A1 in Northumberland: Morpeth to Ellingham

Scheme Number: TR010059

6.40 Environmental Statement Addendum: Southern Access Works for Change Request

Rule 8(1)(c)

Planning Act 2008

Infrastructure Planning (Examination Procedure) Rules 2010

March 2021

Infrastructure Planning

Planning Act 2008

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2010

The A1 in Northumberland: Morpeth to Ellingham

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CONTENTS

TABLES

APPENDICES

1 INTRODUCTION

1.1 PURPOSE OF ES ADDENDUM

1.1.1. This Environmental Statement Addendum (this "ES Addendum") to the Environmental Statement (ES) [**APP-035** to **APP-336**] supports a request to amend an application for development consent [**REP3-004** and **005**].

1.1.2. An application for development consent [**REP3-004** and **005**], which included the ES [**APP-035** to **APP-336**], was submitted by Highways England (the “Applicant”) to the Secretary of State for Transport via the Planning Inspectorate (the "Inspectorate") on 7 July 2020 for the A1 in Northumberland: Morpeth to Ellingham (“the Scheme”).

1.1.3. The Scheme is formed of two parts known as Part A (Morpeth to Felton) and Part B (Alnwick to Ellingham). A full description of the Scheme can be found at **Chapter 2: The Scheme** of the ES [**APP-037**]. The ES sets out the findings of the Environmental Impact Assessment (EIA) that was carried out for the Scheme.

1.1.4. The application was accepted for Examination on 4 August 2020.

1.1.5. As is normal in relation to any engineering project, further design development of the Scheme has continued to be undertaken by the Applicant since the application for the Development Consent Order (DCO) was made in order to release efficiencies and design benefits. This is particularly important in optimising a scheme being delivered by the public sector in the public interest.

1.1.6. The proposed amendment to the application that this ES Addendum relates to the provision of a temporary access to the southern bank of the River Coquet (the “Southern Access Works”) by crossing the river from the temporary working area on the northern bank as extended in order to accommodate the proposed land stabilisation north of the River Coquet (the “Stabilisation Works”) (described in **Environmental Statement Addendum: Stabilisation Works for Change Request**) instead of creating an access track down the southern river embankment as described in **Chapter 2: The Scheme** of the ES [**APP-037**]. In addition, it is anticipated that there would be some temporary river training works along the southern riverbank. Temporary land outside the existing Order limits of Part A would be required as a working area to facilitate the river crossing. In addition, the Applicant has determined the need for additional permanent scour protection on the southern bank in light of the latest ground investigation information, taking into account the presence of scour protection for the existing pier and the results of a preliminary hydraulic calculations of distributed design flows and velocities within the river corridor as detailed in **Appendix E: Preliminary Scour Assessment** of this ES Addendum.

1.1.7. The details of the Southern Access Works as proposed in this ES Addendum to the application are described in **Chapter 2: Southern Access Works** of this ES Addendum and shown on **Figure 1: Southern Access Works Proposals** in **Appendix A: Figures** of this ES Addendum.

1.1.8. The purpose of this ES Addendum is to ensure that the environmental impacts of the Southern Access Works have been appropriately assessed with any likely significant environmental effects identified, and to satisfy the requirements of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regulations).

1.1.9. This ES Addendum presents a combined assessment of the likely significant effects as a result of the inclusion of the Southern Access Works (described in **Chapter 2: Southern Access Works**) and the Stabilisation Works (described in **Environmental Statement Addendum: Stabilisation Works for Change Request**) in the application. It is not a duplication of the ES submitted with the application for development consent and should be read in conjunction with the ES.

1.2 SCOPE OF THE ES ADDENDUM

1.2.1. In order to understand if there would be significant environmental effects as a result of the inclusion of the proposed temporary Southern Access Works in the application, a desktop assessment was carried out. The purpose of the desktop assessment was to consider whether the Southern Access Works would alter the conclusion of the EIA already undertaken and reported in the ES. The outcome of the desktop assessment then informed a scoping exercise to identify if further EIA, in accordance with the EIA Regulations, would be required. The findings of the scoping exercise are presented in **Appendix B: Summary of Proposed Changes to Application** of this ES Addendum which sets out the proposed extent of the Southern Access Works and proposed approach to assessment of environmental impacts. Certain topics have been scoped out of the assessment, and reasonings are provided within this Appendix. The topics of Cultural Heritage and Geology and Soils have been scoped out in their entirety.

1.2.2. **Appendix B: Summary of Proposed Changes to Application** of this ES Addendum indicates that the Southern Access Works have the potential to change the conclusions of Part A of the ES, for the:

a. Construction assessment for **Chapter 5: Air Quality Part A** of the ES [**APP-040**];
b. Construction assessment for Chapter 6: Noise and Vibration Part A of the ES [APP-042];
c. Construction and operational assessment for **Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**];
d. Construction and operational assessment for **Chapter 9: Biodiversity Part A** of the ES [**APP-048]**;
e. Construction and operational assessment for Chapter 10: Road Drainage and the Water Environment Part A of the ES [APP-050];
f. Construction assessment for Chapter 12: Population and Human Health Part A of the ES [APP-054];
g. Construction assessment for Chapter 13: Material Resources Part A of the ES [APP-056];
h. Construction assessment for **Chapter 14: Climate Part A** of the ES [**APP-058**];
i. Construction assessment for Chapter 15: Assessment of Combined Effects Part A of the ES [APP-060];

j. Construction assessment for Chapter 16: Assessment of Cumulative Effects of the ES [APP-062]

1.2.3. The findings of the scoping exercise at **Appendix B: Summary of Proposed Changes to Application** of this ES Addendum confirmed that the Southern Access Works do not change the conclusions of Part B of the ES due to the localised nature of the works in Part A.

1.2.4. This ES Addendum therefore presents an assessment of the likely significant effects as a result of the Southern Access Works upon the above environmental topics.

APPROACH TO THE ASSESSMENT

1.2.5. The assessment has been carried out in line with the methodologies described in the ES, using the professional judgement of the competent experts detailed within the ES, unless otherwise stated in the relevant technical chapters in this ES Addendum.

1.2.6. The mitigation measures detailed in Outline Construction Environmental Management Plan (Outline CEMP) [REP3-013 and 014] still apply for the Southern Access Works. Table E-1 in Appendix E: Register of Environmental Actions and Commitments of the ES Addendum details those measures that are additional or require amendment to those shown in the Outline CEMP [REP3-013 and 014] for the Southern Access Works. If the Southern Access Works are accepted by the Planning Inspectorate and Secretary of State for Transport, then the measures in Table E-1 will be incorporated into the Outline CEMP.

1.2.7. The scoping exercise presented in **Appendix B: Summary of Proposed Changes to Application** of this ES Addendum identifies that the Southern Access Works have the potential to change the conclusions of **Chapter 15: Assessment of Combined Effects Part A** of the ES [**APP-060**]. The Southern Access Works described in **Chapter 2: Southern Access Works** of this ES Addendum are dependent on implementation of the Stabilisation Works described in **Environmental Statement Addendum: Stabilisation Works for Change Request**, with the proposals described in both Addendums being undertaken concurrently. In order to assess the combined effects of the proposals described in both Addendums, where relevant, the assessment of each environmental topic presented in this ES Addendum has considered the following:

a. The baseline conditions described account for and assume the creation of the working area platform implemented as part of the Stabilisation Works.
b. The assessment of likely significant effects considers the combined effects of the Stabilisation Works (described in **Chapter 2: Stabilisation Works** of **Environmental Statement Addendum: Stabilisation Works for Change Request**) together with the proposals described in **Chapter 2: Southern Access Works** of this ES Addendum.

1.2.8. The proposals subject to this combined assessment are shown on **Figure 2: Overview of Proposals Assessed** in **Southern Access Works ES Addendum** in **Appendix A: Figures** of this ES Addendum.

CONSULTATION

1.2.9. A summary of consultation undertaken prior to the non-statutory consultation which commenced on 29 January 2021 and any meetings is presented in **Table 1-1** below. Further details of the non-statutory consultation will be provided in a **Consultation Statement** which has been submitted at Deadline 4 (12 March 2021) of the Examination. The consultation was undertaken with reference to both the Southern Access Works and the Stabilisation Works.

Table 1-1 - Summary of Consultation by Topic

Date / Method of Contact	Consultee / Name of Consultee	Overview of Consultation
Air Quality		
There has been no change to the assessment of significance and assessment methodology. Therefore, no consultation was required for the Southern Access Works and Stabilisation Works assessment.		
Noise and Vibration		
There has been no change to the assessment of significance and assessment methodology. Therefore, no consultation was required for the Southern Access Works and Stabilisation Works assessment.		
Landscape and Visual		
17/12/2020 Teleconference	Northumberland County Council (NCC)	**Key Topics** The Applicant presented to NCC the proposed temporary access to the southern of the River Coquet. **Key Outcomes** The NCC Landscape Officer did not raise any concerns in relation to the Southern Access Works. Further details will be provided in the Consultation Statement which has been submitted at Deadline 4 (12 March 2021) of the Examination.
Biodiversity		
16/12/2020 Teleconference	Natural England and Environment Agency	**Key Topics** The Applicant presented to Natural England and the Environment Agency the Southern Access Works and the Stabilisation Works assessment. The Stabilisation Works would result in the loss of woodland within the Coquet River Felton Park Local Wildlife Site (LWS), for which mitigation and compensation would be required. The Applicant presented a proposed approach and, in acknowledgement of proposed soil salvage efforts and replanting post-construction, woodland creation (compensation) at a ratio of 1:6 (loss: creation) was proposed. Natural England raised concern regarding the proposed scour protection of the north bank. Natural England stated the River Coquet and Coquet Valley Woodlands Site of Special Scientific Interest (SSSI) is designated for its morphology, form and function. Natural England see the use of scour protection as a permanent loss of bank habitat that would require compensation. The Environment Agency raised that in addition to construction impacts, operational impacts should also be considered in relation to the scour protection as there is the potential for materials to enter the river over the lifespan of the scour protection. This was supported by Natural England. The Environment Agency stated that the control of run-off entering the watercourse during the works should be considered and mitigation developed.

Date / Method of Contact	Consultee / Name of Consultee	Overview of Consultation
		Key Outcomes Natural England confirmed that, in relation to loss of woodland, they would prefer the approach detailed within **Appendix 9.21: Ancient Woodland Strategy Part A** of the ES [**APP-247**] (revised Ancient Woodland Strategy for the proposed changes to the Scheme has been submitted at Deadline 4 of the Examination) to be applied. This would constitute a 1:12 (loss : creation) ratio for the purpose of woodland compensation. The Applicant agreed to this approach. Regarding the proposed scour protection, it has been determined that there is a requirement to protect the bridge foundations from hydraulic action and that scour protection measures are required to maintain the integrity of the proposed design. The currently preferred scour protection solution is a rock armour revetment which maintains the existing channel cross section profile. This protects the bridge foundation and also prevents scour from outflanking the solution through erosion of the banks in the downstream reach. The Applicant has not concluded that compensatory provision for the loss of riverbank is necessary. The Applicant has considered the operational impacts from the proposed scour protection in this ES Addendum. The Applicant has considered mitigation to control run-off entering the river during construction. Further details will be provided in the **Consultation Statement** which has been submitted at Deadline 4 (12 March 2021) of the Examination.
17/12/2020 Teleconference	Northumberland County Council (NCC)	**Key Topics** The Applicant stated that it is intended to compensate the loss of woodland within the Coquet River Felton LWS using the same approach as detailed within **Appendix 9.21: Ancient Woodland Strategy Part A** of the ES [**APP-247**] (revised Ancient Woodland Strategy for the proposed changes to the Scheme has been submitted at Deadline 4 of the Examination). This was agreed following consultation with Natural England (16/12/2020). NCC's Ecologist requested confirmation that the baseline ecological surveys covered the proposed additional land take areas. NCC's Ecologist requested confirmation that pre-commencement surveys are in place relating to protected species and the proposed additional land take. **Key Outcomes** NCC's Ecologist confirmed agreement with the approach to woodland compensation. It was also agreed by both parties that the significance of effect would remain the same, given the same impacts and mitigation would occur, only over a slightly larger area. The Applicant confirmed that baseline ecological surveys extended beyond the Order limits by at least 100 m. The Applicant confirmed that existing baseline survey data has been used to inform this ES Addendum. The Applicant confirmed that existing mitigation, detailed in **Section 9.9, Chapter 9: Biodiversity Part A** of the ES [**APP-048**] includes pre-commencement surveys for otter, badger, bats and great created newts (of relevance to the Stabilisation Works). NCC raised no other queries in relation to biodiversity.

Date / Method of Contact	Consultee / Name of Consultee	Overview of Consultation
		Further details will be provided in the Consultation Statement which has been submitted at Deadline 4 (12 March 2021) of the Examination.
Road Drainage and the Water Environment		
16/12/2020 Teleconference	Natural England and Environment Agency	**Key Topics** The Applicant presented the approach to the environmental assessment reported in this ES Addendum. Natural England raised concern regarding the proposed scour protection of the north bank and along with Environment Agency queried the requirement for scour protection on the south bank. Natural England confirmed the River Coquet and Coquet Valley Woodlands SSSI is designated for its river type, flora and fauna. **Key Outcomes** Natural England see the use of scour protection as a permanent loss of bank habitat that would require compensation. The Applicant has not concluded that compensatory provision for the loss of riverbank is necessary. Further details to be provided in the Consultation Statement which has been submitted at Deadline 4 (12 March 2021) of the Examination.
04/03/2021	Environment Agency	**Key Topics** The Applicant presented the results of an initial scour assessment undertaken to further inform the nature and extent of the permanent scour protection required for the North and South banks of the River Coquet. Consideration given by the Applicant to a range of potential habitat compensation measures was presented. Points raised by the Environment Agency in their consultation response to **Environmental Statement Addendum: Earthworks Amendments for Change Request, Environmental Statement Addendum: Stabilisation Works for Change Request** and **Environmental Statement Addendum: Southern Access Works for Change Request** with respect to the Water Framework Directive (WFD) were discussed. The Applicant presented current progress with the River Coquet hydraulic modelling and timescales for completion and review were discussed. The points raised by the Environment Agency in their consultation and the Applicant's responses are provided in the **Consultation Statement** (submitted at Deadline 4 of the Examination). **Key Outcomes** An update to **Appendix 10.2: Water Framework Directive Assessment Part A** of the ES **[APP-255]** would be required to reflect the changes described in **Environmental Statement Addendum: Stabilisation Works for Change Request** and in this ES addendum. The need for compensation referred to by the Environment Agency in their consultation response to **Environmental Statement Addendum: Earthworks Amendments for Change Request, Environmental Statement Addendum: Stabilisation Works for Change Request** and **Environmental Statement Addendum: Southern Access Works for Change Request** relates to compensation for the loss of SSSI habitat. The Applicant has not concluded that compensatory provision for the loss of riverbank is necessary

Date / Method of Contact	Consultee / Name of Consultee	Overview of Consultation
		The timescales allocated for Environment Agency review of the River Coquet hydraulic model are reasonable, with consideration to be given to whether any opportunities for feedback during the review process is possible.
Population and Human Health		
There has been no change to the assessment of significance and assessment methodology. Therefore, no consultation was required for the Southern Access Works and Stabilisation Works assessment.		
Material Resources		
There has been no change to the assessment of significance and assessment methodology. Therefore, no consultation was required for the Southern Access Works and Stabilisation Works assessment.		
Climate		
There has been no change to the assessment of significance and assessment methodology. Therefore, no consultation was required for the Southern Access Works and Stabilisation Works assessment.		
Cumulative Effects		
There has been no change to the assessment methodology. Changes to the assessment of significance relate to Biodiversity and Road Drainage and the Water Environment cross topic combined effects and have been considered as part of the consultation undertaken for those topics, as detailed above.		

1.2.10. Based on the meeting with Environment Agency and Natural England, the operational impacts of the proposed scour protection have been considered in the Biodiversity and Road Drainage and Water Environment assessments presented in this ES Addendum. This has resulted in the scope of the environment sensitivity assessments as presented in **Appendix B: Summary of Proposed Changes to Application** of this ES Addendum evolving to include these aspects of the assessment.

1.2.11. The Environment Agency and Natural England have lodged representations to the Planning Inspectorate in relation to the Southern Access Works and the Stabilisation Works. Both the Environment Agency and Natural England raised concerns relating to the Southern Access Works and the Stabilisation Works, in particular to the permanent loss of riverbank associated with the proposed scour protection.

1.2.12. The West End Anglers has also lodged a representation to the Planning Inspectorate in relation to the Southern Access Works and the Stabilisation Works. The West End Anglers main concerns relate to access to the riverbank under the A1 viaduct during operation and construction and the impact of scour protection on fish passage. The riverbank would be accessible during the operation of the Southern Access Works and the Stabilisation Works, however during construction access would be limited for health and safety reasons. As detailed in Chapter 6: Biodiversity of this Addendum, the Southern Access Works and the Stabilisation Works would not significantly affect fish passage during construction or operation.

1.2.13. Non-statutory consultation was held between 29 January and 25 February 2021, with the following consultees providing responses in relation to the Stabilisation Works:

a. Natural England;
b. Environment Agency;
c. Northumbrian Wildlife Trust;
d. West End Angler's Club;
e. Historic England;
f. Northumberland County Council; and
g. The Coal Authority.

1.2.14. Further detail of these responses is provided within the **Consultation Statement** submitted at Deadline 4 of the Examination.

1.3 STRUCTURE OF THE ES ADDENDUM

1.3.1. This ES Addendum consists of the following:

a. ES Addendum Main Text, setting out the environmental assessment.
b. ES Addendum Appendices

- Appendix A: Figures
- Appendix B: Summary of Proposed Changes to Application
- Appendix C: Visual Effects Schedule
- Appendix D: Register of Environmental Actions and Commitments

- Appendix E: Preliminary Scour Assessment

c. Non-Technical Summary (NTS)

1.3.2. The ES Addendum Main Text follows the content structure set out below:

a. **Chapter 1: Introduction** to this ES Addendum including the purpose of the document, a brief overview of the Scheme, the scope of the assessment and a summary of consultation.
b. **Chapter 2: Southern Access Works** provides a description of the Southern Access Works.
c. **Chapter 3: Assessment of Alternatives** provides a description of the reasonable alternative considered and justification for the chosen option.
d. **Chapter 4 – 12** details the EIA process, legislative and policy framework, methodology, design, mitigation and enhancement measures and the likely significant effects for each of the environmental topics assessed in this ES Addendum, including:

- Chapter 4: Air Quality
- Chapter 5: Noise and Vibration
- Chapter 6: Landscape and Visual
- Chapter 7: Biodiversity
- Chapter 8: Road Drainage and the Water Environment
- Chapter 9: Population and Human Health
- Chapter 10: Material Resources
- Chapter 11: Climate
- Chapter 12: Assessment of Cumulative Effects

e. **Chapter 13: Summary** provides a summary of the likely significant effects reported in this ES Addendum
f. Chapter 14: Abbreviations

1.3.3. Within each chapter of this ES Addendum, updated information is presented under the same section headings as the original assessment of the ES. Where text has not changed, it is stated under the section headings, unless otherwise indicated.

2 SOUTHERN ACCESS WORKS

2.1 INTRODUCTION

2.1.1. The content of **Chapter 2: The Scheme** of the ES [**APP-037**] remains unchanged and valid, with the exceptions of the additions and changes to the sections of that chapter outlined below.

2.2 NEED FOR THE SOUTHERN ACCESS WORKS

JUSTIFICATION FOR TEMPORARY ACCESS

2.2.1. The Stabilisation Works described in **Chapter 2: Stabilisation Works** of **Environmental Statement Addendum: Stabilisation Works for Change Request** present an opportunity to provide a temporary access to the southern bank of the River Coquet by crossing the river from the temporary works on the northern bank instead of creating an access track down the southern river embankment as described in **Chapter 2: The Scheme** of the ES [**APP-037**].

2.2.2. The benefits for the access works would be to:

a. Reduce impact on the southern bank of the River Coquet and Coquet Valley Woodland Site of Special Scientific Interest (SSSI) by removing the need for vehicular access from the south (a pedestrian access may still be required).
b. Reduce long-term impact to southern escarpment landscape.
c. Reduced spread of construction activity over the area, leaving some areas undisturbed and increasing coppicing only activity as opposed to full clearance to reduce disturbance to the River Coquet and Coquet Valley Woodland SSSI and ancient woodland. This undisturbed area equates to circa 500 m^2. The additional area over the river is 360 m^2, showing a net benefit of 140 m^2.

JUSTIFICATION FOR SCOUR PROTECTION

2.2.3. The Applicant has determined the need for additional permanent scour protection on the southern bank in light of the latest ground investigation information, taking into account the presence of scour protection for the existing pier and the results of preliminary hydraulic calculations of distributed design flows and velocities within the river corridor as detailed in **Appendix E: Preliminary Scour Assessment** of this Addendum . This analysis has indicated that there is a scour risk on the south bank of the River Coquet and concluded that scour protection systems are required to maintain the integrity of the proposed design. Given prevailing ground conditions, such protection is required in order to provide consistency with the existing structure which includes scour protection of the pier.

2.2.4. The proposed scour protection comprises a hard engineered 'grey' solution in closer proximity to the structure in the form of rock armour moving to a green-grey solution for the reinstated banks outside the zone of protection required for the bridge foundations. Green-grey solutions are a hybrid of engineered and biodegradable / vegetated solutions that are considered more environmentally sensitive but have a greater resistance to scour than

green solutions like wood revetment or biodegradable vegetated matting. Further analysis will be undertaken to further define the design criteria, particularly the hydraulic conditions and a 2-D hydraulic model will be used to inform the scour design process. The scour design will be refined, where possible, in order to reduce impacts on the environment. Further details are provided in **Appendix F: Preliminary Scour Assessment** of this ES Addendum.

2.2.5. The benefits for the scour protection would be to:

a. Assure the structural integrity of the new pier from the risk of channel movement over the design life.
b. Offer protection to the reinstated ground disturbed by the construction works close to the river edge.

2.3 SOUTHERN ACCESS WORKS LOCATION

2.3.1. The activities associated with the Southern Access Works are located at the northern end of Part A, as shown in **Figure 3: Site Location Plan** in **Appendix A: Figures** of this ES Addendum.

2.3.2. The remaining content of **Section 2.3, Chapter 2: The Scheme** of the ES [**APP-037**] remains unchanged and valid.

SOUTHERN ACCESS WORKS FOOTPRINT

2.3.3. Approximately 360 m^2 of additional temporary possession over the River Coquet is required outside of the existing Order Limits of Part A in order to complete the Southern Access Works. This is in addition to the additional land required for the Stabilisation Works as described in **Chapter 2: Stabilisation Works** of **Environmental Statement Addendum: Stabilisation Works for Change Request**. The extended Order limits of Part A associated with the Southern Access Works is shown in **Figure 1: Southern Access Works Proposals** in **Appendix A: Figures** of this ES Addendum.

OVERVIEW OF SURROUNDING AREA

2.3.4. An element of the Southern Access Works would be undertaken within the River Coquet and Coquet Valley Woodlands SSSI and the Coquet River Felton Park LWS. The closest human receptor is a residential property located approximately 350 m to the north-east of the Site at Felton Park. The closest Listed Building is the Grade II Listed 'Boundary Stones to the South and South West of Longfield Cottage', located approximately 350 m north of the Site.

2.4 SOUTHERN ACCESS WORKS DESCRIPTION

OVERVIEW

2.4.1. The content of **Section 2.5, Chapter 2: The Scheme** of the ES [**APP-037**] remains unchanged and valid, with the exception of the additions and changes outlined below.

2.4.2. The revised **General Arrangement Plans** for the proposed changes to the Scheme (submitted at Deadline 4 of the Examination) illustrate the main components of the revised Scheme including these design changes.

2.4.3. The construction of a temporary bridge for the temporary access to the southern bank as part of the Southern Access Works would replace the need to construct vehicular access to the south bank of the River Coquet down the southern river embankment. As such, this activity would no longer be required as described in **Section 2.5, Chapter 2: The Scheme** of the ES [**APP-037**].

2.4.4. The following description of works is based on preliminary engineering assessment and design information and as such, will be subject to further assessment, modelling and detail design. Consequently, some details may vary from those set out here. However, the detail presented represents a reasonable worst case upon which to base an assessment.

CONSTRUCTION OF A TEMPORARY BRIDGE CROSSING OF THE RIVER COQUET

2.4.5. It is proposed that the temporary access to the southern bank of the River Coquet would be via a temporary bridge to be constructed in the location shown on **Figure 1: Southern Access Works Proposals** in **Appendix A: Figures** of this ES Addendum.

2.4.6. A series of manhole rings filled with approximately 98 m^3 of concrete or stone would be placed in the riverbank on each side of the river to act as foundation supports for the temporary bridge. Initial access to the south bank for machinery/equipment would either be via crane or tracking across the river.

2.4.7. The temporary bridge would have a span of approximately 50 m and would comprise a steel open lattice type structure which would be delivered to the north bank of the River Coquet and assembled adjacent to the river, before being lifted into position using a 750 tonne crane situated on the north bank. The bridge deck would be set at 38.0 m AOD.

TEMPORARY RIVER TRAINING WORKS

2.4.8. A series of concrete Legato blocks founded on a gabion mattress would be installed in the river, around the south bank temporary working area, to act as a temporary retaining wall. This wall would be approximately 68 m long and be aligned such that c. 47 m would lie within the river channel, with the remaining length either just outside the channel or at the eastern extent of the wall, returned into the bank / hillside.

ALTERATION TO THE PROPOSED PERMANENT SCOUR PROTECTION FOR THE SOUTHERN PIER

2.4.9. An extension of the currently proposed permanent scour protection around the southern bridge pier is required. For the purposes of this ES Addendum, the following design has been assessed as a reasonable worst case:

a. Form of protection: a combination of rock armour, reno mattress and green-grey bank protection

b. Dimensions: the footprint and position of the scour protection is shown on **Figure 1: Southern Access Works Proposals** in **Appendix A: Figures** of this ES Addendum.

2.4.10. The extension of the proposed scour protection would impact c. 45 m of riverbank (c. 28 m as rock armour, c. 17 m as green-grey bank protection), in addition to the riverbank affected by the scour protection described in **Chapter 2: The Scheme** of the ES [**APP-037**].

2.5 CONSTRUCTION

2.5.1. The content of **Section 2.8, Chapter 2: The Scheme** of the ES [**APP-037**] remains unchanged and valid, with the exception of the additions outlined below.

2.5.2. The Southern Access Works would involve the creation of a dry area to allow reparation of the riverbed to accept the temporary river training works and the permanent scour protection.

2.5.3. It is expected that the works would begin in July 2022, with removal of the temporary works, including the temporary bridge, following construction being completed by early 2024.

2.5.4. The only additional plant to that accounted for in the construction assessment reported in the ES, is a 750 tonne crane situated on the north bank of the River Coquet which is required to manoeuvre the temporary bridge into position (see **Figure 1: Southern Access Works Proposals** in **Appendix A: Figures** of this ES Addendum).

CHANGES TO TRAFFIC FLOWS

2.5.5. The content of **Section 2.7, Chapter 2: The Scheme** of the ES [**APP-037**] remains unchanged and valid, with the exception of the additions outlined below.

2.5.6. The requirement for additional construction activities associated with the Southern Access Works would generate construction traffic movements additional to those assessed in the ES:

a. Approximately 146 Heavy Good Vehicles (HGV) movements would be required to install the 68 m temporary training wall along the south bank and then remove it on completion.
b. Approximately 78 HGV movements would be required to install the permanent scour protection along the south bank.

2.5.7. The Southern Access Works would not change the operational traffic flows.

2.6 OPERATIONAL MAINTENANCE AND MANAGEMENT

2.6.1. The content of **Section 2.9, Chapter 2: The Scheme** of the ES [**APP-037**] remains unchanged and valid, with the exception of the additions outlined below.

2.6.2. The operational maintenance and management measures outlined in the ES Part A and the **Outline CEMP [REP3-013 and 014**] would remain the same as originally proposed. As outlined in **Appendix D: Register of Environmental Actions and Commitments** of this ES Addendum, following completion of construction of the scour protection, the main contractor would be responsible for defects over a set period (generally 12 months). After this period the scour protection would be adopted by the Applicant and fall within their

routine schedule of maintenance and inspections. Towards the end of the construction period the CEMP would be developed as a Handover Environmental Management Plan (HEMP) which would include the monitoring and management arrangements of the scour protection going forward during future maintenance and operation.

3 ASSESSMENT OF ALTERNATIVES

3.1.1. Since the submission of the Summary of the Proposed Changes to the Application document submitted as part of Deadline A of the Examination in December 2020 (see **Appendix B: Summary of Proposed Changes to the Application** of this ES Addendum) the design has evolved and been refined in order to reduce environmental effects. These design changes are a result of consultation undertaken on the Southern Access Works.

3.1.2. **Table 1-1** details the consultation in relation to the Southern Access Works undertaken prior to the commencement of the non-statutory consultation.

3.1.3. Non-statutory consultation was held between 29 January and 25 February 2021, with the following consultees providing responses in relation to the Southern Access Works:

a. Natural England;
b. Environment Agency;
c. Northumbrian Wildlife Trust;
d. West End Angler's Club;
e. Historic England;
f. Northumberland County Council; and
g. The Coal Authority.

3.1.4. Further detail of these responses is provided within the **Consultation Statement** submitted at Deadline 4 of the Examination.

3.1.5. The comments raised prior to the non-statutory consultation and as part of the non-statutory consultation have been considered and influenced design as shown in **Table 3-1**.

Table 3-1 – Environmental considerations in the evolution of the design

Environmental topic	Consultation Comments	Original Design	Amended Design	Reason for Changes and Effects
River training works on South Bank and Temporary Bridge				
Biodiversity Road Drainage and the Water Environment	As part of the consultation, concerns were raised in relation to the river training works. It was raised that the river training works should not damage existing geomorphological features of value at the site or downstream. The level of the temporary bridge over the river was also noted as a potential flood risk concern.	Length of the temporary river training works: c. 70 m Position of the works within the river channel: minimum channel width of c. 20 m Length of temporary bridge: 38 m Height of the temporary bridge deck: 36 m AOD	Length of the temporary river training works: c.68 m Position of the works within the river channel: minimum channel width of c.24 m Length of temporary bridge: 50 m Height of the temporary bridge deck: 38 m AOD	Based on feedback received from consultees, the temporary training works have been realigned and bought closer to the riverbank on the south bank and have been slightly reduced in length. The temporary bridge has been lengthened and raised. The amended river training works and temporary bridge design has a number of benefits: – Due to the alignment of the temporary training works, only c. 47 m of the 68 m length would lie within the river channel itself, with the remaining length either just outside the channel or at the eastern extent of the works, where it returns into the bank / hillside. The original design affected c. 60 m of the river channel. – Approximately 12 m of the riverbank within the affected 47 m stretch of the river, comprises non-natural bank, hence the length of affected natural riverbank is c. 35 m. – The alignment of the river training works is closer to the riverbank than the original option, lessening the extent of constriction to the width of the river by up to 6 m. – The river training works are better aligned with the riverbank, therefore changes in flow patterns are likely to be more muted. – The height of the temporary bridge, being 2 m higher than in the original design, would have a reduced potential impact on flood risk. Whilst the range of impacts identified with the original design would remain with the new option, many of the impacts would be reduced in their extent and / or severity as a result of the benefits outlined above.
Permanent Scour Protection on South Bank				
Biodiversity Road Drainage and the Water Environment	During consultation, it was raised that rock armour is not favourable due to its visual and geomorphological impact and the limitations it can pose on ecology. Furthermore, it is also unlikely to have a lifespan to match that of the bridge. In addition, concerns that permeant scour protection along the south bank of the River	Length of the permanent scour protection: c. 70 m Form of the permanent scour protection: rock armour	Length of the permanent scour protection: c. 45 m Form of the permanent scour protection: rock armour (28 m);	Based on feedback received from consultees and the results of a preliminary scour assessment (**Appendix E: Preliminary Scour Assessment of this ES Addendum**), the type of permanent scour protection proposed has been amended and its length has been reduced. The amended permanent scour protection design has a number of benefits: – The total extent of natural riverbank permanently affected by the scour protection is much reduced, from approximately 70 m to 45 m.

Environmental topic	Consultation Comments	Original Design	Amended Design	Reason for Changes and Effects
	Coquet could damage riverbank habitat and geomorphological process were raised.		green-grey bank protection (17 m)	– As a result of the overall reduction in length of the riverbank permanently affected and the use of green-grey bank protection, the amended design represents a 60 % reduction in hard bank (grey) protection compared to the original design. Whilst the range of impacts identified with the original design would remain with the new option, many of the impacts would be reduced in their extent and / or severity as a result of the benefits outlined above.

4 AIR QUALITY

4.1 INTRODUCTION

4.1.1. **Chapter 5: Air Quality Part A** of the ES [**APP-040**] considers the likely significant effects of Part A on Air Quality. This comprises a review of the dust and particulate matter generated as a result of the construction works.

4.1.2. This chapter of the ES Addendum considers the likely significant effects of the Southern Access Works (described in **Chapter 2: Southern Access Works** of this ES Addendum) and the Stabilisation Works (described in **Chapter 2: Stabilisation Works** of the **Environmental Statement Addendum: Stabilisation Works for Change Request**) on Air Quality. As detailed in **Appendix B: Summary of Proposed Changes to Application** of this ES Addendum, the Southern Access Works and the Stabilisation Works are not anticipated to impact operational Air Quality and therefore this has not been considered in this chapter.

4.2 COMPETENT EXPERT EVIDENCE

4.2.1. As detailed in **Table 4-1**, the professionals contributing to the production of this assessment have sufficient expertise to ensure the completeness and quality of this assessment. The table sets out the details of expertise where this is different to those presented in the ES.

Table 4-1 – Air Quality Professional Competence

Name	Role	Qualifications and Professional Membership	Experience
Sioni Hole	Author	MPhys, Physics Associate of the Institute for Environmental Scientist (AIES) Associate of the Institute for Air Quality Management (AIAQM)	Six years of relevant Environmental Impact Assessment (EIA) experience Air Quality specialist on the A1 Birtley to Coal House Stages 2 and 3 Assessments Air Quality specialist on the A1 Scotswood to North Brunton Stages 2 and 3 Assessments Air Quality specialist for the A1(M), M27 and M3 smart motorway Schemes
Bethan Tuckett-Jones	Reviewer	BSc, Physics PhD Meteorology	20 years of relevant EIA experience:

Name	Role	Qualifications and Professional Membership	Experience
		Member of the Institution of Environmental Sciences (MIES) Member of the Institute of Air Quality Management (MIAQM)	Air Quality technical lead on the A1 Birtley to Coal House Stages 2 and 3 Assessments Air Quality technical lead on the A1 Scotswood to North Brunton Stages 2 and 3 Assessments Air Quality technical lead for the A1(M), M27 and M3 smart motorway schemes

4.3 LEGISLATIVE AND POLICY FRAMEWORK

4.3.1. The legislative and policy framework for Air Quality has not changed since the publication of the ES. Therefore, the text within **Section 5.3, Chapter 5: Air Quality Part A** of the ES [**APP-040**] remains valid.

4.4 ASSESSMENT METHODOLOGY

4.4.1. In order to ensure a comparable assessment with the ES, the assessment methodology followed for Air Quality has not changed in response to the proposed amendments to the Scheme. Therefore, the text within **Section 5.4, Chapter 5: Air Quality Part A** of the ES [**APP-040**] remains unchanged and valid.

4.5 ASSESSMENT ASSUMPTIONS AND LIMITATIONS

4.5.1. The assessment assumptions and limitations for Air Quality for the Southern Access Works have not changed from the ES. Therefore, the text within **Section 5.5, Chapter 5: Air Quality Part A** of the ES [**APP-040**] remains unchanged and valid.

4.6 STUDY AREA

4.6.1. The Study Area for the assessment of construction dust set out within **Section 5.6, Chapter 5: Air Quality Part A** of the ES [**APP-040**] is extended slightly as a result of the Southern Access Works. The Study Area consists of a 200 m corridor about the extended Order limits of Part A. The original study area is shown in **Figure 5.4: Construction Receptors Part A** of the ES [**APP-078**].

4.6.2. The Southern Access Works would result in an extension to the Order limits of Part A, however, there are no additional receptors sensitive to air quality impacts arising from construction works as a result of the additional temporary land required to complete these works. Therefore, the text covering the construction aspect of the Scheme set out within

Section 5.6, Chapter 5: Air Quality Part A of the ES [**APP-040**] remains unchanged and valid.

4.7 BASELINE CONDITIONS

4.7.1. The baseline for the Air Quality assessment has not changed for the Southern Access Works. Therefore, the text within **Section 5.7, Chapter 5: Air Quality Part A** of the ES [**APP-040**] remains unchanged and valid.

4.8 POTENTIAL IMPACTS

CONSTRUCTION

4.8.1. The assessment of impacts arising from construction dust detailed within **Section 5.8, Chapter 5: Air Quality Part A** of the ES [**APP-040**] considers the potential impacts of all dust generating activities arising from construction of the Scheme. Inherent within the assessment methodology is the assumption that dust generating activities may occur at any location within the Order limits. Whilst there are changes to the existing Order limits of Part A with the Southern Access Works, there are no additional receptors for dust impacts and therefore all impacts during construction remain unchanged.

4.9 DESIGN, MITIGATION AND ENHANCEMENT MEASURES

4.9.1. The mitigation requirements for Air Quality have not changed due to the Southern Access Works. Therefore, the text within **Section 5.9, Chapter 5: Air Quality Part A** of the ES [**APP-040**] remains unchanged and valid. Additional mitigation measures are not required as a result of the Southern Access Work.

4.10 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION

4.10.1. As set out within **Section 5.10, Chapter 5: Air Quality Part A** of the ES [**APP-040**], with the application of appropriate mitigation measures there are no significant effects expected as a result of the Scheme. This assessment would remain valid and unchanged with the inclusion of the Southern Access Works.

4.11 MONITORING

4.11.1. The monitoring requirements for Air Quality have not changed due to the Southern Access Works. Therefore, the text within **Section 5.11, Chapter 5: Air Quality Part A** of the ES [**APP-040**] remains unchanged and valid.

4.12 UPDATED DMRB GUIDANCE

4.12.1. Since the assessments in the ES were completed, the DMRB methodology was superseded and replaced with updated guidance as detailed in **Section 5.4, Chapter 5: Air Quality Part A** of the ES [**APP-040**]. An Air Quality DMRB sensitivity test for likely significant effects has been undertaken as detailed in **Appendix 5.8: Air Quality DMRB Sensitivity Test Part A** of the ES [**APP-205**], wherein it was determined that there would be a non-material

change to the methodology of the assessment of construction dust as a result of the updated methodology. Therefore, there would be no change to the results of the assessment in this ES Addendum as a result of the updated DMRB guidance.

5 NOISE AND VIBRATION

5.1 INTRODUCTION

5.1.1. **Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] considers the likely significant effects of Part A on construction Noise and Vibration.

5.1.2. This chapter of the ES Addendum considers the likely significant effects of the Southern Access Works (described in **Chapter 2: Southern Access Works** of this ES Addendum) and the **Stabilisation Works** (described in **Chapter 2: Stabilisation Works** of the **Environmental Statement Addendum: Stabilisation Works for Change Request**) on Noise and Vibration. As detailed in **Appendix B: Summary of Proposed Changes to Application** of this ES Addendum, the Southern Access Works and the Stabilisation Works are not anticipated to impact operational Noise and Vibration and therefore this has not been considered in this chapter. The alignment of the Part A carriageway and traffic data are would remain unchanged, therefore the operational stage assessment presented within the **Noise Addendum [REP1-019]** remains valid.

5.2 COMPETENT EXPERT EVIDENCE

5.2.1. The competent expert advice for the Noise and Vibration assessment has not changed for this assessment. Therefore, the text relating to Michael Ashcroft, Nicola Bolton and Steve Fisher within **Section 6.2, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] remains unchanged and valid.

5.3 LEGISLATIVE AND POLICY FRAMEWORK

5.3.1. The legislative and policy framework for the Noise and Vibration assessment has not changed since the publication of the ES. Therefore, the text within **Section 6.3, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] remains valid.

5.4 ASSESSMENT METHODOLOGY

5.4.1. In order to ensure a comparable assessment with the ES, the methodology followed for the Noise and Vibration assessment has not changed in response to the Southern Access Works. Some additional plant is assumed to be required for the construction of the Southern Access Works and the details are discussed in **Section 5.8** below of this ES Addendum. Therefore, the text within **Section 6.4, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] remains valid.

5.5 ASSESSMENT ASSUMPTIONS AND LIMITATIONS

5.5.1. The assumptions and limitations for the Noise and Vibration assessment for the construction of the Southern Access Works have not changed from the ES. As noted above some additional construction plant is assumed to be required for these works and the details are discussed in **Section 5.8** of this ES Addendum. The text within **Section 6.5, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] remains valid.

5.6 STUDY AREA

5.6.1. **Paragraph 6.6.4** within **Section 6.6, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] states that the Construction Stage Study Area has been set at 300 m from the boundary of any construction activity associated with Part A. The construction of the Stabilisation Works requires an extension to the existing Order limits of Part A as discussed in **Section 5.6** of the **Environmental Statement Addendum: Stabilisation Works for Change Request**. The Southern Access Works does not require an additional extension to the Construction Stage Study Area to that presented in **Environmental Statement Addendum: Stabilisation Works for Change Request**.

5.7 BASELINE CONDITIONS

5.7.1. The baseline for the Noise and Vibration assessment has not changed as a result of the Southern Access Works. Therefore, the text within **Section 6.7, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] remains unchanged and valid. As stated in **Section 5.7** of the **Environmental Statement Addendum: Stabilisation Works for Change Request**, there are no additional receptors within the extended Construction Stage Study Area as a result of the Southern Access Works.

5.8 POTENTIAL IMPACTS

CONSTRUCTION

5.8.1. No significant adverse Noise and Vibration impacts are anticipated during the construction of the Southern Access Works, as there are no receptors within the extended Construction Stage Study Area. Further details are provided below.

5.8.2. It is anticipated that the main plant required to construct the Southern Access Works is a 750 tonne crane to lift the temporary bridge into place. However, there is the potential for the construction works associated with the Southern Access Works to occur concurrently with the Stabilisation Works (as discussed within **Section 5.7** of the **Environmental Statement Addendum: Stabilisation Works for Change Request**) and thereby give rise to cumulative noise impacts.

5.8.3. **Section 5.8** of the **Environmental Statement Addendum: Stabilisation Works for Change Request** concluded that no significant adverse noise and vibration impacts were anticipated as a result of the Stabilisation Works as no receptors are located within 300 m of the construction activities associated with these works. The plant items required for the Stabilisation Works are not dissimilar to those presented within **Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] for the bridge construction works.

5.8.4. A 750 tonne crane is larger than that assumed in **Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] for the permanent bridge construction activity, or for the Stabilisation Works. However, the significant observed adverse effect level (SOAEL) zone (the area within which the SOAEL might be exceeded) from this activity in conjunction with all other activities (i.e. bridge construction and the proposed land stabilisation) is unlikely to be

greater than the 300 m Construction Stage Study Area. Therefore, as there are no receptors within 300 m of the proposed works associated with the construction of the Southern Access Works, significant adverse noise impacts are not anticipated.

5.8.5. The crane required for the construction of the Southern Access Works is unlikely to generate perceptible levels of vibration at the nearest receptors. Therefore, no significant adverse vibration impacts are anticipated as a result of the construction of the Southern Access Works.

5.8.6. In addition to the works to construct the temporary bridge, no significant adverse impacts are expected as a result of construction plant using the temporary bridge during the construction stage.

5.8.7. All other impacts during construction, as detailed within **Section 6.8, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**], remain unchanged and valid.

5.9 DESIGN, MITIGATION AND ENHANCEMENT MEASURES

5.9.1. The measures detailed within **Section 6.9, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] remain unchanged and valid. Additional mitigation measures are not required as a result of the Southern Access Work.

5.10 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION

5.10.1. The assessment of likely significant effects for Noise and Vibration has not changed due to the works to construct the Southern Access Works and Stabilisation Works. Therefore, the text within **Section 6.10, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**], remains unchanged and valid.

5.11 MONITORING

5.11.1. The monitoring requirements for Noise and Vibration have not changed due to the Southern Access Works. Therefore, the text within **Section 6.11, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] remains unchanged and valid.

5.12 UPDATED DMRB GUIDANCE

5.12.1. Since the assessments in the ES were completed, the DMRB methodology was superseded and replaced with updated guidance in the form of DMRB LA 111 Noise and Vibration Revision 21.

[1] Highways England (2020) Design Manual for Roads and Bridges (DMRB) LA 111 Noise and Vibration.

5.12.2. The methodology used to undertake the construction Noise and Vibration assessments detailed within **Section 6.4, Chapter 6: Noise and Vibration Part A** of the ES [**APP-042**] is sufficiently similar to that presented within DMRB LA 111 that the potential for changes to the conclusions of the construction stage assessments is considered to be low.

6 LANDSCAPE AND VISUAL

6.1 INTRODUCTION

6.1.1. **Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**] considers the likely significant effects of the Scheme on Landscape and Visual.

6.1.2. This chapter of the ES Addendum considers the likely significant effects of the Southern Access Works (described in **Chapter 2: Southern Access Works** of this ES Addendum) and the Stabilisation Works (described in **Chapter 2: Stabilisation Works** of the **Environmental Statement Addendum: Stabilisation Works for Change Request**) on Landscape and Visual.

6.2 COMPETENT EXPERT EVIDENCE

6.2.1. As detailed in **Table 6-1**, the professionals contributing to the production of this assessment have sufficient expertise to ensure the completeness and quality of this assessment. The table sets out the details of expertise where this is different to those presented in the ES.

Table 6-1 – Landscape and Visual Professional Competence

Name	Role	Qualifications and Professional Membership	Experience
Sophie Lewis	Author	BA (Hons) Landscape Architecture MA Landscape Architecture CMLI (Chartered member of the Landscape Institute)	Senior Landscape Architect Chartered member of the Landscape Institute, with over five years of project experience. Project experience includes responsibility for Landscape Visual Impact Assessment and design inputs for a diverse range of schemes including: Spalding Western Relief Road, Sections 1 and 5 M1 Junction 19 Improvement scheme
Andrew Williams	Reviewer	BA (Hons) Landscape Architecture Grad Dip Landscape Architecture CMLI	Technical Director Over 20 years' experience of landscape architecture with a focus on highways. Preparation of and review of Landscape and Visual Impacts Assessments, including: A1 Birtley to Coal House A31 Magherafelt bypass Lincoln Eastern By-pass

6.3 LEGISLATIVE AND POLICY FRAMEWORK

6.3.1. The legislative and policy framework for Landscape and Visual has not changed since the publication of the ES. Therefore, the text within **Section 7.3, Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**] remains valid.

6.4 ASSESSMENT METHODOLOGY

6.4.1. In order to ensure a comparable assessment with the ES, the assessment methodology followed for Landscape and Visual has not changed in response to the Southern Access Works. Therefore, the text within **Section 7.4, Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**] remains unchanged and valid.

6.5 ASSESSMENT ASSUMPTIONS AND LIMITATIONS

6.5.1. The assessment assumptions and limitations for Landscape and Visual for the Southern Access Works have not changed from the ES and the assessment assumption set out in the **Environmental Statement Addendum: Stabilisation Works for Change Request**. Therefore, the text within **Section 7.5, Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**] and the **Environmental Statement Addendum: Stabilisation Works for Change Request** remains unchanged and valid.

6.6 STUDY AREA

6.6.1. The Study Area for the Landscape and Visual assessment has not materially changed for the Southern Access Works, the 2 km buffer extending from the centre line of the Scheme. Therefore, the text within **Section 7.6, Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**] remains unchanged and valid.

6.7 BASELINE CONDITIONS

6.7.1. The baseline for the Landscape and Visual assessment has not changed for the Southern Access Works. Therefore, the text within **Section 7.7, Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**] remains unchanged and valid and no new receptors have been identified.

6.8 POTENTIAL IMPACTS

VISUAL

Construction

6.8.1. The potential visual impacts, and specifically those viewpoints and visual receptors that currently experience views of the River Coquet valley are not anticipated to significantly change. However, during construction, the anticipated additional impacts of the Southern Access Works above those that identified for removal in **Chapter 7: Landscape and visual Part A** of the ES [**APP-044**] and the **Environmental Statement Addendum: Stabilisation Works for Change Request** are outlined below.

6.8.2. For the users of Public Rights of Way (PRoW) to the south side of the River Coquet and with views to the north (Footpath 422/020 and Footpath 422/002) and associated viewpoints 18 and 19, south of the River Coquet, potential impacts would arise as a result of:

a. The awareness of the construction and use of the temporary bridge and the erection and use of the crane platform.
b. The presence of construction activity and associated plant, representing a perceptibly larger working footprint (additional 360 m^2) within the previously assessed construction activity, associated with the temporary bridge supports and deck.

6.8.3. For the users of the PRoW to the north side of the River Coquet and with views to the south (St Oswald's Way) and associated viewpoints 21 and 24, north of the River Coquet, potential impacts would arise as a result of:

a. The awareness of the construction and use of the temporary bridge and the erection and use of the crane platform.
b. Prior to the re-establishment of woodland, the awareness of the scour protection measures on the south bank would be visible from elevated locations looking into the valley.
c. The presence of construction activity and associated plant, representing a perceptibly larger working footprint (additional 360 m^2) within the previously assessed construction activity associated with the bridge supports and deck. However, these would be partially obscured by the retained woodland vegetation in the foreground.

6.8.4. For the users of PRoW to the south side of the River Coquet and with views to the south along the A1 corridor (Footpath 422/020 and Footpath 422/002) and associated viewpoint 20, south of the River Coquet, potential impacts would arise as a result of:

a. The awareness of the construction and use of the temporary bridge and the erection and use of the crane platform.
b. The presence of construction activity and associated plant, representing a perceptibly larger working footprint (additional 360 m^2) within the previously assessed construction activity, associated with the bridge supports and deck.

6.8.5. All other impacts during construction, detailed within **Section 7.8, Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**] remain unchanged are valid.

Operation

6.8.6. The potential visual impacts, and specifically those viewpoints and visual receptors that currently experience views of the River Coquet valley are not anticipated to significantly change. During operation, the anticipated additional impacts of the Southern Access Works and above those that identified in **Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**] and the **Environmental Statement Addendum: Stabilisation Works for Change Request** are outlined below.

6.8.7. For the users of Public Rights of Way (PROW) to the south side of the River Coquet and with views to the north (Footpath 422/020 and Footpath 422/002) and associated viewpoints 18 and 19, south of the River Coquet, potential impacts would arise as a result of:

a. Greater appreciation of the river corridor would be experienced, there would be awareness at a distance of scour protection on the south bank.

6.8.8. For the users of the PROW to the north side of the River Coquet and with views to the south (St Oswald's Way) and associated viewpoints 21 and 24, north of the River Coquet, potential impacts would arise as a result of:

a. The presence of scour protection on the south bank would barely be perceptible due to intervening vegetation.

6.8.9. For the users of PROW to the south side of the River Coquet and with views to the south along the A1 corridor (Footpath 422/020 and Footpath 422/002) and associated viewpoint 20, south of the River Coquet, potential impacts would arise as a result of:

a. Greater appreciation of the river corridor would be experienced, there would be awareness at a distance of scour protection on the south bank.

6.8.10. All other impacts during construction, detailed within **Section 7.8, Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**] remain unchanged are valid.

6.9 DESIGN, MITIGATION AND ENHANCEMENT MEASURES

6.9.1. There would be no further mitigation beyond that detailed in the Environmental Statement Addendum: Stabilisation Works for Change Request and set out within Section 7.9, Chapter 7: Landscape and Visual Part A of the ES [APP-044].

ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

Visual

6.9.2. As set out in **Section 6.8** of this ES Addendum, the additional impacts of the Southern Access Works would be limited to the following receptors and associated viewpoints:

Recreational Receptors:

a. Users of Footpath 422/020;
b. Users of Footpath 422/002; and
c. Users of Footpath St Oswald's Way (115/009).

Viewpoints:

a. Viewpoint 18: View looking north-west from PRoW (422/020);
b. Viewpoint 19: View looking north from PRoW (422/020);
c. Viewpoint 20: View looking south from PRoW (422/020);
d. Viewpoint 21: View looking south-west from St Oswald's Way (115/009); and
e. Viewpoint 24: View looking west from St Oswald's Way (115/009).

Construction

6.9.3. Following the review of the potential impacts against the identified receptors as set out within **Appendix C: Visual Effects Schedule** of this ES Addendum. It is anticipated that these receptors would experience a marginal increase in the magnitude of impact, however the increase is not anticipated to be sufficient to change the overall magnitude of impact ratings. Therefore, the landscape and visual effects identified within the **Environmental**

Statement Addendum: Stabilisation Works for Change Request would remain the same.

Operation

6.9.4. Following the review of the potential impacts against the identified receptors as set out within **Appendix C: Visual Effects Schedule** of this ES Addendum. It is anticipated that these receptors would not experience a discernible increase in the magnitude of impact, and the magnitude of impact ratings would remain. Therefore, the landscape and visual effects identified within the **Environmental Statement Addendum: Stabilisation Works for Change Request** would remain the same.

6.10 MONITORING

6.10.1. The monitoring requirements for Landscape and Visual have not changed due to the Southern Access Works. Therefore, the text within **Section 7.11, Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**] remains unchanged and valid.

6.11 UPDATED DMRB GUIDANCE

6.11.1. Since the assessments in the ES were completed, the DMRB methodology was superseded and replaced with updated guidance as detailed in **Section 7.4, Chapter 7: Landscape and Visual Part A** of the ES [**APP-044**]. A DMRB sensitivity test for likely significant effects has been undertaken, that identified that changes to the sensitivity of some receptors would be higher, and that less focus would be given to individual receptors, instead the focus would be on the effects on settlements/communities. The findings of the DMRB sensitivity assessment would not be materially different to those outlined above.

7 BIODIVERSITY

7.1 INTRODUCTION

7.1.1. **Chapter 9: Biodiversity Part A** of the ES [**APP-048**] considers the likely significant effects of Part A on Biodiversity.

7.1.2. This chapter of the ES Addendum considers the likely significant effects of the Southern Access Works (described in **Chapter 2: Southern Access Works** of this ES Addendum) and the Stabilisation Works (described in **Chapter 2: Stabilisation Works** of the **Environmental Statement Addendum: Stabilisation Works for Change Request**) on Biodiversity.

7.1.3. As detailed in **Appendix B: Summary of Proposed Changes to Application** of this ES Addendum, the Southern Access Works and the Stabilisation Works are not anticipated to have an impact on operational air quality and nitrogen deposition levels, and therefore this has not been considered in this chapter.

7.2 COMPETENT EXPERT EVIDENCE

7.2.1. As detailed in **Table 7-1**, the professional contributing to the production of this assessment has sufficient expertise to ensure the completeness and quality of this assessment. The table sets out the details of expertise where this is different to those presented in the ES.

Table 7-1 – Biodiversity Professional Competence

Name	Role	Qualifications and Professional Membership	Experience
Andy McIlwraith	Author	MSc – Wildlife Management (Conservation and Control). BSc (Hons) – Zoology. Full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). Chartered Environmentalist with Society for the Environment (CEnv).	Director Over 18 years' experience in ecological consultancy and impact assessment. Other recent relevant DCO experience includes: Ecology lead for A19 Testo's Junction Alteration; Ecology lead for A19 Downhill Lane Junction Improvements, and; Ecology lead for A160 Port of Immingham Improvements.

Name	Role	Qualifications and Professional Membership	Experience
Matthew Robson	Check/Review	PhD BSc (Hons) Full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM)	Principal Ecologist Over 16 years' experience in ecological consultancy and impact assessment. Other recent relevant DCO experience includes: Species lead for A12 Chelmsford to A120 Widening scheme; and, Ecological clerk of works on A19 Downhill Lane Junction Improvements, and A19 Testo's Junction Alteration.

7.3 LEGISLATIVE AND POLICY FRAMEWORK

7.3.1. The legislative and policy framework for Biodiversity has not changed since the publication of the ES. Therefore, the text within **Section 9.3, Chapter 9: Biodiversity Part A** of the ES [**APP-048**] remains valid.

7.4 ASSESSMENT METHODOLOGY

7.4.1. In order to ensure a comparable assessment with the ES, the assessment methodology followed for Biodiversity has not changed in response to the Southern Access Works, except for additional consultation presented in **Table 1-1**. The text within **Section 9.4, Chapter 9: Biodiversity Part A** of the ES [**APP-048**] remains unchanged and valid.

7.5 ASSESSMENT ASSUMPTIONS AND LIMITATIONS

7.5.1. The assessment assumptions and limitations for Biodiversity for the Southern Access Works have not changed from the ES. Therefore, the remaining text within **Section 9.5, Chapter 9: Biodiversity Part A** of the ES [**APP-048**] remains unchanged and valid.

7.6 STUDY AREA

7.6.1. The Southern Access Works results in the extension of the Order Limits of Part A. However, the Study Area for the Biodiversity assessment has not changed for the Southern Access Works and is considered valid for the assessment in this ES Addendum. Therefore, the text

within **Section 9.6, Chapter 9: Biodiversity Part A** of the ES [**APP-048**] remains unchanged and valid.

7.7 BASELINE CONDITIONS

7.7.1. The Stabilisation Works and construction of the northern bank working platform is anticipated to have been completed prior to commencement of the works to facilitate Southern Access Works. This is described in **Chapter 2: Stabilisation Works** of the **Environmental Statement Addendum: Stabilisation Works for Change Request**.

7.8 POTENTIAL IMPACTS

7.8.1. Potential impacts are presented below for those ecological receptors that may be impacted by the Southern Access Works. Potential impacts for all other ecological receptors, detailed within **Section 9.8** and summarised in **Table 9-21** of **Chapter 9: Biodiversity Part A** of the ES [**APP-048**], remain unchanged and valid.

7.8.2. Whilst the River Coquet represents a Habitat of Principal Importance (HPI), the flora and fauna of the river are qualifying features of the River Coquet and Coquet Valley Woodlands SSSI. As such, impacts to the river habitat have been assessed as part of the impact assessment of the SSSI.

7.8.3. Impacts to European sites for nature conservation are not discussed within this Addendum and have been assessed within an Updated Habitats Regulations Assessment (HRA) Report for Change Request issued at Deadline 4 of the Examination.

CONSTRUCTION

7.8.4. During construction, the anticipated impacts of the Southern Access Works are described below.

River Coquet and Coquet Valley Woodlands SSSI – river course

a. Permanent loss of riverbank habitat as a result of construction of the temporary / permanent scour protection measures.
b. Permanent damage or degradation of watercourse due to changes in water chemistry as a result of construction of the temporary / permanent scour protection measures (in relation to materials used).
c. Temporary damage of in-river habitat during the installation of temporary river training measures.
d. Temporary damage of in-river habitat due to potential changes in geomorphological processes such as sediment transport, erosion and deposition.
e. Temporary damage of riverbank habitat during the installation of supports for the temporary bridge spanning the River Coquet.
f. Temporary, indirect damage or degradation of watercourse due to potential pollution event and silt run-off during installation of temporary river training measures and permanent scour protection and installation of erosion protection measures.
g. Temporary indirect impacts (such as noise, dust, light, vibration).

Otter

a. Reduction in foraging success due to permanent damage or degradation of watercourse that may affect fish populations.
b. Temporary obstruction of movement through installation of the temporary bridge over the River Coquet and construction of bankside supports.
c. Temporary indirect disturbance and displacement should otter be present along the River Coquet (noise, dust, light, vibration, visual).

Fish

a. Permanent loss of riverbank habitat as a result of construction of the temporary / permanent scour protection measures.
b. Permanent reduction in population due to damage or degradation of watercourse resulting from changes in water chemistry (in relation to materials used).
c. Permanent loss of bankside habitat, which may be used by juvenile fish, as a result of the permanent scour protection;
d. Temporary damage of in-river habitat (potential spawning areas) due to changes in geomorphological processes such as sediment transport, erosion and deposition.
e. Temporary partial obstruction of migratory route through construction of bankside supports for the installation of the temporary bridge over the River Coquet (in relation to salmon and trout in the River Coquet).
f. Temporary damage of riverbank habitat during the installation of temporary supports for the temporary bridge spanning the River Coquet.
g. Temporary loss of habitat during installation of river training measures.
h. Temporary, indirect damage or degradation of watercourse due to potential pollution event and silt run-off during installation of temporary river training measures and permanent scour protection and installation of erosion protection measures.
i. Temporary indirect disturbance (such as noise, light, vibration, visual).

Aquatic invertebrates

a. Permanent reduction in population due to damage or degradation of watercourse resulting from changes in water chemistry (in relation to materials used).
b. Temporary reduction in population due to mortality from the construction of river training measures.
c. Permanent loss of bankside habitat as a result of the permanent scour protection;
d. Temporary loss of river habitat during installation of river training measures.
e. Temporary, indirect damage or degradation of watercourse due to potential pollution event and silt run-off during installation of temporary river training measures and permanent scour protection and installation of erosion protection measures.

OPERATION

7.8.5. Following consultation with Natural England and the Environment Agency (refer to **Table 1-1**) impacts identified and assessed for the operational phase comprise: adverse impacts to the River Coquet (SSSI and HPI) from materials of the scour protection entering the watercourse and impacts on biodiversity due to permanent changes in morphology.

7.8.6. The release of materials from scour protection may occur during flood events or following natural degrading of the scour protection over its lifespan. This has also been considered

with regards to otter, fish and aquatic invertebrates, which are reliant on the health of the watercourse.

7.8.7. All other impacts during operation, detailed within **Section 9.8, Chapter 9: Biodiversity Part A** of the ES [**APP-048**], remain unchanged and valid.

7.9 DESIGN, MITIGATION AND ENHANCEMENT MEASURES

7.9.1. In addition to the measures detailed within **Section 9.8, Chapter 9: Biodiversity Part A** of the ES [**APP-048**], the following mitigation measures would be implemented.

CONSTRUCTION

7.9.2. The temporary river training measures and scour protection would be constructed using suitable materials to avoid changes in water chemistry, such as the use of washed stone or inert materials. This measure has been captured **in Appendix D: Register of Environmental Commitments** of this ES Addendum.

7.9.3. A site-specific drainage management plan would be created to attenuate, treat and discharge site runoff. In-channel silt barriers (i.e. silt curtains or similar) would be deployed as far as reasonably practical or a similar form of barrier if silt water runoff is discharging into the River Coquet to control the downstream dispersion of suspended solids. Further, a suitable geomembrane would be installed between the river training works and piling platform to minimise the release of construction aggregate associated with the piling platform. This measure is captured in **Appendix D: Register of Environmental Actions and Commitments** of this ES Addendum.

7.9.4. In addition, to the above the following measures specific to the Southern Access Works and installation the temporary bridge would be implemented to mitigate for site runoff and potential pollution events:

a. All plant and vehicles using the temporary bridge are to be well maintained and serviced. Use of biodegradable oils for all plant and equipment working in the vicinity of the River Coquet.

b. A haul road on the approach to the temporary bridge would be maintained as clean stone and/or blinded (where a thin layer of concrete is added over the stone to protect it) to minimise debris collecting on the vehicle prior to entry onto the bridge.

c. A surface water drainage system would be developed by the main contractor for the temporary bridge structure. This would ensure that runoff or spillages on the bridge do not enter the River Coquet and transfer any collected runoff to appropriate treatment measures. The system may include the implementation of a containment screen on the underside of the temporary bridge to prevent any falling debris or sediment from entering the River Coquet.

7.9.5. The above measures are captured in Appendix D: Register of Environmental Actions and Commitments of this ES Addendum.

7.9.6. An assessment of the biological water quality and water chemistry would be undertaken prior to and during construction to monitor the river during the proposed works. The main contractor will monitor and take appropriate action if water quality deteriorates, following

agreement with Natural England and the Environment Agency where required (for example where a permit or licence is in place with conditions/restrictions). The monitoring would assess pH, suspended solids, Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD). The methodology of the monitoring will be determined at detailed design and captured within a monitoring and management strategy for the proposed works. The monitoring and management strategy captured in **Appendix D: Register of Environmental Commitments** of this ES Addendum.

7.9.7. To protect fish, particularly migratory salmon *Salmo salar* and brown trout *Salmo trutta*, mitigation measures EM014 and EM017 detailed within **Table 9-23, Chapter 9: Biodiversity Part A** of the ES [**APP-048**], and complimentary measures detailed within measures S-W12, S-B14, A-B29 and A-B33 of the **Outline CEMP [REP3-013 and 014]**, would also be applied to the installation of scour protection, temporary river training measures and works associated with the installation of the temporary bridge and bankside supports. Mitigation measures EM014 and EM017 includes restricting the timing of the works outside the 'in river works' period where possible, restriction of works to daylight hours and implementation of a fish rescue plan during dewatering activities. Supervision would also be provided by an Ecological Clerk of Works (ECoW) or fish biologist with sufficient experience of fish rescue plans, who would temporarily suspend works should evidence be obtained to suggests the works are having a negative impact on fish migration / spawning. Fish rescues would also include a search for lamprey ammococoetes (larvae) that may be present. The river training measures may be in situ for approximately 16 months, although once installed would not incur a barrier to fish migration, as the training measures are located close to the riverbanks and would not obstruct the channel.

7.9.8. Following the removal of the temporary river training measures, the riverbed would be restored to a comparable pre-works condition, as outlined in **Appendix D: Register of Environmental Actions and Commitments** of this ES Addendum.

7.9.9. The permanent scour protection would be designed to be in keeping with existing natural rocky areas of the River Coquet. Whilst the scour protection would result in the permanent loss of natural riverbank habitat, the design of the scour protection would provide suitable sheltering habitat for aquatic invertebrates and juvenile fish as it would become naturally vegetated over time. Is detailed within **Appendix D: Register of Environmental Actions and Commitments** of this ES Addendum.

OPERATION

7.9.10. A management and monitoring strategy for the proposed scour protection for the River Coquet will be developed at detailed design in consultation with Natural England and the Environment Agency. The requirement for the strategy is captured within **Appendix D: Register of Environmental Commitments** of this ES Addendum. The strategy would include, but not be limited to, inspections of the scour protection at an appropriate frequency throughout its lifespan to monitor the structural condition and conduct repairs / replacement where necessary. Any repair or replacement works would be subject to the same

construction mitigation detailed within **Section 9.9, Chapter 9: Biodiversity Part A** of the ES [**APP-048**], relevant measures within the **Outline CEMP [REP3-013 and REP3-014]** and **paragraphs 7.9.2 to 7.9.9** of this ES Addendum.

7.9.11. The design/configuration of the scour protection has been considered to reduce the level of impact to the SSSI. The design of the scour protection would provide suitable sheltering habitat for aquatic invertebrates and fish (qualifying features of the SSSI) and shall naturally become vegetated over time. In addition, the scour protection would be designed to avoid permanent impacts to the watercourse (SSSI) as a result of changes in water chemistry.

7.9.12. An assessment of the biological water quality and water chemistry would be undertaken post-construction to monitor water conditions within the River Coquet. The results of the monitoring would be compared against baseline data collected prior to and during construction. If required, remedial actions would be implemented following consultation and agreement with Natural England and the Environment Agency. The requirement for this post-construction monitoring is captured within **Appendix D: Register of Environmental Actions and Commitments** of this ES Addendum.

7.10 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

7.10.1. An assessment of likely significant effects is presented below for those ecological receptors that may be impacted by the Southern Access Works. The significance of effects for all other ecological receptors, detailed within **Section 9.10, Chapter 9: Biodiversity Part A** of the ES [**APP-048**], remain unchanged and valid.

CONSTRUCTION

Statutory Sites, Non-Statutory Sites and Ancient Woodland

7.10.2. The proposed Southern Access Works would result in the permanent and temporary loss of natural habitat along the River Coquet (part of the River Coquet and Coquet Valley Woodlands SSSI) as a result of the construction of scour protection, temporary river training measures and installation of the temporary bridge over the River Coquet.

7.10.3. The design of the scour protection has been considered to reduce the level of impact to the SSSI. As detailed in **paragraph 7.9.9** above, the design of the scour protection would provide suitable sheltering habitat for aquatic invertebrates and fish (qualifying features of the SSSI) and shall naturally become vegetated over time. In addition, as detailed in **paragraph 7.9.2**, the scour protection would be designed to avoid permanent impacts to the watercourse (SSSI) as a result of changes in water chemistry.

7.10.4. Mitigation detailed within **Chapter 9: Biodiversity Part A** of the ES [**APP-048**] would reduce the effects of habitat damage / degradation, including adherence to Pollution Prevention Guidance (PPG) (see EM045 of **Table 9-23, Chapter 9, Biodiversity Part A** of the ES [**APP-048**]), which has been secured in measure A-B38 of the **Outline CEMP [REP3-013 and 014]**. Measure A-W15 of the **Outline CEMP [REP3-013 and 014]** includes the use of sediment barriers between earth works, the construction zone and the

watercourse to prevent sediment from washing into the river. Silt management would be implemented not only adjacent to the watercourse, but also up the valley sides to minimise fine sediment input to the watercourse. In addition, the **Outline CEMP [REP3-013 and 014]** includes adherence to the control of water pollution from construction sites guidance produced by the Construction Industry Research and Information Association (CIRIA) (C532), as well as other good practice guidance (see S-W8 of the **Outline CEMP [REP3-013 and 014]**).

7.10.5. Further, mitigation is proposed to control sources of disturbance (noise, light and vibration) detailed within **Section 9.9, Chapter 9: Biodiversity Part A** of the ES [**APP-048**] and measures S-G5, S-B14 and S-B16 of the **Outline CEMP [REP3-013 and 014**].

7.10.6. The loss of riverbank habitat represents an adverse impact to an ecological receptor of National importance. As such, the loss of riverbank habitat as a result of the Southern Access Works might be considered to result in a **Very Large Adverse** effect to the SSSI. However, the extent of impact to riverbank habitat represents approximately 0.29 % of the total bank length (both north and south banks) of the SSSI unit (Unit 5 – approximately 45km total unit riverbank length) within which the proposed Southern Access Works is located, and is unlikely to affect the integrity of the SSSI or its ecological function. This takes into account a total of 90 m of rock armour and 41 m of green-grey erosion control measures proposed for works to the south and north banks. Therefore, the significance of effect is downgraded. The loss of riverbank habitat of the SSSI as a result of the Southern Access Works would result in a direct, permanent **Moderate Adverse** effect. Following the successful implementation of mitigation, the loss, damage and disturbance to habitats of the River Coquet and Coquet Valley Woodlands SSSI would result in a direct, temporary **Slight Adverse** effect (not significant). This does not exceed the **Very Large Adverse** effect to the SSSI already reported for Part A as a result of the loss of ancient woodland habitat within the SSSI, as detailed in **paragraph 9.10.2, Chapter 9: Biodiversity Part A** of the ES [**APP-048**].

7.10.7. The Southern Access Works would reduce the extent of construction activities within the areas of ancient woodland in the SSSI. While the Southern Access Works would result increased coppicing activities to allow clearance for a piling platform and rig accessed via the temporary bridge from the north bank of the River Coquet they avoid the greater extent of vegetation and ground clearance required for an access ramp from fields to the south of the River Coquet, as included in the current application for development consent. In total this area of reduced clearance would equate to an area of approximately 500 m^2. However, this reduction of clearance does not alter the **Very Large Adverse** effect to the SSSI already reported for Part A as a result of the loss of ancient woodland habitat within the SSSI, as detailed in **paragraph 9.10.2, Chapter 9: Biodiversity Part A** of the ES [**APP-048**].

7.10.8. As reported in the **Environmental Statement Addendum: Stabilisation Works for Change Request**, the Stabilisation Works would result in an additional loss of 0.28 ha of

broadleaved woodland within the Coquet River Felton Park Local Wildlife Site (LWS), adopted as ancient woodland for the purposes of mitigation. This is in addition to the 0.41 ha of LWS woodland lost and assessed within **Chapter 9: Biodiversity Part A** of the ES [**APP-048**]. However, following the implementation of the revised **Ancient Woodland Strategy Part A [APP-247]** for the revised Scheme (submitted at Deadline 4 of the Examination) and additional measures (additional permanent land take for compensatory habitat), it is considered that the significance of effect to the LWS due to the loss of habitat remains the same, **Moderate Adverse**, as detailed in **paragraph 9.10.3, Chapter 9: Biodiversity Part A** of the ES [**APP-048**].

Otter

7.10.9. Following the successful implementation of mitigation to reduce disturbance impacts detailed within **Section 9.9, Chapter 9: Biodiversity Part A** of the ES [**APP-048**], the Southern Access Works would not alter the assessment of significant effects detailed within **Chapter 9: Biodiversity Part A** of the ES [**APP-048**] and measure A-B2 of the **Outline CEMP [REP3-013 and REP3-014].** As such, it is considered the revised Scheme would result in a **Neutral** (not significant) effect to otter during construction.

7.10.10. The above assessment is not altered when taking into consideration the Stabilisation Works reported in the **Environmental Statement** A**ddendum: Stabilisation Works for Change Request**.

Fish

7.10.11. The Southern Access Works would incur temporary disturbance to fish during the installation of river training measures, scour protection and temporary bridge crossing, which may include the creation of a dry works area, and subsequent construction of the permanent scour protection works. Temporary disturbance may also occur during the installation of erosion protection measures, particularly as a result of piling activities. Mitigation measures are proposed to reduce the effects of disturbance (seasonal and daily timing of works, supervision from an ECoW, control of light, noise and vibration and fish rescue during the works). In addition, sediment barriers would be used between earth works, the construction zone and the watercourse to prevent sediment from washing into the river.

7.10.12. During in-channel works and whilst river training measures are in place, the works would incur a temporary obstruction to an area of river that may be used by fish. However, works would not result in an obstruction to migration as river training measures would be located close to the riverbank. The Southern Access Works would incur the permanent loss of a small stretch of the riverbank as a result of the permanent scour protection. However, the design of the scour protection would allow for natural vegetation colonisation and development overtime. As such, in the long-term, opportunities for sheltering juvenile fish would be created.

7.10.13. Following successful implementation of mitigation, the Southern Access Works would result in a temporary **Slight Adverse** effect to fish (not significant) during construction. As such, there is no change to the significance of effect reported in **Chapter 9: Biodiversity Part A** of the ES [**APP-048**].

7.10.14. The above assessment is not altered when taking into consideration the Stabilisation Works reported in the **Environmental Statement Addendum: Stabilisation Works for Change Request**.

Aquatic Invertebrates

7.10.15. The Southern Access Works would result in the temporary loss of aquatic habitat during installation of river training measures, scour protection and temporary bridge crossing, which may include the creation of a dry works areas, although this would be reinstated post-construction. The construction of the permanent scour protection would result in the permanent loss of a small stretch of the riverbank. Nevertheless, the design of the scour protection shall provide suitable sheltering habitat for aquatic invertebrates and would become vegetated over time.

7.10.16. Mitigation detailed within **Chapter 9: Biodiversity Part A** of the ES [**APP-048**] would reduce the effects of habitat damage / degradation, including adherence to PPGs (see EM045 of **Table 9-23, Chapter 9, Biodiversity Part A** of the ES [**APP-048**]), which has been secured in measure A-B38 of the **Outline CEMP** [**REP3-013 and 014**]. Measure A-W15 of the **Outline CEMP** [**REP3-013 and 014**] includes the use of sediment barriers between earth works, the construction zone and the watercourse to prevent sediment from washing into the river. In addition, the **Outline CEMP** [**REP3-013 and 014**] includes adherence to the control of water pollution from construction sites guidance produced by CIRIA (C532), as well as other good practice guidance (see S-W8 of the **Outline CEMP** [**REP3-013 and 014**]).

7.10.17. Following the successful implementation of mitigation, the Southern Access Works would not alter the assessment of significant effects detailed within **Chapter 9: Biodiversity Part A** of the [**APP-048**]. As such, it is considered Part A would result in a temporary, **Slight Adverse** effect to aquatic invertebrates (not significant) during construction.

7.10.18. The above assessment is not altered when taking into consideration the Stabilisation Works reported in the **Environmental Statement Addendum: Stabilisation Works for Change Request**.

OPERATION

7.10.19. Following the implementation of the proposed management and monitoring strategy for the permanent scour protection, effects to both the River Coquet watercourse (HPI), River Coquet and Coquet Valley Woodlands SSSI, otter, fish and aquatic invertebrates as a result of materials entering the watercourse are predicted to be **Neutral** (not significant).

7.10.20. Regarding impacts to biodiversity due to permanent changes in morphology, the operational geomorphology assessment presented within **Chapter 8: Road Drainage and Water**

Environment (summarised in **Table** 8**-8**) concludes that whilst there may be local effects on the dynamics of water flow, water velocity, sediment regime and natural fluvial processes as a result of the proposed scour protection, impacts are predicted to be **Minor Adverse** or **Negligible**. It is therefore concluded that the impacts to biodiversity would also be comparable (minor adverse or negligible) in relation to geomorphology. The permanent changes in morphology would result in **Slight** (not significant) effects to biodiversity (namely River Coquet watercourse (HPI), River Coquet and Coquet Valley Woodlands SSSI, fish and aquatic invertebrates).

7.10.21. As such, whilst the significance of effects has increased from that reported in **Section 9.10, Chapter 9: Biodiversity Part A** of the ES [**APP-048**], the effects remain no significant..

7.11 MONITORING

7.11.1. Monitoring will be undertaken as part of the maintenance and monitoring strategy for the permanent scour protection. The methodology of the proposed monitoring will be determined at the detailed design stage in consultation with Natural England and the Environment Agency.

7.11.2. All other monitoring requirements for Biodiversity have not changed due to the Southern Access Works and the text within **Section 9.11, Chapter 9: Biodiversity Part A** of the ES [**APP-048**] remains valid.

7.12 UPDATED DMRB GUIDANCE

7.12.1. Since the assessments in the ES were completed, the DMRB methodology was superseded and replaced with updated guidance as detailed in **Section 9.4, Chapter 9: Biodiversity Part A** of the ES [**APP-048**]. As detailed in **paragraph 9.4.31, Chapter 9: Biodiversity Part A** of the ES [**APP-048**], with the exception of the updated guidance relating to air quality (LA 105)[2], the other updated DMRB guidance documents relevant to the biodiversity assessment are less prescriptive in their requirements regarding methodologies and approach to mitigation when compared to the former guidance. The updated DMRB guidance primarily references best practice, Chartered Institute of Ecology and Environmental Management (CIEEM) guidelines and standing advice, which were used to inform the assessment presented within this addendum. As detailed in **paragraph 4.1.2** of this ES Addendum, an assessment in relation to air quality has been scoped out. As such, the conclusions of the assessment in relation to potential impacts and their likely significance would remain unchanged with the application of the updated guidance.

[2] Highways England (2019) Design Manual for Roads and Bridges (DMRB) LA 105 Air Quality.

8 ROAD DRAINAGE AND THE WATER ENVIRONMENT

8.1 INTRODUCTION

8.1.1. **Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**] considers the likely significant effects of the Scheme on Road Drainage and the Water Environment.

8.1.2. This chapter of the ES Addendum considers the likely significant effects of the Southern Access Works (described in **Chapter 2: Southern Access Works** of this ES Addendum) and the Stabilisation Works (described in **Chapter 2: Stabilisation Works** of the **Environmental Statement Addendum: Stabilisation Works for Change Request**) on Road Drainage and the Water Environment.

8.2 COMPETENT EXPERT EVIDENCE

8.2.1. As detailed in **Table 8-1**, the professionals contributing to the production of this assessment have sufficient expertise to ensure the completeness and quality of this assessment. The table sets out the details of expertise where this is different to those presented in the ES.

Table 8-1 – Road Drainage and the Water Environment Professional Competence

Name	Role	Qualifications and Professional Membership	Experience
Alexander Bellis	Author (Geomorphology)	BA (Hons) Geography MSc Applied Geomorphology Fellow of Geological Society of London Member of the British Society for Geomorphology	8 years of experience in consultancy as a geomorphologist including contributions to EIA assessment for: A9 Glen Garry to Dalraddy (Central Section) Dualling Hawick Flood Protection scheme A82 (Tarbet to Inverarnan) Improvements
Ian Coleman	Author (Groundwater)	PhD Hydrogeology, Newcastle University MSc Groundwater Engineering, Newcastle University BSc (Hons) Geology and Geography,	19 years' experience providing consultancy support to infrastructure, industrial, public sector and private clients in groundwater, contaminated land and environmental assessment.

Name	Role	Qualifications and Professional Membership	Experience
		University of Bedfordshire Fellow of the Geological Society	8 years Environmental Impact Assessment (EIA) experience, recent project experience includes work on EIA for large road and other infrastructure developments in England, Scotland and Wales.
Andrew Picken	Author (Water Quality)	BSc (Hons) Physics MSc Applied Meteorology Member of the Chartered Institute of Water and Environmental Management (MCIWEM) Chartered Water and Environmental Manager (C.WEM)	11 years' experience in environmental consultancy providing water related support to infrastructure, public sector, and private clients in water quality, flood risk, and environmental assessment. Nine years' water environment impact assessment, recent project experience includes: A9 Pass of Birman to Tay Crossing Confidential Water Pipeline Upgrade
Ian Griffin	Reviewer	BSc (Hons) Botany PhD Environmental Science Member of the Chartered Institute of Water and Environmental Management (MCIWEM) Chartered Water and Environmental Manager (C.WEM) Chartered Environmentalist (CEnv)	19 years' academic, conservation and consultancy experience in river process, geomorphology, hydrology and environmental engineering. Recent relevant project experience includes: Technical Lead, A9 Pass of Birman to Tay Crossing Technical Lead, A9/A96 Inches to Smithton Project Principal, Manchester North West Quadrant

8.3 LEGISLATIVE AND POLICY FRAMEWORK

8.3.1. The legislative and policy framework for Road Drainage and the Water Environment has not changed since the publication of the ES. Therefore, the text within **Section 10.3, Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**] remains valid.

8.4 ASSESSMENT METHODOLOGY

8.4.1. In order to ensure a comparable assessment with the ES, the assessment methodology followed for Road Drainage and the Water Environment within **Section 10.4, Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**] remains unchanged and valid, other than the limited, specific changes relating to the geomorphological assessment as described below.

GEOMORPHOLOGICAL ASSESSMENT

8.4.2. The geomorphological assessment for this ES Addendum comprises a desk study drawing upon baseline data collected and documented in **Appendix 10.7: Geomorphology Assessment – River Coquet Parameter 10 Part A** of the ES [**APP-260**], and site visits carried out on 26 January and 26 February 2021. During the site visits, channel forms, features, processes and flow types were mapped and a geolocated photographic record captured. In addition, the presence and extent of existing modifications were mapped, which included the existing A1 bridge pier, river training works, drainage outfall and estimated extent of made ground around the existing bridge. In addition, the weir approximately 700 m downstream of the A1 bridge was surveyed and the estimated upstream backwater effect mapped.

8.4.3. The geomorphological assessment also draws upon the results from hydraulic calculations of water level, velocity, stream power and shear stress to assess potential changes in sediment transport, erosion and deposition. The methodologies of these calculations are the same as those documented in **Appendix 10.7: Geomorphology Assessment – River Coquet Parameter 10 Part A** of the ES [**APP-260**]. These calculations are performed on two cross sections of the river which have been adjusted to reflect the proposed works during operation and construction phases. Further, detailed hydraulic analysis and associated geomorphological assessment within the Examination to allow verification of these preliminary results. This will include development of a two-dimensional hydraulic model, utilising bathymetric survey data, the outputs of which, will inform a refined geomorphological assessment.

8.4.4. The previous assessment in **Appendix 10.7: Geomorphology Assessment – River Coquet Parameter 10 Part A** of the ES [**APP-260**] provides criteria for estimating the magnitude of impact on the River Coquet. This table has been adapted (**Table 8-2**) to make it specific for the purposes of assessing the geomorphological impacts of the Southern Access Works and the Stabilisation Works within this ES Addendum.

Table 8-2 - Criteria for Estimating the Magnitude of Impact on the River Coquet

Magnitude	Description
Major Adverse	Sediment regime: Major change to the natural equilibrium through modification, significantly changing the natural function of the watercourse (sediment source, sink or transfer zone). This may arise from a major increase in amount of fine sediment and turbidity and transport of large (boulder) particle sizes. Channel morphology: Major impacts on channel morphology through the removal of a wide range of morphological features. Significant alteration to the natural channel cross-section and bank profiles. A significant increase in stream power may result which may pose erosion risk problems. Natural fluvial processes: Major interruption to fluvial processes such as channel planform evolution or erosion and deposition.
Moderate Adverse	Sediment regime: Moderate change to the natural equilibrium through modification, partially changing the natural function of the watercourse (sediment source, sink or transfer zone). This may arise from a moderate increase in amount of fine sediment and turbidity and transport of large substrate sizes (large cobbles and small boulders). Channel morphology: Moderate impact on channel morphology through the removal of a range of morphological features. Any works that may alter out-of-bank flows and cause scour. Natural fluvial processes: Moderate interruption to fluvial processes such as channel planform evolution or erosion.
Minor Adverse	Sediment regime: Minor change to the natural equilibrium through modification, locally changing the natural function of the watercourse (sediment source, sink or transfer zone). This may arise from a slight increase in amount of fine sediment and turbidity and transport of small cobbles. Channel morphology: Limited impact on channel morphology, through removal of some morphological features. Natural fluvial processes: Slight change in fluvial processes operating in the river; any change is likely to be localised.
Negligible	Sediment regime: Negligible change to the natural equilibrium. Negligible amount of sediment released into the watercourse, with no noticeable change to the turbidity or bed substrate. Channel morphology: No significant impact on channel morphology in the local vicinity of proposed new River Coquet bridge. Natural fluvial processes: No change in fluvial processes operating in the river; any change is likely to be highly localised.

8.4.5. In addition, to account for the potential impacts arising from the Southern Access Works, the magnitude of impact assessed takes into account the duration of the impact, and reversibility of the impact.

8.5 ASSESSMENT ASSUMPTIONS AND LIMITATIONS

8.5.1. The assessment assumptions and limitations stated within **Section 10.5, Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**] remains unchanged and valid for the purposes of this assessment.

8.5.2. The hydraulic analysis undertaken to support the assessment set out in this ES Addendum is limited to two cross sections (one representing the operational stage at the location of the new bridge, and another further downstream closer to the location of the temporary bridge) of the channel and utilises one-dimensional hydraulic calculation methods to estimate water level, velocity, stream power and shear stress.

8.5.3. The method allows an approximation of the magnitude of impact of the proposed works. However, the spatial extent (upstream and downstream) of such change cannot be evaluated at this time. Further detailed hydraulic modelling is anticipated within the Examination to allow verification of these results and provide further detail on the spatial extents and changes in flow and sediment behaviour in the vicinity of the works.

8.6 STUDY AREA

8.6.1. The Study Area for the Road Drainage and the Water Environment assessment has not changed for the Southern Access Works. The additional land required for the Stabilisation Works is located within the defined Study Area for the discipline topics which extend several hundred metres upstream and downstream of Part A. Therefore, the text within **Section 10.6, Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**] and **Appendix 10.7: Geomorphology Assessment – River Coquet Parameter 10 Part A** of the ES [**APP-260**] remains unchanged and valid.

8.7 BASELINE CONDITIONS

8.7.1. The baseline for the Road Drainage and the Water Environment assessment has not changed for the Southern Access Works, except for the points detailed below.

8.7.2. Review of the Environment Agency's Catchment Data Explorer[3] indicates an overall quality of the River Coquet (Coquet from Forest Burn to Tidal Limit) of 'Moderate' with the ecological quality assessed as 'Good' and the chemical quality assessed as 'Fail', due to a

[3] Environment Agency (2020), Catchment Data Explorer [Available online] https://environment.data.gov.uk/catchment-planning/ [Accessed December 2020]

fail for priority substances. The hydromorphological status remains unchanged as 'Supports Good'.

8.7.3. The River Coquet is designated as part of the River Coquet and Coquet Valley Woodlands SSSI. The SSSI is designated for aquatic flora and fauna, the habitats for which have the potential to be affected by geomorphological change. In accordance with **Appendix 10.7: Geomorphology Assessment – River Coquet Parameter 10 Part A** of the ES [**APP-260**] an importance of 'High' has been given to the River Coquet when assessing the geomorphological importance of the river.

8.7.4. The site visits carried out on 26 January and 26 February 2021, showed that the north bank within the reach of the proposed works exhibited evidence of previous modification. This included modification associated with the construction of the existing crossing, including means for access, and a highway related drainage outfall with associated rock armour protection. The south bank also exhibits modification with encroachment into the channel from river training works associated with the existing southern bridge pier (a total length of 35 m, including the pier and the river training works upstream and downstream of the pier). Approximately 640 m downstream of the proposed works, a river wide weir impounds the river creating a backwater effect which extends approximately 300-350 m upstream (to within 300-350 m of the proposed works).

8.7.5. Further monitoring of groundwater in ground investigation boreholes has been undertaken between January and March 2020. The monitored locations are predominantly on the north side of the River Coquet (BH1904, BH1906, BH1910, BH1911 and BH1914), with only one deeper piezometer on the south side (BH1901)[4]. Of these, only two are monitoring groundwater in the superficial deposits (BH1906 and BH1914) and these have recorded maximum groundwater levels between around 0.6 m and 4 m below ground level. This is consistent with conditions reported in **Chapter 11: Geology and Soils Part A** of the ES [**APP-052**]. For the purposes of the assessment set out in this ES Addendum, given the lack of shallow groundwater monitoring on the south side of the River Coquet, the functional groundwater surface has been assumed to be similar to that on the north side and shallow, at around 1 m below ground level.

8.7.6. The remainder of the text within Section 10.7, Chapter 10: Road Drainage and the Water Environment Part A of the ES [APP-050] and Appendix 10.7: Geomorphology Assessment – River Coquet Parameter 10 Part A of the ES [APP-260] remains unchanged and valid.

[4] Jacobs (2020), A1 Morpeth to Ellingham Dualling – River Coquet Combined Preliminary Sources Study And Ground Investigation Report. HE551459-JAC-HGT- m^2F_S03_NS39363-RP-GI-0001, Rev. P02.

8.8 POTENTIAL IMPACTS

CONSTRUCTION

8.8.1. The potential impacts during the construction phase of the Southern Access Works would be short-term, limited to the duration of the works, with 16 months for near and in-channel works.

8.8.2. During construction, the anticipated impacts of the Southern Access Works are:

a. Potential for increased fine sediment delivery to the watercourse.
b. Reduced groundwater baseflow to the River Coquet.
c. Ground disturbance and compaction associated with construction.
d. Potential geomorphological (hydromorphological) impacts including:

- Potential for alteration of the sediment regime.
- Potential for an increase in fluvial activity, such as erosion of mobile bed material and the banks within the area of works as well as downstream of the works.
- Potential for loss or adverse impact to bed and bank morphological features.

8.8.3. These impacts are discussed in more detail in **paragraphs** 8**.8.4 to** 8**.8.9** below, with further information on geomorphological impacts included in **Table** 8**-2**.

Sedimentation

8.8.4. There is the potential for temporary increases in sedimentation within the River Coquet caused by surface water runoff containing elevated levels of suspended particles. This potential impact may result from activities associated with the installation of the piling platform and associated river training works required for stabilisation and erosion control works (described in the **Environmental Statement Addendum: Stabilisation Works for Change Request**) as well as the installation of the foundations for the temporary bridge. Plant machinery tracking may also lead to increased sediment generated due to the localised disturbance caused by repeated movements of heavy vehicles.

8.8.5. In channel works would be required for the placement of the temporary river training structures, temporary bridge abutment and construction of the lower piling platform on the north bank and placement of river training material on the south bank. These works could mobilise sediments from the removal of bank-side vegetation which may lead to an increase in suspended sediment and turbidity within the river.

Pollution risk

8.8.6. Due to the close proximity of works in relation to the River Coquet, there is increased risk of pollution from the spillage or leak of fuels or other harmful substances from plant machinery. Earthworks required for the haul roads and working areas may expose unidentified contaminants which may be a risk to water quality. There is a risk of a spillage or leakage of concrete adjacent to the watercourse during the formation of the foundations of the temporary bridge.

Construction Activities within Watercourses

8.8.7. There is the potential for impacts to the hydromorphological, chemical and ecological quality associated with temporary works within, or in close proximity to the River Coquet from the installation of the piling platform and associated river training works as part of the Stabilisation Works (described in the **Environmental Statement Addendum: Stabilisation Works for Change Request**), as well as construction, operation and removal of the temporary bridge. Further details on the potential impacts to geomorphological process are detailed below.

Groundwater Resources

8.8.8. As described in the **Environmental Statement Addendum: Stabilisation Works for Change Request**, there is the potential for a localised reduction in baseflow to the River Coquet due to groundwater drawdown associated with the Stabilisation Works. Furthermore, there is the potential for a localised reduction in groundwater baseflow to the River Coquet from ground disturbance and compaction associated with construction of the temporary bridge foundations.

Geomorphology

8.8.9. In addition to the potential impacts described in the **Environmental Statement Addendum: Stabilisation Works for Change Request** there are further potential impacts on geomorphology as a result of the Southern Access Works during construction which are summarised in **Table 8-3**.

Table 8-3 - Potential Impacts on Fluvial Geomorphology During Construction

Source of impact	Potential impact to	Description
South bank associated works, including temporary bridge and temporary retaining wall / river training works.	Sediment regime	Construction of the temporary retaining wall/river training works and temporary bridge could lead to a short-term increase in the volume of fine sediment directly entering the channel and cause siltation of the channel substrate. Any out-of-bank flows reaching construction areas may entrain material from exposed stockpiles, surfaces and excavations which may be transported to the watercourse. This sediment may be carried a considerable distance downstream, with the potential for detrimental impacts on important aquatic habitats. The restriction of flow and reduced channel width due to the river training walls (present on both north and south banks) may, for the duration of the works, alter the sediment transport competence of the river locally, potentially resulting in increased sediment transport competence adjacent to the river training works. Upstream of the works, the channel constriction may result in the potential for reduced sediment transport during times of high flows. The prevailing sediment

Source of impact	Potential impact to	Description
		transport regime is characterised by efficient transport of coarse sediment through the reach with relatively little deposition driven by the confined nature of the gorge and bedrock channel. The potential for significant deposition upstream is therefore low. There may be a very limited and localised impact on coarse sediment supply at times of high flow due to the works footprint extending over any potential bank and bed sediment sources, thus reducing sediment supply to the channel from the south bank. The channel constriction between the north bank (as described in the **Environmental Statement Addendum: Stabilisation Works for Change Request**) and the Southern Access Works may increase the risk of erosion to banks immediately downstream with the potential to increase sediment supply.
	Channel morphology	Changes in sediment transport capacity may locally change the distribution of erosional and depositional features. In addition, bank and bed features, including riparian vegetation would be lost within the footprint of these works. There may also be a requirement to 'key in' the temporary retaining walls to the bed, which may include removal of some bed material (including bedrock) to create a level surface on which to construct the retaining walls.
	Natural fluvial processes	The encroachment of the works into the channel would alter the channel dynamics under both low and high flow conditions. This could result in increased coarse sediment deposition upstream, bed scour and lateral erosion parallel with the works and downstream eddying (beyond the channel constriction). These changes may locally change fluvial processes and the distribution of erosional and depositional features. At low to normal flows, very localised changes in velocities may be anticipated adjacent to the river training walls, causing very localised changes in sand and fine sediment deposition here. Away from the river training walls there is unlikely to be any impact on velocities, sediment transport, erosion or deposition.

8.8.10. All other impacts during construction, detailed within **Section 10.8, Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**], remain unchanged and valid.

OPERATION

8.8.11. During operation, the anticipated impacts of the Southern Access Works are:

a. Increased modification to the watercourse due to the scour protection measures associated with the pier and erosion protection required as part of the bank reinstatement.

b. Potential for the permanent alteration of the sediment regime, channel morphology and natural fluvial processes due to the introduction of pier scour protection and erosion protection required as part of the bank reinstatement.

8.8.12. These impacts are discussed in more detail in **paragraphs 8.8.13 to 7.8.15** below, with further information on geomorphological impacts included in **Table 8-3**.

8.8.13. As described in the **Environmental Statement Addendum: Stabilisation Works for Change Request**, the total extent of rock armour along the north bank is currently anticipated to be 62 m. The extent of natural bank that this would impact is 51 m because the rock armour would be constructed over 11 m of bank that was disturbed and reinstated during the construction of the pier for the existing River Coquet Bridge.

8.8.14. A total of 24 m of north bank would be disturbed during construction and reinstated to existing profiles following completion of the Stabilisation Works using green or green-grey erosion control methods set out in HR Wallingford (2017)[5] and planted to allow recovery of the riparian vegetation structure.

8.8.15. On the south bank, the rock armour extent is currently anticipated to be approximately 28 m. A further 17 m of south bank that would have been disturbed would be reinstated to existing profiles following completion of the permanent works using green or green-grey erosion control methods.

Sedimentation

8.8.16. Surfaces exposed during construction of the Stabilisation Works (as described in the **Environmental Statement Addendum: Stabilisation Works for Change Request**) would be temporarily prone to surface water runoff during reinstatement and the establishment of erosion controls. This could lead to increased inputs of suspended solids and turbidity which could temporarily deteriorate water quality until vegetation establishment is achieved.

8.8.17. Similar impacts may be realised for a temporary period post-construction following reinstatement and establishment of erosion controls associated with the south bank pier scour and bank protection.

[5] HR Wallingford (2017) Green approaches in river engineering, Supporting implementation of green infrastructure.

Groundwater Resources

8.8.18. As described in the **Environmental Statement Addendum: Stabilisation Works for Change Request** there is the potential for reduced groundwater baseflow to the River Coquet due to the permanent pile installation for the north bank. No further groundwater impacts associated by the works covered by this ES Addendum are expected during operation.

Geomorphology

8.8.19. In addition to the potential impacts described in the **Environmental Statement Addendum: Stabilisation Works for Change Request** there are further potential impacts on geomorphology during operation. These impacts are shown in **Table 8-4**.

Table 8-4 - Potential Impacts on Fluvial Geomorphology During Operation

Source of impact	Potential impact to	Description
South bank pier scour protection	Sediment regime	The protection of 28 m of south bank may lead to a very localised reduction in availability of erodible material and reduced sediment supply from the protected banks. Further protection of a 17 m of bank, which was disturbed during the construction works may lead to a very localised reduction in the availability of erodible bank material and very localised reduction in sediment supply from the grey-green protected banks. Increased run-off may occur locally due to immature vegetation, in the reinstated construction zone outwith the extent of the permanent erosion protection. The scour protection may cause erosion locally downstream, increasing sediment supply from the bank.
	Channel morphology	The works are anticipated to reinstate the existing bank profile, to minimise changes to the channel geometry. However, there is the potential that some bank and near-bank bed morphological features would be lost within the footprint of these works.
	Natural fluvial processes	The change in materials from which the bank is composed would, by necessity of design, reduce the channel's ability to adjust, thus protecting the bridge foundations and stability of slope below the bridge abutments. Increased run-off may occur locally due to immature vegetation. The south bank erosion protection may lead to a small alteration in channel cross sectional area, which could potentially cause localised changes to stream power, channel velocity, water level and erosion and deposition during high flows. For example, a reduced bank roughness of the proposed revetment, compared to the current tree lined bank

Source of impact	Potential impact to	Description
		could increase erosion immediately downstream of the revetment.
South bank reinstated made ground (outwith extent of pier scour protection).	Sediment regime	Potential for erosion of made ground during out-of-bank flows during operation, which may increase fine sediment delivery to the river.
	Channel morphology	The potential for erosion of the reinstated made ground increasing fine sediment delivery may cause localised fine sediment deposits altering bed morphology.
	Natural fluvial processes	Due to the increased erodibility of exposed, reinstated banks within the flood zone there may be an increase in bank erosion during high flow conditions. This may lead to a small alteration in channel cross sectional area, which would potentially cause localised changes to stream power, channel velocity, erosion and deposition. At low to normal flows, very localised changes in velocities may be anticipated adjacent to the scour protection, causing very localised changes in sand and fine sediment deposition here. Away from the channel margins there is unlikely to be any impact on velocities, sediment transport, erosion or deposition.

8.8.20. All other impacts during operation, detailed within **Section 10.8, Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**], remain unchanged are valid.

8.9 DESIGN, MITIGATION AND ENHANCEMENT MEASURES

8.9.1. In addition to the measures detailed within Section 10.9, Chapter 10: Road Drainage and the Water Environment Part A of the ES [APP-050] and those specific to the Stabilisation Works described in the Environmental Statement Addendum: Stabilisation Works for Change Request, the following mitigation measures would also be implemented.

8.9.2. Prescribed mitigation measures to address any potential impacts arising from the Southern Access Works as described in **Table 8-4** and **Table 8-5** and included within **Appendix D: Register of Environmental Actions and Commitments** of this ES Addendum.

CONSTRUCTION

8.9.3. The duration of the construction impacts is expected to be limited, with near-channel and in-channel works limited to approximately 16 months. Following this period, bank and bed features which would not be replaced by permanent infrastructure (see **paragraph 8.10.18** below), would be reinstated as close as possible to their original form.

8.9.4. A summary of the mitigation measures to reduce the impact of the construction activities are provided in **Table 8-5**.

Table 8-5 - Mitigation Measures for Construction

Source of impact	Mitigation measure	Type of mitigation
General construction activities associated with proposed design.	Previous assessment has listed mitigation for reducing and preventing fine sediment delivery to the channel. These proposed measures are relevant to this ES Addendum. A surface water drainage system would be developed by the main contractor for the temporary bridge structure. This would ensure that runoff or spillages on the bridge do not enter the River Coquet and transfer any collected runoff and sediment to appropriate treatment measures. The main contractor would consider the implementation of a containment screen on the underside of the temporary bridge to prevent any falling debris or sediment from entering the River Coquet. Silt fences and / or other edge protection measures would be installed along the River Coquet bank to reduce the risk of increased sedimentation entering the channel during construction. A site-specific drainage management plan will be created to attenuate, treat and discharge site runoff. Deploy in-channel silt barriers (i.e. silt curtains or similar) as far as reasonably practical or a similar form of barrier if silt water runoff is discharging into the River Coquet to control the downstream dispersion of suspended solids. Install a suitable geomembrane between the river training works and piling platform to minimise the release of construction aggregate associated with the piling platform. During periods of heavy rain, adopt regular visual inspections of the watercourse to identify discharges of silt laden runoff and take immediate action if required.	Reduction and prevention
South bank associated works, including temporary bridge and temporary retaining wall / river training works.	Near and in-channel works anticipated to be limited to 16 months.	Reduction
	Bank and bed features (outside the extent of permanent works – see **paragraph 8.10.18** below) as far as practicable to be reinstated to existing profiles following completion of the permanent works. Prior to construction, any sedimentary bed features that may be disturbed would be mapped and photographed, and boulders (>0.5 m) would be surveyed, numbered and marked to show orientation relative to the channel bed. At the onset of the construction phase, these sediments would be removed and stored. Upon completion of construction, the sedimentary	Reduction

Source of impact	Mitigation measure	Type of mitigation
	bed features would be reinstated where practicable, with boulders placed according to the surveyed data.	
	Temporary bridge abutments to be removed when crossing no longer required.	Reduction
	Elevation of temporary bridge to be set to be above the 1% AEP (100 year) flood level.	Reduction
	Temporary bridge to be single span to reduce bed and conveyance impacts. Maximum feasible span to be used to minimise constriction to channel width.	Reduction
	River training walls to be lined with geotextile to prevent release of construction aggregate, associated with the working platform, to the channel.	Reduction

OPERATION

A summary of the mitigation measures to reduce the operational impacts is provided in **Table 8-6.**

Table 8-6 - Mitigation Measures for Operation

Source of impact	Mitigation measure	Type of mitigation
South bank pier scour protection	Construct erosion protection to reflect natural bank profile.	Reduction
	Minimise the extent of hard engineered erosion protection.	Reduction
	Use sympathetic materials and construction techniques, likely to replicate existing bank roughness. Likely measures to be refined during detailed design.	Reduction
	Re-plant the reinstated made ground, using a locally appropriate tree, shrub and seed mix. Apply seeded biodegradable geotextile if outside of growing season, to reduce likelihood of erosion following reinstatement during out-of-bank flows. A total of 17 m of bank impacted by construction activities, and lying outside of the proposed permanent scour protection is proposed to be reinstated (where possible) using green or green-grey erosion control methods set out in HR Wallingford	Reduction

Source of impact	Mitigation measure	Type of mitigation
	(2017)[6] and planted to allow recovery of the riparian vegetation structure.	

8.10 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION

Increased Sedimentation

8.10.1. The magnitude of the potential impacts associated with the Southern Access Works is likely to be greater during periods of heavy rainfall. The greatest risk to increased sedimentation is most likely to be associated with the Stabilisation Works described in the **Environmental Statement Addendum: Stabilisation Works for Change Request**. Further risk is associated with repeated plant vehicle movements which could cause further ground disturbance. Works to install the temporary river training, temporary bridge foundations and southern pier scour protection could also lead to mobilisation of sediment.

8.10.2. Any increase in sedimentation from construction runoff would likely reduce shortly after completion of the works when bare areas of earth are reinstated. The mitigation measures detailed in **Section 8.9** of this ES Addendum and within measures S-W1, S-W8, S-W9, S-W10, S-W12 and A-W15 of the **Outline CEMP** [**REP3-013 and 014**] would ensure the risk of increased sedimentation and potential effects to the watercourse is low. For example, as detailed in reference S-W9 of the **Outline CEMP** [**REP3-013 and 014**] the main contractor will set out how construction activities will be undertaken to ensure all risks to the water environment from material excavation and storage will be further developed as part of the Main Contractor's working method statements. The effects would be direct and temporary, with no long term or permanent impacts expected.

Pollution Risk

8.10.3. There is the potential increased risk of surface water runoff or pollution incidents from the temporary bridge directly into the River Coquet. With the implementation of mitigation measures outlined within measures S-W1, S-W8, S-W10, S-W11, S-GS8 and S-GS13 of the **Outline CEMP** [**REP3-013 and 014**] and additional measures outlined in **Section 8.9** and **Appendix D: Register of Environmental Actions and Commitments** of this ES Addendum, it is considered unlikely that pollution of the River Coquet would occur. For example, as detailed in reference S-W10 of the **Outline CEMP** [**REP3-013 and 014**] the main contractor would be required to comply with the relevant sections of BS 6031:2009

[6] HR Wallingford (2017) Green approaches in river engineering, Supporting implementation of green infrastructure.

Code of Practice for Earthworks with respect to protection of water quality and control of site drainage. Further measures to reduce pollution risk would be implemented, such as storing mechanical plant including generators in bunded areas when not in use as detailed as detailed in reference S-W11 of the **Outline CEMP** [**REP3-013 and 014**].

Construction Activities within Watercourses

8.10.4. Temporary works within or in close proximity to the River Coquet, could result in damage to the banks resulting in short term increases to sediment loading and turbidity. Similar impacts were also described in the **Environmental Statement Addendum: Stabilisation Works for Change Request** covering the Stabilisation Works.

8.10.5. Potential impacts associated with construction works within the watercourse channels are considered to be direct and temporary, as water quality within the watercourses would improve over time as sediments settle and pollutants are treated by entrapment, dilution and natural degradation processes.

River Coquet

8.10.6. Ground disturbance and compaction associated with the construction work and placement of temporary bridge foundations could act to reduce shallow groundwater flow towards the River Coquet and, consequently reduce groundwater baseflow to the river. However, any potential effect would be expected to be small and the area potentially affected would be minimal compared to the size of the River Coquet. Consequently, the potential impact would not be expected to be significant.

Geomorphology

8.10.7. The construction impacts on the sediment regime and natural fluvial processes could occur across the full range of flow conditions. Impacts from fine sediment ingress may be greatest during low flows, however, impacts on coarse sediment transport and erosion and deposition are likely to be greatest during higher and out-of-bank flows where the effects from the works on channel width would be greatest.

8.10.8. Due to the alignment of the temporary training works, approximately 47 m would lie within the river channel itself. Approximately 12 m of the riverbank within the affected 47 m stretch of the river, comprises non-natural bank, hence the length of affected natural riverbank is approximately 35 m.

8.10.9. River depth and width variation would be locally affected by the encroachment of the river training walls (including the temporary bridge abutments into the channel). River depths would increase, and river widths locally decrease between the training walls.

8.10.10. The existing river channel width at the proposed temporary bridge is approximately 34 m. The river training walls and abutments constrict the channel to approximately 24 m. This channel width is the same as the channel width at the existing A1 bridge pier upstream. The hydraulic calculations show that the proposed training walls may increase water depth at the

50%AEP (2-year) flood event by 0.03 m and increase water depth at the 0.5%AEP (200-year) flood event by 0.33 m.

8.10.11. The dynamics of water flow would be locally affected by the proposed river training works. The encroachment of the river training walls including the temporary bridge abutments into the channel, and reduced roughness of the training walls, would alter the channel dynamics under both low and high flow conditions, causing increased water velocities as described below.

8.10.12. This could result in bed scour and downstream eddying (beyond the channel constriction). These changes may locally alter fluvial processes and the distribution of erosional and depositional features. However, the impacts of flow dynamics are likely to be short term and reversible once the channel is reinstated to its natural cross-section.

8.10.13. Hydraulic calculations of the constriction and associated change in bank roughness due to the river training works show a 0.9 m/s (41%) maximum increase in velocity and 9 W/ m^2 (59%) increase in stream power at the channel margins for the 2-year flood event and 1.5 m/s (48%) maximum increase in velocity and 56 W/m^2 (17%) maximum increase in stream power for the 200-year flood event.

8.10.14. However, these increases are not realised across the whole channel. The results show a negligible increase in velocity and a maximum increase in stream power of 2 W/ m^2 (4%) away from the channel margins during the 2-year flood event. For the 200-year flood event, the results show a maximum increase in velocity of 0.2 m/s (7%) away from the channel margins and a maximum increase in stream power of 32 W/ m^2 (19%) away from the margins.

8.10.15. Analysis of sediment entrainment competence indicate that under existing conditions, the grain sizes entrained would typically be gravels (mean grain size of 34 mm). The temporary works lead to a mean increase in grain sizes entrained of 6 mm at the 2-year flood event, and 18 mm at the 200-year flood event.

8.10.16. These results suggest that structure and substrate of the riverbed may locally change due to increased velocities between the training walls, causing scour and/or a coarsening of the grain sizes within the existing depositional features.

8.10.17. The proposed works could create a short-term increase in the volume of fine sediment directly entering the channel and consequently increase turbidity and cause limited, localised draping of bedforms with fine sediment as a result of increased fine sediment supply. These impacts are likely to be temporary and limited in duration as relatively frequent flushing flows are likely to transfer and disperse this excess fine sediment downstream.

8.10.18. As described above, the duration of the works would be relatively short term (approximately 16 months for near-channel and in-channel works) and once completed, the natural bed and banks outside the extent of any permanent works would be reinstated to the baseline cross-sectional profile. As such, impacts to the sediment regime and natural fluvial processes are

considered localised, short term and reversible with the commitment to reinstatement following completion of the works.

8.10.19. The loss of some bank features is unlikely to be reversible through natural processes in the short term. Bank features such as exposed roots, undercut banks, and exposed bedrock would have developed over a long period of time through the balance between fluvial bank erosion and stabilisation by tree growth.

8.10.20. Some bed deposits show indications of long-term stability and may only be transported small distances during rare large magnitude flow events. These features also act to promote deposition of finer sediments through sheltering. Where impacted, such deposits are unlikely to reform in the short term through natural deposition but over time would develop, if boulders exhibiting long-term stability can be replaced or reinstated at their original locations.

8.10.21. Sedimentary bed features that may be directly impacted by construction activities would be mapped prior to construction and sediment removed, stored and reinstated where practicable following construction. Specific measures would be implemented to ensure that any in-channel boulders, affected by the works, that are over 0.5 m are placed back in the same location, with the same orientation.

8.10.22. **Table 8-7** provides a summary of the likely significant effects associated with the Southern Access Works during construction. Permanent effects to hydromorphology associated with Southern Access Works are discussed as operational effects.

Table 8-7 - Assessment of Effects During Construction

Source of Impact	Comments	Magnitude of Impact	Significance of Effect
Increased Sedimentation	A temporary increase in sedimentation associated with the exposure and disturbance of surfaces and works either within or in close proximity to the River Coquet could lead to increased suspended solids and turbidity. River Coquet specific mitigation measures in **Section 8.9** and **Appendix D: Register of Environmental Actions and Commitments** of this ES Addendum and measures S-W1, S-W8, S-W9, S-W10, S-W12 and A-W15 of the of the **Outline CEMP** [**REP3-013 and 014**] would ensure minimal impact. For example, as detailed in reference S-W9 of the **Outline CEMP [REP3-013 and 014**] measures for managing excavated and stored material will be further developed as part of the Main Contractor's working method statements.	**Minor adverse**	**Slight** **(not significant)**
Pollution Risk	Fuel and other harmful substances from plant vehicles and disturbance of unidentified contaminants could lead to a temporary deterioration in water quality. With robust mitigation and spill containment measures proposed in measures S-W8, S-W10, S-W11, S-GS8 and S-GS13 of the **Outline CEMP [REP3-013 and 014**], discharge of significant volumes of harmful substances unlikely to occur. Measures include, for example, that the main contractor would be required to comply with the relevant sections of BS 6031:2009 Code of Practice for Earthworks with respect to protection of water quality and control of site drainage as detailed in reference S-W10 of the **Outline CEMP [REP3-013 and 014**]. Further measures to reduce pollution risk would be implemented, such as storing mechanical plant including generators in bunded areas when not in use as detailed as detailed in reference S-W11 of the **Outline CEMP [REP3-013 and 014].** Further mitigation proposed in **Section 8.9** and **Addendum D: Register of Environmental Actions and Commitments** of this ES Addendum would reduce the risk of pollution from surface water runoff or spillage from the temporary bridge.	**Negligible**	**Neutral** **(not significant)**
Construction Activities within Watercourse	The removal of bankside vegetation and disturbance to the riverbed and banks could lead to increased suspended solids and turbidity. Fuel or other harmful substances from plant vehicles could also lead to a deterioration in water quality. Mitigation measures provided in S-W9, S-W10, S-W12, A-W15 and S-GS9 of the **Outline CEMP [REP3-013 and 014]** would ensure minimal impact. For example, works would be avoided during high flow events and intense rainfall to reduce the risk of fine sediment release as detailed in reference S-W15 of the **Outline CEMP [REP3-013 and 014]**.	**Negligible**	**Neutral** **(not significant)**
River Coquet	Reduced groundwater baseflow associated with construction of the temporary bridge.	**Negligible**	**Neutral** **(not significant)**
General construction activities associated with proposed design.	Sediment regime: A temporary short-term increase in water turbidity and siltation of the channel substrate may occur due to a potential increase in fine sediment supply. The introduction of fine sediments due to the removal of vegetation, resulting in exposed earth, earthworks and excavation could contribute to the release of sediment. This sediment may be carried considerable distances downstream, with potential detrimental impacts on important aquatic habitats. Channel morphology: Limited, localised draping of bedforms with fine sediment as a result of increased fine sediment supply. This may settle between the cobbles and boulders and, where the water is shallow or the	**Negligible**	**Neutral** **(not significant)**

Source of Impact	Comments	Magnitude of Impact	Significance of Effect
	sediment is exposed during baseflow conditions, in-channel vegetation may establish. Any spawning gravels may be covered. These impacts are likely to be temporary and limited in duration as relatively frequent flushing flows are likely to transfer and distribute this excess sediment downstream. Natural fluvial processes: Temporary increases in the extent of bare soil surfaces could result in localised changes to the quantity of flow entering the channel due to more rapid run-off, which has the potential to locally alter flow dynamics.		
Stabilisation Works and Southern Access Works, including temporary bridge and temporary retaining wall/river training works.	Sediment regime: Construction of the piling platform and associated works, including temporary bridge and temporary retaining wall / river training works could create a short-term increase in the volume of fine sediment directly entering the channel and consequently increase turbidity. The restriction of flow and reduced channel width at all flows may alter the sediment transport capability of the river, enabling the transport of larger material at lower flows compared to the baseline. Impacts are likely to be temporary and reversible following completion of construction and reinstatement works. Channel Morphology: Bank and bed features would be degraded within the footprint of the works. Some channel bed impacts may be reversible following end of construction with mitigation provided to reinstate features where practicable, although any loss of bedrock may not be reversible. The impacts on banks are assessed in **paragraphs 8.10.23 to 8.10.42** below. Natural fluvial processes: The presence of the piling platform and associated works, including temporary bridge, abutments and temporary retaining wall/river training works could alter the channel dynamics, which could result in increased erosion and sediment transport rates. Impacts may cease following end of construction.	**Minor adverse**	**Slight (not significant)**

OPERATION

Sedimentation

8.10.23. It is anticipated that any impacts on sedimentation during operation would be short-term whilst erosion controls are established, and bare soil surfaces are restored, as also described in the **Environmental Statement Addendum: Stabilisation Works for Change Request**. **Table** 8**-7** provides a summary of the likely significant effects associated with sediment laden runoff.

Groundwater Resources

8.10.24. The interception of groundwater as a consequence of the installed piles as part of the Stabilisation Works is described in the **Environmental Statement Addendum: Stabilisation Works for Change Request**. No further groundwater impacts associated with the Southern Access Works covered by this ES Addendum are expected during operation.

Geomorphology

8.10.25. Operational impacts are likely to be localised to the footprint of the erosion protection and reinstated made ground included for the south bank. These are summarised in **Table 8**-**7**. The changes would last for the design life of the bridge.

8.10.26. The existing south bank that would be affected includes approximately 35 m of bank already fronted by the existing pier and associated river training works which extends approximately 14 m upstream of the existing pier and approximately 12 m downstream of the existing pier, or by the proposed new southern pier. This leaves approximately 28 m of currently natural bank likely to require rock armour, and up to a further 17 m requiring green-grey erosion controls as set out in HR Wallingford (2017)[7].

8.10.27. The existing undisturbed natural south bank (downstream of the existing river training works) comprises of woodland, which has established over the top of colluvium. Along parts of the north bank and south bank, this includes the presence of boulder sized material derived from rockfall, likely to be similar in grade to the proposed scour protection (**Image 2** and **Image 3**).

[7] HR Wallingford (2017) Green approaches in river engineering, Supporting implementation of green infrastructure.

Image 2. Rockfall along northern banks of the River Coquet 200m downstream of proposed crossing

Image 3. Boulder sized material with trees along south bank (view of looking upstream along south bank to existing pier)

8.10.28. However, the structure of the riparian zone would be impacted through the permanent loss of marginal bed and riverbank features beneath the footprint of the proposed scour protection. This would include the loss of bank features such as exposed roots, undercut banks, and exposed bedrock which would have developed over a long period of time

through the balance between fluvial bank erosion and stabilisation by tree growth. These impacts are however localised to the footprint of the works.

8.10.29. Within the context of the reach as defined by the confined gorge channel typology (approximately 1.4 km) and considering the changes already assessed in the **Environmental Statement Addendum: Stabilisation Works for Change Request**, cumulatively the rock armour along the north and south bank represents around, approximately 3% of the total bank length within the gorge.

8.10.30. The River Coquet and Coquet Valley Woodlands SSSI (Swarland Burn to Coquet Mouth) is approximately 22.7 km in length (a total bank length of approximately 45 km). The proposed rock armour constitutes approximately 0.2% of the bank length (north and south combined) of the SSSI unit within which the Site is located.

8.10.31. The Coquet from Forest Burn to Tidal Limit WFD waterbody is 31.2 km long (which equates to approximately 62.4 km total bank length). The proposed rock armour constitutes approximately 0.14% of the water body total bank length.

8.10.32. The proposed scour protection would be designed to replicate as far as practicable the existing bank profile, maintaining the overall cross-sectional area. However, minor localised differences in channel width at the margins would be expected between a natural bank and engineered bank within the footprint of the works. Scour protection bank roughness is likely to be less rough than the natural bank roughness due to the absence of trees. Chow (1959), suggests that rock armour may have a Manning's roughness of 0.04. In comparison, the existing bank roughness as observed during the site visits can be described as 'light brush and trees' which in winter has a roughness of 0.05 (Chow (1959) but may be higher in summer.

8.10.33. The dynamics of water flow may be locally affected by the proposed scour protection at the channel margins adjacent to the scour protection. These changes may locally alter fluvial processes and the distribution of erosional and depositional features affecting the structure and substrate of the riverbed adjacent to the scour protection and immediately downstream. Hydraulic calculations, the methods of which are comparable to those set out **in Appendix 10.7: Geomorphological Assessment – River Coquet Parameter 10 Part A** of the ES [**APP-260**], under the operational phase using a cross section immediately downstream of the pier, with a reduction in the channel bank roughness on the left bank and right bank to 0.04, reflecting the proposed rock armour is described below.

8.10.34. The results show a 0.24 m/s (25%) maximum increase in velocity and 6 W/ m^2 (24%) maximum increase in stream power at the channel margins for 2-year flood event and a 0.4 m/s (24%) maximum increase in velocity and 25 W/ m^2 (23%) maximum increase in stream power at the channel margins for 200-year flood event.

8.10.35. Away from the channel margins, the impact on velocity and stream power is negligible (less than or equal to 2%).

8.10.36. Analysis of sediment entrainment competence showed that there would be a negligible impact on grainsizes entrained.

8.10.37. The hydraulic calculations support the conclusion that there may be very localised, very minor changes in depositional features adjacent to the proposed scour protection but that there is unlikely to be a significant impact on depositional features away from the toe of the scour protection.

8.10.38. The detailed design stage will seek to minimise the extent of hard engineered erosion protection required and consider the use of sympathetic materials and construction techniques likely to provide increased roughness and improve riparian structure (such as vegetated rock armour).

8.10.39. The proposed works could create a short-term, intermittent increase in the volume of fine sediment directly entering the channel during storm events, until vegetation growth stabilises the surface. This may cause limited, localised draping of bedforms with fine sediment as a result of increased fine sediment supply. These impacts are likely to be temporary and limited in duration.

8.10.40. The protection of the bank may lead to a permanent but localised reduction in the availability of erodible sediment. Locally, the banks are not considered to be an important source of sediment for the channel.

8.10.41. The impact on the sediment regime and natural fluvial processes are assessed to be negligible, with any long-term effects localised to the area of permanent works. It is unlikely that there would be a significant change in the sediment regime due to the localised nature of the works, the existing limited sediment supply from the south bank and the marginal changes to the channel cross section. The impact on channel morphology is considered **Minor Adverse**.

8.10.42. **Table 8-8** below provides a summary of the likely significant effects during operation.

Table 8-8 - Assessment of Effects During Operation

Source of Impact	Comments	Magnitude of Impact	Significance of Effect
Sedimentation	Prior to establishment, bare surfaces could temporarily lead to increased levels of suspended solids and turbidity in the water column. River Coquet specific mitigation measures in **Section 8.9** and **Appendix D: Register of Environmental Actions and Commitments** of this ES Addendum and measure A-W18 of the **Outline CEMP [REP3-013 and 014]** would ensure minimal impact. For	**Negligible**	**Neutral** **(not significant)**

Source of Impact	Comments	Magnitude of Impact	Significance of Effect
	example, the main contractor will reinstate vegetation post-construction with a mix of native tree species with an understorey, including reinstatement of the riparian zone. This would reduce the operational impacts of the River Coquet bridge on river flow and geomorphology.		
Groundwater Resources	No significant impact expected.	n/a	n/a
South bank pier scour protection	Sediment regime: The protection of the bank may lead to a permanent but localised reduction in the availability of erodible sediment. Locally, the banks are not considered to be an important source of sediment for the channel. Channel morphology: Some bank and near-bank bed features would be lost within the footprint of these works. The existing bank profile would be reinstated so alterations in channel cross section are anticipated to be minimal. Some alterations to channel roughness may occur. A reduction in roughness compared to the existing tree line bank may locally increase erosion rates. However, impacts are likely to be small, very localised to the channel margins and limited to the extent of the scour protection. Natural fluvial processes: The change in materials from which the bank is composed would, by design, reduce the channel's ability to adjust its position naturally and mature riparian vegetation would be lost. Increased run off may occur locally due to immature vegetation.	**Minor adverse**	**Slight (not significant)**

Impacts on the fluvial geomorphological forms and function supporting the SSSI

8.10.43. The River Coquet and Coquet Valley Woodlands SSSI is designated for a variety of river types developing from upland mountain stream (Type IX: oligotrophic, mountains and moorland), through to lowland river (Flowing waters - Type V: principally a lowland type,

widespread over resistant rocks in England and Wales). The citation[8] describes a range of aquatic flora and fauna that in many cases are specific to the river type and also rely upon the geomorphic forms and processes operating both within the reach affected by the revised Scheme and upstream.

8.10.44. The citation states that below Rothbury, it is these reaches where the river cuts through sand, gravel and alluvium where richer and fine sediments support a greater diversity of aquatic plants. Specifically, water-crowfoot *Ranunculus fluitans* as being common on riffles while curled, perfoliate and horned pondweeds, branched and un-branched burweeds and alga reflect the base-rich nature of the river. On rocks, the mosses *Fontinalis antipyretica* and *Rhyncostegium lusitanicum* are found. Riverside shingle and sand habitats support an assemblage of ground beetles with several nationally scarce species including *Bembidion schuppeli*.

8.10.45. As described in **Table 8-6** and **Table 8-7** above, channel morphology in the form of natural bank and sediment bedforms would be locally adversely impacted by the bridge piers and associated scour protection system. Both bedrock and a limited area of mobile sediment deposits would be disturbed by the temporary works, and a limited extent of bank would be modified permanently due to scour protection. Within the context of the SSSI, Unit Number 005, within which the proposed works are located, the extent of disturbance on both banks is approximately 0.2% of the approximate 45 km unit length (both north and south banks).

8.10.46. The construction of bank protection is unlikely to significantly alter the current or future sediment supply to the reach, nor significantly change either the reach's morphological behaviour, or the function of the reach as a sediment transfer zone. The proposed works are also considered unlikely to change the river typology which is determined by the confined gorge like channel and substantially bedrock bed.

8.10.47. The impact from the Southern Access Works are considered to be local to the works and therefore unlikely to impact the form or function of the river upstream or downstream beyond the immediate locality of the works.

8.10.48. The assessment above indicates a localised **Slight Adverse** impact on geomorphology based on the criteria set out in **Appendix 10.7: Geomorphology Assessment – River Coquet Parameter 10 Part A** of the ES [**APP-260**]. However, within the context of the SSSI, these localised geomorphological impacts are considered unlikely to extend significantly beyond the locality of the works and are therefore unlikely to significantly affect the supporting the features of the SSSI. The assessment will be refined as detailed below.

[8] Natural England (2020), Designated Sites View, River Coquet and Coquet Valley Woodlands SSSI [Available Online] https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/2000052.pdf [Accessed January 2021]

8.11 MONITORING

8.11.1. The monitoring requirements for Road Drainage and the Water Environment have changed due to the Southern Access Works. Visual survey of the bed and banks would be undertaken to understand the degree and nature of change following any high flow events during construction to verify the findings of the assessment. This should be undertaken by an appropriately qualified geomorphologist or environmental clerk of works with appropriate fluvial geomorphological experience.

8.11.2. Existing monitoring is provided in **Table 5-1** of the **Outline CEMP [REP3-013 and 014]** including, for example, monitoring watercourses within 50 m of the earthworks to identify any pollution. In addition to this monitoring, during construction, regular visual inspections during periods of heavy rain should be undertaken to identify if silt water runoff is discharging into the River Coquet.

8.11.3. The remaining text within Section 10.11, Chapter 10: Road Drainage and the Water Environment Part A of the ES [APP-050] remains unchanged and valid.

8.12 UPDATED DMRB GUIDANCE

8.12.1. Since the assessments in the ES were completed, the DMRB methodology was superseded and replaced with updated guidance as detailed in **Section 10.4, Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**]. A DMRB sensitivity test for likely significant effects showed that the new guidance did not affect the conclusions of the Road Drainage and the Water Environment assessment in **Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**] and similarly does not affect the conclusions presented in this ES Addendum.

8.13 FURTHER WORK

8.13.1. The impact on sediment regime, natural fluvial processes and morphology will be refined to aid the design of suitable erosion and scour protection measures. This will be reported in a further iteration of this Chapter in the ES Addendum or Technical Note (as appropriate) that will be submitted to the Examination.

9 POPULATION AND HUMAN HEALTH

9.1 INTRODUCTION

9.1.1. **Chapter 12: Population and Human Health Part A** of the ES [**APP-054**] considers the likely significant effects of the Scheme on Population and Human Health.

9.1.2. This chapter of the ES Addendum considers the likely significant effects of the Southern Access Works (described in **Chapter 2: Southern Access Works** of this ES Addendum) and the Stabilisation Works (described in **Chapter 2: Stabilisation Works** of the **Environmental Statement Addendum: Stabilisation Works for Change Request**) on recreational users of the River Coquet.

9.2 COMPETENT EXPERT EVIDENCE

9.2.1. As detailed in **Table 9-1**, the professionals contributing to the production of this assessment have sufficient expertise to ensure the completeness and quality of this assessment. The table sets out the details of expertise where this is different to those presented in the ES.

Table 9-1 – Population and Human Health Professional Competence

Name	Role	Qualifications and Professional Membership	Experience
S. Racher	Author	MA (Hons) Environmental Impact Assessment and Management Full member of the Institute for Environmental Management and Assessment (MIEMA) Chartered Environmentalist (CEnv)	Fifteen years of relevant EIA experience EIA Co-ordinator and reviewer of Population & Human Health scoping assessment of the M56 New Junction 11a EIA Co-ordinator and reviewer of Population & Health assessments of the A82 Tarbet to Inverarnan
V. Barraud	Reviewer	MSc Environmental Management Registered EIA Practitioner with IEMA	Twenty-four years of relevant EIA experience Environment Lead and reviewer of M60 J18 Improvement scheme Environment Lead of A1 Birtley to Coal House scheme Environment Lead and reviewer of A595 Whitehaven Bypass scheme

9.3 LEGISLATIVE AND POLICY FRAMEWORK

9.3.1. The legislative and policy framework for Population and Human Health has not changed since the publication of the ES. Therefore, the text within **Section 12.3, Chapter 12: Population and Human Health Part A** of the ES [**APP-054**] remains valid.

9.4 ASSESSMENT METHODOLOGY

9.4.1. In order to ensure a comparable assessment with the ES, the assessment methodology followed for Population and Human Health has not changed in response to the Southern Access Works and the Stabilisation Works. Therefore, the text within **Section 12.4, Chapter 12: Population and Human Health Part A** of the ES [**APP-054**] remains unchanged and valid.

9.5 ASSESSMENT ASSUMPTIONS AND LIMITATIONS

9.5.1. The assessment assumptions and limitations for Population and Human Health for the Southern Access Works and the Stabilisation Works have not changed from the ES. Therefore, the remaining text within **Section 12.5, Chapter 12: Population and Human Health Part A** of the ES [**APP-054**] remains unchanged and valid.

9.6 STUDY AREA

9.6.1. The Study Area for the Population and Human Health assessment has changed in line with the extended Order Limits of Part A for the Southern Access Works and the Stabilisation Works. The text within **Section 12.6, Chapter 12: Population and Human Health Part A** of the ES [**APP-054**] otherwise remains unchanged and valid.

9.7 BASELINE CONDITIONS

9.7.1. The baseline for the Population and Human Health assessment is largely unchanged for the Southern Access Works and the Stabilisation Works. The text within **Section 12.7, Chapter 12: Population and Human Health Part A** of the ES [**APP-054**] remains valid.

9.8 POTENTIAL IMPACTS

CONSTRUCTION

9.8.1. During construction, the anticipated impacts of the Southern Access Works and the Stabilisation Works are:

c. Potential for constriction to the river as a result of the installation of the temporary training walls along the north and south banks, although the river would still remain passable by canoes and other small watercrafts. At its most constricted point, the temporary training walls would reduce the width of the river by approximately 10 m, from approximately 34 m wide to 24 m wide.

d. The installation of the temporary bridge would not prevent use of the river by small crafts on the basis that there would be approximately 4.5 - 5 m of headroom under the bridge during normal river flows (river level approximately 32.0 m AOD (see **Appendix 2.5: South Embankment Haul Road Construction Methodology** of the ES [**APP-191**])).

During the periods when the bridge is being installed and then removed following construction there is likely to be a need to temporarily suspend access along the river, whilst this activity is completed.

9.8.2. All other impacts during construction, detailed within **Section 12.8, Chapter 12: Population and Human Health Part A** of the ES [**APP-054**], remain unchanged and valid.

9.9 DESIGN, MITIGATION AND ENHANCEMENT MEASURES

9.9.1. No further measures in addition to those detailed within **Section 12.9, Chapter 12: Population and Human Health Part A** of the [**APP-054**] are considered necessary. Additional mitigation measures are not required as a result of the Southern Access Work.

9.10 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION

9.10.1. The impacts noted in **Section 9.8** of this ES Addendum would not change the assessment of likely significant effects detailed within **Section 12.10, Chapter 12: Population and Human Health Part A** of the ES [**APP-054**]. The magnitude of change (worst case) would remain at moderate, giving rise to a direct temporary **Moderate Adverse** effect.

9.11 MONITORING

9.11.1. The monitoring requirements for Population and Human Health have not changed due to the Southern Access Works and the Stabilisation Works. Therefore, the text within **Section 12.11, Chapter 12: Population and Human Health Part A** of the ES [**APP-054**] remains unchanged and valid.

9.12 UPDATED DMRB GUIDANCE

9.12.1. Since the assessments in the ES were completed, the DMRB methodology was superseded and replaced with updated guidance as detailed in **Section 12.4, Chapter 12: Population and Human Health Part A** of the ES [**APP-054**]. A DMRB sensitivity test for likely significant effects has been undertaken in **Table 2, Appendix 4.5: DMRB Sensitivity Test** of the ES [**APP-197**]. This notes the assessment of significance with respect to Recreational Facilities would remain the same under both sets of guidance. This conclusion has not changed due to the Southern Access Works and the Stabilisation Works.

10 MATERIAL RESOURCES

10.1 INTRODUCTION

10.1.1. **Chapter 13: Material Resources Part A** of the ES [**APP-056**] considers the likely significant effects of the Scheme on Material Resources. This comprises the assessment of likely significant environmental effects from Part A in relation to material resources and waste. That assessment covered two core topics of material consumption and waste generation.

10.1.2. This chapter of the ES Addendum considers the likely significant effects of the Southern Access Works (described in **Chapter 2: Southern Access Works** of this ES Addendum) and the Stabilisation Works (described in **Chapter 2: Stabilisation Works** of the **Environmental Statement Addendum: Stabilisation Works for Change Request**) on Material Resources. As detailed in **Appendix B: Summary of Proposed Changes to the Application** of this ES Addendum, the Southern Access Works and the Stabilisation Works are not anticipated to impact Material Resources during operation and therefore this has not been considered in this chapter.

10.2 COMPETENT EXPERT EVIDENCE

10.2.1. As detailed in **Table 10-1**, the professionals contributing to the production of this assessment have sufficient expertise to ensure the completeness and quality of this assessment. The table sets out the details of expertise where this is different to those presented in the ES.

Table 10-1 – Material Resources Professional Competence

Name	Role	Qualifications and Professional Membership	Experience
David Notton	Author	Ph.D in the field of Sustainable Waste Management M.Eng Mechanical Engineering Chartered Wastes Manager (MCIWM)	Ten years of relevant Environmental Impact Assessment (EIA) experience Materials and Waste specialist on Western Rail Link to Heathrow Materials and Waste specialist on East West Rail
Carl Hughes	Reviewer	B.Eng. Engineering with Environmental Studies Chartered Wastes Manager (MCIWM)	Over 20 years of relevant EIA experience Materials and Waste specialist on HS2

Name	Role	Qualifications and Professional Membership	Experience
			Materials and Waste specialist on A12

10.3 LEGISLATIVE AND POLICY FRAMEWORK

10.3.1. The legislative and policy framework for Material Resources has not changed since the publication of the ES. Therefore, the text within **Section 13.3, Chapter 13: Material Resources Part A** of the ES [**APP-056**] remains valid.

10.4 ASSESSMENT METHODOLOGY

10.4.1. In order to ensure a comparable assessment with the ES, the assessment methodology followed for Material Resources has not changed in response to the Southern Access Works. Therefore, the text within **Section 13.4, Chapter 13: Material Resources Part A** of the ES [**APP-056**] remains unchanged and valid.

10.5 ASSESSMENT ASSUMPTIONS AND LIMITATIONS

10.5.1. The assessment assumptions and limitations for Material Resources for the Southern Access Works have not changed from the ES. Therefore, the remaining text within **Section 13.5, Chapter 13: Material Resources Part A** of the ES [**APP-056**] remains unchanged and valid.

10.6 STUDY AREA

10.6.1. The Southern Access Works result in the extension of the Order Limits of Part A. This is included in addition to the Study Area within **Section 13.6, Chapter 13: Material Resources Part A** of the ES [**APP- 056**] which remains valid.

10.7 BASELINE CONDITIONS

10.7.1. The baseline for the Material Resources assessment has not changed for the Southern Access Works or the Stabilisation Works (**Environmental Statement Addendum: Stabilisation Works for Change Request**). Therefore, the text within **Section 13.7, Chapter 13: Material Resources Part A** of the ES [**APP- 056**] remains unchanged and valid.

10.8 POTENTIAL IMPACTS

CONSTRUCTION

10.8.1. During construction, the anticipated impacts of the Southern Access Works are as follows:

a. Additional use of materials as described in **Chapter 2: Southern Access Works** of this ES Addendum:

- Approximately 98 m³ of concrete placed on the north bank;
- Approximately 98 m³ of concrete placed on the south bank;
- Use of a reusable steel structure for the temporary crossing, approx. 130 tonnes;
- 76.8 m of pre-cast concrete pipe (internal diameter 1,800 mm) for the bridge supports on the north and south banks – approx. 69.1 tonnes at 900kg/m;
- Temporary wall of approx. 522 m³ constructed from Legato bocks for temporary river training works;
- Gabion bed of approx. 136 m³;
- Rock armour of approx. 600 m³;
- Reno Mattress of 75 m³; and
- Grey-green bank protection (e.g. a geotextile turf type solution) 31 m³.

b. Generation of additional waste from the construction and decommissioning of the temporary bridge and platform; as a worst case this can be considered equivalent to the temporary placement of materials imported (approx. 854 m³) and the pipe, a total of approx. 2,064 tonnes.

c. Reduction in the quantity of vegetation cleared and associated waste arisings.

10.8.2. The temporary crossing is reusable and would, therefore, not be considered as a waste.

10.8.3. The Stabilisation Works (described in Chapter 2: Stabilisation Works of the Environmental Statement Addendum: Stabilisation Works for Change Request) are expected to require the following:

a. Additional use of materials:

- 500 m^3 concrete for piling;
- 1,200 m^3 rock armour for stone gabion wall
- 93 m^3 grey-green bank protection (e.g. a geotextile turf type solution);
- 3,500 m^3 temporary stone for piling platforms (aggregate);
- Temporary wall of approx. 765m³ constructed from Legato bocks for temporary river training works;
- 162 m^3 gabion mattress underlying the temporary river training works and
- 2,100 m^3 imported earthworks, based on the cut and fill deficit.

b. Waste arisings:

- 1,000 tonnes pile arisings; and
- 3,500 m^3 temporary stone for piling platforms (aggregate).

10.8.4. All other impacts during construction, detailed within **Section 13.8, Chapter 13: Material Resources Part A** of the ES [**APP-056**], remain unchanged and are valid.

10.9 DESIGN, MITIGATION AND ENHANCEMENT MEASURES

10.9.1. No additional measures to those detailed within **Section 13.9, Chapter 13: Material Resources Part A** of the ES [**APP-056**] would be implemented. However, those measures would be applicable to the Southern Access Works. The additional mitigation measure

identified in **Environmental Statement Addendum: Stabilisation Works for Change Request** can also be applied:

c. Where site-won material meets re-use criteria, it would be retained within the revised Scheme for use within, for example, footway and bridleway construction, or surfacing materials.

10.10 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION

Materials

10.10.1. Within **Section 13.8, Chapter 13: Material Resources Part A** of the ES [**APP- 056**], the overall requirements for materials for Part A were 313,196 tonnes. The materials volumes above have been converted to tonnages for assessment. The Southern Access Works are expected to require an additional 3,692 tonnes of materials including the steel structure; this represents a small increase in the overall consumption by the Scheme.

10.10.2. The Stabilisation Works would require an additional 14,584 tonnes of materials; this represents approximately 4.7 % of the consumption of the Scheme as a whole.

10.10.3. Combining the Stabilisation Works with the Southern Access Works equates to approximately 5.8 % of the overall consumption of the Scheme.

10.10.4. The sensitivity was previously assessed within **Section 13.8, Chapter 13: Material Resources Part A** of the ES [**APP- 056**], as medium due to the 'lower than UK average availability of construction materials within the north east region, some potential issues regarding stock and supply may be experienced.' However, the additional requirements are not sufficient to result in any increased sensitivity i.e. through stock and supply having known issues.

10.10.5. The magnitude would also be expected to remain at minor with over 50 % of the materials being anticipated to be sourced nationally or at a lower geographic scale.

10.10.6. Therefore, incorporating the Southern Access Works and the Stabilisation Works would result in the effect on Material Resources remaining at **Slight Adverse** which is considered not significant.

Waste

10.10.7. Within **Section 13.8, Chapter 13: Material Resources Part A** of the ES [**APP- 056**], the sensitivity was assessed as low and the magnitude as negligible resulting in a neutral (not significant) effect. In accordance with the assessment methodology, a significant effect for waste cannot be reported unless either the sensitivity is high or the magnitude is minor.

10.10.8. The waste volumes above have been converted to tonnages for assessment. As a worst-case approach, it is assumed that the temporarily placed concrete, manhole rings, Legato blocks and Gabion bed from the Southern Access Works are sent to inert landfill; this is approximately 854 m^3 or 2,064 tonnes. Additionally, there are 6,400 tonnes of waste from

the pile arisings and piling platforms from the Stabilisation Works that are assumed to go to landfill as part of this worst-case scenario. This is a total of 8,464 tonnes.

10.10.9. However, it is likely that much of this waste could be recovered / recycled elsewhere. It is expected that the pile arisings that are chemically and geotechnically suitable would be recovered and reused within the revised Scheme. In addition, subject to further design work, there is also potential for all the stone used for the temporary piling platforms, to be reused within the revised Scheme.

10.10.10. This additional volume of waste to inert landfill is not expected to change either the sensitivity or magnitude of the effect on inert waste landfill. The quantity of waste sent to landfill would remain below 1% of the regional waste management capacity and there is sufficient inert waste infrastructure within the region to accommodate the forecast waste from the revised Scheme.

10.10.11. This would retain the previously assessed **Neutral** (not significant) effect.

10.11 MONITORING

10.11.1. The monitoring requirements for Material Resources have not changed, therefore, the text within **Section 13.11, Chapter 13: Material Resources Part A** of the ES [**APP-056**] remains unchanged and valid.

10.12 UPDATED DMRB GUIDANCE

10.12.1. Since the assessments in the ES were completed, the DMRB methodology was superseded and replaced with updated guidance as detailed in **Section 13.4, Chapter 13: Material Resources Part A** of the ES [**APP-056**]. A DMRB sensitivity test for likely significant effects has been undertaken

10.12.2. Significance criteria for materials in LA 110[9] have been updated in that the previous (IAN 153/11[10]) requirement to assess the geographical source of materials has been removed and replaced with the need to assess the overall percentage of material recovery and recycling of non-hazardous construction and demolition wastes. Within **Section 13.4, Chapter 13: Material Resources Part A** of the ES [**APP- 056**] the low recycling rate (estimated at 61%) resulted in a moderate effect which is considered significant.

10.12.3. Due to the relatively small quantity of materials involved in comparison to the rest of the Scheme, it would not be possible for the Southern Access Works and the Stabilisation Works to significantly affect the overall percentage of material recovery and recycling of non-hazardous construction and demolition wastes. Therefore, Part A with the incorporation

[9] Highways England (2019) Design Manual for Roads and Bridges (DMRB) LA110 Material Assets and Waste
[10] Highways England (2011) Interim Advice Note (IAN) 53/11 Guidance on the Environmental Assessment of Material Resources

of these works would also be assessed as moderate with the triggering of a significant effect. Mitigation as set out in **Section 13.9, Chapter 13: Material Resources Part A** of the ES [**APP-056**] remains relevant. There is no difference between significance criteria for waste used in this assessment and LA 110. Accordingly, the application of the updated guidance would not change the conclusions of the original assessment.

11 CLIMATE

11.1 INTRODUCTION

11.1.1. **Chapter 14: Climate Part A** of the ES [**APP-058**] considers the likely significant effects of the Scheme on Climate. This comprises an assessment of the anticipated greenhouse gas (GHG) emissions generated through construction and operation and the vulnerability of the Scheme to climate change from extreme weather and long-term climate change.

11.1.2. This chapter of the ES Addendum considers the likely significant effects of the Southern Access Works (described in **Chapter 2: Southern Access Works** of this ES Addendum) and the Stabilisation Works (described in **Chapter 2: Stabilisation Works** of the **Environmental Statement Addendum: Stabilisation Works for Change Request**) on Climate. As detailed in **Appendix B: Summary of Proposed Changes to Application** of this ES Addendum, the Southern Access Works and the Stabilisation Works are not anticipated to impact Climate during operation and therefore this has not been considered in this chapter.

11.2 COMPETENT EXPERT EVIDENCE

11.2.1. As detailed in **Table 11-1,** the professionals contributing to the production of this assessment have sufficient expertise to ensure the completeness and quality of this assessment. The table sets out the details of expertise where this is different to those presented in the ES.

Table 11-1 – Climate Professional Competence

Name	Role	Qualifications and Professional Membership	Experience
Hana Pearce	Author	PhD Atmospheric Science (Air Quality and Climate Change) MEnv BSc (Hons) Meteorology and Climate Science Full Member of the Institution of Environmental Sciences Associate Member of the Institute of Air Quality Management	Two years of relevant EIA experience: Climate specialist on Chelmsford North East Bypass, Essex County Council Climate specialist on A120/A133 Link Road, Essex County Council Air quality and climate specialist on A12 Junction 19-25 HIF, Highways England
Steven Byrne	Reviewer	MSc Environmental Technology	In excess of 20 years in environmental consultancy

Name	Role	Qualifications and Professional Membership	Experience
		BSC (Hons) Physics with Environmental Science Member of the Institute of Air Quality Management Member of the Institution of Environmental Sciences	working on a wide range of environmental projects including Environmental Impact Assessment (EIA) for air quality and climate impacts. GHG and climate vulnerability lead or contributor to following schemes: A120/A133 Link Road, Essex County Council Grangemouth Flood Protection scheme, Falkirk Council Review of Bristol Airport expansion climate assessment for planning, North Somerset Council

11.3 LEGISLATIVE AND POLICY FRAMEWORK

11.3.1. The legislative and policy framework for Climate has not changed since the publication of the ES. Therefore, the text within **Section 14.3, Chapter 14: Climate Part A** of the ES [**APP-058**] remains valid.

11.4 ASSESSMENT METHODOLOGY

11.4.1. In order to ensure a comparable assessment with the ES, the assessment methodology followed for Climate has not changed in response to the Southern Access Works. Therefore, the text within **Section 14.4, Chapter 14: Climate Part A** of the ES [**APP-058**] relevant to the assessment of GHG emissions for the construction phase remains unchanged and valid.

11.5 ASSESSMENT ASSUMPTIONS AND LIMITATIONS

11.5.1. The assessment assumptions and limitations for Climate for the Southern Access Works have not changed from the ES. Therefore, the remaining text within **Section 14.5, Chapter 14: Climate** of the ES [**APP-058**] remains unchanged and valid.

11.5.2. In addition, the following assumption and limitation has been identified:

a. It is assumed that the temporary construction materials for the river training / retaining walls would be Legato blocks made of pre-cast high strength concrete. It was also

assumed that the concrete ring bridge supports would be filled with concrete instead of stone as a conservative approach; and

b. Data on the anticipated additional fuel usage of plant and construction equipment over and above what would have been used for creating an access track down the southern river embankment was not available. This data gap is not expected to materially affect the GHG emissions calculations.

11.6 STUDY AREA

11.6.1. The Study Area for the Climate assessment has not changed for the Southern Access Works. Therefore, the text within **Section 14.6, Chapter 14: Climate Part A** of the ES [**APP-058**] remains unchanged and valid.

11.7 BASELINE CONDITIONS

11.7.1. The baseline for the Climate assessment has not changed for the Southern Access Works. Therefore, the text within **Section 14.7, Chapter 14: Climate Part A** of the ES [**APP-058**] remains unchanged and valid.

11.8 POTENTIAL IMPACTS

CONSTRUCTION

11.8.1. During construction, the anticipated impacts of the Southern Access Works are:

a. Increases in GHG emissions associated with construction activities, such as manufacturing of materials and construction processes.

11.8.2. All other impacts during construction, detailed within **Section 14.8, Chapter 14: Climate Part A** of the ES [**APP-058**], remain unchanged and valid.

11.9 DESIGN, MITIGATION AND ENHANCEMENT MEASURES

11.9.1. In addition to the measures detailed within **Section 14.8, Chapter 14: Climate Part A** of the ES [**APP-058**], the following mitigation measures would be implemented.

CONSTRUCTION

11.9.2. Where practicable, the construction materials required for temporary structures would be reused within the revised Scheme (e.g. the steel or Legato blocks for other temporary structures or retaining walls) or reused / recycled offsite by third parties.

11.10 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION

11.10.1. The main source of GHG emissions during the Southern Access Works would be from embedded carbon in the construction materials and their associated transportation. These materials comprise:

b. 130 tonnes of general steel for the temporary bridge construction;
c. 77 m of pre-cast concrete pipe (internal diameter 1,800 mm) for the bridge supports;
d. 196 m^3 of general concrete fill for the bridge supports;

e. 1,253 tonnes of pre-cast high strength concrete for the river training walls (Legato blocks);
f. 272 tonnes of gabion wall equivalent used for the foundation of the river training walls;
g. 1,320 tonnes of rock armour and 150 tonnes of reno mattress, both considered to be gabion wall equivalent; and
h. 310m^2 of geotextile (green/grey bank protection).

11.10.2. For the purposes of the GHG emissions calculations for the temporary construction materials, it was assumed that the steel was recycled off-site, the legato blocks and gabion wall equivalent for the river training walls were reused offsite and the concrete manhole rings and concrete fill were sent to landfill (as a worst case).

11.10.3. Based on the above materials quantities, the Highways England Carbon Tool[11], calculates that the Southern Access Works and other works on the south bank would increase construction phase GHG emissions by 0.7 thousand tonnes of carbon dioxide equivalent (ktCO2e).

11.10.4. The additional construction phase GHG emissions are not of a value to materially affect the findings reported in **Section 14.8, Chapter 14: Climate Part A** of the ES [**APP-058**], or for the Scheme as reported in **Table 16-8, Chapter 16 Assessment of Cumulative Effects** of the ES [**APP-062**].

11.10.5. **Table 11-2** presents the revised Scheme GHG emissions, taking into account the Southern Access Works and Stabilisation Works, as well as the construction of the Scheme, operational replacement, land use change and operational end-user traffic for the Scheme.

Table 11-2 - Revised Scheme Impacts on Carbon Budgets

Stage / timing	Total GHG emissions (thousand tonnes of carbon dioxide equivalent; kTCO2e)
Combined construction phase (2021/23)	61
Operation phase (2023-2082)	2,428
Total for lifecycle (2021-2082)	2,488

[11] Highways England (2020) Carbon emissions calculations tool (version 2.3): Highways England.

Stage / timing	Total GHG emissions (thousand tonnes of carbon dioxide equivalent; kTCO2e)
Total during third Carbon Budget period* (2018-2022) [% of budget]	41 [0.00160 %]
Total during fourth Carbon Budget 4 period (2023-2027) [% of budget]	161 [0.00827 %]
Total during fifth Carbon Budget period (2028-2032) [% of budget]	185 [0.01074 %]
Comparison of 1 Year Operational Scheme GHG Emissions against North East Total Road CO2e Emissions for 2016 (Ref 16.3)	
One year's emission's during the operational phase as a % of North East Total Road CO2e emission estimate in 2016	0.93 %

11.10.6. Based on the assessment methodology set out in **Section 14.4, Chapter 14: Climate Part A** of the ES [**APP-058**], it is anticipated there would be a **Slight Adverse** effect for GHG emissions during construction and operation of the revised Scheme when considering the mitigation measures. IEMA guidance suggests that all GHG emissions are significant in the absence of any significance criteria or defined threshold.

11.10.7. However, given the mitigation measures for the revised Scheme, the magnitude of GHG emissions and the context of the revised Scheme, using professional judgement, it is considered that the **Slight Adverse** effect of the revised Scheme is Not Significant. Furthermore, the GHG impacts of the revised Scheme would not have a material impact on the Government meeting its carbon reduction targets.

11.11 MONITORING

11.11.1. The monitoring requirements for Climate have not changed due to the Southern Access Works and other works on the south bank. Therefore, the text within **Section 14.11, Chapter 14: Climate Part A** of the ES [**APP-058**] remains unchanged and valid.

11.12 UPDATED DMRB GUIDANCE

11.12.1. Since the assessments in the ES were completed, the DMRB methodology was superseded and replaced with updated guidance as detailed in **Section 14.4, Chapter 14: Climate Part A** of the ES [**APP-058**]. A DMRB sensitivity test for likely significant effects has been undertaken and it is concluded that it would not change the likely significance of effects.

This is because the approach used for the assessment has recently evolved and been brought in close alignment with the updated guidance (DMRB LA 114[12]) and therefore, considered to be of the same standard.

[12] Highways England (2019) Design Manual for Roads and Bridges (DMRB) LA 114 Climate.

12 ASSESSMENT OF CUMULATIVE EFFECTS

12.1 INTRODUCTION

12.1.1. **Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-062**] considers the likely significant cumulative effects of the Southern Access Works and the Stabilisation Works. This comprises within topic combined effects (impacts acting on the same common sensitive receptor within an individual environmental topic), cross topic combined effects (impacts from different environmental topics that combine to cause multiple effects on a single common sensitive receptor) and cumulative effects (impacts of the Scheme interacting with impacts from other proposed developments in the vicinity of a receptor).

CUMULATIVE EFFECTS

12.1.2. Although the Southern Access Works and the Stabilisation Works would lead to new significant effects, it is anticipated that due to the distance between the Southern Access Works and the Stabilisation Works and developments that have the potential to impact on the River Coquet, there would be no cumulative impacts above that reported in **Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-062**]. The developments considered in this ES Addendum include the 43 developments identified in the cumulative short list as detailed in **Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-062**] as well as an additional seven developments identified as part of an updated search for relevant planning applications undertaken on 4 January 2021.

WITHIN TOPIC COMBINED EFFECTS

12.1.3. As explained in **Section 1.2** of this ES Addendum, the scoping exercise presented in **Appendix B: Summary of Proposed Changes to Application** of this ES Addendum identifies that the Southern Access Works and the Stabilisation Works have the potential to change the conclusions of **Chapter 15: Assessment of Combined Effects Part A** of the ES [**APP-060**]. The Southern Access Works described in this ES Addendum are dependent on implementation of the Stabilisation Works described in the **Environmental Statement Addendum: Stabilisation Works for Change Request**, being undertaken concurrently. In order to assess the within topic combined effects of the proposals described in both ES Addendums, where relevant, the assessment of each environmental topic presented in this ES Addendum has considered the following:

12.1.4. The baseline conditions described account for and assume the creation of the working area platform implemented as part of the Stabilisation Works.

12.1.5. The assessment of likely significant effects considers the combined effects of the Stabilisation Works (described in **Chapter 2: Stabilisation Works** of the **Environmental Statement Addendum: Stabilisation Works for Change Request**) together with the Southern Access Works described in **Chapter 2: Southern Access Works** of this ES Addendum.

12.1.6. Consequently, the assessment of within topic combined effects has been incorporated into the assessments reported in **Chapters 4 to 11** of this ES Addendum. Therefore, this has been considered further within this chapter.

CROSS TOPIC COMBINED EFFECTS

12.1.7. This chapter of the ES Addendum therefore only considers the likely significant cross topic (Biodiversity and Road Drainage and the Water Environment) combined effects of the Southern Access Works (described in **Chapter 2: Southern Access Works**) and the Stabilisation Works (described in **Chapter 2: Stabilisation Works** of **Environmental Statement Addendum: Stabilisation Works for Change Request**).

12.2 COMPETENT EXPERT EVIDENCE

12.2.1. As detailed in **Table 12-1**, the professionals contributing to the production of this assessment have sufficient expertise to ensure the completeness and quality of this assessment. The table sets out the details of expertise where this is different to those presented in the ES.

Table 12-1 – Cumulative Effects Professional Competence

Name	Role	Qualifications and Professional Membership	Experience
S. Racher	Author	MA (Hons) Environmental Impact Assessment and Management Full member of the Institute for Environmental Management and Assessment (MIEMA) Chartered Environmentalist (CEnv)	Fifteen years of relevant EIA experience EIA Co-ordinator and reviewer of the M56 New Junction 11a scheme EIA Co-ordinator and reviewer of the A82 Tarbet to Inverarnan scheme
V. Barraud	Reviewer	MSc Environmental Management Registered EIA Practitioner with IEMA	Twenty-four years of relevant EIA experience Environment Lead and reviewer of M60 J18 Improvement Scheme Environment Lead of A1 Birtley to Coal House Scheme Environment Lead and reviewer of A595 Whitehaven Bypass Scheme

12.3 LEGISLATIVE AND POLICY FRAMEWORK

12.3.1. The legislative and policy framework for the Assessment of Cumulative Effects has not changed since the publication of the ES. Therefore, the text within **Section 16.3, Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-062**] remains valid.

12.4 ASSESSMENT METHODOLOGY

12.4.1. In order to ensure a comparable assessment with the ES, the assessment methodology followed for the Assessment of Cumulative Effects has not changed in response to the Southern Access Works. Therefore, the text within **Section 16.4, Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-062**] remains unchanged and valid.

12.4.2. As both Biodiversity and Road Drainage and the Water Environment topics in this ES Addendum have reported effects on the River Coquet (see **Sections 7.8** and **8.8** of this ES Addendum), the Assessment of Cumulative Effects reported here considers the likely significant cross topic combined effects on this common sensitive receptor.

12.5 ASSESSMENT ASSUMPTIONS AND LIMITATIONS

12.5.1. The assessment assumptions and limitations for the Assessment of Cumulative Effects for Southern Access Works have not changed from the ES. Therefore, the text within **Section 16.5, Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-062**] remains unchanged and valid.

12.6 STUDY AREA

12.6.1. The study area for the Assessment of Cumulative Effects has not changed for the Southern Access Works. Therefore, the text within **Section 16.6, Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-062**] remains unchanged and valid.

12.7 BASELINE CONDITIONS

12.7.1. The receptor under consideration in this assessment is the River Coquet, the particular features of which are described in **Sections 7.7** and **8.7** and the respective sections of the ES (**Section 9.7, Chapter 9: Biodiversity Part A** of the ES [**APP-048**] and **Section 10.7, Chapter 10: Road Drainage and the Water Environment Part A** of the ES [**APP-050**]).

12.7.2. There are no other changes to the baseline for the Assessment of Cumulative Effects; the text within **Section 16.7, Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-062**] remains valid.

12.8 ASSESSMENT OF CROSS TOPIC COMBINED EFFECTS

CONSTRUCTION

12.8.1. The interaction of the combined biodiversity and road drainage and the water environment effects on the River Coquet are detailed in **Table 12-2**.

Table 12-2 – Assessment of Combined Effects

Common Sensitive Receptor	Impacts	Combined Effect
CONSTRUCTION		
River Coquet: – SSSI and HPI designations – Riverbank and in-river habitats – Water quality (chemical and ecological quality) – Channel morphology	– Permanent loss and temporary damage of riverbank habitat and bed / bank features – Permanent damage or degradation of watercourse due to changes in water chemistry – Temporary damage of in-river habitat – Degradation of bank and bed features – Short term increase in turbidity – Alteration to channel dynamics potentially resulting in increased sediment transport adjacent to the river training works	Mitigation measures are set out within **Sections 7.9** and **8.9**. As detailed in **Section 7.10**, the permanent loss of riverbank habitat of the SSSI / HPI as a result of the Southern Access Works would result in a direct, permanent **Moderate Adverse** residual effect. The temporary damage and degradation to habitats of the SSSI would result in a direct, temporary **Slight Adverse** residual effect (not significant). As detailed in **Section 8.10**, the proposed works would have a **Slight Adverse** residual effect on the River Coquet from sediment regime, channel morphology and natural fluvial processes. When considering both the biodiversity and road drainage and the water environment effects on the River Coquet, the Southern Access Works would have a combined residual effect of **Moderate Adverse** during construction.

12.8.2. All other impacts during construction, detailed within **Section 16.8, Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-062**], remain unchanged and valid.

12.9 MITIGATION AND MONITORING

12.9.1. No further mitigation or monitoring measures are proposed, hence the details within **Section 16.10, Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-062**], remain unchanged and valid.

12.10 UPDATED DMRB GUIDANCE

12.10.1. Since the assessments in the ES were completed, the DMRB methodology was superseded and replaced with updated guidance as detailed in **Section 16.4, Chapter 16: Assessment of Cumulative Effects** of the ES [**APP-062**]. A DMRB sensitivity test for likely significant effects has been undertaken, detailed in **Appendix 4.5: DMRB Sensitivity Test** of the ES [**APP-197**]. The findings of this sensitivity test, that the assessment complies with the changes in the updated guidance (LA 104[13]) and the conclusions would not change, remain valid for the assessment reported in this ES Addendum.

[13] Highways England (2020) Design Manual for Roads and Bridges (DMRB) LA 104 Environmental assessment and monitoring.

13 SUMMARY

13.1 INTRODUCTION

13.1.1. **Chapter 17: Summary** of the ES [**APP-063**] describes the likely significant effects of the Scheme.

13.1.2. A summary of the likely significant effects as a result of the Southern Access Works and the Stabilisation Works is presented below. All other conclusions within **Chapter 17: Summary** of the ES [**APP-063**] remain valid.

13.2 SUMMARY OF LIKELY SIGNIFICANT EFFECTS

BIODIVERSITY

CONSTRUCTION

13.2.1. Significant effect (direct, permanent, **Moderate Adverse**) due to the loss of riverbank habitat in the River Coquet and Coquet Valley SSSI as a result of the proposed hard engineered scour protection to the north and south banks of the river.

CUMULATIVE EFFECTS

CONSTRUCTION

13.2.2. Significant combined residual effect (**Moderate Adverse**) during construction as a result of both the biodiversity and road drainage and the water environment effects on the River Coquet.

13.3 CONCLUSION

13.3.1. The assessments presented in this ES addendum have concluded that although the environmental impacts of the Southern Access Works vary between topics, overall this change to the Scheme would not alter the findings of the ES with comparable effects to those assessed previously, with the exception of Biodiversity and cross-topic combined effects as detailed above.

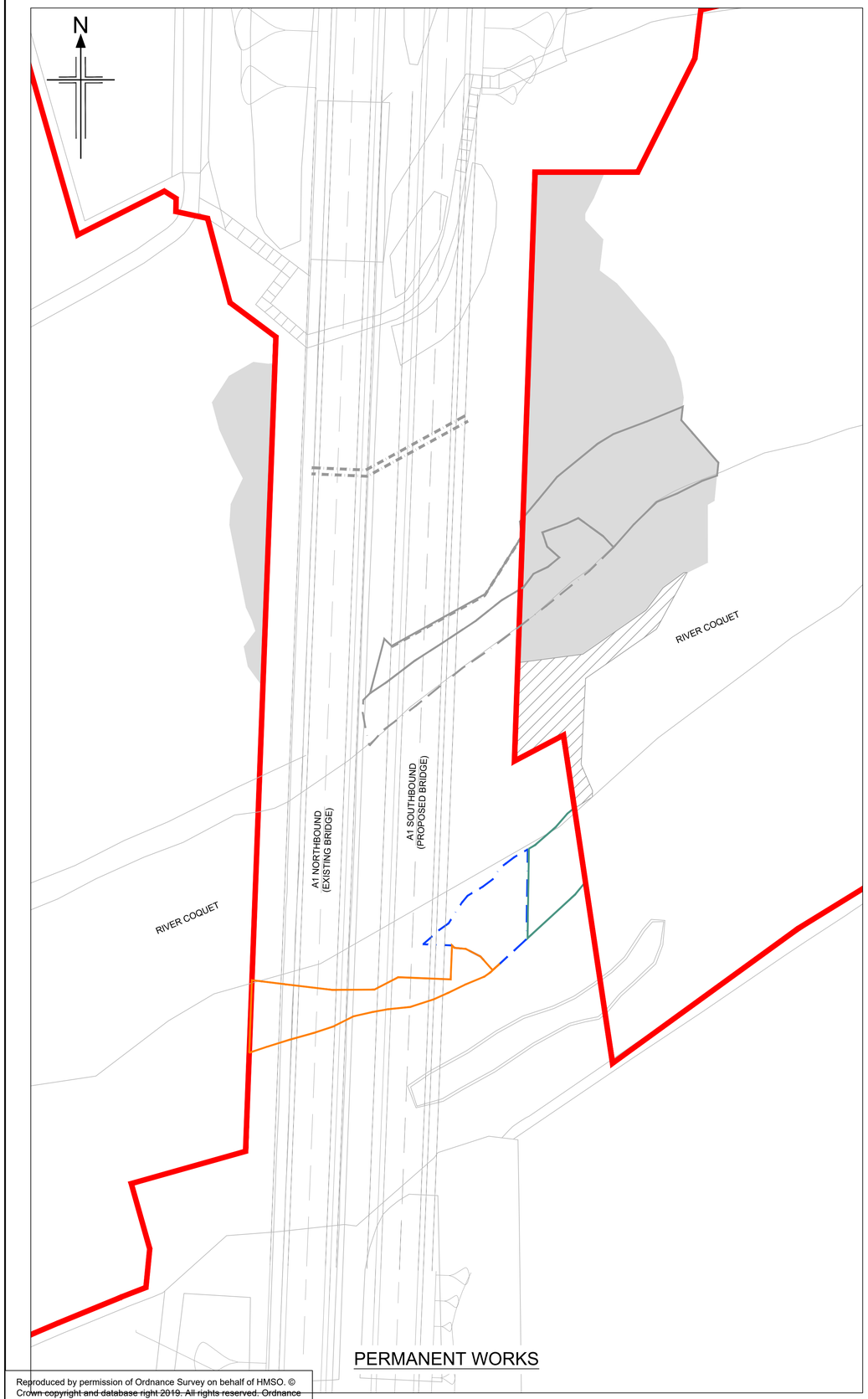
14 ABBREVIATIONS

Acronym	Definition
AOD	Above Ordnance Datum
CEnv	Chartered Environmentalist
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CIRIA	Construction Industry Research and Information Association
C.WEM	Chartered Water and Environmental Manager
DCO	Development Consent Order
DMRB	Design Manual for Roads and Bridges
ECoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
ES	Environmental Statement
GHG	Greenhouse Gas
HEMP	Handover Environmental Management Plan
HGV	Heavy Goods Vehicle
HPI	Habitats of Principal Importance
IEMA	Institute of Environmental Management and Assessment
LWS	Local Wildlife Site
MCIEEM	Member of the Chartered Institute of Ecology and Environmental Management
MCIWEM	Member of the Chartered Institute of Water and Environmental Management
MCIWM	Member of the Chartered Institution of Wastes Management
NCC	Northumberland County Council
NTS	Non-Technical Summary

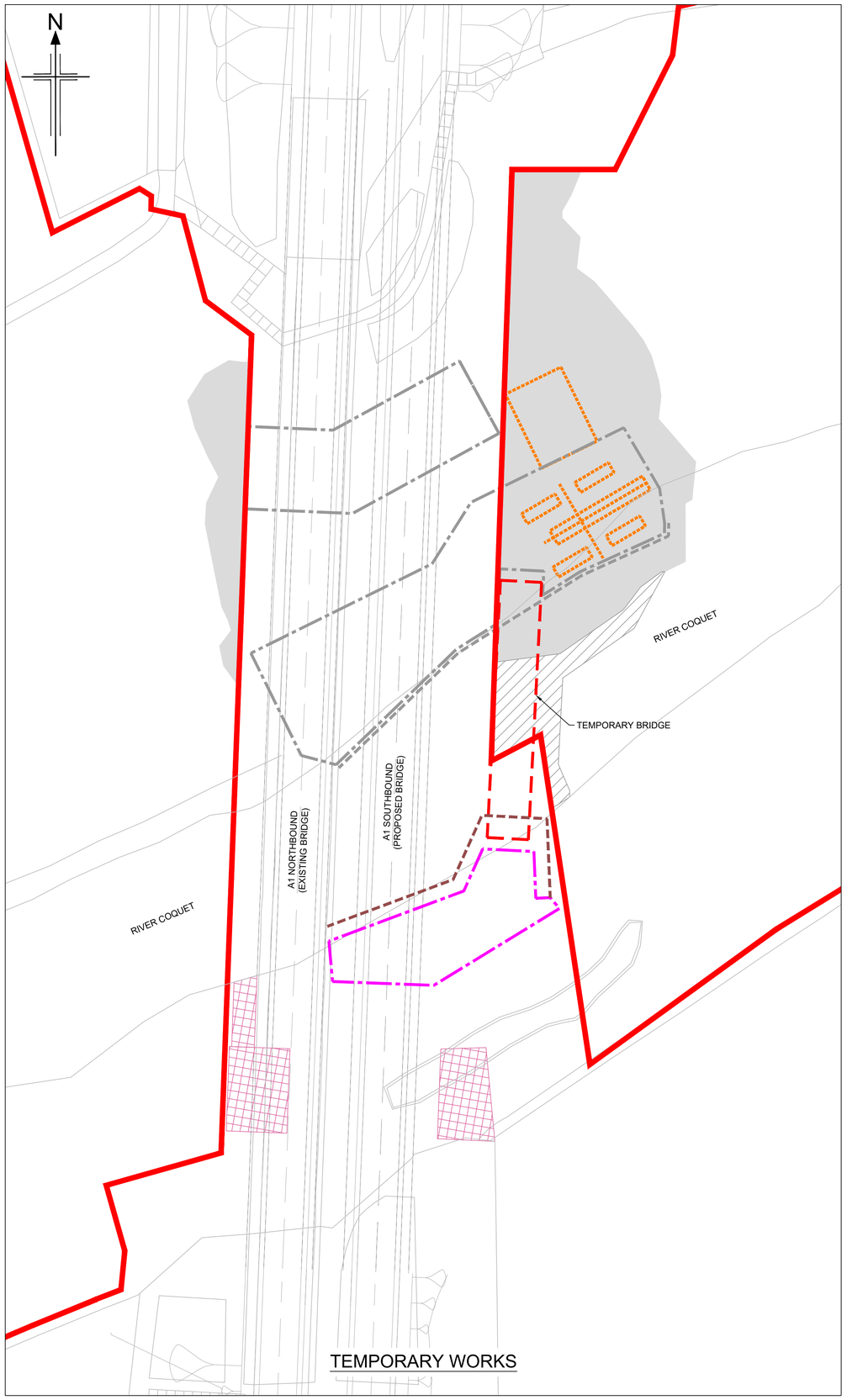
Acronym	Definition
PPG	Pollution Prevention Guidance
SSSI	Site of Special Scientific Interest

Appendix A

FIGURES



PERMANENT WORKS



TEMPORARY WORKS

KEY:

FIGURE 1

Existing Order limits

Area assessed under Environmental Statement Addendum: Southern Access Works for Change Request

Proposed extension to Order limits - south bank stabilisation

Permanent:

Indicative scour protection
- reno mattress
- rock armour
- grey-green bank protection

Temporary:

Indicative areas of potential avoidance of site clearance

Temporary river training work to protect piling platform

Piling platform

Temporary bridge

Construction crane

Area assessed under Environmental Statement Addendum: Stabilisation Works for Change Request

Proposed extension to Order limits - north bank access

Permanent:

Indicative scour protection

Stabilisation piling location

Temporary:

Temporary river training work to protect piling platform

Piling platform

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SCALE 1:500 METRES

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	08/03/21	FIRST ISSUE	RM	GC	GC	SK

Contractor: COSTAIN

Designer: Jacobs
1 City Walk, Leeds, LS11 9DX
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Client: highways england

Project
REGIONAL DELIVERY PARTNERSHIP
A1 MORPETH TO ELLINGHAM
DUALLING

Drawing title
ENVIRONMENTAL STATEMENT ADDENDUM
SOUTHERN ACCESS WORKS FOR CHANGE REQUEST

Drawing status
S2 - SUITABLE FOR INFORMATION

State Code	Preliminary	Sheet Size	
Project Stage	PCF Stage 5		
Scale	1:500@N/A	DO NOT SCALE	
Jacobs No.	B3660114	Rev	P01
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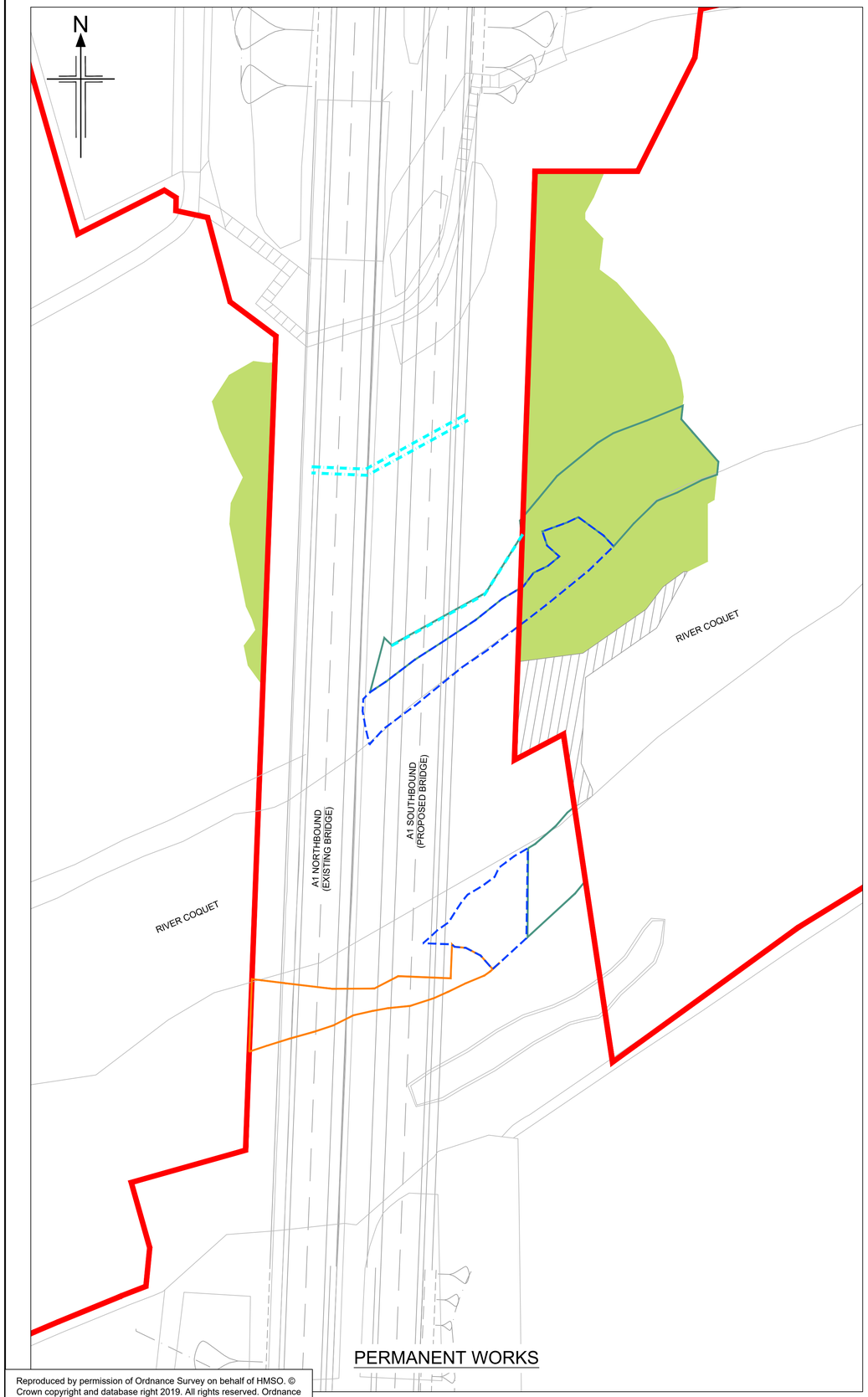
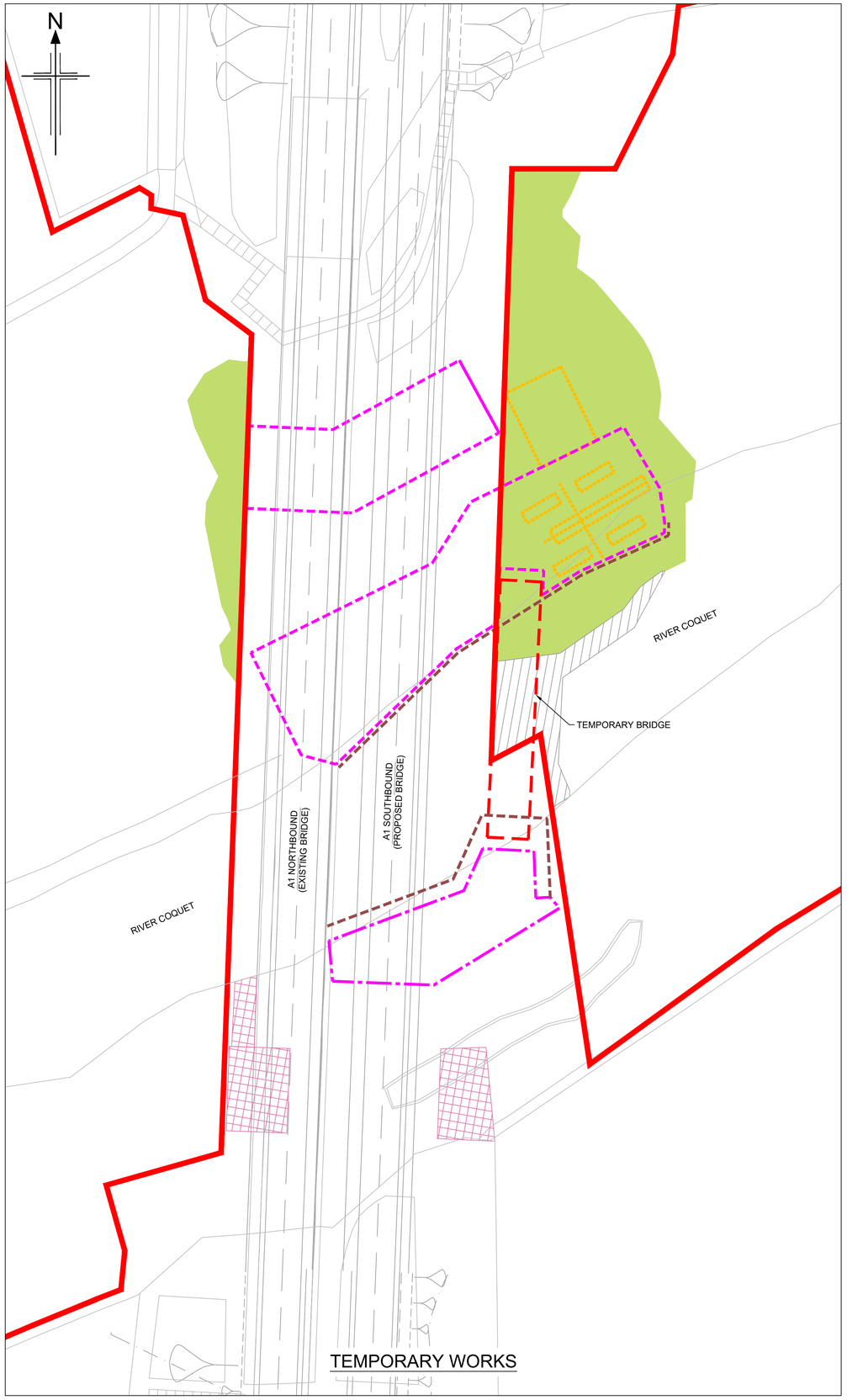


PERMANENT WORKS



TEMPORARY WORKS

KEY:

FIGURE 2

Existing Order limits

Overview of area assessed under Environmental Statement Addendum: Stabilisation Works for Change Request and Environmental Statement Addendum: Southern Access Works for Change Request

Proposed extension to Order limits - north bank stabilisation

Proposed extension to Order limits - south bank stabilisation

Permanent:

Indicative scour protection
- reno mattress
- rock armour
- grey-green bank protection

Stabilisation piling location

Temporary:

Temporary river training work to protect piling platform

Temporary bridge

Piling platform

Construction crane

Indicative areas of potential avoidance of site clearance

0 10 20 30 40 50

SCALE 1:500 METRES

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
P01	08/03/21	FIRST ISSUE	RM	GC	GC	SK

Contractor: COSTAIN

Designer: Jacobs
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Client: highways england

Project
REGIONAL DELIVERY PARTNERSHIP
A1 MORPETH TO ELLINGHAM
DUALLING

Drawing title
PROPOSALS ASSESSED IN ENVIRONMENTAL STATEMENT ADDENDUM: SOUTHERN ACCESS WORKS FOR CHANGE REQUEST

Drawing status
S2 - SUITABLE FOR INFORMATION

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Project Stage	PCF Stage 5	
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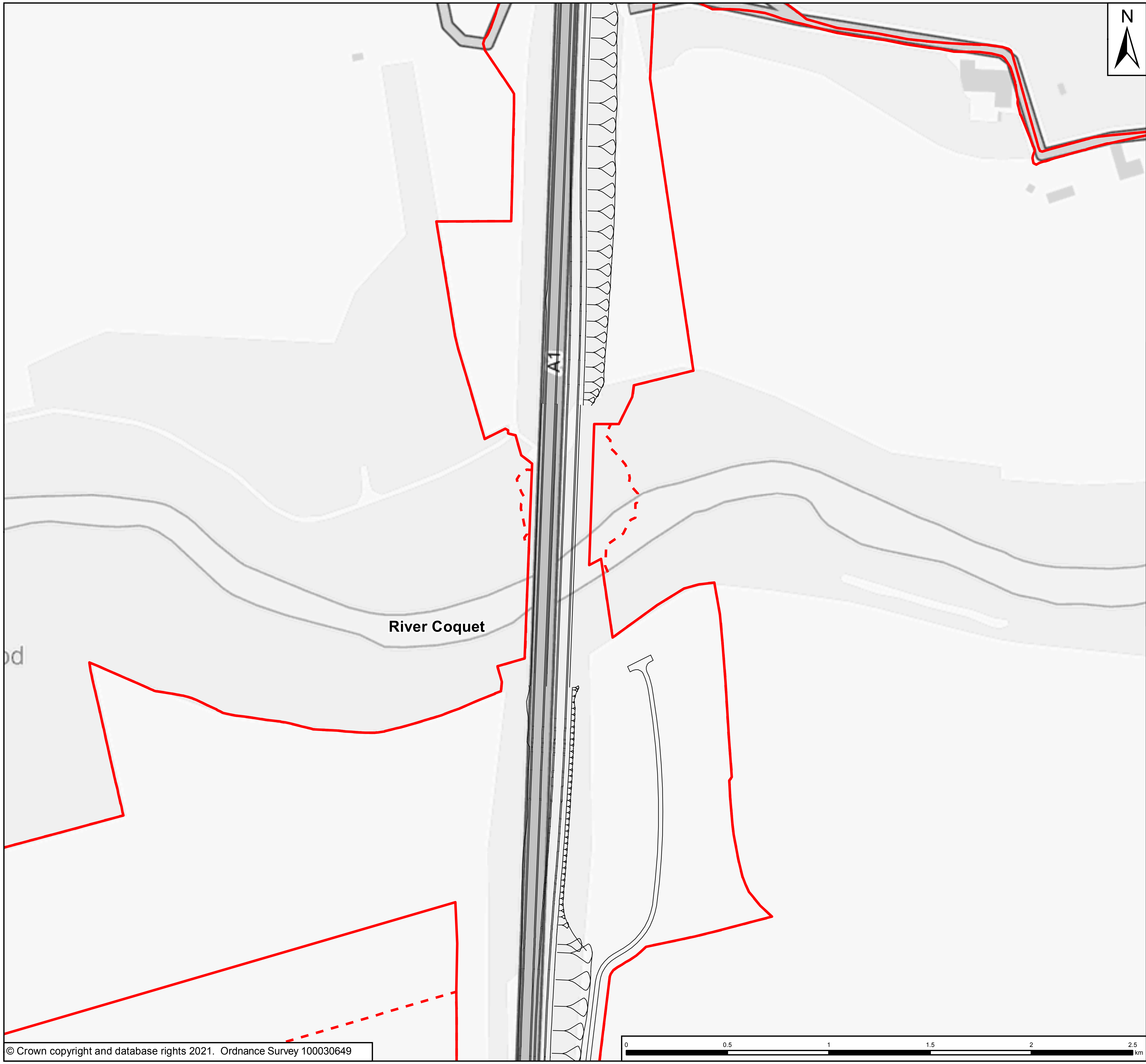

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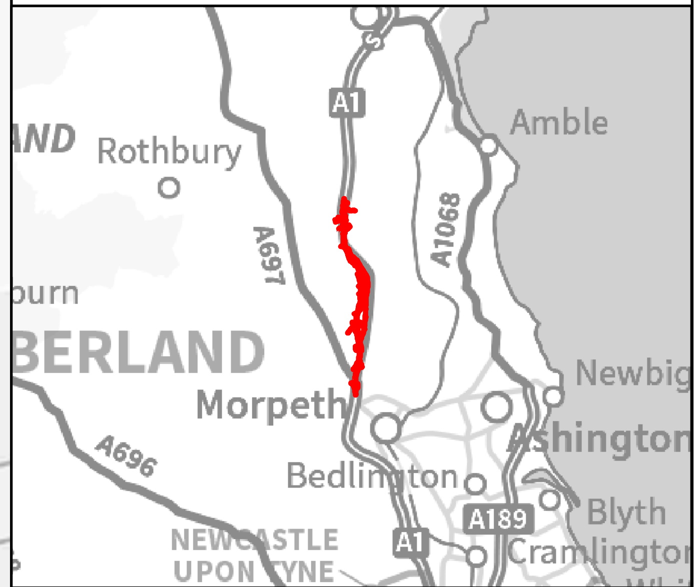
Key

- Existing Order Limits
- Extended Order Limits
- General Arrangement



Rev	Date	Description	By	Chk'd	App'd
P01	07/01/2021	First Issue	RM	LM	KS

Client: highways england

Project Title: A1 in Northumberland: Morpeth to Ellingham

Drawing Title: Figure 3: Site Location Plan

Scale	Drawn	Checked	Approved	Authorised
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Original Size: A3	Date: 07/01/2021	Date: 07/01/2021	Date: 07/01/2021	Date: 07/01/2021

Drawing Status: For Information

Suitability: S1

Drawing Number

Project	Originator	Volume	Project Ref. No.
HE551459	WSP		70044137

Location	Type	Role	Number	Revision
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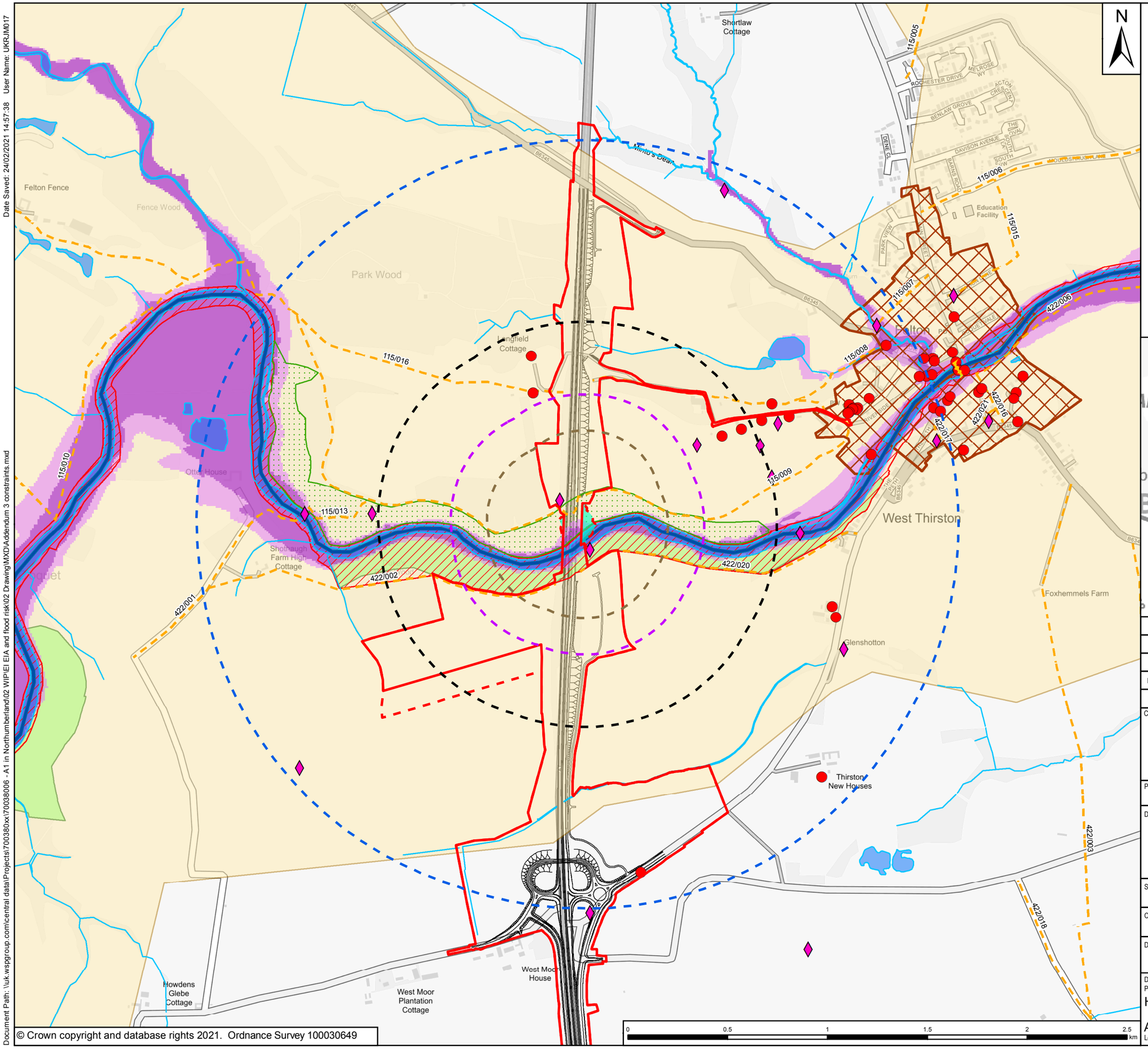
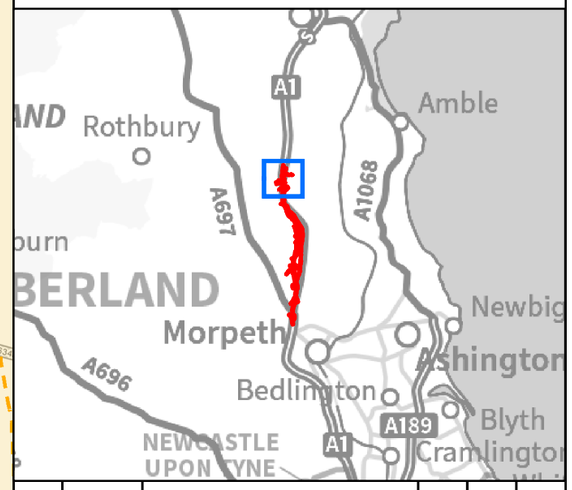


Key

- Existing Order Limits
- Extended Order Limits
- Additional Land Take
- 200 m Buffer
- 300 m Buffer
- 500 m Buffer
- 1 km Buffer
- General Arrangement
- ScheduledMonuments
- Listed Building
- Non-Designated Heritage Assets
- Public Rights of Way
- Statutory Main Rivers
- Surface Watercourses
- Conservation Area
- Local Wildlife Sites
- Site of Special Scientific Interest
- Surface Water Bodies
- Flood Zone 3
- Flood Zone 2
- Ancient Woodland Inventory
- Area of High Landscape Value



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Client: highways england

Project Title: A1 in Northumberland: Morpeth to Ellingham

Drawing Title: Figure 4: Environmental Constraints

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Drawing Status: For Information

Suitability: S1

Drawing Number Project	Originator	Volume	Project Ref. No.
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Appendix B

SUMMARY OF PROPOSED CHANGES TO APPLICATION

A1 in Northumberland: Morpeth to Ellingham

Scheme Number: TR010059

Summary of Proposed Changes to Application

Planning Act 2008

The Infrastructure Planning (Examination Procedure Rules) 2010

Infrastructure Planning (Examination Procedure) Rules 2010

Planning Act 2008

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

December 2020

Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Examination Procedure Rules) 2010

The A1 in Northumberland: Morpeth to Ellingham

Development Consent Order 20[xx]

Summary of Proposed Changes to Application

Regulation Reference:	Infrastructure Planning (Examination Procedure) Rules 2010
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Author:	A1 in Northumberland: Morpeth to Ellingham Project Team, Highways England

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2	December 2020	Revised Submission

CONTENTS

1 INTRODUCTION

1.1 Purpose of this document

1.1.1 This document describes a forthcoming request to amend the application for development consent (the "Application") under the Planning Act 2008 (the "2008 Act") submitted to the Secretary of State for Transport via Planning Inspectorate (the "Inspectorate") on 7 July 2020 by Highways England (the "Applicant") for the A1 in Northumberland: Morpeth to Ellingham (the "Scheme"). Its intention is to make the Examining Authority (ExA) and other participants in the examination aware of proposals for changes to the Application.

1.1.2 The Scheme comprises two sections known as Part A: Morpeth to Felton (Part A) and Part B: Alnwick to Ellingham (Part B).

1.1.3 On 4 August 2020, it was confirmed on behalf of the Secretary of State that the application had been accepted for examination. The ExA was appointed on 19 November 2020. This document has been produced in response to the ExA's Rule 6 Letter – Notification of the Preliminary Meeting and matters to be discussed, which was published 19 November 2020 and in which the ExA makes written submissions on the examination procedure by 10 December 2020 (Deadline A) , which is in advance of the first Preliminary Meeting to be held on 15 December 2020.

1.1.4 As is normal in relation to any engineering project, further design development of the Scheme has continued to be undertaken by the Applicant since the application for the Development Consent Order (DCO) was made in order to release efficiencies and design benefits. This is particularly important in optimizing a scheme being delivered by the public sector in the public interest. Consequently, the Applicant wishes to include certain refinements to the application accordingly and this document sets out those amendments to accommodate them and with the leave of the ExA, the proposed procedure for doing so.

1.1.5 The proposed changes to the Scheme are detailed further in this document and comprise the following:

1. Changes to temporary and permanent earthworks within the Order limits along both Part A (between Morpeth and Felton) and Part B (between Alnwick and Ellingham) in order to reduce earthwork movement. These changes are an extension to Parameters 4 and 5 for Part A, as set out in **Chapter 2: The Scheme** of the Environmental Statement (ES) [APP-037]. There would also be additional temporary and permanent earthworks. These changes to the earthworks strategy would not involve additional land and, as explained in **Section 2.1** of this document, it is not considered that there would be any new or changed environmental impacts as a result.
2. Works on the north bank of the River Coquet in order to stabilise the proposed bridge and existing bridge within Part A. The stabilisation works would include the installation of piles in the north bank of the River Coquet and the installation of erosion protection measures on the river bank. Land outside the Order limits would temporarily be required as a working area for the installation of the piles and access to works, as well as for the carrying out of the erosion protection

measures. As the installation works would lead to the loss of woodland within the Coquet River Felton Park Local Wildlife Site (LWS), there may also be a requirement for additional compensatory habitat outside the Order limits. Permanent erosion protection measures are proposed on the north bank (including outside the existing Order limits) and on the south bank.

3. Provision of a temporary access to the south bank of the River Coquet is proposed by crossing the river from the temporary works on the northern bank. It is anticipated that this would result in improved environmental performance in terms of access that would otherwise be provided from the South bank itself. The engineering solution for such a crossing is to use of a temporary bridge to span over the river. It is anticipated that there would also be some temporary river training works along each riverbank and additional erosion protection to the southern pier of the new bridge. Additional temporary rights would be required for the installation of the temporary bridge.

1.1.6 The Applicant confirms that the Scheme is deliverable without the changes to the temporary and permanent earthworks as referred to in the first sub-paragraph in **paragraph 1.1.5** above. However, as explained in **paragraphs 2.2.1** and **2.2.2**, the ongoing ground investigations have identified slope instability on the north bank of the River Coquet Valley, which means a change in circumstances has occurred. Consequently, the additional slope stabilisation referred to in the second sub-paragraph of **paragraph 1.1.5** is now necessary, but could not have been identified when the Application was made. The south bank access detailed in the third sub-paragraph of **paragraph 1.1.5** is enabled by these works.

1.1.7 An indicative timetable for progressing the amendments to the application through the DCO process is provided in **Section 3** of this document.

2 PROPOSED CHANGES TO THE SCHEME

2.1 Changes to temporary and permanent earthworks

2.1.1 The Applicant proposes to maximise the re-use of materials (via excavation, deposition and temporary storage), within the existing Scheme extents. A recent review of the earthworks strategy has identified an opportunity to reduce earthwork movement and as a result greater flexibility in temporary and permanent storage of Site won material is required to achieve this. The indicative earthworks areas are shown in the figure in the **Indicative Earthwork Change Locations** figure in **Appendix A**.

2.1.2 To balance materials across both Parts A and B, the following methods are proposed:

- **a.** Utilising borrow pits to exchange and win additional material suitable for construction.
- **b.** Maximising use of soil bunds already specified within the **Figure 7.8: Landscape Mitigation Masterplan** for Part A [APP-095], **Figure 7.10 Landscape Mitigation Masterplan** for Part B [APP-144] and **Figure 7.14: Landscape Mitigation Masterplan including Assessment Parameter 3** for Part B [APP-148], for disposal of excess site material, in Part A.
- **c.** Maximising of fill within slopes, already specified within **Figure 7.8**: **Landscape Mitigation Masterplan** for Part A [APP-095] and **Figure 7.10 Landscape Mitigation Masterplan** for Part B [APP-144] and **Figure 7.14: Landscape Mitigation Masterplan including Assessment Parameter 3** for Part B [APP-148], for re-use of site material, in Part A.
- **d.** Creation of new soil bunds within Part B to maximise re-use of excess site material.
- **e.** Maximising of slopes for re-use of excess site material, in Part B.
- **f.** Laying down additional material increasing some localised ground levels.
- **g.** Raising levels of junction “bowls” (level or rounded rather than dished).
- **h.** Creating new, temporary soil storage areas within both Part A and Part B.

2.1.3 These changes are an alteration to Parameters 4 and 5 for Part A, as set out in **Chapter 2: The Scheme** of the ES [APP-037]. There would also be additional temporary and permanent earthworks that require assessment for Part A and Part B. Therefore, it is appropriate to ensure that the environmental information before the Examination addresses the prospect of altered impacts This is addressed by sensitivity testing as described at **paragraph 2.1.6** below.

2.1.4 Mitigation measures such as detention basins, grassed areas, trees, shrubs and hedgerow planting would remain the same as originally proposed in **Figure 7.8 Landscape Mitigation Masterplan** for Part A [APP-095]and **Figure 7.10 Landscape Mitigation Masterplan** for Part B [APP-144]. The earthworks would be designed to accommodate these measures and takes into consideration the diverted 66 kV Extra High Voltage cable (Work Number: 24) as shown on **Figure 7.14: Landscape Mitigation Masterplan including Assessment Parameter 3** for Part B [APP-148].

2.1.5 The benefits for this proposed change for both Part A and Part B would be to:

- **a.** Greater flexibility during construction to reduce road haul and offsite disposal,

therefore reducing vehicle emissions including greenhouse gas.

b. Greater flexibility during construction to reduce the importation of material, therefore reducing vehicle emissions including greenhouse gas.

c. By keeping the majority of material transportation within the Site, vehicle movements between Part A and Part B and for disposal, would be minimised, reducing construction traffic.

d. Where constructed, the addition of new bunds would provide positive impacts in integrating the earthworks into the landscape and immediate landform.

e. Where constructed, the addition of new bunds would facilitate screening for sensitive receptors near the A1, especially during initial woodland establishment, softening the appearance.

f. The increase in height of soil bunds already proposed would facilitate better screening of the A1, especially during the woodland establishment, softening the appearance.

g. Uplift / slackening of slopes to areas would provide positive impacts in integrating the earthworks into the landscape and immediate landform.

h. Infilling of junction “bowls” would achieve better integration with the existing landform.

2.1.6 A sensitivity assessment of the environmental impact of the changes to the temporary and permanent earthworks in the powers contained within the draft DCO [APP-014] is being undertaken to enable the consequences in terms of the environmental impacts already assessed. The assessment will consider whether the changes to the temporary and permanent earthworks would alter the conclusions of the environmental impact assessment already undertaken. This will be concluded by and reported at Deadline 4 (12 March 2021).

2.1.7 The scope of this sensitivity assessment and anticipated outcomes is shown in **Table 1** below, which represent preliminary indications subject to completion of the assessment.

Table 1 - Changes to the temporary and permanent earthworks desktop sensitivity test

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Air Quality			
Dust and particulate matter from changes to the earthworks	Construction	N	Y
Emissions from construction traffic	Construction	N	N
Emissions from operational traffic	Operation	N	N
Noise and Vibration			

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Noise generated from construction activities	Construction	N	Y
Vibration generated from construction activities	Construction	N	Y
Noise from construction traffic	Construction	N	N
Noise from operational traffic	Operation	N	N
Changes to noise barrier effectiveness	Operation	N	Y
Landscape and Visual			
Changes to landscape character	Construction and operation	N	N
Changes to visual amenity	Construction and operation	N	Y
Cultural Heritage			
Changes to the setting of heritage assets	Construction and operation	N	Y
Disruption and disturbance to below ground archaeological remains	Construction	N	Y
Changes to historic landscapes	Construction and operation	N	N
Biodiversity			
Impacts on Statutory and non-statutory sites	Construction and operation	N	N
Changes to habitats	Construction and operation	N	N
Impacts on protected and notable species	Construction and operation	N	N

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Changes to Biodiversity No Net Loss Assessment	Construction and operation	N/A	N
Changes to groundwater dependant terrestrial ecosystems	Construction and operation	N	N
Road Drainage and the Water Environment			
Changes to local hydrogeology in the vicinity of the borrow pits (including groundwater lowering and flooding)	Construction and operation	N	Y
Impact of groundwater to the functionality of the borrow pits (including dewatering)	Construction and operation	N	Y
Changes to flood risk	Construction and operation	N	Y
Changes to water quality	Construction and operation	N	N
Geology and Soils			
Changes to temporary land take	Construction	N	N
Changes to permanent land take	Operation	N	N
Material suitability for re-use	Construction	N	N
Mineral Safeguarding Areas	Construction	N	Y
Pollution to controlled water bodies	Construction	N	N
Foot and mouth burial site	Construction	N	Y
Population and Human Health			
Changes to temporary land take	Construction	N	N

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Changes to permanent land take	Operation	N	N
Changes to recreational journey amenity	Construction and operation	N	N
Changes to direct, indirect and induced job generation	Construction	N	N
Changes to human health determinants	Construction and operation	N	N
Material Resources			
Consumption of materials	Construction	N	Y
Generation and disposal of waste to landfill	Construction	N	Y
Consumption of materials	Operation	N	N
Generation and disposal of waste to landfill	Operation	N	N
Climate			
Effect of the Scheme on climate (Carbon / GHG) due to consumption of materials and transportation of materials	Construction	N	N
Effect of the operation of the Scheme on climate (Carbon / GHG) due to end-user traffic and maintenance, repair and refurbishment.	Operation	N	N
Vulnerability of the Scheme to climate change	Construction and operation	N	N
Combined and Cumulative Assessment			
Assessment of Within Topic combined effects	Construction and Operation	N	N

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Assessment of Cross Topic combined effects	Construction and Operation	N	N
Assessment of cumulative effects	Construction and Operation	N	N

2.1.1 A justification for the aspects of the assessments that would not require further assessments is provided below. The aspects of the assessments not discussed below have been scoped into the sensitivity assessment as shown in **Table 1**. However, where all aspects of the assessments have been scoped into the sensitivity assessment this is stated in the section below for completeness.

Air Quality

Construction Traffic

2.1.2 The changes to the earthworks strategy would reduce the number of construction traffic movements, meaning emissions from construction traffic would be less than that reported in **Chapter 5: Air Quality** Park A of the ES [APP-040] and **Chapter 5: Air Quality** Part B of the ES [APP-041] of the Environmental Statement (ES). As emissions from construction traffic has been reported as not significant in the ES, would remain the same with the changes to the temporary and permanent earthworks.

Operational Traffic

2.1.3 The Scheme alignment and traffic data would remain the same with the changes to the earthworks meaning there would be no change to the operational air quality assessment presented in **Chapter 5: Air Quality** Part A [APP-040] and **Chapter 5: Air Quality** Part B [APP-041].

Noise and Vibration

Construction Traffic

2.1.4 Changes to the earthwork's strategy would reduce the number of construction traffic movements, meaning noise from construction traffic would be less than that reported in **Chapter 6: Noise and Vibration** Part A [APP-042] and **Chapter 6: Noise and Vibration** Part B [APP-043]. As noise from construction traffic has been reported as not significant in the ES, this would not change with the temporary and permanent earthworks.

Operational Traffic

2.1.5 Although additional permanent bunds are proposed, these are not likely to result in any further adverse operational stage effects. Therefore, further assessment work would not be undertaken for this element of the assessment.

Landscape and Visual

Construction and Operation - Landscape Character

2.1.6 The changes to the temporary and permanent earthworks would not change the assessment of significant effects on landscape character as presented in **Chapter 7: Landscape and Visual** Part A [APP-088] and **Chapter 7: Landscape and Visual** Part B [APP-089]. This is because the nature and form of the earthworks would support integration of the Scheme into the local landscape character.

Cultural Heritage

Construction and Operation - Historic Landscapes

2.1.7 Based on professional judgement, that the changes to the temporary and permanent earthworks would not change the assessment of significant effects for historic landscapes as presented in **Chapter 8: Cultural Heritage** Part A [APP-046] and **Chapter 8: Cultural Heritage** Part B [APP-047]. A change in the significance of effects is not predicted due to the nature and location of the additional temporary and permanent earthworks and low value of the historic landscapes.

Biodiversity

Construction and Operation

2.1.8 There would no changes to the habitats proposed in the **Figure 7.8: Landscape Mitigation Masterplan** for Part A [APP-095], **Figure 7.10: Landscape Mitigation Masterplan** for Part B [APP-144] and **Figure 7.14: Landscape Mitigation Masterplan including Assessment Parameter 3** for Part B [APP-148]. This means there would be no changes to the biodiversity assessment as set out in **Chapter 9: Biodiversity** Part A [APP-048] and **Chapter 9: Biodiversity** Part B [APP-049] including the Biodiversity No Net Loss Assessment provided at Appendix 9.20 for Part A [APP-246] and Appendix 9.11 for Part B[APP-309] of the ES.

2.1.9 Where mammal wildlife culverts are proposed the earthworks would be designed around the openings of the culverts to maintain the length shown in **Figure 7.8: Landscape Mitigation Masterplan** for Part A [APP-095].

Road Drainage and the Water Environment

Construction - Water Quality

2.1.10 The mitigation set out in **Chapter 10: Road Drainage and the Water Environment** Part A [APP-050] and **Chapter 10: Road Drainage and the Water Environment** Part B [APP-051] and **Outline Construction Environmental Management** Plan (Outline CEMP) [APP-346] for controlling sediment and pollutants in surface water runoff would be applicable for the changes to the temporary and permanent earthworks. With these measures in place, there would no change to the outcomes of the water quality assessment.

Operation - Water Quality

2.1.11 As the drainage design would not be altered, there would changes to the water quality assessment for the operation of the Scheme as presented in **Chapter 10: Road Drainage and the Water Environment** Part A [APP-050] and **Chapter 10:**

Road Drainage and the Water Environment Part B [APP-051].

Geology and Soils

Construction and Operation - Temporary and Permanent Land Take

2.1.12 There would be no change to the temporary and permanent land take and therefore the assessment presented in **Chapter 11: Geology and Soils** Part A [APP-052] and **Chapter 11: Geology and Soils** Part B [APP-053] would remain the same.

Construction - Material Re-use and Pollution to Controlled Water Bodies

2.1.13 The mitigation set out **Chapter 11: Geology and Soils** Part A [APP-052] and **Chapter 11: Geology and Soils** Part B [APP-053] and **Outline CEMP** [APP-346] for the re-use of materials and control of potential contaminants would be applicable for the changes to the temporary and permanent earthworks. With these measures in place, there would be no change to the outcomes of the assessment.

Population and Human Health

Construction and Operation - Temporary and Permanent Land Take

2.1.14 There would be no change to the temporary and permanent land take and therefore the assessment presented in **Chapter 12: Population and Health** Part A [APP-054] and **Chapter 12: Population and Human Health** Part B [APP-055] would remain the same.

Construction and Operation - Recreational Journey Amenity

2.1.15 There would be no significant changes to recreational journey amenity as presented in **Chapter 12: Population and Human Health** Part A [APP-054] and **Chapter 12: Population and Human Health** Part B [APP-055]. The assessment of recreational journey amenity has considered changes to amenity along the length of the Scheme for walkers, cyclists and horse-riders. There would be no material changes to journey recreational amenity based on the Design Manual for Bridges (DMRB) Volume 11, Section 3, Part 8: Pedestrians, Cyclists, Equestrians and Community Effects criteria for population and human health. The latest DMRB guidance (LA112 Population and Human Health) does not require recreational journey amenity to be assessed.

Construction - Direct, Indirect and Induced Job Generation

2.1.16 Based on professional judgement, there would be no change to the assessment of significance for economy and employment as presented in **Chapter 12: Population and Human Health** Part A [APP-054] and **Chapter 12: Population and Human Health** Part B [APP-055].

Construction and Operation - Human Health

2.1.17 As there would be no changes to the assessment of significance for air quality, noise and vibration as well as road drainage and the water environment, there would be no change to the assessment of significance for human health as reported in **Chapter 12: Population and Human Health** Part A [APP-054] and **Chapter 12: Population and Human Health** Part B [APP-055].

Materials Resources

Operation

2.1.18 The operational consumption of materials and generation of waste would be minimal based on professional judgement and assessments of similar schemes. Therefore, the operational materials and waste assessment would remain the same as reported in **Chapter 13: Material Resources** Part A [APP-056] and **Chapter 13: Material Resources** Part B [APP-057].

Climate

Construction – Greenhouse Gas Emissions

2.1.19 The changes to the temporary and permeant earthworks would reduce imported material or disposal to landfill which would reduce the adverse impacts of the Scheme on greenhouse gas emissions. However, there would not be a substantial enough change to alter the assessment of significance presented in **Chapter 14: Climate** Part A [APP-058] and **Chapter 14: Climate** Part B [APP-059]. Additionally, the assessment reported in **Chapter 14: Climate** Part A [APP-058] and **Chapter 14: Climate** Part B [APP-059] presents a worst-case scenario when compared to the proposed changes to the earthworks.

Operation - Greenhouse Gas Emissions

2.1.20 As there would be no change to the alignment of the Scheme and traffic data, there would be no change to the operational greenhouse gas assessment presented in **Chapter 14: Climate** Part A [APP-058] and **Chapter 14: Climate** Part B [APP-059].

Construction and Operation - Vulnerability of the Scheme to Climate Change

2.1.21 The mitigation set out in **Chapter 14: Climate** Part A [APP-058] and **Chapter 14: Climate** Part B [APP-059] and **Outline CEMP** [APP-346] for futureproofing the Scheme for climate change would be applicable for the changes to the temporary and permanent earthworks. With these measures in place, there would no change to the outcomes of the assessment.

Combined and Cumulative Assessment

Construction and Operation - Within Topic Combined Effects Assessment

2.1.22 The Within Topic combined effects assessment considers the effects of both Part A and Part B on the same common sensitive receptor in an individual environmental topic. As the further assessment work will assess the Scheme as a whole (i.e. Part A and Part B together), a Within Topic combined effects assessment is not required.

Construction and Operation - Cross Topic Combined Effects Assessment

2.1.23 As there would be no change to the assessment of significance for all environmental topics with the changes to the temporary and permanent earthworks, there would not be a change to the assessment of Cross Topic combined effect presented in **Chapter 16: Assessment of Cumulative Effects** [APP-062].

Construction and Operation - Cumulative Effects Assessment

2.1.24 As there would be no change to the assessment of significance for all

environmental topics with the changes to the temporary and permanent earthworks, there would not be a change to the cumulative effect's assessment presented in **Chapter 16: Assessment of Cumulative Effects** of the ES [APP-062].

Changes to the Application

2.1.25 The changes to the application documents would be set out in a report and documents would be updated, if required, as detailed in **Table 2**. However, the proposed changes to the earthworks would not involve an addition to the Order land and the sensitivity assessment indicates that the changes would not be likely to generate new or materially different environmental impacts. Taking into account the guidance in section 2 of Advice Note Sixteen, it is therefore not anticipated that the proposed changes to earthworks would constitute a material change to the Application.

Table 2 - Documents to be updated for changes to the temporary and permanent earthworks

Document	Proposed Update
The draft DCO [APP-014]	The tailpiece to Schedule 1 would be updated if required to reflect the proposed earthworks strategy. Schedule 8 would also be updated to reflect any necessary changes to the use of land of which temporary possession may be taken.
Statement of Reasons [APP-018]	The description of the use of the land would be updated.
Case for the Scheme [APP-344]	The Case for the Scheme would need to be updated if the sensitivity assessment predicted that there would be a change on compliance with policy.
Outline CEMP [APP-346]	This would need to be updated if there was a change in required mitigation as a result of the sensitivity assessment.
Figure 7.8: Landscape Mitigation Masterplan for Part A [APP-095]	This would need to be updated to reflect changes in the temporary and permanent earthworks.
Figure 7.10: Landscape Mitigation Masterplan for Part B [APP-144]	This would need to be updated to reflect changes in the temporary and permanent earthworks.
Figure 7.14: Landscape Mitigation Masterplan including Assessment Parameter 3 for Part B [APP-148]	This would need to be updated to reflect changes in the temporary and permanent earthworks.
Book of Reference [OD-002]	The description of temporary and permanent land take would need to be updated.
National Policy Statement for National Networks Accordance Table [APP-345]	The accordance table would need to be updated if the sensitivity assessment predicted that there would be a change on compliance with policy.

Document	Proposed Update
Lands Plans [APP-006]	This would need to be updated to reflect changes in the temporary and permanent earthworks
Works Plan [APP-007]	This would need to be updated to reflect changes in the temporary and permanent earthworks
General Arrangement [APP-008]	This would need to be updated to reflect changes in the temporary and permanent earthworks
Rights of Way and Access Plans [APP-009]	This would need to be updated to reflect changes in the temporary and permanent earthworks
Consultation Report [APP-0221]	The Consultation Report will be updated to include consultation undertaken on the change to the proposals.

Consultation

2.1.26 As detailed in Advice Note 16, an applicant who intends to make a request for a material change to a DCO application is expected to consult all those prescribed in the Planning Act 2008 under section 42(a) to (d) who would be affected by the proposed change (giving a minimum of 28 days). Even if a requested change is non material, paragraph 2.5 of Advice Note 15 advises that there may still be a need, in the interests of fairness, to carry out consultation. Applicants are recommended to consider whether consultation is required to enable affected persons to make representations on the changes to the application.

2.1.27 The proposed change to the earthworks would not require additional land. Based on the scoping exercise, the changes would not be likely to generate new or materially different environmental impacts. The Applicant therefore does not consider that these changes would constitute a material change to the Application. Nevertheless, affected landowners may have an opinion on the earthworks strategy and the Applicant therefore considers it appropriate to undertake consultation in order that they have the opportunity to make representations. As detailed in **paragraph 3.1.1**, consultation will therefore be undertaken with all persons prescribed under Section 42 of the 2008 Act will be undertaken between 29 January 2021 – 25 February 2021.

2.1.28 The consultation will also be consistent with the procedures under The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

2.2 Land Stabilisation North of the River Coquet – Part A

2.2.1 The DCO application was submitted on 7th July 2020. As is normal with an infrastructure project of this nature, further detailed ground investigation and design has been undertaken in parallel with the DCO application process. It was identified in December 2019 that supplementary ground investigation would be required to inform the detailed design work for the Scheme. This ground investigation was undertaken between January and May 2020 with the first draft report being issued on 17 July 2020 (i.e. after the application had been submitted). The results were reported and reviewed over the summer, with the latest report being issued on 2 December 2020.

2.2.2 The review of the available geological and geotechnical information, including the reporting of the ground investigation works undertaken earlier in 2020, has identified that the north slope of the River Coquet Valley is suffering from instability which, without treatment, could cause a failure in the slope during the construction and operation of the new bridge and could also have a detrimental impact on the existing bridge structure.

2.2.3 Whilst detailed design has not yet taken place, a number of options have been considered to address the instability and a number of piling configurations have been considered. The proposed solution is that it will comprise spaced bored piles, ensuring the stability of the northern valley sides and allowing the new pier foundation to be installed.

2.2.4 The proposal would comprise two rows of spaced piles to the north side of the proposed pier location and a third row to the south side as shown in the **Permanent Works at the River Coquet** figure in **Appendix A**. All of the permanent piling works are currently proposed to stay within the existing Order limits of Part A. However, carrying out the piling works within the existing Order limits of Part A would present engineering challenges. It is therefore necessary to expand the Order limits to provide temporary working areas in order to ensure that the proposed stabilisation construction works can be carried out.

2.2.5 The stabilisation works on the slope will include scour protection along the river's edge on the north bank of the River Coquet to provide erosion protection to the lower stabilisation piles to avoid further works during the design life of the structure, which is 120 years.

2.2.6 Should the erosion protection measures only be installed along the riverside within the current Order limits, it is highly likely that further significant engineering interventions and erosion protection measures would be required in the future in order to protect the new bridge foundations from undermining and slope instability. Therefore, in order to provide robust erosion protection and prevent a deterioration of the toe of the slope of the North bank of the River Coquet over time, it is proposed that rights are acquired for installation and retention of scour protection in additional land that extends beyond the current Order limits, the extent of this additional land is shown in the **Temporary Works at the River Coquet** in **Appendix A**.

2.2.7 As noted above, in order to install the piles and bank scour protection, additional temporary land is required for working areas as well as for construction access, including appropriate clearance to provide access to the piling works.

2.2.8 The land within the extended Order limits would be used for the provision of working platforms and access routes to and around the platforms for use by the plant and equipment required for the construction process. Given the nature of the required works, this could not be carried out within the existing Order limits. The extended limits will also support the movement of the equipment around the piles (once installed) to the rest of the works in the area in this challenging topography. The formation of the accesses and platforms will involve the localised grading of areas, as well as the cutting and filling of several benches within the existing slope.

2.2.9 Construction of the bank scour protection and temporary lower piling platform is likely to require works within the river. Mitigation for these temporary works will be considered as part of the sensitivity assessment and incorporated into the **Outline CEMP** [APP-346].

2.2.10 The proposed temporary use of land outside the current Order limits for the installation works would lead to the loss of woodland within the Coquet River Felton Park Local Wildlife Site (LWS). There may therefore be a requirement for additional compensatory habitat outside the Order limits. The maximum extent of the additional compensatory habitat would be approximately 3.4 ha in accordance with the approach detailed in Ancient Woodland Strategy Part A [APP-247]. Consultation is proposed with Northumberland County Council and Natural England to agree the approach that will be taken. A potential location for compensation land is shown on the **Potential Compensatory Habitat Location** figure in **Appendix A** and will require an extension of the Order limits in that location.

2.2.11 For the purposes of understanding how the proposed land stabilisation north of the River Coquet differs from those already contained in the Application, drawings of the proposed stabilisation works are provided in the **Permanent Works at the River Coquet** figure in **Appendix A**.

2.2.12 The benefits for this proposed change would be to:

a. Protect the River Coquet Site of Special Scientific Interest (SSSI) from damage in the future resulting from slope movements and deposition of large quantities of material into the watercourse.
b. Stabilise the northern slope such that the new bridge foundations are not adversely impacted by slope instability movement.
c. Stabilise the northern slope such that the existing bridge is not impacted by slope movement in the future.
d. Provide a position from which traditional foundations can be constructed for the northern pier and abutment.
e. Provide stabilisation of the slope such that the new bridge would not be destabilised.

2.2.13 A sensitivity assessment of the impact of including the land stabilisation works in the powers contained within the draft DCO [APP-014] is being undertaken to enable the consequences in terms of the environmental impacts already assessed to be understood. The aim of the assessment will be to consider whether the proposed land stabilisation works would alter the conclusions of the environmental impact assessment already undertaken. This will be concluded by and reported at

Deadline 4 (12 March 2021).

2.2.14 The scope of this sensitivity assessment and expected outcomes is shown in **Table 3** below, which represent preliminary indications subject to a fuller assessment.

Table 3 - Land stabilisation north of the River Coquet desktop sensitivity test

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Air Quality			
Dust and particulate matter from additional construction works	Construction	N	Y
Emissions from construction traffic	Construction	N	N
Emissions from operational traffic	Operation	N	N
Noise and Vibration			
Noise generated from construction activities	Construction	N	Y
Vibration generated from construction activities	Construction	N	Y
Noise from construction traffic	Construction	N	N
Noise from operational traffic	Operation	N	N
Landscape and Visual			
Changes to landscape character	Construction and operation	N	N
Changes to visual amenity	Operation and operation	N	Y
Cultural Heritage			

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Changes to the setting of heritage assets	Construction and operation	N	Y
Changes to below ground archaeology	Construction and operation	N	Y
Changes to historic landscapes	Construction and operation	N	Y
Biodiversity			
Impacts on Statutory and non-statutory sites	Construction and operation	N	Y
Changes to habitats	Construction and operation	N	Y
Impacts on protected and notable species	Construction and operation	N	Y
Changes to Biodiversity No Net Loss Assessment	Construction and operation	N/A	Y
Road Drainage and the Water Environment			
Changes to flood risk	Construction and operation	N	N
Changes to water quality	Construction	N	Y
Changes to groundwater flow patterns and levels	Construction and operation	N	Y
Changes to fluvial geomorphology	Construction and operation	N	Y
Geology and Soils			
Changes to land take	Construction and operation	N	Y

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Changes to land instability	Construction and operation	N	Y
Pollution of controlled waters	Construction	N	N
Population and Human Health			
Changes to temporary land use	Construction	N	N
Changes to permanent land take due to additional compensatory habitat	Operation	N	Y
Changes to recreational journey amenity	Construction and operation	N	N
Changes to direct, indirect and induced job generation	Construction	N	N
Changes to human health determinants	Construction and operation	N	N
Material Resources			
Consumption of materials	Construction	N	Y
Generation and disposal of waste to landfill	Construction	N	Y
Consumption of materials	Operation	N	N
Generation and disposal of waste to landfill	Operation	N	N
Climate			

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Effect of the Scheme on climate (Carbon / GHG) due to consumption of materials and transportation of materials	Construction	N	Y
Effect of the operation of the Scheme on climate (Carbon / GHG) due to end-user traffic and maintenance, repair and refurbishment.	Operation	N	N
Vulnerability of the Scheme to climate change	Construction and operation	N	N
Combined and Cumulative Assessment			
Assessment of Within Topic Combined Effects	Construction and Operation	N	N
Assessment of Cross Topic Combined Effects	Construction and Operation	N	N
Assessment of Cumulative Effects	Construction and Operation	N	N

2.2.15 A justification for the aspects of the assessments that would not require further assessment is provided below. The aspects of the assessments not discussed below have been scoped into the sensitivity assessment as shown in **Table 3**. However, where all aspects of the assessments have been scoped into the sensitivity assessment this is stated in the section below for completeness.

Air Quality

Construction Traffic

2.2.16 There would be extra construction vehicles due to the proposed land stabilisation works, but in the context of the Scheme these additional vehicle movements would be minimal. Therefore, there would not be a change in the assessment of significance for construction traffic emissions as presented in **Chapter 5: Air**

Quality Part A[APP-040].

Operational Traffic

2.2.17 The Scheme alignment and traffic data would remain the same with the land stabilisations works, meaning there would be no change to the operational air quality assessment presented in **Chapter 5: Air Quality** Part A [APP-040].

Noise and Vibration

Construction Traffic

2.2.18 There would be extra construction vehicles due to the proposed land stabilisation works, but in the context of the Scheme these additional vehicle movements would be minimal. Therefore, there would not be a change in the assessment of significance for construction traffic noise as presented in **Chapter 6: Noise and Vibration** Part A [APP-042].

Operational Traffic

2.2.19 The Scheme alignment and traffic data would remain the same with the land stabilisations works, meaning there would be no change to the operational noise and vibration assessment presented in **Chapter 6: Noise and Vibration** Part A [APP-042].

Landscape and Visual

Construction and Operation - Landscape Character

2.2.20 The land stabilisation works would not change the assessment of significance for landscape character as presented in the **Chapter 7: Landscape and Visual** Part A [APP-088]. The limited removal of woodland associated with the River Coquet valley would not be a substantially change to the perception of landscape character.

Cultural Heritage

2.2.21 No elements of the cultural heritage assessment have been scoped out of the sensitivity assessment. Additional work for both the construction and operational phases of the Scheme would be required as a result of the compensatory land described in **paragraph 2.2.102.2.10** of this document.

Biodiversity

2.2.22 No elements of the biodiversity assessment have been scoped out of the sensitivity assessment. There would not be a change in the assessment of significance as presented in **Chapter 9: Biodiversity** Part A [APP-048], with the inclusion of suitable mitigation and compensation. The mitigation and compensation will be progressed as part of the sensitivity assessment.

Road Drainage and the Water Environment

Construction and Operation - Flood Risk

2.2.23 As there are minimal changes to the Scheme design next to the watercourse, based on professional judgement, there would be no changes to the assessment of flood risk effects. The nearest flood risk receptors are Shothaugh Farm High Cottage and Otter House located approximately 800 m upstream of the River

Coquet bridge. The rip rap is not considered to increase the local flood risk to these receptors. Therefore, the flood risk assessment detailed in **Appendix 10.1: Flood Risk Assessment** Part A [APP-254] and **Chapter 10: Road Drainage and the Water Environment** Part A [APP-050] would remain the same. The measures set out in the **Outline CEMP** [APP-346] would also be applicable for the construction access, in particular the measures to reduce risk to construction workers during flood events.

Geology and Soils

Construction - Pollution of Controlled Waters

2.2.24 The mitigation set out in **Chapter 11: Geology and Soils** Part A [APP-052] and **Outline CEMP** [APP-346] for the management of potential contaminants would be applicable for the land stabilisation works to the north of River Coquet. With these measures in place, there would be no change to the outcomes of the assessment for the pollution of controlled waters.

Population and Human Health

Construction - Temporary Land Take

2.2.25 Due to the location of the additional temporary land take (i.e. located within Coquet River Felton Park LWS), the stabilisation works would not affect the viability of any agricultural businesses during construction. Therefore, the assessment of temporary land take on agricultural businesses would remain the same as presented in **Chapter 12: Population and Human Health** Part A [APP-054].

Construction and Operation - Recreational Journey Amenity

2.2.26 The proposed stabilisation works would not affect the assessment of recreational journey amenity presented in **Chapter 12: Population and Human Health** Part A [APP-054]. This is because there would already be disturbance at this location during the construction of the Scheme.

Construction - Direct, Indirect and Induced Job Generation

2.2.27 Based on professional judgement, there would be no change to the assessment of significance for economy and employment as presented in **Chapter 12: Population and Human Health** Part A [APP-054].

Construction and Operation - Human Health

2.2.28 As there would be no changes to the assessment of significance for air quality, noise and vibration as well as road drainage and the water environment, there would be no change to the assessment of significance for human health reported in **Chapter 12: Population and Human Health** Part A [APP-054].

Materials Resources

Operation

2.2.29 The operational consumption of materials and generation of waste would be minimal based on professional judgement and assessments of similar schemes. Therefore, the operational assessment for materials and waste would remain the same as reported in **Chapter 13: Material Resources** Part A [APP-056].

Climate

Operation - Greenhouse Gas Emissions

2.2.30 As there would be no change to the alignment of the Scheme and traffic data, there would be no change to the operational greenhouse gas assessment presented in **Chapter 14: Climate** Part A [APP-058].

Construction and Operation - Vulnerability of the Scheme to Climate Change

2.2.31 The mitigation set out in **Chapter 14: Climate** Part A [APP-058] and **Outline CEMP** [APP-346] for futureproofing the Scheme for climate change would be applicable for the land stabilisation works. With these measures in place, there would no change to the outcomes of the assessment.

Combined and Cumulative Assessment

Construction and Operation - Within Topic Combined Effects

2.2.32 As the further assessment work will assess the Scheme as whole (i.e. Part A and Part B together), a Within Topic combined effects assessment is not required.

Construction and Operation - Cross Topic Combined Effects

2.2.33 As there would be no change to the assessment of significance for all environmental topics due to the land stabilisations works, there would not be a change to the Cross Topic combined effects assessment presented in **Chapter 16: Assessment of Cumulative Effects** [APP-062].

Construction and Operation - Cumulative Effects

2.2.34 As there would be no change to the assessment of significance for all environmental topics due to the land stabilisations works, there would not be a change to the cumulative effect's assessment presented in **Chapter 16: Assessment of Cumulative Effects** [APP-062].

Changes to the Application

2.2.35 The changes to the application documents would be set out in a report and documents would be updated, if required, as detailed in **Table 4**.

Table 4 - Documents to be updated for land stabilisation north of the River Coquet

Document	Proposed Update
The draft DCO [APP-014]	Schedule 8 will require to be updated to include additional temporary land. There may also be a need for additional new rights for maintenance access in terms of Schedule 6.
Statement of Reasons [APP-018]	The Statement of reasons would need to be updated to include the additional plots to be acquired.
Case for the Scheme [APP-344]	The Case for the Scheme would need to be updated if the sensitivity assessment predicted that there would be a change on compliance with policy.
Appendix 9.24: Great Crested Newt Method	This may need to be updated to reflect changes in the Great Crested Newt method statement.

Document	Proposed Update
Statement River Coquet Part A [APP-250]	
Appendix 9.20 Biodiversity No Net Loss Assessment Part A	This may need to be updated to reflect changes in biodiversity no net loss.
Appendix 9.21: Ancient Woodland Strategy Part A [APP-247]	This would need to be updated to reflect changes in the ancient woodland strategy.
Figure 7.8: Landscape Mitigation Masterplan for Part A [APP-095]	This would need to be updated to reflect changes in the landscape design.
Book of Reference [OD-002]	The description of temporary and permanent land take would need to be updated.
National Policy Statement for National Networks Accordance Table [APP-345]	The accordance table would need to be updated if the sensitivity assessment predicted that there would be a change on compliance with policy.
Appendix 10.2: Water Framework Directive Part A [APP-255]	This would need to be updated to reflect changes in the Water Framework Directive assessment.
Habitat Regulations Assessment Report [APP-342]	This would need to be updated to reflect changes in the Habitat Regulation Assessment Report.
Outline CEMP [APP-346]	This would need to be updated if there was a change in required mitigation as a result of the sensitivity assessment.
Lands Plans [APP-006]	This would be updated to reflect changes in temporary and permanent land take.
Works Plan [APP-007]	This would be updated to reflect changes in temporary and permanent land take.
General Arrangement [APP-008]	This would be updated to reflect changes in temporary and permanent land take.
Traffic Regulation Plan [APP-010]	This would be updated to reflect changes in temporary access.
Consultation Report [APP-0221]	The Consultation Report will be updated to include consultation undertaken on the change to the proposals.

Consultation

2.2.36 As detailed in Advice Note 16, an applicant who intends to make a request for a material change to a DCO application is expected to consult all those prescribed in the Planning Act 2008 under section 42(a) to (d) who would be affected by the

proposed change (giving a minimum of 28 days. As the proposed change would include the acquisition of additional ground, it would be a material change. The Applicant proposes to consult relevant statutory bodies, including Environment Agency, Natural England and Northumberland County Council, as well as landowners on the proposals of land stabilisation to the north of River Coquet. Consultation with these relevant statutory bodies has started and is ongoing. As detailed in **paragraph 3.1.1**, consultation with all persons prescribed under Section 42 of the 2008 Act will be undertaken between 29 January 2021 – 25 February 2021.

2.2.37 The consultation will also be consistent with the procedures under The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

2.3 Construction access to the south bank from the north bank

2.3.1 The proposed works noted in **Section 2.2** of this document present an opportunity to provide a temporary access to the southern bank of the River Coquet by crossing the river from the temporary works on the northern bank instead of creating an access track down the southern river embankment as described in **Chapter 2 The Scheme** [APP-037]. The engineering solution for such a crossing is to use of a temporary bridge to span over the river. Temporary supports would be constructed on each side of the river then the main support beams would be assembled on the north bank and lifted into place, following which, the deck elements would be installed.

2.3.2 The works described in **Section 2.2** of this document include the construction of a temporary haul road which extends to the north riverbank. A temporary working area is already proposed on the south bank adjacent to the southern pier. It is proposed to include a temporary bridge to provide an access between these two working areas. A small area of additional temporary working area across the river will be required to provide this crossing, as shown in the **Temporary Works at the River Coquet** figure in **Appendix A**.

2.3.3 Whilst a detailed design of the solution is yet to be completed, in accordance with good engineering practicce it is expected that the solution would comprise a temporary 'open truss' type structure spanning the main river channel and seated on temporary supports each side of the river.

2.3.4 In addition, it is anticipated that there would be some temporary river training works along each riverbank, although it is intended that this should be optimised to comprise as much of the permanent scour protection works as is practicable, during the development of the detailed design of the Scheme. To the north bank the scour protection works are associated with the stabilisation requirements referred to in **paragraphs 2.2.1 to 2.2.11**. To the south, the Applicant is reviewing the need for scour protection on the southern bank in light of the latest ground investigation information and taking into account the presence of scour protection for the existing pier. Given prevailing ground conditions, such protection may be required in order to provide consistency with the existing structure which includes scour protection of the pier, and to assure the structural integrity of the new pier from the risk of channel movement over the design life. Erosion protection measures will also offer protection to the reinstated ground disturbed by the construction works close to the river edge. If required it is proposed to use rip-rap stone on the southern riverbank to act as erosion protection, although alternative options and potential refinements will be reviewed with relevant bodies through the design development. As a precaution, and in order to give fair notice of possible further changes, the maximum extent of the potential scour protection on the southern bank is shown on **Permanent Works at the River Coquet** figure in **Appendix A**.

2.3.5 The benefits for this proposed change would be to:

- **a.** Reduce impact on the southern bank SSSI by removing the need for vehicular access from the south.
- **b.** Reduce long-term impact to southern escarpment landscape
- **c.** Reduced spread of construction activity over the area, leaving some areas undisturbed and increasing coppicing only activity as opposed to full clearance

to preserve more of the SSSI. This undisturbed area equates to circa 500m^2. The additional area over the river is 360m^2, showing a net benefit of 140m^2.

2.3.6 A sensitivity assessment of the impact of including the changes to construction access to the south bank of the River Coquet in the powers contained within the draft DCO [APP-014] is being undertaken to enable the consequences in terms of the environmental impacts already assessed to be understood. The assessment will be to consider whether the proposed changes to the construction access for the south bank would alter the conclusions of the environmental impact assessment already undertaken. The construction access would only be altered if the stabilisation works described in **Section 2.2** of this document are taken forward. Therefore, the sensitivity assessment will only cover the effects of the construction access beyond that reported in **Section 2.2** of this document. This will be concluded by and reported at Deadline 4 (12 March 2021).

2.3.7 The scope of this sensitivity assessment and expected outcomes is shown in **Table 5** below, which represent preliminary indications subject to a fuller assessment.

Table 5 - Construction access to the south bank from the north bank of the River Coquet desktop sensitivity test

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Air Quality			
Dust and particulate matter from additional construction works	Construction	N	Y
Emissions from construction traffic	Construction	N	N
Emissions from operational traffic	Operation	N	N
Noise and Vibration			
Noise generated from construction activities	Construction	N	Y
Vibration generated from construction activities	Construction	N	Y
Noise from construction traffic	Construction	N	N

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Noise from operational traffic	Operation	N	N
Landscape and Visual			
Changes to landscape character	Construction and operation	N	N
Changes to visual amenity	Construction	N	Y
Changes to visual amenity	Operation	N	N
Cultural Heritage			
Changes to the setting of heritage assets	Construction and operation	N	N
Changes to below ground archaeology	Construction and operation	N	N
Changes to historic landscapes	Construction and operation	N	N
Biodiversity			
Impacts on Statutory and non-statutory sites	Construction	N	Y
Impacts on Statutory and non-statutory sites	Operation	N	N
Changes to habitats	Construction	N	Y
Changes to habitats	Operation	N	N
Impacts on protected and notable species	Construction	N	Y
Impacts on protected and notable species	Operation	N	N

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Changes to Biodiversity No Net Loss Assessment	Construction	N/A	Y
Changes to Biodiversity No Net Loss Assessment	Operation	N	N
Road Drainage and the Water Environment			
Changes to flood risk	Construction	N	N
Changes to flood risk	Operation	N	N
Changes to water quality	Construction	N	Y
Changes to water quality	Operation	N	N
Changes to groundwater flow patterns and levels	Construction	N	Y
Changes to groundwater flow patterns and levels	Operation	N	N
Changes to fluvial geomorphology	Construction	Y	Y
Changes to fluvial geomorphology	Operation	N	N
Geology and Soils			
Changes to land take	Construction	N	N
Changes to land take	Operation	N	N
Pollution of controlled waters	Construction	N	N

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Pollution of controlled waters	Operation	N	N
Population and Human Health			
Changes to temporary land use	Construction	N	N
Changes to permanent land take	Operation	N	N
Changes to recreational journey amenity	Construction	N	N
Changes to recreational journey amenity	Operation	N	N
Recreation along the River Coquet	Construction	N	Y
Recreation along the River Coquet	Operation	N	N
Changes to direct, indirect and induced job generation	Construction	N	N
Changes to direct, indirect and induced job generation	Operation	N	N
Changes to human health determinants	Construction	N	N
Changes to human health determinants	Operation	N	N
Material Resources			
Consumption of materials	Construction	N	Y

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Generation and disposal of waste to landfill	Construction	N	Y
Consumption of materials	Operation	N	N
Generation and disposal of waste to landfill	Operation	N	N
Climate			
Effect of the Scheme on climate (Carbon / GHG) due to consumption of materials and transportation of materials	Construction	N	Y
Effect of the operation of the Scheme on climate (Carbon / GHG) due to end-user traffic and maintenance, repair and refurbishment.	Operation	N	N
Vulnerability of the Scheme to climate change	Construction	N	N
Vulnerability of the Scheme to climate change	Operation	N	N
Combined and Cumulative Assessment			
Assessment of Within Topic Combined Effects	Construction and Operation	N	N
Assessment of Cross Topic Combined Effects	Construction	N	Y

Aspect of Assessment	Construction / Operation	Likely Change to Significant Effects Y/N	Further Assessment likely required to Confirm Significance Y/N
Assessment of Cross Topic Combined Effects	Operation	N	N
Assessment of Cumulative Effects	Construction	N	N
Assessment of Cumulative Effects	Operation	N	N

2.3.8 A justification for the aspects of the assessments that would not require further assessment is provided below. The aspects of the assessments not discussed below have been scoped into the sensitivity assessment as shown in **Table 5**. However, where all aspects of the assessments have been scoped into the sensitivity assessment this is stated in the section below for completeness.

Air Quality

Construction Traffic

2.3.9 There would be extra construction vehicles due to the changes to the construction access for the south bank of the River Coquet, but in the context of the Scheme these additional vehicle movements would be minimal. Therefore, there would not be a change in the assessment of significance for construction traffic emissions as presented in **Chapter 5: Air Quality** Part A [APP-040].

Operational Traffic

2.3.10 The Scheme alignment and traffic data would remain the same with the changes to the construction access, meaning there would be no change to the operational air quality assessment presented in **Chapter 5: Air Quality** Part A [APP-040].

Noise and Vibration

Construction Traffic

2.3.11 There would be extra construction vehicles due to changes to the construction access for the south bank of the River Coquet, but in the context of the Scheme these additional vehicle movements would be minimal. Therefore, there would not be a change in the assessment of significance for construction traffic noise as presented in **Chapter 6: Noise and Vibration** Part A [APP-042].

Operational Traffic

2.3.12 The Scheme alignment and traffic data would remain the same with the changes to the construction access, meaning there would be no change to the operational noise and vibration assessment presented in **Chapter 6: Noise and Vibration** Part A [APP-042].

Landscape and Visual

Construction and Operation - Landscape Character

2.3.13 The changes to the construction access for the south bank of the River Coquet would not change the assessment of significance for landscape character as presented in the **Chapter 7: Landscape and Visual** Part A [APP-088].

Cultural Heritage

Construction

2.3.14 Due to the topography and nature of the works, the proposed changes to the construction access would not affect the assessment of significance for cultural heritage as presented in **Chapter 8: Cultural Heritage** Part A [APP-046].

Operation

2.3.15 As the works are temporary, there would not be a change in the assessment of significance as presented in **Chapter 8: Cultural Heritage** Part A [APP-046] during operation.

Biodiversity

Construction

2.3.16 No elements of the biodiversity assessment have been scoped out of the sensitivity assessment. There would not be a change in the assessment of significance as presented in **Chapter 9: Biodiversity** Part A [APP-048], with the inclusion of suitable mitigation. The mitigation will be progressed as part of the sensitivity assessment.

Operation

2.3.17 As the works are temporary, there would not be a change in the assessment of significance as presented in **Chapter 9: Biodiversity** Part A [APP-048] during operation.

Road Drainage and the Water Environment

Construction and Operation – Flood Risk

2.3.18 During construction and operation, the proposals may increase flood levels locally but this would not change the assessment of flood risk presented in **Appendix 10.1: Flood Risk Assessment** Part A [APP-254] and **Chapter 10: Road Drainage and the Water Environment** Part A [APP-050] due to the distance between the proposals and closest receptors. The nearest flood risk receptors are Shothaugh Farm High Cottage and Otter House located approximately 800 m upstream of the River Coquet bridge. The measures set out in the **Outline CEMP** [APP-346] would also be applicable for the construction access, in particular the measures to reduce risk to construction workers during flood events.

Operation

2.3.19 As the works are temporary, there would not be a change in the assessment of significance as presented in **Chapter 10: Road Drainage and the Water Environment** Part A [APP-050] during operation.

Geology and Soils

Construction

2.3.20 The mitigation set out in **Chapter 11: Geology and Soils** Part A [APP-052] and **Outline CEMP** [APP-346] for the management of potential contaminants would be applicable for the construction access across for the south bank of the River Coquet. With these measures in place, there would be no change to the outcomes of the assessment for the pollution of controlled waters.

Operation

2.3.21 As the works are temporary, there would not be a change in the assessment of significance as presented in **Chapter 11: Geology and Soils** Part A [APP-052] during operation.

Population and Human Health

Construction - Temporary Land Take

2.3.22 The construction access would require temporary rights over the River Coquet but would not require additional temporary or permanent land take. Therefore, the assessment of land take presented in **Chapter 12: Population and Human Health** Part A [APP-054] would remain the same.

Construction - Recreational Journey Amenity

2.3.23 The proposed changes to the construction access would not affect the assessment of recreational journey amenity presented in **Chapter 12: Population and Human Health** Part A [APP-054]. This is because there would already be disturbance at this location during the construction of the Scheme.

Construction - Direct, Indirect and Induced Job Generation

2.3.24 Based on professional judgement, there would be no change to the assessment of significance for economy and employment as presented in **Chapter 12: Population and Human Health** Part A [APP-054].

Construction – Human Health

2.3.25 As there would be no changes to the assessment of significance for air quality, noise and vibration as well as road drainage and the water environment, there would be no change to the assessment of significance for human health reported in **Chapter 12: Population and Human Health** Part A [APP-054].

Operation

2.3.26 As the works are temporary, there would not be a change in the assessment of significance as presented in **Chapter 12: Population and Human Health** Part A [APP-054] during operation.

Materials Resources

Operation

2.3.27 The operational consumption of materials and generation of waste would be minimal based on professional judgement and assessments of similar schemes. Therefore, the operational assessment for materials and waste would remain the same as reported in **Chapter 13: Material Resources** Part A [APP-056].

Climate

Operation - Greenhouse Gas Emissions

2.3.28 As there would be no change to the alignment of the Scheme and traffic data, there would be no change to the operational greenhouse gas assessment presented in **Chapter 14: Climate** Part A [APP-058].

Construction - Vulnerability of the Scheme to Climate Change

2.3.29 The mitigation set out in **Chapter 14: Climate** Part A [APP-058] and **Outline CEMP** [APP-346] for futureproofing the Scheme for climate change would be applicable for the construction access. With these measures in place, there would no change to the outcomes of the assessment.

Operation- Vulnerability of the Scheme to Climate Change

2.3.30 As the works are temporary, there would not be a change in the assessment of significance as presented in **Chapter 14: Climate** Part A [APP-058] during operation.

Combined and Cumulative Assessment

Construction and Operation - Within Topic Combined Effects

2.3.31 As the further assessment work will assess the Scheme as whole (i.e. Part A and Part B together), a Within Topic combined effects assessment is not required.

Construction and Operation - Cumulative Effects

2.3.32 There could potentially be a significant effect on fluvial geomorphology due to the changes in the construction access for the south bank of the River Coquet. However, due to the location of the cumulative schemes identified in **Chapter 16: Assessment of Cumulative Effect**s [APP-062], there would be no significant interaction between the Scheme and the cumulative schemes for the River Coquet.

Changes to the Application

2.3.33 The changes to the application documents would be set out in a report and documents would be updated, if required, as detailed in **Table 6**.

Table 6 - Documents to be updated for changes to construction access to the south bank from the north bank of the River Coquet

Document	Proposed Update
The draft DCO [APP-014]	Schedule 8 will require to be updated to include additional rights.
Statement of Reasons [APP-018]	The Statement of reasons would need to be updated to include the additional rights that would be required.
Case for the Scheme [APP-344]	The Case for the Scheme would need to be updated if the sensitivity assessment predicted that there would be a change on compliance with policy.

Document	Proposed Update
Appendix 9.21: Ancient Woodland Strategy Part A [APP-247]	This would need to be updated to reflect changes in the ancient woodland strategy.
Figure 7.8: Landscape Mitigation Masterplan for Part A [APP-095]	This would need to be updated to reflect changes in the landscape design.
Book of Reference [OD-002]	The description of the temporary rights would need to be updated.
National Policy Statement for National Networks Accordance Table [APP-345]	The accordance table would need to be updated if the sensitivity assessment predicted that there would be a change on compliance with policy.
Appendix 10.2: Water Framework Directive Part A [APP-255]	This would need to be updated to reflect changes in the Water Framework Directive assessment.
Habitat Regulations Assessment Report [APP-342]	This would need to be updated to reflect changes in the Habitat Regulation Assessment Report.
Appendix 9.20 Biodiversity No Net Loss Assessment Part A	This may need to be updated to reflect changes in biodiversity no net loss.
Outline CEMP [APP-346]	This would need to be updated if there was a change in required mitigation as a result of the sensitivity assessment.
Lands Plans [APP-006]	This would be updated to reflect changes in temporary rights.
Works Plan [APP-007]	This would be updated to reflect changes in temporary rights.
General Arrangement [APP-008]	This would be updated to reflect changes in temporary rights.
Traffic Regulation Plan [APP-010]	This would be updated to reflect changes in temporary access.
Consultation Report [APP-0221]	The Consultation Report will be updated to include consultation undertaken on the change to the proposals.

Consultation

2.3.34 As detailed in Advice Note 16, an applicant who intends to make a request for a material change to a DCO application is expected to consult all those prescribed in the Planning Act 2008 under section 42(a) to (d) who would be affected by the proposed change (giving a minimum of 28 days. As the proposed change would include the acquisition of additional ground, it would be a material change. As detailed in **paragraph 3.1.1**, consultation with all persons prescribed under Section 42 of the 2008 Act will be undertaken between 29 January 2021 – 25 February 2021.

2.3.35 The consultation will also be consistent with the procedures under The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.

3 CONCLUSION AND PROPOSED NEXT STEPS

3.1.1 Taking into account the guidance in PINS Advice Note 16, it is proposed that:

a. The Applicant submits its proposal to make changes to the Application in document **TR010059** – (10 December 2020)

b. The Examining Authority should consider this procedural proposal and issue advice about the procedural implications of the proposed changes at or following the first preliminary meeting – (15 December 2020)

c. Sensitivity assessments of the is undertaken and consultation documentation is prepared:
- Changes to temporary and permanent earthworks;
- Land stabilisation north of the River Coquet; and
- Changes to construction access to the south bank of River Coquet from the north bank.

d. Consultation on proposed changes and updated environmental information – 29 January 2021 – 25 February 2021.

e. Submission of formal change request, together with full supporting documents at Deadline 4 – (12 March 2021)

f. Subsequent procedure will depend on whether the Infrastructure Planning (Compulsory Acquisition) Regulations 2010 are engaged. If the 2010 Regulations are engaged then the indicative timetable set out in **Table 7** is proposed.

Table 7 – Indicative Timetable

Procedure	Deadline
Deadline for decision on acceptance of change request	9 April 2021
Notice to affected persons	12 April 2021
First newspaper notice	15 April 2021
Second newspaper notice	22 April 2021
Deadline for representations	20 May 2021
Submission of Hydraulic modelling & geomorphological information to ExA	25 May 2021 Deadline 8
Issue of updated examination timetable and preliminary consideration of issues by ExA	3 June 2021
Issue of written questions by ExA	3 June 2021
Notification of hearing date by ExA (if required)	3 June 2021
Deadline for written representations and responses to written questions	10 June 2021
Date for response to written representations and comments	17 June 2021

Procedure	Deadline
on responses to written questions	
Hearing date (if required)	24 June 2021
Deadline for post hearing submissions	2 July 2021 (existing deadline 11)

Appendix A: Figures

Indicative Earthwork Change Locations

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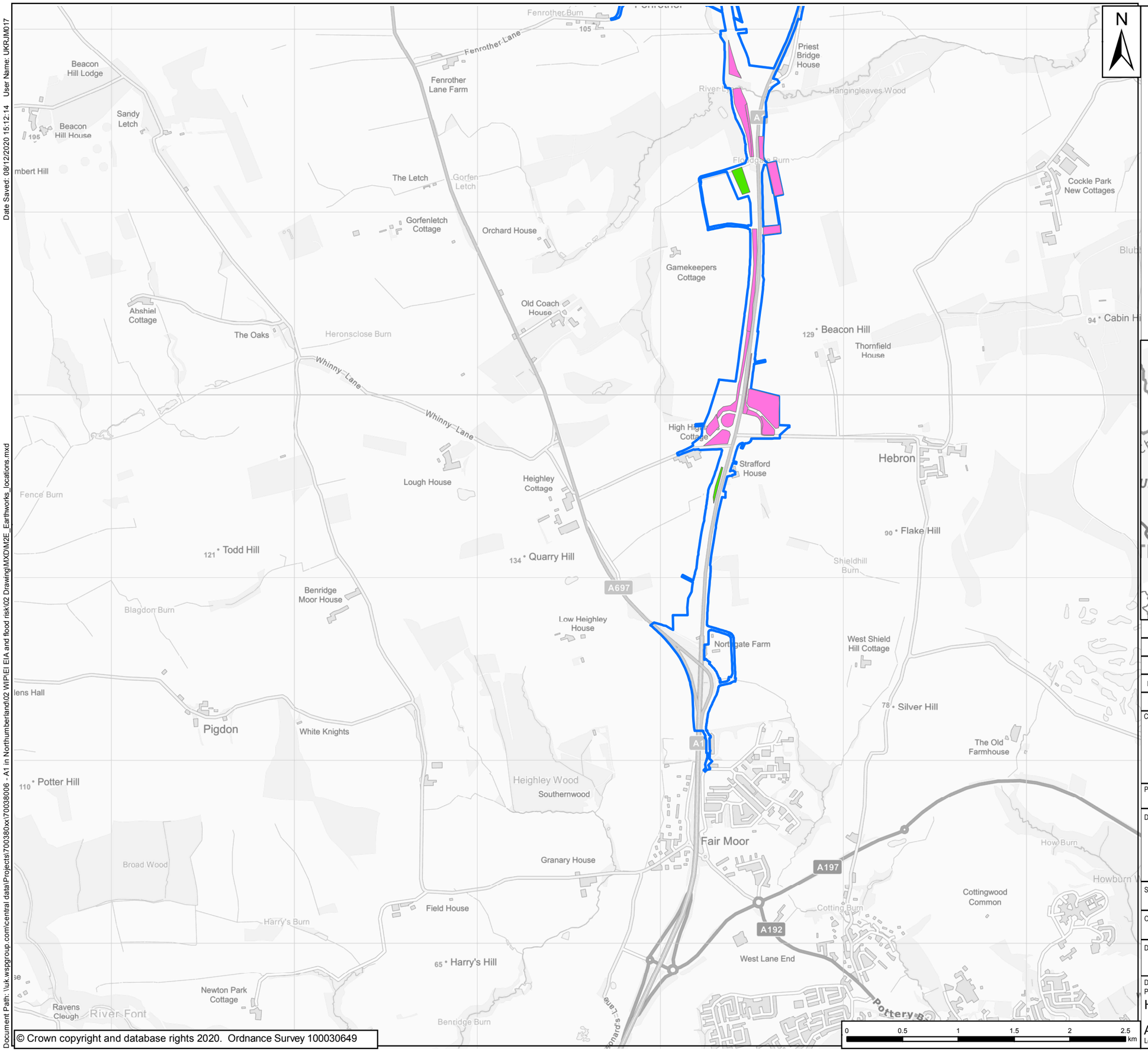

Rev	Date	Description	By	Chk'd	App'd
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Client: highways england

Project Title: A1 in Northumberland: Morpeth to Ellingham

Drawing Title: Indicative Earthwork Change Locations Page 1 of 5

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Drawing Status: For Information

Suitability: S1

Drawing Number Project	Originator	Volume	Project Ref. No.
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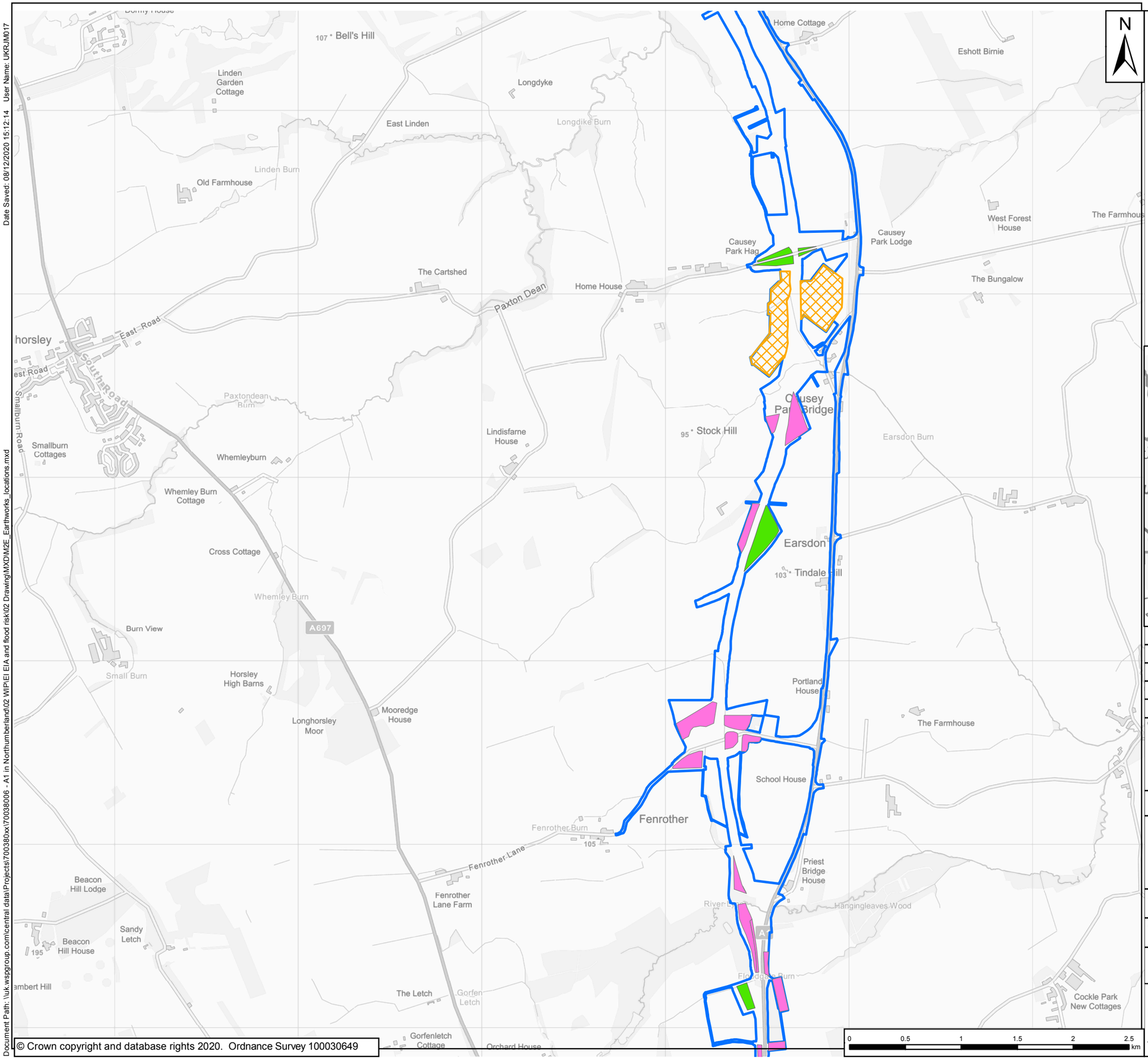
A2E Location	**RP Type**	**LE Role**	**2130 Number**

Revision: P01



P01	09/09/2020	First Issue	GH	LM	KS
Rev	Date	Description	By	Chk'd	App'd

Client: highways england

Project Title: A1 in Northumberland: Morpeth to Ellingham

Drawing Title: Indicative Earthwork Change Locations Page 2 of 5

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Drawing Status: For Information

Suitability: S1

Drawing Number: Project HE551459 | Originator WSP | Volume

Project Ref. No.: 70044137

A2E Location | RP Type | LE Role | 2130 Number

Revision: P01

Date Saved: 08/12/2020 15:12:14 User Name: UKRJM017

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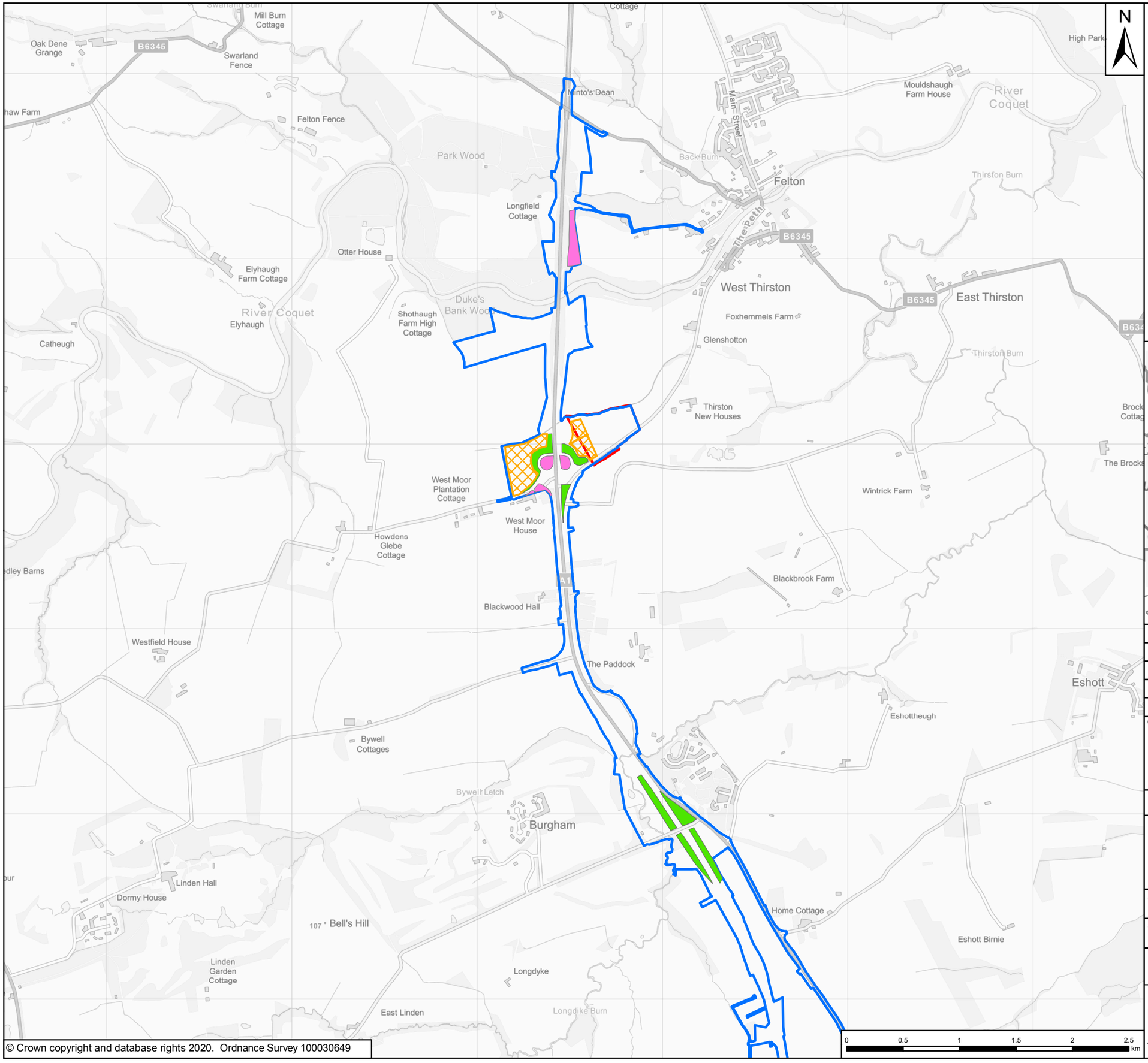

Key

- A2E Order Limits
- M2F Order Limits

Permanent Earthworks

- Changes to gradient and height of proposed earthworks
- Changes to gradient and height of proposed earthworks of Parameter 4 or 5 in Part A

Temporary Earthworks

- Borrow Pit
- Temporary Storage

Rev	Date	Description	By	Chk'd	App'd
P01	09/09/2020	First Issue	GH	LM	KS

Client: highways england

Project Title: A1 in Northumberland: Morpeth to Ellingham

Drawing Title: Indicative Earthwork Change Locations Page 3 of 5

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Drawing Status: For Information

Suitability: S1

Drawing Number: Project HE551459 | Originator WSP | Volume

A2E Location | RP Type | LE Role | 2130 Number

Project Ref. No.: 70044137

Revision: P01

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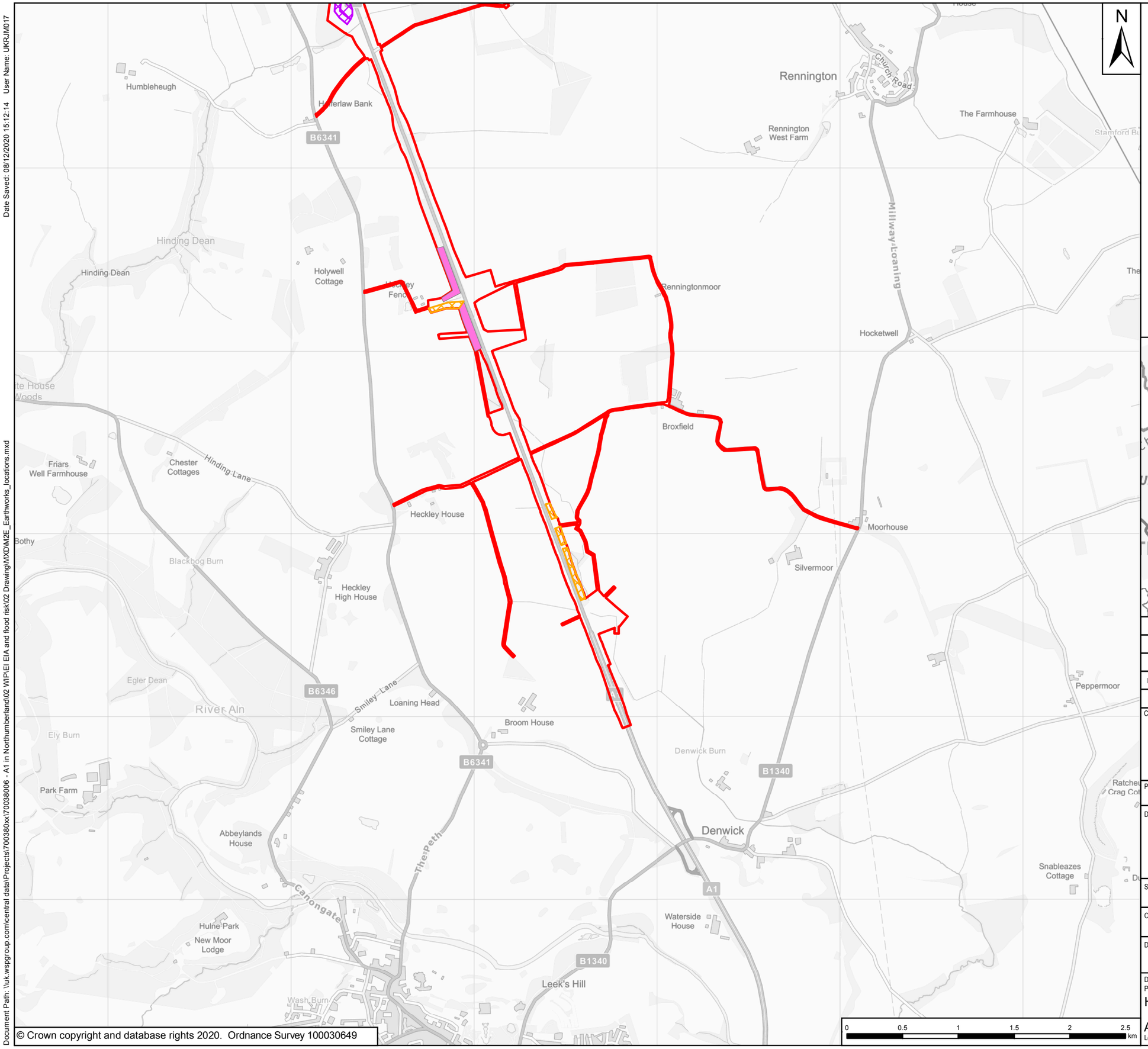

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Client: highways england

Project Title: A1 in Northumberland: Morpeth to Ellingham

Drawing Title: Indicative Earthwork Change Locations Page 4 of 5

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Drawing Status: For Information

Suitability: S1

Drawing Number: Project HE551459 | Originator WSP | Volume

A2E Location | RP Type | LE Role | 2130 Number

Project Ref. No.: 70044137

Revision: P01

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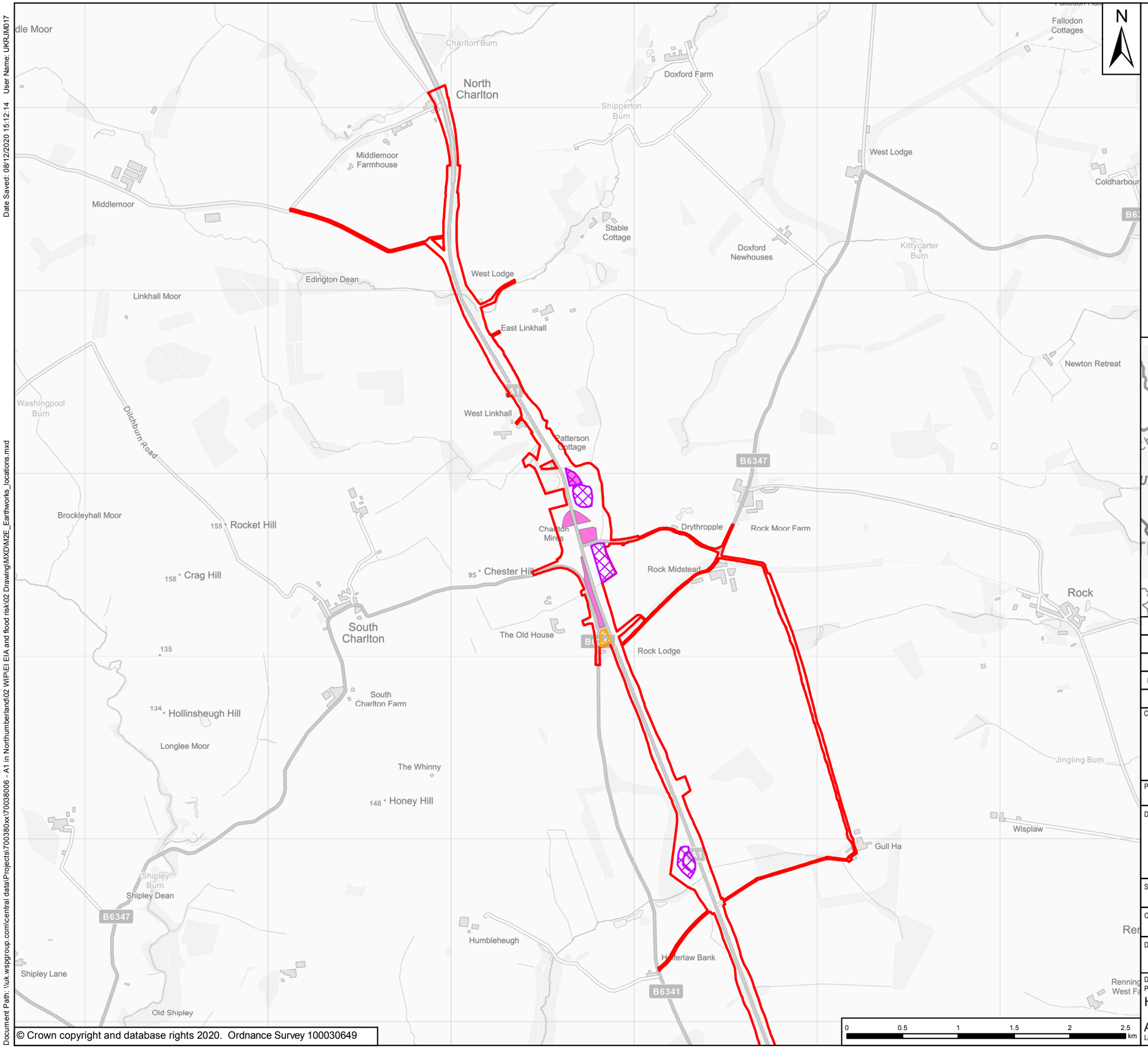

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Client: highways england

Project Title: A1 in Northumberland: Morpeth to Ellingham

Drawing Title: Indicative Earthwork Change Locations Page 5 of 5

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Drawing Status: For Information

Suitability: S1

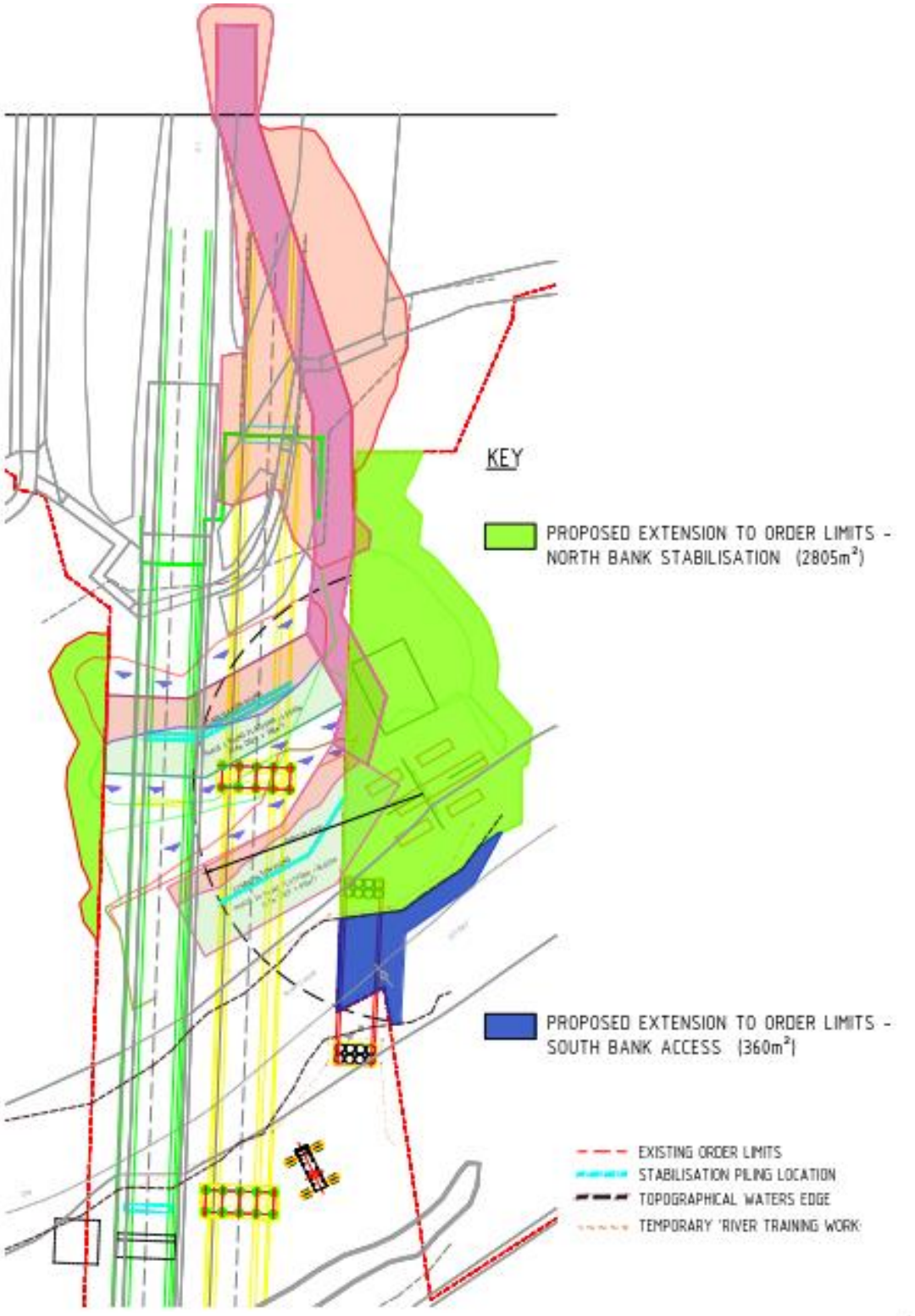
Drawing Number: Project HE551459 | Originator WSP | Volume

A2E Location | RP Type | LE Role | 2130 Number

Project Ref. No.: 70044137

Revision: P01

Temporary Works at the River Coquet



Permanent Works at the River Coquet

KEY:

- 3m wide strip of land required for erosion control
- Proposed extension to Order limits - North bank stabilisation
- Existing Order limits
- Stabilisation piling location

RIVER COQUET

A1 NORTHBOUND
(EXISTING BRIDGE)

A1 SOUTHBOUND
(PROPOSED BRIDGE)

RIVER COQUET

Potential Compensatory Habitat Location

Order limits

Proposed extension to Order limits - compensatory habitat

Appendix C

VISUAL EFFECTS SCHEDULE

Table C-1 - Viewpoints Visual Effects Schedule – please refer to Appendix 7.2: Viewpoints Visual Effects Schedule Part A of the ES [APP-217] and ES Addendum – Stabilisation Works

Viewpoint Reference/ Sensitivity	Description of impact (in addition to those in Appendix 7.2 Viewpoints Visual Effects Schedule Part A of the ES [APP-217]) ES Addendum – Stabilisation Works		Environmental Statement Effects			Additional temporary land south of the River Coquet (ES Addendum –Stabilisation Works combined with the Southern Access Works described in Chapter 2: Southern Access Works of this Addendum)		
			Construction	**Operation Year 1**	**Operation Year 15**	**Construction**	**Operation Year 1**	**Operation Year 15**
Viewpoint 18: View looking north-west from PRoW (422/020)	Construction: – The awareness of the construction and use of the temporary construction bridge and the erection and use of the crane platform. – The presence of construction activity and associated plant, representing a perceptibly larger working footprint (additional 360m^2) within the previously assessed construction activity associated with the bridge supports and deck. Operation – Although greater appreciation of the river corridor would be experienced, there would be awareness at distance of scour protection on the south bank.	Magnitude of Impact	Minor	Minor	No Change	Minor	Minor	Minor
High		Significance of effect	**Moderate Adverse**	Slight Adverse	Neutral	**Moderate Adverse**	Slight Adverse	Slight Adverse
Viewpoint 19: View looking north from PRoW (422/020)	Construction: – The awareness of the construction and use of the temporary construction bridge and the erection and use of the crane platform within the context of the existing bridge structure. – The presence of construction activity and associated plant, representing a perceptibly larger working footprint (additional 360 m^2) within the previously assessed construction activity associated with the bridge supports and deck. Operation – Although greater appreciation of the river corridor would be experienced,	Magnitude of Impact	Moderate	Minor	Minor	Moderate	Minor	Minor
High		Significance of effect	**Moderate Adverse**	Slight Adverse	Slight Adverse	**Moderate Adverse**	Slight Adverse	Slight Adverse

Viewpoint Reference/ Sensitivity	Description of impact (in addition to those in Appendix 7.2 Viewpoints Visual Effects Schedule Part A of the ES [APP-217]) ES Addendum – Stabilisation Works		Environmental Statement Effects			Additional temporary land south of the River Coquet (ES Addendum –Stabilisation Works combined with the Southern Access Works described in Chapter 2: Southern Access Works of this Addendum)		
			Construction	**Operation Year 1**	**Operation Year 15**	**Construction**	**Operation Year 1**	**Operation Year 15**
	there would be awareness at distance of scour protection on the south bank.							
Viewpoint 20: View south from 422/020 & 422/002	Construction: – The awareness of the construction and use of the temporary construction bridge and the erection and use of the crane platform would arise within the diversion of the footpath. – The presence of construction activity and associated plant, representing a perceptibly larger working footprint (additional 360 m^2) within the previously assessed construction activity associated with the bridge supports and deck. Operation – Although greater appreciation of the river corridor would be experienced, there would be awareness at a distance of scour protection on the south bank.	Magnitude of Impact	Moderate	Minor	Minor	Moderate	Minor	Minor
High		Significance of effect	**Moderate Adverse**	Slight Adverse	Slight Adverse	**Moderate Adverse**	Slight Adverse	Slight Adverse
Viewpoint 21: View looking south-west from St Oswalds Way	Construction: – The awareness of the construction and use of the temporary construction bridge and the erection and use of the crane platform would not be readily perceived within the context of the woodland in the foreground. – The presence of construction activity and associated plant, representing a perceptibly larger working footprint (additional 360 m^2) within the previously assessed construction activity associated with the bridge supports and deck, however these would be partially obscured by the	Magnitude of Impact	Minor	Minor	No Change	Minor	Minor	No Change
High		Significance of effect	Slight Adverse	Slight Adverse	Neutral	Slight Adverse	Slight Adverse	Neutral

Viewpoint Reference/ Sensitivity	Description of impact (in addition to those in Appendix 7.2 Viewpoints Visual Effects Schedule Part A of the ES [APP-217]) ES Addendum – Stabilisation Works		Environmental Statement Effects			Additional temporary land south of the River Coquet (ES Addendum –Stabilisation Works combined with the Southern Access Works described in Chapter 2: Southern Access Works of this Addendum)		
			Construction	**Operation Year 1**	**Operation Year 15**	**Construction**	**Operation Year 1**	**Operation Year 15**
	retained woodland vegetation in the foreground. Operation – The presence of scour protection on the south bank would be barely perceptible due to intervening vegetation.							
Viewpoint 24: View looking south east from PRoW (115/009)	Construction – The awareness of the construction and use of the temporary construction bridge and the erection and use of the crane platform. – The presence of construction activity and associated plant, representing a perceptibly larger working footprint (additional 360 m^2) within the previously assessed construction activity associated with the bridge supports and deck. Operation – Although partially obscured by the landform and lower slopes – there would likely remain awareness of the scour protection on the south bank.	Magnitude of Impact	Major	Minor	No Change	Major	Moderate	Minor
High		Significance of effect	**Large Adverse**	**Moderate Adverse**	Neutral	**Large Adverse**	**Large Adverse**	Slight Adverse

Table C-2 - Residential Visual Effects Schedule – please refer to Appendix 7.3: Residential Visual Effects Schedule - Part A of the ES [APP-218] and ES Addendum –Stabilisation Works

Viewpoint Reference/ Sensitivity	Description of impact (in addition to those in Appendix 7.3 Residential Visual Effects Schedule - Part A of the ES [APP-218]) and ES Addendum – Stabilisation Works		Environmental Statement Effects			Additional temporary land south of the River Coquet (ES Addendum –Stabilisation Works combined with Southern Access Works detailed in Chapter 2: Southern Access Works of this Addendum)		
			Construction	Operation Year 1	Operation Year 15	Construction	Operation Year 1	Operation Year 15
Receptor 27 (Helmspeth)	Construction: – A marginal increase in the area impacted and of activity associated with the construction of the River Coquet bridge, beyond the existing woodland in the foreground, this would provide an effective screen to the majority of construction activity. Operation – The presence of scour protection on the south bank would be barely perceptible due to intervening vegetation.	Magnitude of Impact	Minor	Negligible	Negligible	Minor	Negligible	Negligible
High		Significance of effect	Slight Adverse	Slight Adverse	Slight Adverse	Slight Adverse	Slight Adverse	Slight Adverse

Table C-3 - Public Rights of Way Visual Effects Schedule – please refer to Appendix 7.4: Public Rights of Way Visual Effects Schedule Part A of the ES [APP-219] and ES Addendum –Stabilisation Works

Viewpoint Reference/ Sensitivity	Description of impact (in addition to those in Appendix 7.4 Public Rights of Way Visual Effects Schedule Part A of the ES [APP-219]) and ES Addendum – Stabilisation Works		Environmental Statement Effects			Additional temporary land south of the River Coquet (ES Addendum –Stabilisation Works combined with Southern Access Works detailed in Chapter 2: Southern Access Works of this Addendum)		
			Construction	Operation Year 1	Operation Year 15	Construction	Operation Year 1	Operation Year 15
PRoW 422/020	Construction: – The awareness of the construction and use of the temporary construction bridge and the erection and use of the crane platform. – The presence of construction activity and associated plant, representing a perceptibly larger working footprint (additional 360 m^2) within the	Magnitude of Impact	Minor	Minor	No Change	Minor	Minor	Minor
High		Significance of effect	**Moderate Adverse**	Slight Adverse	Neutral	**Moderate Adverse**	Slight Adverse	Slight Adverse

Viewpoint Reference/ Sensitivity	Description of impact (in addition to those in Appendix 7.4 Public Rights of Way Visual Effects Schedule Part A of the ES [APP-219]) and ES Addendum – Stabilisation Works		Environmental Statement Effects			Additional temporary land south of the River Coquet (ES Addendum –Stabilisation Works combined with Southern Access Works detailed in Chapter 2: Southern Access Works of this Addendum)		
			Construction	**Operation Year 1**	**Operation Year 15**	**Construction**	**Operation Year 1**	**Operation Year 15**
	previously assessed construction activity associated with the bridge supports and deck. Operation – Although greater appreciation of the river corridor would be experienced, there would be awareness at distance of scour protection on the south bank.							
PRoW 422/020	Construction: – The awareness of the construction and use of the temporary construction bridge and the erection and use of the crane platform. – The presence of construction activity and associated plant, representing a perceptibly larger working footprint (additional 360 m^2) within the previously assessed construction activity associated with the bridge supports and deck. Operation – Although greater appreciation of the river corridor would be experienced, there would be awareness at distance of scour protection on the south bank.	Magnitude of Impact	Moderate	Minor	Minor	Moderate	Minor	Minor
High		Significance of effect	**Moderate Adverse**	Slight Beneficial	Slight Beneficial	**Moderate Adverse**	Slight Adverse	Slight Adverse
St Oswalds Way	Construction: – The awareness of the construction and use of the temporary construction bridge and the erection and use of the crane platform. – The presence of construction activity and associated plant, representing a perceptibly larger working footprint (additional 360 m^2) within the previously assessed construction	Magnitude of Impact	Major	Minor	No Change	Major	Moderate	Minor
High		Significance of effect	**Large Adverse**	**Moderate Adverse**	Neutral	**Large Adverse**	**Large Adverse**	Slight Adverse

Viewpoint Reference/ Sensitivity	Description of impact (in addition to those in Appendix 7.4 Public Rights of Way Visual Effects Schedule Part A of the ES [APP-219]) and ES Addendum – Stabilisation Works		Environmental Statement Effects			Additional temporary land south of the River Coquet (ES Addendum –Stabilisation Works combined with Southern Access Works detailed in Chapter 2: Southern Access Works of this Addendum)		
			Construction	Operation Year 1	Operation Year 15	Construction	Operation Year 1	Operation Year 15
	activity associated with the bridge supports and deck. Operation – Although greater appreciation of the river corridor would be experienced, there would be awareness at distance of scour protection on the south bank.							

Appendix D

REGISTER OF ENVIRONMENTAL ACTIONS AND COMMITMENTS

The mitigation measures detailed in **Outline CEMP** [**REP3-013 and 014**] still apply for the Southern Access Works. **Table D-1** details those measures that are additional or require amendment to those shown in the **Outline CEMP** [**REP3-013 and 014**] for the Southern Access Works**.** If the Southern Access Works are accepted by the Planning Inspectorate and Secretary of State for Transport, then the measures in **Table D-1** will be incorporated into the Outline CEMP [**REP3-013 and 014**].

Table D-1 - Additional Mitigation Measures for the Register of Environmental Actions and Commitments

Ref	Action (Including Monitoring Requirements)	Objective	Source Reference	Organisation / Individual Delivering Measure	Achievement Criteria and Reporting Requirements (Reported on the Requirements Register published on the Applicant's Scheme website)	Project Phase (Design, Pre-Construction, Construction, Operation)	Record of Completion (Signature and Date)
General							
SAW-G1	Following completion of construction of the scour protection, the main contractor will be responsible for defects over a set period (generally 12 months). After this period the scour protection will be adopted by the Applicant and fall within their routine schedule of maintenance and inspections. Towards the end of the construction period the CEMP will be developed as a Handover Environmental Management Plan (HEMP) which will include the monitoring and management arrangements of the scour protection going forward during future maintenance and operation. The indicative contents of a HEMP are detailed in Annex C of IAN 183/14.	To ensure the continued maintenance of the Scheme once operational.	**Paragraph 2.6.2** of this ES Addendum	The main contractor, or the Applicant, or Northumberland County Council	CEMP approved by the Secretary of State following consultation with NCC as per Requirement 5, Schedule 2 of the **draft DCO** [**REP3-004 and 005**] HEMP	Construction Operation	
Biodiversity							
SAW-B1	The temporary river training measures and scour protection would be constructed using suitable materials to avoid changes in water chemistry, such as the use of washed stone or inert materials.	To manage risk to ecology associated with the design of changes to/new structures within watercourses.	**Paragraph 7.9.2** of this ES Addendum	Designer Main contractor	CEMP approved by the Secretary of State following consultation with NCC as per Requirement 4, Schedule 2 of the **draft DCO** [**REP3-004 and 005**] As built drawings	Design	
SAW-B2	The permanent scour protection will be designed to be in keeping with existing natural rocky areas of the River Coquet. Whilst the scour protection will result in the permanent loss of natural riverbank habitat, the design of the scour protection will provide suitable sheltering habitat	To manage risk to ecology associated with the design of changes to/new	**Paragraph 7.9.9** of this ES Addendum	Designer Main contractor	As built drawings	Design	

Ref	Action (Including Monitoring Requirements)	Objective	Source Reference	Organisation / Individual Delivering Measure	Achievement Criteria and Reporting Requirements (Reported on the Requirements Register published on the Applicant's Scheme website)	Project Phase (Design, Pre-Construction, Construction, Operation)	Record of Completion (Signature and Date)
	for aquatic invertebrates and juvenile fish as it will become naturally vegetated over time.	structures within watercourses.					
SAW-B3	The design/configuration of the scour protection has been considered to reduce the level of impact to the SSSI. The design of the scour protection will provide suitable sheltering habitat for aquatic invertebrates and fish (qualifying features of the SSSI) and shall naturally become vegetated over time. In addition, the scour protection will be designed to avoid permanent impacts to the watercourse (SSSI) as a result of changes in water chemistry.	To manage risk to ecology associated with the design of changes to/new structures within watercourses.	**Paragraph 7.9.11** of this ES Addendum	Designer Main contractor	As built drawings	Design	
SAW-B4	The temporary river training measures and scour protection will be constructed using suitable materials to avoid changes in water chemistry, such as the use of washed stone or inert materials.	To manage risk to ecology associated with the design of changes to/new structures within watercourses.	**Paragraph 7.9.2** of this ES Addendum	Designer Main contractor	CEMP approved by the Secretary of State following consultation with NCC as per Requirement 4, Schedule 2 of the **draft DCO** [**REP3-004 and 005**] As built drawings	Design Construction	
SAW-B5	An assessment of the biological water quality and water chemistry will be undertaken prior to and during construction to monitor the river during the Stabilisation Works. The main contractor will monitor and take appropriate action if water quality deteriorates, following agreement with Natural England and the Environment Agency where required (for example where a permit or licence is in place with conditions/restrictions). The monitoring will assess pH, suspended solids, Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD). The methodology of the monitoring will be determined at detailed design and captured within a monitoring and management strategy for the Southern Access Works.	To reduce or prevent the impact of the Southern Access Works	**Paragraph 7.9.6** of this ES Addendum	ECoW	Water Quality Monitoring and Management Strategy	Construction	
SAW-B6	Following the removal of the temporary river training measures, the riverbed will be restored to a comparable pre-works condition.	To manage risk to ecology associated with the design of	**Paragraph 7.9.8** of this	Designer Main contractor	CEMP approved by the Secretary of State following consultation with	Construction	

Ref	Action (Including Monitoring Requirements)	Objective	Source Reference	Organisation / Individual Delivering Measure	Achievement Criteria and Reporting Requirements (Reported on the Requirements Register published on the Applicant's Scheme website)	Project Phase (Design, Pre-Construction, Construction, Operation)	Record of Completion (Signature and Date)
		changes to/new structures within watercourses.	ES Addendum		NCC as per Requirement 4, Schedule 2 of the **draft DCO** [**REP3-004 and 005**] As built drawings		
SAW-B7	The following measures specific to the Southern Access Works and installation the temporary bridge will be implemented to mitigate for site runoff and potential pollution events: **a.** All plant and vehicles using the temporary bridge are to be well maintained and serviced. Use of biodegradable oils for all plant and equipment working in the vicinity of the River Coquet. **b.** A haul road on the approach to the temporary bridge will be maintained as clean stone and/or blinded (where a thin layer of concrete is added over the stone to protect it) to minimise debris collecting on the vehicle prior to entry onto the bridge. **c.** A surface water drainage system will be developed by the main contractor for the temporary bridge structure. This will ensure that runoff or spillages on the bridge do not enter the River Coquet and transfer any collected runoff to appropriate treatment measures. The system may include the implementation of a containment screen on the underside of the temporary bridge to prevent any falling debris or sediment from entering the River Coquet.	To minimise the impact of the construction of the Southern Access Works	**Paragraph 7.9.4** of this ES Addendum	Designer Main contractor	CEMP approved by the Secretary of State following consultation with NCC as per Requirement 4, Schedule 2 of the **draft DCO** [**REP3-004 and 005**] As built drawings	Construction	
SAW-B8	A management and monitoring strategy for the proposed scour protection for the River Coquet will be developed at detailed design in consultation with Natural England and the Environment Agency. The strategy will include, but not be limited to, inspections of the scour protection at an appropriate frequency throughout its lifespan to monitor the structural condition and conduct repairs / replacement where necessary. Any repair or replacement works will be subject to the same construction mitigation detailed within	To monitor the impact of the Scheme on biological water quality during operation.	**Paragraph 7.9.10** of this ES Addendum	The Applicant	HEMP	Operation	

Ref	Action (Including Monitoring Requirements)	Objective	Source Reference	Organisation / Individual Delivering Measure	Achievement Criteria and Reporting Requirements (Reported on the Requirements Register published on the Applicant's Scheme website)	Project Phase (Design, Pre-Construction, Construction, Operation)	Record of Completion (Signature and Date)
	Section 9.9, Chapter 9: Biodiversity Part A of the ES [**APP-048**] and this ES Addendum.						
SAW-B9	An assessment of the biological water quality and water chemistry will be undertaken post-construction to monitor water conditions within the River Coquet. The results of the monitoring will be compared against baseline data collected prior to and during construction. If required, remedial actions will be implemented following consultation and agreement with Natural England and the Environment Agency.	To monitor the impact of the Scheme on biological water quality during operation.	**Paragraph 7.9.12** of this ES Addendum	The Applicant	HEMP	Operation	
Road Drainage and the Water Environment							
SAW-W1	The detailed design stage will seek to minimise the extent of hard engineered erosion protection required and consider the use of sympathetic materials and construction techniques likely to provide increased roughness and improve riparian structure (such as vegetated rock armour).	To minimise the impacts of the south bank scour protection.	**Paragraph 8.10.38** of this ES Addendum	Designer Main Contractor	CEMP approved by the Secretary of State following consultation with NCC as per Requirement 4, Schedule 2 of the **draft DCO** [**REP3-004 and 005**] As built drawings	Design	
SAW-W2	The following design measures associated with the south bank pier scour protection will include the following: **a.** Construct erosion protection to reflect the natural bank profile. **b.** Minimise the extent of hard engineered erosion protection. **c.** Use sympathetic materials and construction techniques, likely to replicate existing bank roughness. Likely measures to be refined during detailed design. **d.** Re-plant the reinstated made ground, using a locally appropriate tree, shrub and seed mix. Apply seeded biodegradable geotextile if outside of growing season, to reduce likelihood of erosion following reinstatement during out-of-bank flows.	To minimise the impacts of the south bank scour protection.	**Table 8-6** of this ES Addendum	Designer Main Contractor Environmental Manager (main contractor)	CEMP approved by the Secretary of State following consultation with NCC as per Requirement 4, Schedule 2 of the **draft DCO** [**REP3-004 and 005**] As built drawings	Design	

Ref	Action (Including Monitoring Requirements)	Objective	Source Reference	Organisation / Individual Delivering Measure	Achievement Criteria and Reporting Requirements (Reported on the Requirements Register published on the Applicant's Scheme website)	Project Phase (Design, Pre-Construction, Construction, Operation)	Record of Completion (Signature and Date)
SAW-W3	Prior to construction, any sedimentary bed features that may be disturbed will be mapped and photographed, and boulders (>0.5 m) will be surveyed, numbered and marked to show orientation relative to the channel bed. At onset of the construction phase, these sediments will be removed and stored. Upon completion of construction, the sedimentary bed features will be reinstated where practicable, with boulders placed according to the surveyed data.	To reduce the impact of the Southern Access Works on the geomorphology of the River Coquet	**Table 8-5** of this ES Addendum	Main contractor Environmental Manager (main contractor) (with Geomorphological Specialist support)	CEMP approved by the SoS following consultation with NCC	Pre-Construction	
SAW-W4	The following additional measures will be implemented during the construction of the Southern bank associated works, including temporary bridge and temporary retaining wall works, alongside measures outlined in A-W15 of the **Outline CEMP** [**REP3-013 and 014**]: **a.** Bank and bed features (outwith extent of permanent works) will be reinstated to existing profiles following completion of the permanent works. **b.** Temporary bridge abutments to be removed when crossing no longer required. **c.** Elevation of temporary bridge to be set to be above the 1% AEP (100 year) flood level. **d.** Temporary bridge to be single span to reduce bed and conveyance impacts. Maximum feasible span to be used to minimise constriction to channel width. **e.** River training walls to be lined with geotextile to prevent release of construction aggregate, associated with the working platform, to the channel.	To reduce the impact of the Southern Access Works on the River Coquet	**Table 8-5** of this ES Addendum	Main contractor Environmental Manager (main contractor) (with Geomorphological Specialist support)	CEMP approved by the SoS following consultation with NCC Scheme design drawings	Pre-Construction Construction	
SAW-W5	The following additional measures will be implemented during the construction of the Southern Access Works, alongside measures outlined in A-W15 of the **Outline CEMP** [**REP3-013 and 014**]: **i.** A surface water drainage system will be developed by the main contractor for the temporary bridge structure. This will ensure that runoff or spillages on the bridge do not enter the River Coquet and transfer any collected runoff and sediment to appropriate treatment measures.	To reduce the impact of the Southern Access Works on the River Coquet.	**Table 8-5** of this ES Addendum **Paragraph 8.9.3** of this ES Addendum	Main contractor Environmental Manager (main contractor) (with Geomorphological Specialist support)	CEMP approved by the SoS following consultation with NCC Scheme design drawings	Construction	

Ref	Action (Including Monitoring Requirements)	Objective	Source Reference	Organisation / Individual Delivering Measure	Achievement Criteria and Reporting Requirements (Reported on the Requirements Register published on the Applicant's Scheme website)	Project Phase (Design, Pre-Construction, Construction, Operation)	Record of Completion (Signature and Date)
	j. The main contractor will consider the implementation of a containment screen on the underside of the temporary bridge to prevent any falling debris or sediment from entering the River Coquet. **k.** Silt fences and / or other edge protection measures will be installed along the River Coquet bank to reduce the risk of increased sedimentation entering the channel during construction. A site specific drainage management plan will be created to attenuate, treat and discharge site runoff. **l.** Deploy in-channel silt barriers (i.e. silt curtains or similar) as far as reasonably practical or a similar form of barrier if silt water runoff is discharging into the River Coquet to control the downstream dispersion of suspended solids. **m.** Install a suitable geomembrane between the river training works and piling platform to minimise the release of construction aggregate associated with the piling platform. **n.** During periods of heavy rain, adopt regular visual inspections of the watercourse to identify discharges of silt laden runoff and take immediate action if required. **o.** Near and in-channel works are anticipated to be limited to 16 months.						
SAW-W6	Visual survey of the bed and banks will be undertaken to understand the degree and nature of change following any high flow events during construction to verify the findings of the assessment. This should be undertaken by an appropriately qualified geomorphologist or environmental clerk of works with appropriate fluvial geomorphological experience.	To manage risks to the water environment (pollution risks).	**Paragraph 8.11.1** of this ES Addendum	Main contractor Appropriately qualified geomorphologist or Environmental Manager (main contractor) with appropriate fluvial geomorphological experience	CEMP approved by the SoS following consultation with NCC as per Requirement 4, Schedule 2 of the **draft DCO** [**REP3-004 and 005**] Signed toolbox talk records Water Quality Monitoring and Management Strategy	Construction	
Materials and Waste							

Ref	Action (Including Monitoring Requirements)	Objective	Source Reference	Organisation / Individual Delivering Measure	Achievement Criteria and Reporting Requirements (Reported on the Requirements Register published on the Applicant's Scheme website)	Project Phase (Design, Pre-Construction, Construction, Operation)	Record of Completion (Signature and Date)
SAW-M1	Where site-won material meets re-use criteria, it will be retained within the Scheme for use within, for example, footway and bridleway construction, or surfacing materials.	In order to increase resource efficiency.	**Paragraph 10.9.1** of this ES Addendum	Main contractor Environmental Manager (main contractor) Environmental Consultant (designer)	CEMP approved by the SoS following consultation with NCC Materials Management Plan	Construction	
Climate							
SAW-M1	Where practicable, the construction materials required for temporary structures would be reused within the Scheme (e.g. the steel or Legato blocks for other temporary structures or retaining walls) or reused / recycled offsite by third parties.	In order to increase resource efficiency.	**Paragraph 11.9.2** of this ES Addendum	Main contractor Environmental Manager (main contractor) Environmental Consultant (designer)	CEMP approved by the SoS following consultation with NCC Materials Management Plan	Construction	

Appendix E

PRELIMINARY SCOUR ASSESSMENT

Technical Note

Project: A1 IN NORTHUMBERLAND

Date: 12/03/2021

River Coquet - Preliminary Fluvial Scour Risk Assessment

1. INTRODUCTION

1.1 DMRB guidance CD 356 Design of Highway Structures for Hydraulic Action (CD 356) is applicable to all new structures in, or over rivers, estuaries and floodplains and includes the design of scour protection measures and other river training works for both temporary and permanent works. This applies to the River Coquet underbridge which is both over and has temporary and permanent structural elements within the channel confines.

1.2 The CD356 design procedure details the following stages:

1) establishment of design principles;
2) determination of design criteria;
3) assessment of scour risk;
4) design of scour protection, where required;
5) calculation of hydraulic actions and checks of the structure under the effect of these actions; and
6) design of specific elements of the structure.

1.3 It should be noted that the design process is currently at a Preliminary Stage 3 (Assessment of Scour Risk) and is an iterative process, as the structural design develops and influences the risk of scour and the design of the scour protection system. This has provided sufficient information for the purposes of EIA and submission of the Change Request. Design continues to iterate including 2-Dimensional (2-D) hydraulic modelling, which will provide improved determination of design criteria and allow confirmation of scour risk and then inform subsequent design stages.

1.4 This preliminary fluvial scour risk assessment ("preliminary assessment") reports the predicted total scour depth associated with the proposed River Coquet road bridge with consideration of scour at the following two locations:

- Rock revetment (north bank)
- Southern bridge pier (south bank)

2. METHODOLOGY

2.1 This preliminary assessment has been undertaken in accordance with the requirements presented in DMRB CD356 'Design of Highways Structures for Hydraulic Action' and the supporting methodologies presented in CIRIA C742 'Manual on Scour at Bridges and other Hydraulic Structures' and Hydraulic Engineering Circular No18 'Evaluating Scour at Bridges'.

2.2 The assessment is also based on the results following a preliminary hydraulic assessment for scour examining distributed design flows and velocities within the river corridor and is summarised below in Section 3.1. As detailed above, computational numerical modelling of the River Coquet at the proposed bridge location is required to improve the determination of design criteria and hence this preliminary assessment will be reviewed and updated with the numerical modelling results. The updated assessment will be made available at Deadline 8 of the Examination.

2.3 The scour assessment has considered the following design flood event and two 'check' events as required by DMRB.

Design Event	0.5% AEP (200-year) plus 50% allowance for climate change (200yr + 50%)[1]
Check Events	0.5% AEP (200-year) plus 65% allowance for climate change (200yr + 65%)
	0.1% AEP (1000-year) plus 50% allowance for climate change (1000yr + 50%)

2.4 For each flood event, the preliminary assessment has calculated a total scour depth at key locations of interest to the design of the new bridge, which are: at the toe of the north bank, for consideration of the stability of the left hand bank which provides support to the north pier and north abutment of the bridge; and around the base of the south pier which is located within the flood extents on the south bank adjacent to the main channel.

2.5 At each location of interest, the total scour depth is the combination of contraction scour and local scour effects. Contraction scour is caused by the reduction in river cross-section available to the flow which, in this case, arises from the introduction of the new bridge, whereas local scour is caused by individual artificial elements within the flow such as the southern pier or a riverbank revetment.

2.6 The design impacts of the predicted scour depths are then assessed by considering both the susceptibility of the proposed structural design to scour, and any relevant geotechnical information such as predicted bedrock levels. If bedrock is present at a

[1] The Environmental Statement uses the 1% AEP plus a 50% allowance for climate change, whereas CD356 directs the designer to this higher magnitude event.

shallow depth, may limit the scour depths which would be achieved in practice to a smaller value than calculated.

3. RESULTS

Hydraulic Assessment for scour

3.1 The hydraulic assessment for scour is based on the results of a simplified hydraulic assessment of flow distribution within the river corridor. Manning's equation was used to investigate and compare the distribution of flows between the river channel and left- and right- hand inset floodplains for both the existing baseline condition and the proposed condition with the new bridge in place. Given that the combination of the existing and proposed new bridge piers at an angle to the river will reduce the ability of the right hand floodplain to convey flow, but the degree of blockage was unable to be confirmed at the time of assessment, a conservative assumption was made that no flow could pass via the right hand floodplain.

3.2 The predicted distribution of flows used in the scour assessment is summarised in Table 1, below, which shows the increase in flows carried by the main channel and left hand floodplain as a result of the loss of conveyance on the right hand floodplain.

Table 1: Distribution of flows in baseline and proposed conditions

	Baseline Condition Flows (m^3/s)			Proposed Condition Flows (m^3/s)		
Flow event	LH floodplain	Main channel	RH floodplain	LH floodplain	Main channel	RH floodplain
200yr+50%	4.5	557.1	117.6	12.4	666.8	0.0
200yr+65%	8.3	606.4	132.5	20.2	727.0	0.0
1000yr+50%	13.1	653.2	146.8	29.2	783.9	0.0

Contraction Scour

3.3 Contraction scour is associated with the loss of cross-sectional area due to the proposed bridge features. As described above, this has been simplified to assume that the right inset floodplain is 'blocked' by the existing pier and the proposed pier comprised in Work No. 4 as detailed hydraulic information is not available on the flood mechanism around the pier. This leads to precautionary values for contraction scour as the flow is focused in the central portion of the channel.

3.4 Predicted contraction scour depths are presented in Table 2.

Table 2: Predicted Contraction Scour Depth

Design/check event	Predicted Contraction scour depth
200yr+50%	0.36m
200yr+65%	0.39m
1000yr+50%	0.41m

Predicted Local scour at North bank (left bank)

3.5 The stabilisation of the north valley side is required to avoid potential excessive loading of the proposed northern pier foundation together with the loss of down slope support and lateral restraint to the foundation. To prevent failure of the valley side and to provide support to the north bridge pier, it is proposed to install a line of semi-continuous non-interlocking bored concrete piles (contiguous bored pile wall) close to the river bank. On the river side of these piles it is proposed to install a rock revetment system, to support and offer protection to the piles and prevent the loss of material from between individual piles. This rock revetment system would form the north river bank at this location.

3.6 Consideration has been given to the predicted scour depth i.e. contraction scour in the main channel and local scour associated with the revetment. Predicted contraction scour in the main channel is presented in Table 2.

3.7 Predicted local scour associated with the proposed revetment is presented in Table 3.

Table 1: Predicted local scour depths at revetment toe

Design/Check event	Predicted Local scour depth (Revetment)
200yr+50%	1.5m
200yr+65%	1.6m
1000yr+50%	1.7m

3.8 Taking the most onerous design condition i.e. 1.7m and adding the predicted contraction scour yields a predicted total scour depth at this location of circa 2.1m. This is measured from existing river bed level, and hence it is recommended that the toe of the rock revetement is appropriately designed to safely accommodate a scour depth of 2.1m, notwithstanding the presence of competent bedrock which may limit the scour depth. As bedrock is at 31-32mAOD, the rock revetment would be appropriately 'keyed' into the bedrock at its toe. This would require a channel to be cut into the bedrock to improve the stability of the rocks at the toe of the revetment and prevent failure.

3.9 Based on the preliminary hydraulic assessment for scour and estimated flow velocities, it is proposed that that rock revetment comprises a rock size (dn_{50}) of between 0.8m and 1m. The system shall be two rock layers thick, overlying an

appropriate geotextile filter and with a 1:2 profile. A steeper profile up to 1:1.5 may be possible, but this may require a larger rock size.

3.10 The extent of the rock revetment will extend beyond the end of the proposed pile wall allowing for a taper into the existing river bank and is detailed in Figure 1: Stabilisation Works in Appendix A: Figures of the ES Addendum.

Predicted Local scour at South Pier (right bank)

3.11 Local scour at a bridge pier is a function of the shape of the pier (width and length), depth of water, velocity and flow direction relative to the principal pier axis.

3.12 For the purposes of this preliminary assessment, it is assumed that the existing and proposed piers are largely acting independently of each other, given the space between them, and the risk of debris being trapped and forming a blockage between the piers has not been included. The flow angle relative to the pier axis is considered to range between 15° and 30° as currently this is subjective based on the hydraulic assessment for scour. At this stage no factor of safety has been included as the scour depth is already predicted to be close to the bed rock plane and therefore is limited to this depth.

3.13 The predicted local scour depth associated with the southern pier is presented in Table 4.

Table 4: Predicted local scour and depths at southern pier

Design/check event	Predicted local Scour depth (Pier)	
	15° attack angle	30° attack angle
200yr+50%	2.92m	3.76m
200yr+65%	3.47m	4.47m
1000yr+50%	3.85m	4.96m

3.14 The predicted local scour depth range at the southern pier is between *circa* 3m and 5m. Including the predicted contraction scour from Table 2, the total predicted scour depth range at the southern pier is between *circa* 3.3m and 5.4m. Note that this does not include a factor of safety.

3.15 The southern pier is proposed to be supported by a piled foundation with the top of the pile cap at a level of 36.0mAOD, hence the predicted scour depth level measured from here is between 32.7mAOD and 30.6mAOD. This is close to the level of the existing river bed and anticipated bedrock level, which is at around 31.0 - 32.0mAOD. Given the location of the proposed pier at the right hand river bank, it is very likely

that the combination of contraction scour and local scour would result in the loss of the natural river bank at this location.

3.16 DMRB CD356 suggests that the pile cap should be placed below total scour depth or where this is not the case, piles should be designed as columns with reduced lateral restraint and/or reduced skin friction due to the loss of surrounding material.

Pier foundation solutions

3.17 A free-standing pile is not considered as an acceptable solution both aesthetically and from optimal engineering solution. There are three solutions for the pier foundation – 1) offer a conventional scour protection measure to prevent the loss of material surrounding the pier foundations, 2) place the pile cap below the total predicted scour depth, or 3) install an embedded wall in the river bank between the channel and required pier foundation in conjunction with surface protection to the area surrounding the pier.

3.18 Due to the proximity of the proposed pier to the existing river bank and the extension of the existing river training works 12m into the area of the new pier, there is limited space for a conventional scour protection system such as a rock revetment without this projecting into the main channel (see Photograph 1). This would reduce channel capacity, exacerbate contraction scour and possibly deflect energy downstream. To make space for a rock revetment would likely require relocating the bridge pier away from the river bank, which at this stage is assumed to be unacceptable due to the impacts that this would have on hydromorphology and sediment behaviour.

Photograph 1: South pier looking upstream to river training works and position of the new pier

3.19 The second option is to place the pile cap below the predicted total scour depth. This would require the top of the pile cap to be set at 30.6mAOD which as noted previously is expected to approximately coincide with bedrock level. To cast a pile cap at this level would require a temporary excavation up to 7.4m deep. This poses challenges with constructability and safety and increased risk of inundation from the river. There

is also the potential for disturbance to aquatic organisms due the nature of the required excavation into the bedrock.

3.20 The third option would require a line of continuous interlocking bored concrete piles (secant bored pile wall) to be installed along the crest of the existing river bank with the pile cap retained at the currently proposed higher level. The piles within the river bank would prevent scour beneath the foundation but the piles would be exposed if scour of the river bank did take place. The piles would need to extend up- and down-stream of the proposed foundation and to be tied into to scour protection to the existing pier foundation. This option is considered to be more practical than placing the pile cap at depth and is therefore the recommended solution as works would be less susceptible from flooding from the river, and has a lesser potential for disturbance to aquatic organisms.

3.21 To construct the proposed southern pier, a working platform is proposed immediately downstream of the pier. This would require 'cut' into the valley side resulting in a steep sided profile which would also extend beneath the proposed bridge. This would be reinstated following construction. The reinstated slope will be subject to inundation during flood events and potential for erosion. As noted previously this may result in unacceptable instability of the valley slope; therefore, it is recommended that the toe of the slope is offered protection against fluvial erosion. The nature of the scour protection system at this location would be subject to the nature and profile of the engineered slope and available space and be comprised of either a reno mattress and gabions or a rock armour solution to the 0.1%AEP plus 50% flood level of 38.86mAOD .

3.22 The viable pier foundation options would be considered in subsequent design development and in relation to complimentary scour protection systems. The current proposed scour protection system is considered a worst plausible case and is detailed in Figure 1: Stabilisation Works in Appendix A: Figures of the ES Addendum.

4. CONCLUSION / FUTURE WORK

4.1 This preliminary assessment has detailed the scour risk to the north and south bank features of the River Coquet crossing using the guidance set out in CD356. This has concluded that the north bank and south bank require scour protection systems and the extents are detailed in Figure 1: Stabilisation Works in Appendix A: Figures of the ES Addendum.

4.2 This comprises a hard engineered 'grey' solution in closer proximity to the structure in the form of rock armour moving to a green-grey solution for the reinstated banks outside the zone of protection required for the bridge foundations. Green-grey solutions are a hybrid of engineered and biodegradable / vegetated solutions that are considered more environmentally sensitive but have a greater resistance to scour than green solutions like wood revetment or biodegradable vegetated matting. These grey-green solutions will be considered further during the design development process.

4.3 As detailed above further assessment work is proposed to further define the design criteria, particularly the hydraulic conditions and as described above a 2-D hydraulic model will be used to inform the scour design process. The structural pier foundation design and the scour protection design will be refined and presented at Deadline 8.

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

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