access to the bus stops west

of Testos Junction, which provide the nearest public transport route to Middlesbrough, and also access to other destinations such as Sunderland, Gateshead and Newcastle.

Option 2

- 13.5.13 The removal of the agricultural bridge carrying bridleway B28 would mean pedestrians and cyclists wishing to cross between Boldon Business Park and destinations west and southwest of Testos Junction, would do so via Abingdon Way and the A184. A new signalised crossing of the A184 west of Testos Roundabout for pedestrians and cyclists would improve the safety of crossings of the A184 for these northeast-to-southwest journeys. The closure of B28 could increase journey distances for some people (e.g. workers travelling to/from the business park), but the very low levels of use indicate a relatively small impact, and the journey would be potentially safer.
- 13.5.14 West of Testos Junction, the new signalised crossing would make access for pedestrians between the west-bound and east-bound bus stops along the A184 safer.
- 13.5.15 A new bridleway to the south of Testos Junction would replace the equestrian link lost by the removal of the B28. Equestrians travelling between the Boldon Colliery area and West Pastures lane would be diverted via Abingdon Way and the B46 to this new bridleway, which would pass adjacent to fields south of the electricity sub-station (along the upgraded B27), north past the Mt. Pleasant Marsh LWS and A19, across Pegasus crossings at the two Testos Junction connector roads (and under the A19), and westwards parallel to the A184 to West Pastures lane. Screening would defend horses and their riders from the effects of traffic, including potential 'spooking' of horses by vehicle movement, noise and headlights.
- 13.5.16 This diversion would remove or discourage the existing and relatively unsafe equestrian crossings of the A184 west of Testos Roundabout, and therefore make east-west equestrian movements in the area of the junction more attractive. It would also provide more continuous off-road equestrian routes in the

study area, which would likely improve the amenity value of the bridleway network.

- 13.5.17 In addition to reduced traffic at the roundabout, the new bridleway along the A184 and signalised crossing of the A184 west of Testos Junction would provide safer and more continuous access for people of the West Pasture's Travellers Site to services and facilities in the Boldon Colliery and West Boldon area.

Option 2a

- 13.5.18 The impacts of Option 2a would resemble those of Option 2, with the exceptions described below.
- 13.5.19 An additional combined cycleway / footway parallel to, and north of, the A184 to the west of Testos Junction would further segregate cyclists from pedestrians and traffic. This could potentially improve cyclist and pedestrian safety, and would add further connectivity within the wider regional / sub-regional cycle network.
- 13.5.20 The provision of separate two-way cyclist facilities on the north side of the A184, linked to the signalised crossing of the A19 north of Testos Junction, mean that no signalised crossing of the A184 is deemed to be required.

Impacts on vehicle travellers

- 13.5.21 After completion of the junction improvements, traffic would flow much more freely than it would without improvements.
- 13.5.22 This is likely to have a positive impact on drivers' stress levels, through reduced congestion and improved journey times and safety. Calculations carried out in 2007 showed reductions in driver stress both in the opening year and 15 years after opening, compared to both the existing situation and to the opening year without the scheme.
- 13.5.23 In the year of opening and in the future year, the proposed scheme would offer improved views for travellers staying on the

A19 in either direction, due to the elevated views available from the new raised carriageway.

- 13.5.24 For travellers on the A184 travelling towards Testos Junction from either direction however, the scheme would offer worse views than at present, as the views would be interrupted and constrained by the new raised A19 carriageway.

13.6 Potential mitigation for operational impacts

- 13.6.1 The proposed scheme incorporates permanent diversions and new crossing facilities to mitigate for the loss of the existing A19 crossing points on Bridleway B28 and Footpath B27. All new or altered facilities would be designed in accordance with relevant Highways Agency guidance¹⁶.
- 13.6.2 Landscape mitigation measures, including native tree and shrub planting, habitat creation and the incorporation of a landscape mound, would help to integrate the proposals into the surrounding landscape, replace lost vegetation and minimise the loss of amenity on affected routes for both vehicular and non-motorised travellers (see Chapter 8).
- 13.6.3 The anticipated effects of the scheme on drivers' stress levels are beneficial, therefore no mitigation is proposed in relation to these effects.

¹⁶ DMRB Volume 6, Section 3, Part 5, 'The geometric design of pedestrian, cycle and equestrian routes' (TA90/05)

14 COMMUNITIES AND PRIVATE ASSETS

14.1 Introduction

- 14.1.1 The term 'community' can be defined in many ways, and at different geographic scales. Community facilities and services include schools and other educational institutions, nurseries, GP surgeries, libraries, village halls, local shops and any other facilities that are designed for general community use at a local level.
- 14.1.2 The direct loss of land (land-take) and the proximity of new or enlarged highway infrastructure can affect the viability of the existing uses of land adjacent to the highway. They can also affect the way that land may be used in the future, for instance by either promoting or inhibiting future development proposals.
- 14.1.3 The understanding of the existing environment in respect of communities and private assets expressed in this report has been derived from EIA work previously published in the A19 Testos Junction Comparative Environmental Assessment report (2009). Certain information has been reviewed through published information such as available online mapping. However, the results of further research and survey, which were not available prior to the preparation of this report, will be reported in the forthcoming ES for the proposed scheme.
- 14.1.4 As baseline data may now be out of date, the 2014 assessment will build upon existing information within a study area extending 1 km in all directions from the nearest point of the scheme. The proposed study area will include all private properties, community uses of land and buildings, agricultural land, other businesses, and the communities through which the proposed scheme is routed.

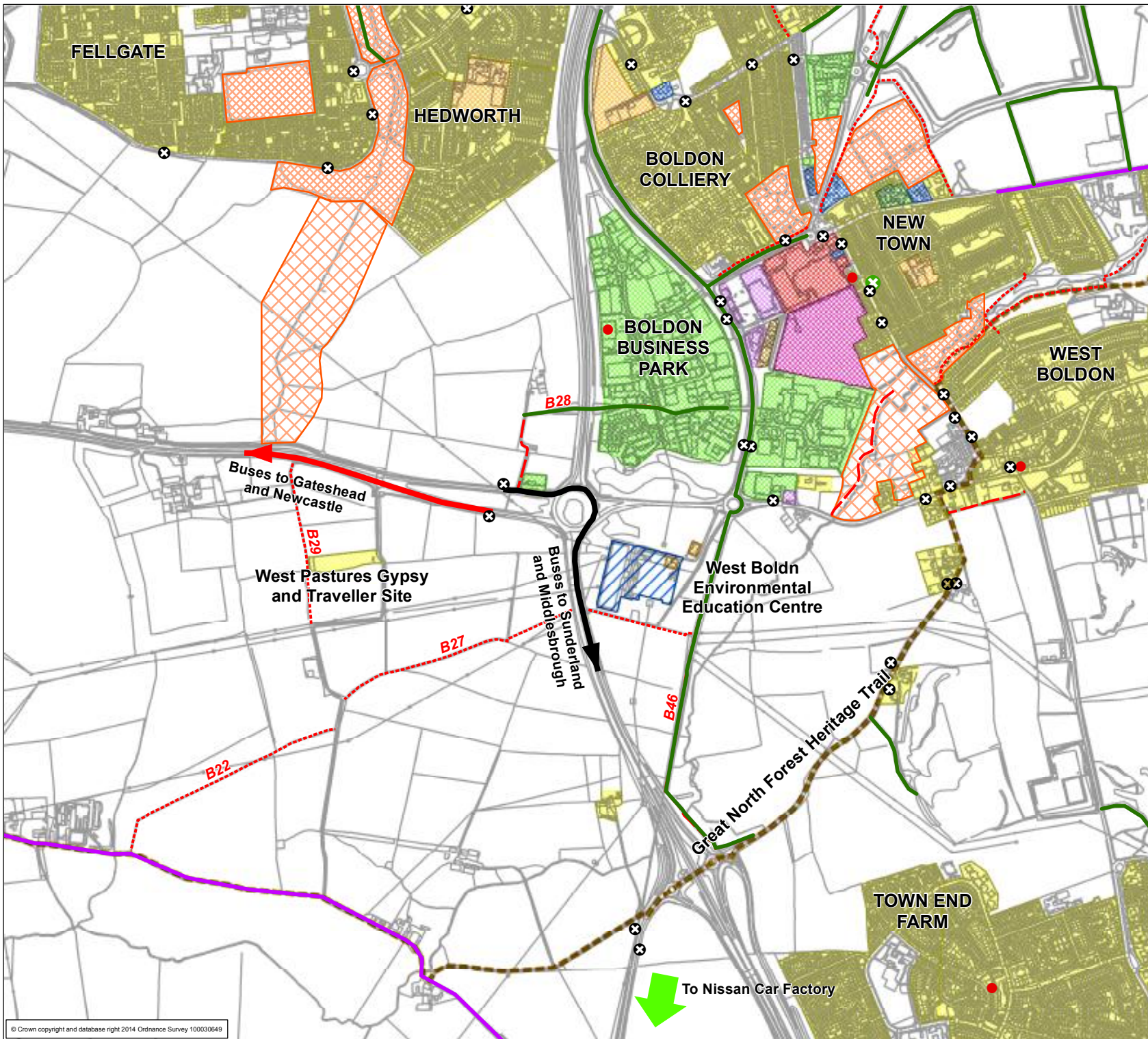
14.2 Existing and baseline knowledge

- 14.2.1 Figure 14.1 on the following page shows a number of key land uses relevant to 'Communities and Private Assets' described in this section.

Private property

- 14.2.2 The private property that has been considered under this topic area includes residential, commercial or industrial land in private ownership.
- 14.2.3 **Residential:** There are no residential properties located on the route. However, two residential properties lie close to the west side of the existing A19.
- 14.2.4 West House Farm Farmhouse lies approximately 110 m west of the existing A19 highway boundary. The house forms part of a wider agricultural holding flanking the west side of the A19, mostly to the north of the A184.
- 14.2.5 The second residential property close to the scheme is Make-Me-Rich Farm House, which lies approximately 75 m from the existing highway fence boundary and approximately 65 m from the proposed new boundary. The house lies on a smallholding located to the southwest of the proposed scheme.
- 14.2.6 **Commercial:** There are two active commercial properties adjacent to the scheme; Boldon Business Park and Enterprise Rent-A-Car, located on the northeast and northwest corners of the junction respectively.
- 14.2.7 Boldon Business Park lies to the east of the proposed scheme and north of Testos Junction. The business park covers an area of approximately 23 hectares. The 'Quadrus Centre', a landmark building located just north of Boldon Lake, is a hi-tech business centre occupied by small-to-medium sized service businesses, including a number of consultancy and recruitment firms.
- 14.2.8 Since the Testos scheme was last active the disused site to the northwest of the junction, which was formerly a specialist car dealership, has been acquired and developed by Enterprise Rent-A-Car.

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Legend

- Post Office
- ⊕ Health Facility
- ⊗ Bus Stop
- ⋯ Footpath
- Bridleway
- Traffic-free routes (National Cycle Network)
- On-road routes (National Cycle Network)
- Buses to Gateshead and Newcastle
- Buses to Sunderland and Middlesbrough
- ▨ Residential
- ▨ Employment Sites
- ▨ School, Education or Child Care
- ▨ Health Facility including Pharmacies
- ▨ Food Shop
- ▨ Leisure Facility/Restaurant or Fast Food
- ▨ Retail
- ▨ Other Community Facility
- ▨ Allotment
- ▨ Designated Open Space
- ▨ Proposed Open Space
- ▨ Electricity Sub-Station

Drawing Title

**FIGURE 14.1
NON-MOTORISED USERS
AND COMMUNITY**

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14.2.9 **Industrial:** An electricity sub-station jointly operated by National Grid and Northern Powergrid is located on land adjacent to the existing Testos Junction, east of the A19 and south of the A184.

14.2.10 The sub-station site incorporates Mount Pleasant Marsh Local Wildlife Site (Chapter 9). It also houses the West Boldon Environmental Education Centre, a purpose built environmental education centre with 13 hectares of land, which is a valued community resource. It was opened in August 2010 as a partnership project between Groundwork South Tyneside and National Grid, with funding and support from both partners. In addition to local schools, the centre is used by local community groups, youth projects, environmental professionals and teachers, and provides volunteering opportunities, training and event facilities.

Agricultural land and businesses

14.2.11 Most of the land required for the scheme is farmland, mainly lying to the west of the existing A19, with some smaller areas of farmland to the east. In 2006, the results of an agricultural desk-based assessment and walkover survey suggested that all of the agricultural land in the vicinity of the proposed improvement scheme is likely to fall outside the 'best and most versatile' category. A new survey in 2014 will confirm this.

14.2.12 In 2006, agricultural land use in the route corridor was mainly mixed arable, with some grazing livestock, including horses. Arable cropping was mainly cereals (wheat and barley) in rotation with oilseed rape. There was a limited area of grassland, used as permanent or long-term pasture for grazing, including by horses. No intensive beef cattle, dairy, pig or poultry enterprises lay within close proximity to the junction improvement scheme.

14.2.13 In 2006, eight farming units were identified in the vicinity of the proposed junction improvements. These were:

- Elliscope Farm, Follonsby Lane, West Boldon;
- Make-Me-Rich Farm, Follonsby Lane, West Boldon;
- Hylton Grove Farm, Follonsby Lane, West Boldon;
- West House Farm, Newcastle Road, West Boldon;
- Land at Downhill Lane Junction;
- Glebe Farm, Newcastle Road, West Boldon;
- Mount Pleasant Farm, Newcastle Road, West Boldon; and
- Land east of West Pastures

14.2.14 Land east of West Pastures is not affected by the scheme and was not therefore included in the pre-2009 EIA data-gathering and consultations.

Community land and facilities

14.2.15 Land which may be used by the community is defined in DMRB as:

- Common Land;
- Town or Village Green;
- Fuel or Field Garden Allotments (defined in the Acquisition of Land Act 1981); and
- Public Open Space.

14.2.16 There are three areas of community land within the study area that are covered by the DMRB definition.

14.2.17 Boldon Lake Local Wildlife Site (see Figure 5.1) is located immediately adjacent to the existing Testos Junction, east of the A19 and north of the A184. The lake is unfenced and open to the public.

14.2.18 Mount Pleasant Marsh Local Wildlife Site is located immediately adjacent to the existing Testos Junction, east of the A19 and south of the A184. Both Local Wildlife Sites are covered in more detail in Chapter 9.

- 14.2.19 In addition, the land adjacent to the river Don, approximately 1 km to the northeast of the scheme, is designated as public open space.
- 14.2.20 A section of land adjacent to the river Calf Close Burn, approximately 1 km to the northwest of the Testos Junction has been identified as proposed open space.
- 14.2.21 The key communities in the study area are:
- Fellgate and Hedworth, South Tyneside;
 - Boldon Colliery, South Tyneside; and
 - Town End Farm, Sunderland.
- 14.2.22 West Boldon is a built-up residential area to the east of Testos Junction, however it lies outside the study area.
- 14.2.23 The built-up residential areas of these communities are mainly located at the outer fringes of the study area. The areas closest to the scheme are predominantly open countryside within the Greenbelt, together with a commercially developed area at Boldon Business Park.
- 14.2.24 The Nissan Car Plant, although it lies outside the study area in Washington North, is a significant employer in the area. Past NMU surveys showed that some Nissan employees commute to and from the plant from Boldon Colliery, Fellgate and Hedworth, using the rights of way, cycle paths and roads in or near the study area (in particular, Bridleway B46, the 'Don Valley Footpath') – see Chapter 13.

Fellgate and Hedworth

- 14.2.25 Fellgate and Hedworth ward flanks the west side of the A19. It comprises two built-up residential areas located approximately 1 km northwest of Testos Junction, and a large rural area bisected by the A184. This area holds several farms and other isolated properties, including Make-Me-Rich Farm, West House Farm and Elliscrope Farm, which are the closest residential properties to the scheme. The built-up areas are self-contained communities with access to local facilities

such as shops, post offices, primary schools and the Fellgate Metro Station.

Boldon Colliery

- 14.2.26 Boldon Colliery is the closest community to the proposed junction improvements. The ward flanks the east side of the A19 for the whole length of the scheme.
- 14.2.27 The community comprises primarily residential areas at Boldon Colliery and West Boldon, and a commercial area at Boldon Business Park, all to the north of the A184, together with a rural area south of the A184.
- 14.2.28 Community facilities within Boldon Colliery include a cinema, restaurants and a large supermarket, as well as a parade of local shops, a post office and primary schools. These facilities are all located north of the A184 and east of the A19, mainly in and around Boldon Business Park. The community is fairly self-contained, in that most of the necessary local community facilities are available within its own built-up area.

Town End Farm

- 14.2.29 Town End Farm is a residential area within the boundaries of Sunderland City Council, to the southeast of Downhill Lane Junction. Town End Farm is a self-contained community with access to key facilities such as shops, a post office and primary schools within its own boundaries.

Effects on development land

- 14.2.30 Development land is defined in DMRB as:
- land that is covered by local planning authorities' future development land use designations as indicated in adopted and emerging development plans; or
 - land upon which planning permission has been granted for developments that have not yet been built, such as for housing development.

14.2.31 Table 14.1 shows a number of local developments identified through desk-based research, along with relevant planning policy that relates to them.

Table 14.1: Land use allocations

Planning Policy Document	Allocation Type and Location	Relevant Policy and Implications
South Tyneside Local Plan: Core Strategy (2007)	Employment Land at Boldon Colliery, to the north east of Testos Junction.	E1- Delivering Economic Growth and Prosperity. 40 ha of land allocated to meet economic development requirements, including 35 ha for new employment land and employment uses within mixed development sites.
South Tyneside Local Plan: Core Strategy (2007)	Transport links along the A19 Economic Growth Corridor.	A1 – Accessibility. Priority given to improving accessibility, particularly by encouraging and promoting public transport improvements, both within the borough and between the borough and the A19 Economic Growth Corridor, including the major employment area at Boldon Colliery.
South Tyneside Local Plan: Core Strategy (2007)	Greenbelt land immediately west of the A19.	EA1- Local Character and Distinctiveness. B) Focus on protecting and enhancing the openness of the greenbelt.
South Tyneside Local Plan: Core Strategy (2007)	Residential villages to the north and west of the A19 Testos Junction.	EA1- Local Character and Distinctiveness. C) Preserving the special and separate characters of urban fringe villages, including; Boldon Colliery, West Boldon and East Boldon.
South Tyneside Site-Specific	Transport links. B1298 Abingdon Way	SA2-I-xv. Enhancements and highway infrastructure

Planning Policy Document	Allocation Type and Location	Relevant Policy and Implications
Allocations (2012)	/ B1298 Henley Way Junction, Boldon Colliery. North east of the Testos Junction.	improvements for traffic movement and the reduction of congestion on the Strategic Road Network by 2021.
South Tyneside Site-Specific Allocations (2012)	Transport Links. B1298 Abingdon Way between the A184 Newcastle Road and the B1298 Henley Way, Boldon Colliery. East of the Testos Junction.	SA2-I-xvi. Enhancements and highway infrastructure improvements for traffic movement and the reduction of congestion on the Strategic Road Network by 2021.
South Tyneside Site-Specific Allocations (2012)	1.1 Hectares of Economic Development Land at Boldon Business Park, Brooklands Way	SA3-C-ix. Priority economic development site to be developed by 2016. Assumed to be equal mix business, general industrial and storage and distribution.
South Tyneside Site-Specific Allocations (2012)	Gypsy and Traveller Caravan Accommodation. Greenbelt land at West Pastures, to the west of Boldon and southwest of Testos Junction.	SA10-A. Allocated to provide for 13 permanent gypsy and traveller caravan pitches with opportunity for transit accommodation.

14.3 Potential impacts during construction

Private property

14.3.1 The proposed junction improvement scheme would not require the demolition of any properties. Certain properties would be in closer proximity to the A19 as a result of the scheme. The potential effects of the scheme on air quality and noise are addressed in Chapters 6 and 12 respectively.

- 14.3.2 The scheme would not require demolition or landtake from commercial properties, and would not affect the use of the car rental site. There is therefore no land-use impact in relation to commercial properties.
- 14.3.3 The scheme would not require any landtake from Boldon Business Park or affect the existing and proposed buildings on the business park. Occupiers of the business park may experience some slight disruption during the construction period, due to potential temporary road closures or diversions. However, during operation there would be slight long-term benefits as a result of reduced congestion and improved safety on the A19.
- 14.3.4 There would be no demolition of buildings at the electricity sub-station and landtake would not affect the operation of the sub-station.
- 14.3.5 The scheme requires the diversion of overhead power lines that originate at the substation to run underground. Two additional sets of cables that currently cross the A19 below ground would also be affected by the loss of pylons at the point where they switch to overhead routes.
- 14.3.6 Works to divert the cables and provide replacement pylons would not significantly disrupt the operation of the sub-station, and would not compromise electricity supply.

Agricultural land and businesses

- 14.3.7 There would be some loss of agricultural land, which was identified in 2006 as Grade 3b at best, and therefore not in the 'best and most versatile agricultural land' category. Loss of this land is unavoidable.
- 14.3.8 The proposed scheme would not cause any farm unit to lose access to any of its land, or to lose access routes that are currently available.
- 14.3.9 The original construction of the A19 interrupted pre-existing land drainage systems, and it is understood that this created an occasional problem of ponding and waterlogging in some

of the land adjacent to the west side of the A19. The proposed scheme would include drainage design to collect and remove water draining off the adjacent land to the west. This will to some extent alleviate the existing problem. The scheme would have no effect on agricultural water supply.

Community land and facilities

- 14.3.10 The proximity of Boldon Lake Local Wildlife Site to the scheme construction site means that there could be some minor loss of amenity during the construction period.
- 14.3.11 The scheme would require a small-scale permanent loss of land on the western fringes of Mount Pleasant Marsh Local Wildlife Site. The ecological impacts of this effect are taken into account in Chapter 9. The operations of the West Boldon Environmental Education Centre are not likely to be significantly affected by this permanent landtake; however, they could be affected by temporary works to divert overhead power lines.
- 14.3.12 The designated open space land adjacent to the river Don, approximately 1 km northeast of the scheme, is not likely to be affected by the scheme.
- 14.3.13 The communities within the study area are largely self-contained and the non-motorised user survey undertaken as part of the pre-2009 EIA work showed a low level of use of the local rights of way, cycle routes and roads for commuting. It is recognised there would be temporary impacts along the majority of the pedestrian, equestrian and cyclist routes in the vicinity of the proposed scheme. These impacts are covered in Chapter 13.

Effects on development land

- 14.3.14 Apart from some potentially minor, temporary disruption to Boldon Business Park and the Travellers' site at West Pastures, there would be no significant effect on any extant planning permissions or outstanding planning applications during construction.

14.4 Potential mitigation for construction impacts

Private property

- 14.4.1 No mitigation measures are required in respect of residential property for the scheme.
- 14.4.2 The effects of disruption during construction on businesses in Boldon Business Park would be minimised or avoided through measures in the Construction Environmental Management Plan. These could include restrictions on the routes to be taken by construction traffic and careful design/timing of temporary road closures or diversions.
- 14.4.3 The works to divert electricity power cables would be designed, managed and implemented in consultation with the operator (Northern Powergrid) and National Grid, in line with standard procedures for the diversion of statutory undertakers' equipment. This would minimise or avoid any disruption to electricity supply or the operation of the sub-station.

Agricultural land and businesses

- 14.4.4 The loss of some Grade 3b agricultural land is unavoidable, therefore no mitigation is proposed.
- 14.4.5 A scheme for sustainable use of soil resources within the scheme (a 'Soil Management Plan') would be devised. This would include the restoration to agricultural use of any temporarily used agricultural land, where possible, and the sustainable use of any surplus topsoil produced by the construction process.
- 14.4.6 Maintaining access to farmed land during the works can be achieved, to enable continued farming on all holdings. However, this might involve extended journeys for some occupiers on public roads between blocks of land.

Community land and facilities

- 14.4.7 Any temporary loss of amenity at Boldon Lake and Mount Pleasant Marsh Local Wildlife Sites during construction would

be minimised through measures in the Construction Environmental Management Plan.

- 14.4.8 Mitigation proposed to mitigate the effects of cable diversion works on the West Boldon Environmental Education Centre, will be undertaken in consultation with the centre management, the substation operator Northern Powergrid and National Grid. Mitigation is likely to involve adopting a modified construction method (see Section 2.5), to minimise the area of vegetation clearance required and reduce both the severity and the duration of disruption to its operations.

Effects on development land

- 14.4.9 Any minor, temporary impacts on development land such as that at Boldon Business Park and West Pastures Travellers' Site would be mitigated, where possible, by adhering to the Construction Management Plan and following standardised construction procedures.

14.5 Potential impacts during operation

Private property

- 14.5.1 West House Farm Farmhouse, Make-Me-Rich Farmhouse and a number of properties in Hedworth and Boldon Colliery are located less than 100 m from the scheme. These properties may experience greater air quality and noise impacts resulting from increases in traffic.
- 14.5.2 For West House Farmhouse in particular, the distance to the A19 would be reduced from approximately 110 m at present to approximately 45 m (to the northbound on-slip road).
- 14.5.3 The potential effects of the scheme in terms of air quality and noise are addressed in Chapters 6 and 12 respectively.
- 14.5.4 As the scheme would require no demolition or land-take from commercial properties, the land-use impact on commercial properties is not considered to be significant.

- 14.5.5 Occupiers of the Boldon Business Park and Enterprise Rent-A-Car may experience some slight long-term benefits as a result of reduced congestion and improved safety on the A19.
- 14.5.6 There would be no demolition of buildings at the electricity sub-station and land-take would not affect its operation. The scheme does require the diversion of overhead power lines that originate at the substation to run underground. More information about this effect is given in Chapter 8.
- 14.5.7 Two additional sets of cables that currently cross the A19 below ground would also be affected by the loss of pylons at the point where they switch to overhead routes. The existing underground routes would need to be extended, and new pylons provided west of the new A19 boundary.
- 14.5.8 Works to divert the cables and provide replacement pylons would not significantly disrupt the operation of the sub-station, and would not compromise electricity supply.

Agricultural land and businesses

- 14.5.9 The potential impacts on agricultural land and businesses during operation of the scheme are the same as those outlined for during construction (see above).

Community land and facilities

- 14.5.10 The proposed scheme would not require any land-take or loss of vegetation surrounding Boldon Lake Local Wildlife Site, and the use of the site would be unaffected during operation of the road.
- 14.5.11 The scheme would require a small-scale permanent loss of land on the western fringes of Mount Pleasant Marsh Local Wildlife Site. The ecological impacts of this effect are taken into account in Chapter 9. This land is owned by National Grid and used by the West Boldon Environmental Education Centre. As it is arranged in a narrow strip along the present western boundary of the site, and is mostly heavily vegetated at present, the operations of the Environmental Education

Centre at West Boldon Lodge are not likely to be significantly affected by this permanent land-take.

Effects on development land

- 14.5.12 The effect on extant planning permissions or outstanding planning applications will be limited to minor, temporary disruption during construction only. There will be no significant impacts during operation.

14.6 Potential mitigation / enhancement for operational impacts

Private property

- 14.6.1 Mitigation options for Air and Noise impacts on private properties are outlined in Sections 6 and 12 respectively.

Agricultural land and businesses

- 14.6.2 Access to agricultural land adjacent to the scheme will be maintained as fully as possible during both construction and operation of the scheme.
- 14.6.3 A new Private Means of Access (PMA) is likely to be required from the northbound connector road, to ensure continued access into a grass field belonging to Elliscope Farm.
- 14.6.4 The scheme may also require provision of a second PMA from the southbound connector road, allowing continued access to land currently farmed as part of Mount Pleasant Farm, to the south of the sub-station.
- 14.6.5 The potential disruption of land drainage systems would be mitigated through the provision of effective drainage outlets.

Community land and facilities

- 14.6.6 Discussions will be sought with the management of West Boldon Environmental Education Centre and National Grid to identify potential opportunities to provide permanent improvements to the facilities there as part of the project. Additional opportunities would be identified to provide educational facilities or activities during the construction

process that would enhance the centre's programme of activities.

Effects on development land

- 14.6.7 As there would be no significant effect on any extant planning permissions or outstanding planning applications during operation, no mitigation is required.

15 ROAD DRAINAGE AND THE WATER ENVIRONMENT

15.1 Introduction

- 15.1.1 This topic covers the hydrology (including water quantity and flood risk) and water quality of surface waters and groundwater, taking account of the construction and operational impacts of the scheme.
- 15.1.2 In parallel with this, a separate assessment will be completed in response to Water Framework Directive (WFD) legislation. This assessment is proposed to be appended to the ES, with the main findings summarised within the road drainage and the water environment chapter.
- 15.1.3 The understanding of the water environment expressed in this report has been derived from pre-2009 EIA work and the Comparative Environmental Assessment report (2009). Updated information has been obtained from online sources, such as Environment Agency water quality data. Additional information will be obtained through site visits as the EIA progresses.
- 15.1.4 The study area for this topic is based on the features and attributes of the water environment in the surrounding area that have the potential to be affected by the project. It has not been defined as a measured zone around the project location.

15.2 Existing and baseline knowledge

- 15.2.1 Figure 5.1 in Chapter 5 illustrates the indicative environmental constraints for the wider study area, including the key water environment features.
- 15.2.2 The River Don rises north of Washington and flows in a generally easterly direction, mainly through farmland, until it meets the A19 at Downhill Lane Junction, approximately 980 m south of Testos Junction. At Downhill Lane, the River Don passes beneath the A19 in a culvert approximately 160 m long. The river then follows a sinuous, but generally northerly course, between fields for around 1 km and then

through a predominantly urban area, to discharge into the tidal River Tyne at Jarrow.

- 15.2.3 The Environment Agency classifies the River Don as a heavily modified water body (i.e. its shape or form has been significantly altered by people over time). The River Don is classified as being of 'good' ecological potential from its source to its confluence with the River Tyne. The River Don is not classified for chemical quality. It is not a designated fishery.
- 15.2.4 The Environment Agency records available in May 2014 show three pollution incidents involving the River Don, all being 'significant' incidents (potentially causing significant damage to ecology or use of the river). None of these were near to Testos Junction. Two incidents in 2001 and 2002 involved the spillage of sewerage/storm overflow and unspecified pollutants into the River Don, while a third in 2005 involved oils and fuel at a tributary to the river.
- 15.2.5 Calf close Burn, a tributary of the Don whose confluence with the river is over 2 km north (and downstream) of the scheme, lies just over 800 m west of Testos Junction. It flows directly northwards, into and through the residential area of Fellgate. It is a candidate Local Wildlife Site, given interest in its lowland fen habitat, which included a large reedbed. It is not a designated fishery.
- 15.2.6 Boldon Lake is a small artificial lake situated directly northeast of Testos Junction, designated by the local planning authority as a Local Wildlife Site (LWS). The site comprises a lake fringed by marginal vegetation, with a surrounding strip of marshy grassland. Boldon Lake is popular with anglers.
- 15.2.7 Mount Pleasant Marsh is an LWS located at the southeast corner of Testos Junction roundabout, and comprises open water, reed-beds, marshy grassland, scrub and plantation woodland, all surrounding a large electricity sub-station. Make-Me-Rich Meadow is a marshy meadow also designated

as an LWS, located near Downhill Lane Junction. The meadow is located between the left bank of the River Don and Bridleway B46 (the 'Don Valley Footpath', following the former Stanhope & Tyne Railway). It is believed that the natural conditions that maintain the wetness of the meadow are due to its location within the floodplain of the River Don.

- 15.2.8 There is a Secondary A aquifer in the bedrock beneath the project area. There is no aquifer in the superficial deposits. The site is not in a groundwater source protection zone. The groundwater vulnerability beneath the site is classified as low.
- 15.2.9 The Environment Agency's on-line flood maps indicate that Testos Junction does not lie within a floodplain. However, the A19 just north of the Downhill Lane Junction, crosses over the River Don and its floodplain.
- 15.2.10 In terms of highway drainage, run-off from the A19 in the vicinity of Testos Junction drains to the River Don via a number of local highway drainage outfalls. This includes a direct outfall to the River Don near Downhill Lane Junction, a pipe beside Mount Pleasant Marsh which is believed to enter the River Don approximately 500 m east of the A19, and a highway drainage system from the Testos Junction itself and the A19 to the north which drains into the River Don, 2 km north of Testos Junction.
- 15.2.11 A former outfall into Boldon Lake, northeast of Testos Junction, is no longer in use and has been sealed shut.

15.3 Potential impacts during construction

- 15.3.1 Without considering any form of mitigation, the construction of highway schemes has the potential to have impacts on the water environment in the following ways:
 - mobilisation of sediments, particularly during earthworks and high rainfall events;
 - inadvertent discharge to surface waters or groundwater;

- disruption of groundwater or surface water flows, in particular in areas where excavations are proposed (i.e. road cuttings and/or borrow pits); and
- the risk that construction works could create new pathways for contaminants to migrate into water receptors; and
- loss of floodplain storage, either temporarily or permanently.

- 15.3.2 There is also the potential for pollution in surface water runoff or from on-site spills by sediment and polluting substances (e.g. oils, fuels etc.).
- 15.3.3 There are standard construction techniques and best practices to avoid or reduce these potential environmental impacts as summarised below.

15.4 Potential mitigation for construction impacts

- 15.4.1 During the construction process, best practice would be followed to address the potential impacts detailed above, including the Environment Agency's Pollution Prevention Guidelines. These would all be clearly documented in method statements and a bespoke Construction Environmental Management Plan.
- 15.4.2 Site drainage would be programmed early in the construction sequence, to ensure that any run-off from the site can be intercepted and controlled. This would include early construction of the proposed permanent balancing ponds and the connection of the construction site drainage to the balancing ponds.
- 15.4.3 Other mitigation would include:
 - oil, fuel and chemical storage tanks for use during construction kept as far away from the key water environment receptors as possible;

- bunding and/or storage facilities with impervious walls and floors installed around oil, fuel and chemical tanks at least 110% of the volume of the protected tank;
- appropriate and legislatively compliant disposal of waste oils;
- minimising areas of exposed surface in the vicinity of watercourses;
- use of wheel wash facilities to minimise the spread of silt;
- minimising the gradient of exposed surfaces where possible to help reduce run-off; and
- mixing of concrete in a designated area away from any potential receiving waters.

15.4.4 Additional mitigation would be reviewed as part of the EIA and specified in the forthcoming Environmental Statement. This could include, for example, use of water-based drilling fluids, using inert bentonite clay as a lubricant, specifying drilling methods to avoid proximity of equipment and entry site to receiving waters, and containment of used drilling muds in sealed containers.

15.5 Potential impacts during operation

- 15.5.1 Without mitigation measures incorporated into the drainage design, there is a risk of contaminated road runoff being discharged to the receiving water environment. Potential contaminants can include:
- fuel and other oil deposits that have leaked onto the road surface;
 - hydrocarbons from exhaust deposits;
 - lead, copper, zinc and cadmium deposits from exhaust emissions and tyre wear;
 - synthetic rubber deposits from tyre wear;
 - chemicals used in windscreen washes such as detergents or de-icer;

- de-icing agents such as salt, but also potentially including trace amounts of impurities such as cyanide, metals and clays;
- herbicides from road-side verge maintenance; and
- chemicals or oils that result from spillage and leakage after traffic collisions.

15.5.2 Without mitigation in place, highway runoff has the potential to cause adverse effects on various attributes of the receiving waters, such as water quality, water supply, dilution of waste products, conveyance of flow, and biodiversity. The effects depend on a number of contributory factors, such as the size of the area of paved surfaces in the highway, volume and composition of the traffic using the road and the amount of water in the water body.

15.5.3 The junction improvements would result in a greater area of impermeable surfaces than presently exists, leading to increased volumes of surface water run-off.

15.6 Potential mitigation for operational impacts

15.6.1 The proposed A19 Testos Junction improvement scheme of 2009 included two balancing ponds in the drainage design to attenuate the rate of surface water run-off. They were designed to achieve no net increase in the rate of runoff prior to discharge into the River Don, and thus no net increase in flood risk. The drainage design (e.g. presence and number of balancing ponds) and attenuation requirement will be revisited as part of the EIA.

15.6.2 A secondary effect of balancing ponds would be to retain, and to a certain extent to treat, sediment and pollutants associated with the sediment fraction of drainage run-off. In particular, balancing ponds are particularly effective at allowing metals which are present as contaminants in the run-off water to settle out before the water is released into the environment. Other forms of water storage (e.g. water tanks) can achieve similar benefits, and may be considered as part of the EIA.

- 15.6.3 It is likely that shut-off valves would also be provided, enabling any fuel or chemical spillages to be contained within the ponds (or other water storage, as appropriate).
- 15.6.4 The drainage design will be developed in line with current DMRB guidance, which may modify and revise that published in the 2009 CEAR. At this stage, it is expected that attenuation ponds are likely to form an important part of the design.

16 CUMULATIVE EFFECTS

16.1 Introduction

- 16.1.1 Two types of cumulative effects will be assessed. The first type is where multiple impacts from the A19/A184 Testos Junction Improvement would affect the same receptor, for example if a residential property were affected by noise and also changes in visual amenity. The second type is where the impacts of this project could combine with the impacts of other proposed developments and affect the same receptor(s).
- 16.1.2 The A19/A184 Testos Junction Improvement would be planned and co-ordinated in line with other road infrastructure projects within the vicinity to ensure that cumulative effects are managed. For example, the A19/1058 Coast Road junction Improvement to the north of this scheme is currently moving towards submission of an application for a Development Consent Order (DCO) in autumn 2014, with construction programmed to begin in spring 2016. The progress of this scheme will be monitored and any cumulative impacts managed.
- 16.1.3 Potential and “committed” developments will be further reviewed as the Testos scheme progresses, in consultation with relevant stakeholders, in order to assess potential cumulative effects.
- 16.1.4 These projects will include, but not necessarily be limited to:
- Trunk road and motorway projects that have been confirmed (i.e. gone through the statutory processes and achieved authorisation), and
 - Development projects with planning permissions as granted by the Local Planning Authority, and for which formal EIA is a requirement or for which non-statutory environmental impact assessment has been undertaken.
- 16.1.5 Other proposed developments will identified and reviewed for potential cumulative effects in combination with the scheme,

and their consideration and any significant cumulative effects identified will be reported in the forthcoming ES.

16.2 Interactions between topics

- 16.2.1 There are several areas where the impact of the junction improvements on one environmental topic may have knock-on effects on a second topic. In addition, the provision of mitigation measures for one topic may have either adverse or beneficial effects on another topic. The majority of such interactions are addressed within the individual specialist chapters, and only a summary of certain key aspects is presented here, with cross-references to the relevant sections within the report.

Potential cumulative effects

- 16.2.2 Adverse effects on surface water quality and flood risk in the River Don (see Chapter 15) could have knock-on impacts on ecological receptors in the river corridor (see Chapter 9). However, the provision of balancing ponds to prevent increased flood-risk also provides protection that does not currently exist against pollution from both routine run-off and from spillage events. This would protect and enhance water quality, and therefore should improve existing conditions in habitats used by, for instance, otters and water voles.
- 16.2.3 The creation of new routes for Public Rights of Way (PRoWs; see Chapters 2 and 13) increases the land required for the scheme. This has adverse effects on land use (Chapter 14), in particular for West House Farm and for Mount Pleasant Marsh. As the latter is a designated Local Wildlife Site (LWS) and is used by West Boldon Environmental Education Centre, this also has implications for ecological receptors (Chapter 9) and for community and private assets (Chapter 14).
- 16.2.4 Scots House is considered as a visual receptor (see Chapter 8), because of the potential effects on residents of changes in the views available from the flats in the house. Visual amenity effects on Scots House are also considered

separately in Chapter 7, in the context of the ‘setting’ of the Listed Building. Although both potential effects relate to the visual impact of the proposed junction improvements, the nature of the effect and the sensitivity of the receptor differ in these two different contexts. The resulting significance of impact is therefore not the same.

Mount Pleasant Marsh / West Boldon Environmental Education Centre

- 16.2.5 The scheme would require a small strip of permanent land-take along the western boundary of Mount Pleasant Marsh. This land is required to permit construction of the new slip-road leading from the roundabout to the raised A19 southbound carriageway. The amount of land required may vary according to the option for NMU provision selected (see Section 2.4), as certain options would include the diversion of Footpath B27 through this area to a new signal-controlled crossing point at the roundabout. This would permanently remove a small proportion of the existing plantation woodland within the LWS (see Chapter 8 for the effect of this change on the landscape, and Chapter 9 for its effect on ecology). However, it is not considered that this loss will significantly affect the operations of West Boldon Environmental Education Centre (see Chapter 14).
- 16.2.6 The construction of the raised carriageway requires the diversion of existing overhead power lines to new underground routes, where they cross the A19. The pylons associated with the overhead lines would be removed. Three rows of pylons originating within Mount Pleasant Marsh would be affected by the scheme.
- 16.2.7 The works to divert the overhead cables comprise four key elements:
- civil engineering works to provide a new underground route;
 - construction of three new pylons west of the A19 and installation of new cables in the underground route;

- connection of the new cables to the electricity distribution network; and
- removal of the redundant overhead cables and of six redundant pylons, including three within Mount Pleasant Marsh.

- 16.2.8 The civil engineering works would be designed and implemented by the Main Contractor (Costain), but must meet the technical requirements of the electricity distribution company (Northern Powergrid). The remaining works would be designed and implemented by Northern Powergrid. All of the works would be purchased by the Highways Agency and managed by the Main Contractor. All of the design work would be done during the detailed design or construction phases of the project, after project authorisation.
- 16.2.9 Conventional construction methods would involve placing the new cables in an open cut trench. After connection of the new cables to the electricity distribution network, the redundant overhead cables would be disconnected and lowered to the ground.
- 16.2.10 To facilitate these works, a total of up to 8,000 m² of vegetation would be cleared, divided between three corridors, each up to 40 m wide, along each set of overhead wires. To protect the buried cables, it would probably be necessary to maintain permanent clear corridors in which the vegetation could not be replaced. This would prevent the full replacement of lost habitat, and would open views from within West Boldon Environmental Education Centre towards the A19 and the southbound on-slip road. There would also be glimpsed views from the road towards the electricity sub-station, a significant visual detractor.
- 16.2.11 Additionally, safety considerations mean that access would be denied to the western part of the LWS for users of the centre for the whole duration of the works (provisionally, four weeks in winter and six weeks in summer). The area affected by clearance and by temporary denial of access is in

regular use by the centre for teaching activities, all year round. It includes a bird-watching/feeding area, with recently-constructed hides, a tree nursery, willow bowers and other features.

- 16.2.12 Notwithstanding the above adverse effects, in the long term, the removal of three existing pylons within Mount Pleasant Marsh and the overhead lines leading westwards from them would be a beneficial effect for the users of West Boldon Environmental Education Centre.

16.3 Potential mitigation

Interactions between topics

- 16.3.1 Mitigation and, where relevant, enhancement measures relating to impacts discussed above are addressed in the individual specialist chapters, except in relation to Mount Pleasant Marsh / West Boldon Environmental Education Centre, which is dealt with here.

Mount Pleasant Marsh / West Boldon Environmental Education Centre

- 16.3.2 All of the works would be carried out in accordance with a Specification agreed between Costain and Northern Powergrid, designed to reduce environmental impact.
- 16.3.3 Where practicable, and subject to an agreement with Northern Powergrid, the civil engineering works east of the A19 would be carried out using trenchless construction methods. It is provisionally intended that this would comprise directional drilling, and the description given here is also provisional pending further discussions with Northern Powergrid.
- 16.3.4 The drilling plant would operate in a pit placed west of the A19, drilling towards a reception pit adjacent to the sub-station fence within Mount Pleasant Marsh.
- 16.3.5 The redundant cables would be removed using scaffolding towers with nets strung between them, again to reduce the

amount of vegetation clearance required. Where vegetation clearance cannot be avoided, it should be possible to re-plant the majority of the cleared area, as the cables would be protected by robust plastic pipes.

- 16.3.6 Preliminary estimates suggest that implementation of the alternative construction methods described above would reduce the area of vegetation clearance by half. Instead of three corridors across the full width of the site, this area would comprise approximately nine isolated blocks of land to provide 'reception pits' for the trenchless construction, and to allow construction of scaffolding towers).
- 16.3.7 During the civil engineering works, the area to which access would be denied for West Boldon Environmental Education Centre's operations would be minimised. It is intended that through such temporary landtake minimisation, the centre's programme of activities would be able to continue with a minimum of hindrance. Disruption during the works by Northern Powergrid would also be reduced.

17 NEXT STEPS

17.1 Consultation

- 17.1.1 The Highways Agency wishes to obtain the views of the public on the draft proposals for the proposed scheme design as it has been developed up to October 2014, taking into account the potential environmental effects of the proposed scheme. Those views can then be taken into account in finalising the design and refining the environmental impact assessment (EIA) and Environmental Statement (ES).
- 17.1.2 Consultation at this stage follows previous consultation of the community in March 2009. The previous consultation was about choosing the best option for the improvement, between two offline and one online alternative. The current consultation is about more detailed proposals that have now been developed for the online option that was selected.
- 17.1.3 There will be a seven-week period from 13 October 2014 for members of the public to respond to the consultation. Responses can relate to the preliminary environmental information set out in this report or to any other aspect of the proposed scheme. They can be made by completing a questionnaire by letter by e-mail or online, using any of the following addresses:

A19 Testos Project Team
Major Projects, Highways Agency
3 South,
Lateral,
8 City Walk,
Leeds,
LS11 9AT.

Website: <http://www.highways.gov.uk/roads/road-projects/a19-testos-junction-improvements/>

Email: a19testosjunctionimprovements@highways.gsi.gov.uk

17.2 After the consultation

- 17.2.1 After the consultation period, all responses will be considered in finalising the proposed scheme design and the ES. A report will be prepared on the responses received and how they have been taken into account, including whether or not they led to changes to the proposed scheme.
- 17.2.2 The Highways Agency is required to seek authorisation to construct the proposed scheme through an application to the Secretary of State through the Planning Inspectorate (as responsible agency) for a Development Consent Order (DCO). The ES will be submitted with the DCO application in summer 2015. Once accepted by the Planning Inspectorate on behalf of the Secretary of State, the public will have further opportunity to comment on the application. Information about how the process works can be found on the National Infrastructure Planning website¹⁷ and information is also provided in the A19 Testos Junction Consultation Brochure.

¹⁷ The Planning Inspectorate (2012). National Infrastructure Planning. Available at: <http://infrastructure.planningportal.gov.uk/>

APPENDIX A: GLOSSARY

AADT	Annual Average Daily Traffic
AHLV	Area of High Landscape Value
AOD	Above Ordnance Datum
AQMA	Air Quality Management Area
AQO	Air Quality Objective
BAP	Biodiversity Action Plan
CCTV	Closed-Circuit Television
CEAR	Comparative Environmental Assessment report
CEMP	Construction Environmental Management Plan
dB	Decibel
DCO	Development Consent Order
DMRB	Design Manual for Roads and Bridges
ECI	Early Contractor Involvement
EIA	Environmental Impact Assessment
ES	Environmental Statement
HA	Highways Agency
HER	Historic Environment Records
HDV	Heavy Delivery Vehicle / Heavy Duty Vehicle
HGV	Heavy Goods Vehicle
IAN	Interim Advice Note
JNCC	Joint Nature Conservation Committee
LBAP	Local Biodiversity Action Plan
LCU	Landscape Character Unit
LNR	Local Nature Reserve
LWS	Local Wildlife Site

NMU	Non-Motorised User
NO ₂	Nitrogen Dioxide
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
OS	Ordnance Survey
PEI	Preliminary Environmental Information
PM ₁₀	Particulate Matter with a diameter of 10 micrometres or less
PRoW	Public Right of Way
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SoCC	Statement of Community Consultation
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
SWMP	Site Waste Management Plan
TAG	Transport Appraisal Guidance
TAMMS	Tyneside Area Multi-Modal Study
UKBAP	UK Biodiversity Action Plan
WFD	Water Framework Directive