Department for Infrastructure

The Roads (Northern Ireland) Order 1993
The Local Government Act (Northern Ireland) 2014

A29 COOKSTOWN BYPASS SCHEME
PUBLIC INQUIRY

October 2024

Proof of Evidence
Environmental Impact Assessment Report (EIAR)

By

Andy Saunders

WSP
8 First Street
Manchester
M15 4RP

Table of Contents

List of tables

1 INTRODUCTION

1.1 Personal Details

1.1.1 My name is Andy Saunders. I am an Environmental Director at WSP and appointed to assist the Department for Infrastructure (DfI) ("the Department") to deliver the A29 Cookstown Bypass Project ("The Proposed Scheme"). I am a Chartered Member of the Institution of Water and Environmental Management, a Chartered Member of the Institute of Ecology and Environmental Management, a Chartered Environmentalist and a Chartered Water and Environmental Manager. I am also a certified and approved trainer in Advanced Environmental Impact Assessment for the Institute of Environmental Management and Assessment.

1.1.2 I have over 30 years' experience in public and private sector environmental consultancy work including in Environmental Impact Assessments (EIA) for major infrastructure projects particularly major road schemes. The assessments of major road schemes have included the preparation of Constraints Studies; Route Selection Reports; and Environmental Statements/Environmental Impact Assessment Reports (EIAR). I have also contributed to the preparation of best practice guidance in relation to EIA including for the EU and to the Design Manual for Roads and Bridges (DMRB).

1.1.3 I have managed or co-ordinated over 100 EIAs for road schemes and acted as expert witness in relation to environmental matters for road schemes in Northern Ireland, Wales, England and Scotland. Most recently I acted as expert witness for the A5 Western Transport Corridor and am the environmental planning lead for that project.

1.2 Project Role

1.2.1 I have acted as Environmental Project Director for the Proposed Scheme on behalf of WSP. As Environmental Project Director I have been responsible for providing environmental guidance to the overall project team as well as performing a technical review role in the production of the published EIAR and other associated environmental documents including the shadow Habitats Regulations Assessment (HRA).

2 SCOPE OF EVIDENCE

2.1.1 My evidence covers the EIAR and shadow HRA published in April 2024.

2.1.2 My evidence summarises the EIAR chapters and results of the shadow HRA and I will address any matters arising at the inquiry however individual EIA specialists can be made available if necessary to assist in responses to detailed queries.

3 STRUCTURE OF ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR)

3.1.1 The term 'environmental impact assessment' describes a procedure that must be followed for certain types of projects before they can be given Approval to Proceed by the relevant decision maker. The procedure is a means of drawing together, in a systematic way, an assessment of a project's likely significant environmental effects. This helps to ensure that the importance of the predicted effects and the scope for reducing them are properly understood by the public and the relevant competent authority before it makes its decision.

3.1.2 The published EIAR documents the EIA process which has been undertaken in accordance with (but not limited to) the following key legal framework:

- The Roads (Northern Ireland) Order 1993;
- The Roads (Environmental Impact Assessment) (EIA) Regulations (Northern Ireland) 2017; and
- The Roads (Environmental Impact Assessment) (Amendment) (Northern Ireland) (European Union (EU) Exit) Regulations 2019.

3.1.3 The associated shadow HRA process has been undertaken in line with The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended).

3.1.4 Under the EIA Regulations, there is a requirement for the Department for Infrastructure (DfI) (the Department) to:

- Determine whether any proposed project falls within Annex I or Annex II of the EIA Directive; and
- Publish any EIA determination they make in respect of a roads project.

3.1.5 In November 2021 the Department published on its website notice that, in accordance with Part V of the Roads (Northern Ireland) Order 1993 ("the 1993 Order") as amended, that it considers that its proposal for the construction of the new A29 Cookstown Bypass is a relevant project within the meaning of Article 67(1) of the 1993 Order.

3.1.6 The Department has determined that this proposal should be made subject to an EIA in accordance with Article 67 of the 1993 Order.

3.1.7 The structure of the published EIAR was set out as follows:

- **Volume 1: Main EIAR Chapters;**
- **Volume 2: EIAR Technical Appendices;**
- **Volume 3 – Figures; and**

- a **Non-Technical Summary (NTS)** which provides a summary of the findings of the EIAR in non-technical language.

3.1.8 The EIA Regulations outline the formal requirements for the content of the EIAR. The Regulations state that an EIAR should include as a minimum:

a) A description of the project comprising information on the site, design, size and other relevant features of the project;

b) A description of the likely significant effects of the project on the environment;

c) A description of the features of the project and measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;

d) A description of the reasonable alternatives studied by the Department which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment;

e) A non-technical summary of the information referred to in the bullets points above; and

f) Any additional information relevant to the specific characteristics of the particular project or type of project and to the environmental features likely to be affected.

3.1.9 The published EIAR presents the results of the EIA to demonstrate how identified mitigating factors have been taken into account through the design evolution to ensure that the project is environmentally acceptable and sustainable. The chapters that are included in the EIAR are set out in Table 3.1 below.

Table 3.1 - Chapters of the EIAR

Chapter 1	Introduction
Chapter 2	Existing Environment
Chapter 3	Description of the Proposed Scheme
Chapter 4	Consideration of Alternatives
Chapter 5	Overview of the Assessment Process
Chapter 6	Air Quality
Chapter 7	Climate Change
Chapter 8	Cultural Heritage
Chapter 9	Geology and Soils
Chapter 10	Landscape and Visual Amenity
Chapter 11	Material Assets and Waste

Chapter 12	Biodiversity
Chapter 13	Noise and Vibration
Chapter 14	Population and Human Health
Chapter 15	Road Drainage and the Water Environment
Chapter 16	Cumulative Effects
Chapter 17	Summary of the EIAR
Chapter 18	Abbreviations and Glossary

3.1.10 The format in Table 3.1 corresponds to the list of environmental topics specified in the EIA Regulations as set out in Table 3.2 below.

Table 3.2 - Compliance with EIA Regulation Topics

EIA Regulations Topic	**Covered in the EIAR under**
Population and Human Health	Population and Human Health, Land Use, Air Quality, Noise, and Vibration
Biodiversity	Biodiversity, Road Drainage and the Water Environment
Land	Population and Human Health, Geology and Soils
Soils	
Land Use, Soils and Geology	
Water	Road Drainage and the Water Environment, Geology and Soils
Air; Climate	Air Quality, Climate Change
Material Assets	Material Assets and Waste
Landscape	Landscape and Visual Amenity
Cultural Heritage	Cultural Heritage
Interactions	Cumulative Effects
Major Accidents and Disasters	Scoped out

3.1.11 With regards to the scoping out of Major Accidents and Disasters, a review found that the probability, frequency and likelihood of natural disasters is considered very low and as such, the Proposed Scheme is not considered to influence the likelihood of existing or new receptors experiencing a natural disaster and was scoped out for further assessment. Environmental

risks of pollution during operation due to accidental spillages where spilled materials may drain from the road surface polluting the receiving water bodies was considered in Volume 1, Chapter 15: Road Drainage and the Water Environment. In addition, the risk of flooding during construction and operation is considered in the Flood Risk Assessment (FRA) (contained in Volume 2, Appendix 15.4: Flood Risk Assessment) and Volume 1, Chapter 15: Road Drainage and the Water Environment. Hence, Major Accidents and/or Disasters was not included as a standalone topic or chapter within the EIAR.

3.1.12 Consideration of transboundary impacts is also a requirement under the EIA Regulations. At its closest point to the Proposed Scheme, the nearest European Environment Agency (EEA) Member State boundary is the Republic of Ireland border which is located approximately 30km to the south-east of the southernmost extent of the Proposed Scheme. Given this distance from the Proposed Scheme boundary, there are no likely significant transboundary effects identified for the Proposed Scheme. Hence, assessment for potential transboundary impacts was also scoped out of the EIAR.

3.1.13 Each EIAR topic chapter, as identified in Table 3.1, considers the following aspects:

- **Study area** – topic specific study areas are defined based on professional judgement, current best practice and guidance.
- **Baseline scenario** – existing baseline information (environmental characteristics and conditions) have been collated, based on surveys, consultations and desk-based information.
- **Future Baseline** – the assessment has considered how the current baseline conditions may change in the future without the presence of the Proposed Scheme.
- **Stages of the Proposed Scheme** – for the purposes of the EIA, consideration has been given to two stages of the Proposed Scheme (i.e. construction and operation). The **assessment** scenarios considered in the preparation of the EIAR are the construction year: 2026 to 2027; the opening year: 2027; and the forecast design year: 2042 (i.e. 15 years after opening of the Proposed Scheme).
- **Assessment Criteria** – unless specifically detailed otherwise; the assessment approach has been based on DMRB LA 104 Environmental assessment and monitoring, as detailed in Volume 2, Appendix 5.1: Assessment Criteria. In accordance with the DMRB guidance, the assessment covers the likely significant effects arising from the temporary, permanent, direct, indirect, secondary, cumulative, short, medium, long-term, beneficial and adverse effects of the Proposed Scheme. The assessment methodologies, including sensitivity and value of receptors, impact magnitudes, assessment matrices and determination of overall effects, are presented for each topic based upon the respective guidance for the discipline.

- **Classifying Effects** – wherever possible and appropriate, the effects have been assessed quantitatively. Determining the classification of environmental effects has been undertaken using professional judgement. Unless otherwise stated in Chapters 6 to 15 of the EIAR, effects that are classified as moderate or above are considered to be significant. Effects classified as minor or below are considered to be not significant.

- **Mitigation Measures** – Volume 1, Chapter 3: Description of the Proposed Scheme sets out the primary mitigation measures embedded into the Proposed Scheme design. Secondary mitigation measures are presented in the individual topic chapters. In order to control construction effects, a first iteration Environmental Management Plan (fiEMP) accompanies the EIAR (it is provided in Volume 2, Appendix 3.1: First Iteration Environmental Management Plan). It identifies all the construction phase mitigation that has been identified within the EIAR. The fiEMP would be refined and implemented by the Principal Contractor once appointed. This is known as a second iteration Environmental Management Plan (siEMP). This would detail all the environmental controls and management measures to be adopted during the construction of the Proposed Scheme.

- **Residual Effects and Monitoring** – the classification of residual effects has been assessed with regard to the extent to which secondary mitigation measures will avoid, prevent, reduce or, if possible, offset adverse effects or enhance beneficial effects. Where monitoring is required of any significant adverse residual effects it is described within the relevant environmental topic chapter. In some cases, for instance where there is uncertainty of residual effects remain, it may also be appropriate to implement monitoring.

- **Limitations and Assumptions** – where there are limitations or assumptions used within the preparation of the EIAR technical chapters; these are clearly identified.

4 AIR QUALITY

4.1 Methodology

4.1.1 The air quality assessment reported in the EIAR considered human and ecological receptors and focused on the likely impacts and effects to local air quality and regional pollutant emissions associated with the operational phase of the Proposed Scheme. The assessment also considered likely effects to local air quality and amenity associated with construction phase activities.

4.1.2 The following guidance and standards documents were used during the preparation of the EIAR chapter:

- Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction (2014);
- Local Air Quality Monitoring (LAQM) Technical Guidance (TG) 22; and
- Design Manual for Roads and Bridges (DMRB) LA 105 Air quality.

4.1.3 Consultation was undertaken with Mid Ulster District Council Environmental Health Department (including to agree to 20 air quality monitoring locations for nitrogen dioxide) and Northern Ireland Environment Agency (NIEA) Natural Environment Division to inform the assessment.

4.2 Findings

4.2.1 A review of the latest Local Air Quality Management (LAQM) review and assessment report published by Mid Ulster District Council confirmed that there are no Air Quality Management Areas (AQMAs) declared within or near to the Cookstown area.

4.2.2 The assessment of impacts associated with dust-generating construction activities has demonstrated that, with appropriate mitigation measures focused on the control and suppression of dust, the Proposed Scheme would not have a significant effect on local air quality and amenity during construction. The assessment of impacts associated with emissions (nitrogen dioxide and particulate matter) arising from construction-related traffic using existing roads would result in temporary increases in concentrations of these pollutants, but not of an order or duration that would constitute a significant effect on local air quality.

4.2.3 The assessment of impacts associated with the operational phase of the Proposed Scheme has demonstrated that more people would experience improved air quality (i.e. benefit from reduced concentrations of key air pollutants – nitrogen dioxide and particulate matter) than would experience a worsening in air quality. This would largely be a result of traffic moving from the existing A29 through Cookstown to use the Proposed Scheme.

4.2.4 Some of the main findings of the operational assessment are as follows:

- Annual mean nitrogen dioxide concentrations for the baseline year (i.e. without the Proposed Scheme in 2019) were predicted to be below the air quality limit value at all modelled receptors with the exception of a receptor on Church Street which just exceeded the nitrogen dioxide limit value of 40 micrograms per cubic metre;

- Modelled concentrations for annual mean particulate matter were predicted to be below the air quality limit value at all modelled receptors;

- In the Proposed Scheme opening year (2027) modelled concentrations at all receptors are predicted to be below the air quality limit value both without and with the Proposed Scheme in operation;

- With the Proposed Scheme the greatest improvement in nitrogen dioxide concentrations is predicted at the modelled receptor on Church Street which is expected to experience a 17 micrograms per cubic metre reduction in nitrogen dioxide concentrations. This compares with the largest increase which is expected to be 3.3 micrograms per cubic metre;

- As there are no new exceedances of the annual mean limit value in either the Do Minimum or Do Something scenario for all modelled pollutants, no changes as a result of the Proposed Scheme are significant;

- For the opening year approximately 84% of the considered receptor locations are predicted to experience an improvement in annual mean nitrogen dioxide concentrations with approximately 6% expected to experience a deterioration. Similar results are predicted for particulate matter; and

- A Compliance Risk Assessment has been undertaken. None of the compliance receptors are predicted to be in exceedance of the annual mean limit value or cause the UK0043 Northern Ireland zone to become non-compliant with the Air Quality Standards (Northern Ireland) Regulations.

4.2.5 For ecological receptors, the operational phase assessment of the Proposed Scheme has considered the potential impacts of vehicle emissions on identified nitrogen-sensitive habitats within Upper Ballinderry River Area of Special Scientific Interest (ASSI)/ Special Area of Conservation (SAC). It was determined that no significant effects are likely as a result of nitrogen deposition.

4.3 Mitigation

4.3.1 For construction dust appropriate prevention and mitigation measures have been devised based on the risk rating for the area. These measures are contained in the First Iteration Environmental Management Plan (located in Volume 2, Appendix 3.1 of the EIAR) which will be developed by the principal contractor.

4.3.2 Measures include a Stakeholder Communication Plan, a Dust Management Plan (to be approved by Mid Ulster District Council's Public Protection Officer), site management measures such as speed limits, dust sweeping on access and local roads and monitoring. A full list of proposed measures are given in paragraphs 6.6.48 to 6.6.50 of the EIAR.

4.3.3 As no overall significant effect in regard to local air quality has been determined for the operational Proposed Scheme, no primary mitigation is proposed.

4.4 Conclusions

4.4.1 For the construction stage it can be concluded that with the implementation of mitigation measures including through the development of various control plans, the Proposed Scheme would not have a significant effect on local air quality and amenity during construction.

4.4.2 For the operational stage it can be concluded that significantly more properties would benefit than disbenefit from improved air quality, no limit values would be exceeded, there would be no risk of non-compliance with the Air Quality Standards (Northern Ireland) Regulations and no significant effects are likely as a result of nitrogen deposition on ecological receptors.

5 CLIMATE CHANGE (INCLUDING GREENHOUSE GASES)

5.1 Methodology

5.1.1 A climate resilience assessment considered the vulnerability of the Proposed Scheme to climate change, in particular, from extreme weather events and long-term climate change during the operational phase. The assessment focused on the impact of climate on the Proposed Scheme (rather than the impact of the Proposed Scheme on the environment).

5.1.2 The following guidance and standards documents were used during the preparation of the climate resilience elements of the EIAR chapter:

- Design Manual for Roads and Bridges (DMRB) LA 114 Climate;
- IEMA (2020) EIA Guide to Climate Change Resilience and Adaptation;
- British Standards ISO 14091:2021 Adaptation to climate change: Guidelines on vulnerability, impacts and risk assessment; and
- UK Government (2019) National Planning Practice Guidance, Climate Change.

5.1.3 The greenhouse gas (GHG) assessment reports the outcome of likely significant effects arising from the Proposed Scheme upon GHG emissions and the climate. It assesses the potentially significant effects arising from GHG emissions from activities and traffic associated with both the construction and operational stages. To determine significance, GHG emissions were quantified over the project lifespan (60 years), and included emissions from sources during construction and operation of the Proposed Scheme

5.1.4 The following guidance and standards documents were used during the preparation of the EIAR chapter:

- DMRB LA 114 Climate;
- PAS 2080:2016 Carbon Management in Infrastructure;
- Royal Institute of Chartered Surveyors (RICS) Whole life carbon assessment for the built environment (2017);
- Transport Analysis Guidance: Unit A3 Environmental Impact Appraisal; and
- Institute of Environmental Management and Assessment (IEMA) (2022) Assessing Greenhouse Gas Emissions and Evaluating their Significance 2nd Edition.

5.1.5 It should be noted there are currently no agreed thresholds for what level of GHG emissions is considered significant for EIA. The significance of GHG emissions is assigned with reference to the magnitude of emissions, their context on the UK's trajectory towards net zero, guidance from IEMA's Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance (referenced above), and the use of professional judgement.

5.1.6 This chapter of the EIAR presents the assessment that considers the effects on climate and associated Greenhouse Gas emissions (GHG) due to the proposed development. Carbon dioxide is the most important GHG and therefore is used as a key indicator for the purposes of assessing the impacts of projects on climate change. The chapter references, The Institute of Environmental Management & Assessments (IEMA) EIA Guide to: Assessing Greenhouse Gas Emission and Evaluating their Significance, 2017. This IEMA document also endorses the use of the DMRB Regional Assessment for road schemes in terms of assessing GHG emissions.

5.2 Findings

5.2.1 From a climate resilience perspective, sensitive receptors that have been identified for the Proposed Scheme include:

- Road components (e.g. pavement, carriageway, drainage, embankment);
- Structural components (bridges, underpass, flood and retaining walls) components;
- Ancillary components (e.g. street furniture, vegetation); and
- The end users of the Proposed Scheme.

5.2.2 The most recent UK Climate Projections (UKCP18) project that the location of the Proposed Scheme will experience wetter winters and drier summers.

5.2.3 The changes in the climate variables over time have the potential to pose significant threat to the lifetime of the Proposed Scheme. Based on the likelihood of the climate hazard occurring, impact of these events and taking into account embedded mitigation measures within the design.

5.2.4 With regards to GHG emissions, the construction impact of the Proposed Scheme on GHG emissions arising from the embodied carbon within materials, transportation of materials to site, transport of waste from site and construction plant use are estimated to be 27,791 tonnes of carbon dioxide equivalent (tCO2e), which represents 0.0014% of the fourth UK carbon budget and are assessed as being moderate adverse and therefore significant.

5.2.5 The operational impact of the Proposed Scheme is expected to be beneficial and significant due to a decrease in GHG emissions in comparison to a scenario where the road is not built. This GHG reduction is based on traffic modelling predicting reduced time spent by vehicles on the

road and optimisation of vehicle speed (reducing fuel consumption) over the 60-year lifespan of the Proposed Scheme.

5.2.6 The total GHG emissions arising from the end user traffic from the operation of the Proposed Scheme are estimated to be approximately 4,010,612tCO2e. Without the Proposed Scheme emissions would be 4,054,469tCO2e, which is a 43,857tCO2e reduction with the Proposed Scheme.

5.2.7 Total emissions from the Proposed Scheme (construction and net operational emissions) are estimated to be -16,066tCO2e. The reductions represent -0.0002% of the fifth UK carbon budget and -0.0004% of the sixth UK carbon budget.

5.2.8 The net GHG impacts are below zero when compared to the baseline ("Do Minimum") resulting in a positive climate impact. Therefore, the significance of the effect is deemed to be beneficial (significant).

5.3 Mitigation

5.3.1 To reduce the potential significance of impacts due to climate change, the following mitigation has been identified:

- Designing above and beyond the current design standards to ensure that the Proposed Scheme will be resilient to future climate impacts; and
- Incorporating an adaptive design approach into maintenance plans to ensure that the design life of the Proposed Scheme is met.

5.3.2 Measures recommended to reduce the GHG emissions associated with the Proposed Scheme include:

- Design optimisation to reflect the carbon reduction hierarchy;
- Substitute construction materials for lower-carbon alternatives;
- Using more efficient construction plant and delivery vehicles;
- Maximise the local sourcing of materials and use of local waste management facilities; and
- Re-use of materials onsite rather than taking offsite as a waste.

5.3.3 The GHG emissions associated with the eventual operation of the Proposed Scheme can be minimised by, amongst others:

- Opportunities to sequester carbon through increased tree planting; and
- Use road surface options with greater longevity, to reduce frequency of replacements throughout use phase.

5.4 Conclusions

5.4.1 By incorporating the impact of future climate into the design and/or developing maintenance plans with adaptive design measures, the climate resilience effect would not be significant.

5.4.2 With regards to the construction and operation of the Proposed Scheme net GHG impacts are below zero when compared to the baseline ("Do Minimum") resulting in a positive climate impact which is assessed as a beneficial significant effect.

6 CULTURAL HERITAGE

6.1 Methodology

6.1.1 The following guidance and standards documents were used during the preparation of the EIAR chapter:

- Chartered Institute for Archaeologists (CIfA) Standards and Guidance for Historic Environment Desk Based Assessments;
- Design Manual for Roads and Bridges (DMRB) LA 104 Environmental assessment and monitoring and LA 106 Cultural heritage assessment;
- Directorate of Engineering Memorandum (DEM) 156/15 Management of Archaeological Investigations on Major Road Improvement Schemes; and
- Historic Environment Division (HED) Guidance on Setting and the Historic Environment.

6.1.2 Consultation was undertaken with Mid Ulster District Council and Department for Communities HED to inform the assessment.

6.1.3 A desk-based assessment and walkover surveys were undertaken. The assessment considered potential impacts during the construction and operation of the Proposed Scheme.

6.2 Findings

6.2.1 A total of 100 heritage assets were included in baseline, ranging in date from prehistoric to modern. They include scheduled monuments, historic buildings, historic parks, gardens and demesne, Area of Archaeological Potential, Area of Significant Archaeological Interest, several undesignated heritage assets highlighted within the Northern Ireland Sites and Monuments Record, and several heritage assets highlighted by a map regression study and walkover survey.

6.2.2 The assessment determined there is the potential for 14 undesignated heritage assets to be adversely impacted upon during construction. The impact on a medium valued heritage asset, Bronze Age archaeological remains, would result in a significant effect prior to mitigation.

6.2.3 During operation, there is potential for the setting of three designated and seven undesignated heritage assets to be impacted. The sensitive receptors of the medium value New Buildings rath, and the high value Killymoon Castle Historic Park, Garden and Demesne would receive direct, permanent, minor adverse impacts from measurable changes to their setting through increases in noise and visual impacts. These result in a significance of effect of Slight Adverse which is not considered significant from an EIA perspective. The impacts on a further eight heritage assets during operation do not result in significant effects.

6.3 Mitigation

6.3.1 Embedded mitigation to reduce the impact to the setting of heritage assets in the form of noise reduction measures and screening along the Proposed Scheme has been considered in the assessment.

6.3.2 It is recommended that the impact on the medium valued heritage asset, Bronze Age archaeological remains and other heritage assets within the Proposed Scheme boundary are mitigated through a programme of archaeological investigations to ensure preservation by record. The methodologies for works would be approved by the Historic Environment Division of the Department for Communities.

6.3.3 Following implementation of this mitigation, the residual effects on heritage assets are expected to be not significant.

6.4 Conclusions

6.4.1 With the implementation of the proposed mitigation any residual effects arising from the construction and operation of the scheme would be no greater than Slight Adverse and therefore not significant.

7 GEOLOGY AND SOILS

7.1 Methodology

7.1.1 During the scoping exercise, potential impacts to geology were scoped out of further assessment, as they are not considered to give rise to likely significant effects as a result of the Proposed Scheme. Therefore, the assessment has focused on potential impacts to agricultural soils and also considered contaminated land.

7.1.2 The following guidance and standards documents were used during the preparation of the EIAR chapter:

- Design Manual for Roads and Bridges (DMRB) LA 109 Geology and Soils;
- Design Manual for Roads and Bridges (DMRB) LA 104 Environmental Assessment and Monitoring;
- British Standards Institute (BSI) BS10175:2011 +A2:2017;
- Environment Agency Land Contamination Risk Management guidance; and
- Construction Industry Research Information Association (CIRIA) C552 200113.

7.1.3 In addition, the chapter was prepared in accordance with the UK Government's National Planning Practice Guidance.

7.1.4 Consultation was undertaken with Mid Ulster District Council's Environmental Health Department and DAERA to inform the assessment.

7.1.5 Reports have been produced which include field study results including ground investigations. Walkover surveys were carried out in 2019 and again in 2020 / 21. The reports are contained as appendices 9.1 and 9.2 in the EIAR.

7.2 Findings

7.2.1 The Proposed Scheme route is predominantly within a greenfield location, the soils in the study area are largely Cambisols which make good agricultural land and are intensively used. The Agricultural Land Classification and sensitivity (as outlined in the DMRB) of land within the Proposed Scheme Boundary includes Grade 2 (Very High Sensitivity), Grade 3B (Medium Sensitivity) and Grade 4A (Low Sensitivity).

7.2.2 Within the Proposed Scheme Boundary, Sandholes Link Road covers an area of 2.3ha which is wholly classified as urban soil and is therefore not considered further.

7.2.3 The required agricultural land-take within the Proposed Scheme Boundary includes the following grades of agricultural land:

- Grade 2 – 29.7ha;
- Grade 3B – 5.9ha; and
- Grade 4A – 1ha.

7.2.4 Agricultural land-take for the deposition areas comprises the following grades of agricultural land:

- Grade 2 – 12ha; and
- Grade 3B – 1ha.

7.2.5 The deposition areas do not form part of the land to be vested by the Department and it is possible they would be returned to agricultural use post construction (at the discretion of the landowner). However, for the purposes of the assessment it has been assumed that all agricultural land within the Proposed Scheme Boundary will be permanently taken. This is due to the activities associated with construction of the deposition areas, such as, potential damage to soil structure, compaction, changes in drainage characteristics and workability.

7.2.6 The permanent loss of Grade 2 agricultural land is considered to be very large adverse and the permanent loss of Grade 3B agricultural land is considered to be a moderate adverse. Both effects are therefore considered to be significant with no secondary mitigation being possible.

7.2.7 With regards to contamination, the Interpretative Ground Investigation Report did not identify any significant contamination which could lead to potentially significant effects. As such, the sensitive receptors (human health and controlled waters) associated with contamination were not considered further.

7.3 Mitigation

7.3.1 Due to the nature of the Proposed Scheme, it is not possible to mitigate the loss of this agricultural land.

7.3.2 To address possible contaminated land effects the following embedded mitigation will be implemented through an Environmental Management Plan:

- The Principal Contractor will take the ground investigation information into account when preparing their risk assessments and method statements, will conduct a watching brief during the works to identify any unforeseen potential contamination and be responsible for managing excavated soils in accordance with waste management Regulations; and
- All temporary stockpiles will be sealed and/or covered if comprising

potentially contaminated soils.

7.4 Conclusions

7.4.1 The permanent loss of Grade 2 and Grade 3B agricultural land is considered to be significant with no secondary mitigation being possible.

7.4.2 With regards to contamination, no significant contamination which could lead to potentially significant effects has been identified and with the proposed mitigation measures no significant effects are predicted.

8 LANDSCAPE AND VISUAL

8.1 Methodology

General Approach

8.1.1 The following main guidelines and documents have been used to derive the methodology during preparation of the EIAR chapter:

- DMRB, Volume 11, Section 3, Part 5 Landscape Effects; and
- Guidelines for Landscape and Visual Impact Assessment, Third Edition (The Landscape Institute and Institute of Environmental Management & Assessment, 2013) (GLVIA3).

8.1.2 Consultation with Mid Ulster District Council and the Woodland Trust informed the assessment.

8.1.3 The landscape and visual amenity assessments have focused on the likely impacts and effects to landscape character and the visual context in the vicinity of the Proposed Scheme and were based on a combination of desk-based assessments and summer and winter site surveys.

8.1.4 Information on the existing baseline of the study area was collected through desk-based study incorporating reference to local plans, Ordnance Survey maps (OS), Zone of Theoretical Visibility (ZTV) analysis as well as relevant literature published by the local planning authorities.

8.1.5 The initial site survey work was undertaken in September 2019 (summer) when trees were in leaf. A site visit was carried out in March 2022 (winter) to capture viewpoint photography, taking account of the revised representative viewpoint locations identified following design progression. A subsequent site visit was carried out in October 2022 (summer), when the trees were still in leaf to review the baseline situation and capture updated photography.

8.1.6 A computer-generated ZTV has been produced to support the assessment and represents the extent to which there would be potential for views of the Proposed Scheme (without secondary mitigation) and represents a realistic worst-case scenario.

8.2 Findings

Construction Phase Landscape & Visual Effects

8.2.1 Construction works are anticipated to be approximately 20 months in duration. Works will be visible during to a varied extent depending upon the individual construction activity at any given time.

8.2.2 The assessment of landscape character has identified that impacts on the following landscape settings would constitute significant (moderate adverse) effects on the baseline environment during construction:

- Settled farmland to the east of Cookstown (Local Landscape Character Area 4 (LLCA4));
- The recreational landscape of the Killymoon Golf Course (LLCA5); and
- The Ballinderry River valley to the south-east of Cookstown (LLCA6).

8.2.3 The assessment of impacts on views experienced from sensitive receptors (predominantly residential properties and public locations) identified significant effects on visual receptors throughout the southern and eastern residential fringes of Cookstown during construction. Receptors likely to experience a significant effect (both moderate and large adverse) during construction include those on Tullywiggan Road, Castle Road, Golf View, Festival Park, Sandholes Road, Coolnafranky Park, Coagh Road, Old Coagh Road, A29 Moneymore Road and users of Cabin Wood walk. A full list of the receptors assessed and the effects predicted during the construction phase is provided in Table 10-8 of the EIAR.

Operational Phase Landscape & Visual Effects

8.2.4 With regards to landscape effects, in the first year of operation of the Proposed Scheme effects on the three LLCAs identified above are predicted to be moderate adverse during both the daytime and night-time with the exception of LLCA4 which is anticipated to experience slight adverse effects during the night-time.

8.2.5 Following the implementation of mitigation measures it is anticipated that the daytime effect on the three LLCAs would reduce from moderate adverse in Winter year 1 to slight adverse by the summer of Year 15. All night-time effects on the LLCAs are also predicted to be slight adverse by Year 15.

8.2.6 With regards to visual effects during operation, maturation of mitigation planting would reduce the visual impacts of the Proposed Scheme, particularly in summer months. Those receptors where a significant effect would remain are distributed throughout the Proposed Scheme corridor to the east of Cookstown and where the existing views are typically rural in nature and likely to be subject to a substantial change in visual outlook that cannot be fully mitigated.

8.2.7 Receptors subject to a significant visual effect (moderate and large adverse) after 15 years of operation are located on Tullywiggan Road, Otter Lodge, Castle Road, Castle Villas, Golf View, Coolnafranky Park, Old Coagh Road and the A29 Moneymore Road. A full list of the receptors assessed and the effects predicted during the operational phase is provided in Table 10-9 of the EIAR.

8.3 Mitigation

8.3.1 During the construction phase good site practice would be ensured through the implementation of the Environmental Management Plan. Volume 2, Appendix 3.1 of the EIAR: First Iteration Environmental Management Plan provides commitments including tree and hedgerow protection, weed

control, stockpile storage, signage, boundary fencing, reducing impacts on nearby sensitive visual receptors and reinstatement of land required temporarily.

8.3.2 The principal objective of landscape mitigation is to integrate the Proposed Scheme into the local landscape to minimise adverse landscape and visual impacts. A full range of design, mitigation and enhancement measures are provided in Section 10.9, of Volume 1, Chapter 10 of the EIAR. Mitigation measures to screen views and/or integrate the Proposed Scheme into the landscape include:

- Screen planting, once matured, such as that proposed at Golf View, Festival Park and Coagh Road;
- Earthwork bunds in proximity to Golf View, Festival Park, Cloghog Road, Coagh Road and Old Coagh Road; and
- Environmental barriers proposed in proximity to Otter Lodge, Castle Road, Castle Villas, Golf View, Coagh Road and Festival Park contribute to the mitigation of impacts on visual receptors.

8.3.3 The Environmental Masterplan contained in Volume 3 of the EIAR as Figure 10.9 provides details of some of the measures provided to mitigate landscape and visual effects.

8.4 Conclusions

8.4.1 Significant (moderate adverse) effects would occur at various times during the 20-month construction phase to three LLCAs and at certain visual receptors (moderate and large adverse) throughout the southern and eastern residential fringes of Cookstown.

8.4.2 The three LLCAs would also experience significant (moderate adverse) effects at the opening year of the Proposed Scheme. These operational effects would reduce over time to slight adverse in Year 15 following implementation of the mitigation measures such as the maturing of planting.

8.4.3 Although implementation of the landscape scheme would reduce operational visual effects to receptors over time some receptors would still be subject to a significant daytime summer visual effect (moderate and large adverse) after 15 years of operation. These include receptors located on Tullywiggan Road, Otter Lodge, Castle Road, Castle Villas, Golf View, Coolnafranky Park, Old Coagh Road and the A29 Moneymore Road.

8.4.4 Properties on Castle Road and Clare Lane are also predicted to experience a moderate adverse visual impact during night-time in winter in the first year of opening although all properties are forecast to experience no significant night-time visual effects during summer in year 15.

9 MATERIAL ASSETS AND WASTE

9.1 Methodology

9.1.1 The Design Manual for Roads and Bridges (DMRB) LA 110 Material Assets and Waste was used during the preparation of the EIAR chapter.

9.1.2 Consultation was undertaken with Mid Ulster District Council's Waste Department and the Department for the Economy to inform the assessment.

9.2 Findings

9.2.1 The current land use is predominantly agricultural land and requires minimal consumption of construction materials and minimal generation of waste for disposal to landfill.

9.2.2 Published information on the availability of the main construction materials required for the Proposed Scheme in Northern Ireland and the rest of the UK indicates that there are sufficient material resources available regionally and UK wide.

9.2.3 A review of waste recovery facilities to identify the availability of infrastructure and capacity for the transfer and recovery of Construction, Demolition and Excavation (CDE) wastes in Northern Ireland suggests that there is the potential to divert from landfill any site arisings generated by the Proposed Scheme.

9.2.4 The Proposed Scheme is anticipated to achieve a 63% overall material recovery rate of non-hazardous construction and demolition waste to substitute use of primary materials. In accordance with the significance criteria set out in DMRB LA 110 Material assets and waste standard, the effects from material resource use is considered moderate adverse and therefore significant prior to mitigation.

9.2.5 It is anticipated that 99% of the waste generated during the construction of the Proposed Scheme would be diverted from landfill and the total waste sent to landfill would result in a less than 1% reduction in regional landfill capacity which is not significant under the criteria set out in DMRB LA 110. The second iteration Environmental Management Plan (siEMP) (as part of good practice) will set out the requirement for the Principal Contractor to develop and implement a Materials Management Plan (MMP) or similar protocol, to ensure site won arisings (earthworks) meet reuse criteria. This would seek to ensure any contaminated materials are either maximally reused as part of the cut and fill earthworks or disposed of to a suitably licensed facility.

9.2.6 The second iteration EMP will also detail that the Principal Contractor will make every effort to minimise the disposal of waste (including potentially contaminated earthworks) outside of the region. This may include (depending on the type of contamination present and subject to the successful deployment of any Remediation Strategy), treatment either on or off site for subsequent disposal as non-hazardous waste. The development

and implementation of a Site Waste Management Plan (SWMP) by the Principal Contractor must set out the process to be used in the event that any contaminated earthworks are identified, and to ensure that appropriate treatment, transfer or disposal methods are implemented.

9.3 Mitigation

9.3.1 To address the potential significant effect on material resource use (moderate adverse without mitigation) additional mitigation measures will include:

- The second iteration of the Environmental Management Plan (EMP) would include requirements to maximise recycled and secondary content of materials and the reuse of site won arisings to minimise the requirement for imported (primary) resources.
- This would also include a 10% target for recycled aggregate content, where the use of recycled aggregate is feasible. This will be managed and monitored through the implementation of SWMP and MMP, or similar protocol, by the Principal Contractor.
- At the detailed design stage, the Design Team and Principal Contractor will ensure the design and specification of materials maximises the use of recycled and secondary content of materials

9.3.2 With additional measures implemented by the Principal Contractor through the second iteration EMP, SWMP and MMP it is considered that at least a 70% material reuse, recovery or recycling rate will be achieved which would result in a slight adverse effect for material assets which is not significant.

9.4 Conclusions

9.4.1 It can be concluded that:

- Sufficient material resources are available regionally;
- With additional mitigation measures, at least a 70% material reuse, recovery or recycling rate will be achieved which would result in a slight adverse effect for material assets which is not significant; and
- It is anticipated that 99% of the waste generated during the construction of the Proposed Scheme would be diverted from landfill and the total waste sent to landfill would result in a less than 1% reduction in regional landfill capacity which is not significant.

10 BIODIVERSITY (INCLUDING SHADOW HABITATS REGULATIONS ASSESSMENT)

10.1 Methodology

10.1.1 The following guidance and standards were used during the preparation of the EIAR chapter:

- Design Manual for Roads and Bridges (DMRB) LA 108 Biodiversity;
- Chartered Institute of Ecology and Environmental Management (CIEEM) Ecological Impact Assessment (EIA) Guidelines; and
- CIEEM Advice Note on the Lifespan of Ecological Reports and Surveys.

10.1.2 Consultation was undertaken with Mid Ulster District Council, DAERA, RSPB, the Woodland Trust and the Agriculture, Food and Biosciences Institute to inform the assessment.

10.1.3 The assessment of potential impacts on biodiversity (defined as plants and animals and the environment in which they live) is informed by DMRB LA 108 Biodiversity and the Chartered Institute of Ecology and Environmental Management (CIEEM) Ecological Impact Assessment guidelines.

10.1.4 Following a process of scoping in of receptors which were considered to have the potential to experience likely significant effects the assessment considered potential effects of the construction and operation of the Proposed Scheme on designated sites, habitats and species, comprising the following features:

- Upper Ballinderry River Special Area of Conservation (Freshwater Pearl Mussel and otter);
- Upper Ballinderry River Area of Special Scientific Interest;
- Cabin Wood Woodland Trust Reserve;
- Woodland and scrub including ancient and semi-natural woodland;
- Open water (including minor watercourses);
- Boundaries (including tree lines and hedgerows);
- Badger;
- Bats;
- Birds;
- Fish (Atlantic salmon, brown trout, European eel, river and brook lamprey;

- White clawed crayfish; and
- Invasive non-native species of plant.

10.1.5 The presence and extent of biodiversity receptors within the ecological survey area has been assessed by means of consultations, desk-based assessment and detailed surveys by qualified specialists, in accordance with standard survey guidance documents.

10.2 Findings

10.2.1 One of the key risks to biodiversity during the construction of the Proposed Scheme is silt laden and polluted run-off entering the Ballinderry River from construction of a new bridge crossing and diversion of the Fairy Burn. Although the Proposed Scheme is downstream of the area designated as SAC and ASSI, the species and habitats which make the river important are at risk from downstream activity. However, the construction phase will be subject to control and management measures as set out in the first iteration EMP and during operation, control measures including sensitive road lighting design and Sustainable Drainage Systems (SuDS) will mitigate the risk of light spill and uncontrolled polluted runoff. A clear span bridge will avoid the need for construction within the river.

10.2.2 Vegetation clearance including woodland and boundary features during ground clearance and earthworks would result in loss or disturbance to woodland habitat and its nesting, roosting, resting and foraging habitat for a number of species. Habitat loss will be partly offset by provision of woodland planting and new grassland, hedgerow and wetland features.

10.2.3 Section 12.6 of the EIAR provides full details of the assessment of effects, mitigation and residual effects for the construction and operation stages. Table 10.1 below summarises the conclusions of the assessments for each of the ecological features that have been scoped in to the assessment.

Table 10.1 – Significance of Construction and Operation Stage Effects on Ecological Features

Ecological Feature	Construction Stage Significance	Operation Stage Significance
Upper Ballinderry River Special Area of Conservation (Freshwater Pearl Mussel and otter)	Slight adverse	Slight adverse
Upper Ballinderry River Area of Special Scientific Interest	Neutral	Slight adverse
Cabin Wood Woodland Trust Reserve	Neutral	Neutral

Ecological Feature	Construction Stage Significance	Operation Stage Significance
Woodland and scrub including ancient and semi-natural woodland	Slight adverse	Neutral
Open water (including minor watercourses)	Slight adverse	Neutral
Boundaries (including tree lines and hedgerows)	Slight adverse	Neutral
Badger	Slight adverse	Slight adverse
Bats	Slight adverse	Slight adverse
Birds	Slight adverse	Slight adverse
Fish (Atlantic salmon, brown trout, European eel, river and brook lamprey)	All slight adverse except brook lamprey which is neutral or slight adverse	All neutral
White clawed crayfish	Slight adverse	Neutral
Invasive non-native species of plant.	Neutral	Neutral

10.2.4 The shadow Habitats Regulations Assessment (sHRA) also concluded that with the application of appropriate mitigation measures in which there is a high degree of confidence, the Proposed Scheme both on its own and in combination with other plans or projects will not result in adverse effects on site integrity of the Upper Ballinderry River SAC.

10.3 Mitigation

10.3.1 Mitigation is required where either:

- The ecological feature is legally protected and it is mandatory to provide measures to ensure an offence is not committed; and/or
- Because significant (in EIA terms) effects have been identified in the assessment process.

10.3.2 Mitigation measures which will be implemented to reduce adverse impacts of the Proposed Scheme on species include:

- Fencing to guide species away from the carriageway;
- Mammal tunnels and culverts adapted for mammal passage to allow

safe crossing;

- Measures to encourage safe crossings for bats;
- Replacement roosting habitat for bats and resting sites for otter and badger as appropriate (under licence);
- Timing of works to avoid sensitive periods for migratory and spawning fish;
- Avoidance and management of invasive species of plant, together with biosecurity measures to avoid their inadvertent spread; and
- Implementation of best practice measures as set out in a second iteration EMP.

10.4 Conclusions

10.4.1 The assessment of ecological effects as part of the EIA has concluded that with mitigation in place there would be no significant effects during construction or operation of the scheme. Slight adverse effects (not significant) during the operation stage are predicted on the Upper Ballinderry River SAC and ASSI, badger, bats and birds.

10.4.2 The shadow Habitats Regulations Assessment (sHRA) also concluded that there would be no adverse effects on site integrity of the Upper Ballinderry River SAC.

11 NOISE AND VIBRATION

11.1 Methodology

11.1.1 The following guidance and standards were used during the preparation of the EIAR chapter:

- British Standard 5228 parts 1 and 2 (for construction noise and vibration);
- Calculation of Road Traffic Noise 1988 (CRTN);
- DMRB, LA 111 Noise and Vibration; and
- Director of Engineering Memorandum 164/17, Noise Insulation Regulations (NI) Guidance (DEM 164/17).

11.1.2 Baseline noise surveys were completed in June 2019 at ten locations representative of sensitive receptors near the Proposed Scheme corridor and Sandholes Road and are appropriate to describe the noise climate in the area of the Proposed Scheme. The survey method and locations were agreed with the Mid Ulster District Council Environmental Health Team prior to the surveys taking place.

11.1.3 The assessment has focused on the likely effects associated with the construction and operation of the Proposed Scheme due to noise and vibration. The assessment has focused on dwelling receptors, non-dwelling buildings considered sensitive and other public amenity spaces.

11.1.4 Geographic Information Systems (GIS) tools and spreadsheets have been used to apply the BS 5228 calculation methods to predict construction noise and vibration levels for each work stage given an assumption of the likely plant which would be used and the distance from each work area to the nearest receptors.

11.1.5 Specialist 3D noise modelling software has been used to assess the impacts and effects of changes in road traffic noise levels at sensitive receptors as a result of the operation of the Proposed Scheme.

11.2 Findings

11.2.1 The noise model has been run for the year of opening without the scheme in operation and found that the 561 dwelling receptors experiencing the highest existing road traffic noise levels are those with facades closest to the busiest existing roads, primarily:

- The A29 through Cookstown – Moneymore Road through to Dungannon Road;
- Morgans Hill Road, through Westland Road and Westland Road South; and

- The A505 Drum Road.

11.2.2 The assessment of impacts and effects associated with construction noise has demonstrated that, with appropriate best working practice and mitigation measures to be incorporated into the second iteration EMP, the construction of the Proposed Scheme would not cause significant effects at the nearest receptors to the works.

11.2.3 The assessment of impacts and effects associated with construction vibration has found that temporary significant effects are likely to occur at two receptor locations close to the Otter Lodge and Ballinderry River piling works. Measures to mitigate these effects are provided in Section 11.3.

11.2.4 The assessment of impacts and effects associated with road traffic noise in the operational phase of the Proposed Scheme has found that there are predicted to be more significant beneficial effects than significant adverse effects due to the alleviation of traffic currently using the A29 through Cookstown rerouting onto the Proposed Scheme.

11.2.5 With the introduction of mitigation measures it is predicted that major adverse effects would occur at 31 dwellings (daytime) (compared to 80 dwellings without mitigation), 115 dwellings (night-time) (compared with 220 dwelling without mitigation) and 5 non–dwelling receptors (compared with 6 without mitigation).

11.2.6 Two dwellings (39 Castle Road and 26A Dungannon Road) would potentially qualify under the Noise Insulation Regulations (Northern Ireland) in the absence of mitigation. With the provision of the proposed mitigation (screening earth bunds, 2m noise barriers and low noise surfacing) the noise levels are predicted to reduce to below the qualifying level.

11.3 Mitigation

11.3.1 For the construction phase, mitigation would comprise temporary noise barriers where appropriate, best practice construction methods through implementation of a siEMP and noise monitoring during construction.

11.3.2 In relation to piling, alternative piling methods would be investigated, further detailed assessment, test piling and vibration monitoring would also be required.

11.3.3 Where significant adverse operational noise effects are predicted, the implementation of mitigation through low noise surfacing and targeted 2 metre high noise barriers have been included within the Proposed Scheme design and assessed. A total length of 1695m of noise fencing barriers at 6 locations were detailed in the EIAR. The noise barrier locations and extents detailed in the EIAR are shown on Figure 10.9 of Volume 3 and detailed in Table 3.12 of Volume 1 of the EIAR. Since submission of the EIAR an additional 2.0m high noise barrier has been provided on Coagh Road from approximately Chainage 2425 to Chainage 2550 (southbound / eastern side).

11.3.4 These measures would reduce the number of significantly affected receptors as far as reasonably practicable.

11.4 Conclusions

11.4.1 The assessment of construction noise has determined that with mitigation there would be no significant effects on receptors. Temporary significant vibration effects are likely to occur at two receptor locations close to the Otter Lodge and Ballinderry River piling works. Further mitigation measures would be investigated prior to piling taking place.

11.4.2 For the operational phase there would be more significant beneficial effects than significant adverse effects and no properties are expected to qualify for noise insulation with the provision of mitigation measures such as bunding, barriers and low noise surfacing.

12 POPULATION AND HUMAN HEALTH

12.1 Methodology

12.1.1 The following guidance and standards were used during the preparation of the EIAR chapter:

- Design Manual for Roads and Bridges (DMRB) LA 112 Population and human health; and
- DMRB LA 104 Environmental assessment and monitoring.

12.1.2 Consultation was undertaken with the Department for Health, Harps Cycling Club, Mid Ulster District Council, Mid Ulster Walking Club, Positive Steps Community Centre, Public Health Agency, Sustrans and Ulster Federation Rambling Clubs to inform the assessment.

Land Use and Accessibility

12.1.3 The land use and accessibility assessment has focused on likely impacts and effects associated with land take, demolition of private property, agricultural land holdings, farms, land used by the community and development land.

Human Health

12.1.4 The human health assessment focused on likely impacts and effects on the health outcomes within Cookstown and the surrounding communities associated with the Proposed Scheme, utilising information from other environmental topic chapters.

12.2 Findings

Land Use and Accessibility

12.2.1 During the construction phase, permanent land take from seven private properties and one housing allocation (H24) would have a significant effect. There is also likely to be a significant effect to the community asset, Killymoon Golf Course, due to permanent land take required for the Proposed Scheme, and a loss of amenity during construction. The Golf Club has entered into discussions to acquire additional land and reconfigure the course prior to the start of construction in order to maintain a Par 70 course, equal and equivalent in standard to the existing course. Land and Property Services (LPS) will act on behalf of the Department to assess fair and equitable compensation.

12.2.2 The Proposed Scheme would also have a significant effect on 25 business premises accessed by Sandholes Road, and four other businesses, during the construction phase due to temporary disruption to access. Where practicable during construction, existing access to business premises would remain open or partially open. Alternative access would be provided if the current access is inhibited, through discussion and agreement with the

business premises. Should alternative access be required during construction, access measures regarding temporary supervised traffic control to the business premises would be added to a Traffic Management Plan and appropriate signage provided.

12.2.3 The assessment of agricultural land holdings has demonstrated that 21 farms would be affected in total, with impacts ranging from slight to moderate adverse (significant) being assessed. Measures to mitigate the effects on individual farms have been embedded in the design of the Proposed Scheme to ensure continual agricultural access to land during construction and operation of the Proposed Scheme. Measures have been included for alternative access where the Proposed Scheme would sever existing fields or access to parts of a farm. Existing farm infrastructure such as water supply and drainage networks would also be maintained as far as practicable during construction. Such works would be agreed with farm owners prior to the start of construction.

12.2.4 The assessment has considered the likely impacts and effects on journeys undertaken by pedestrians, cyclists and equestrians and users of local roads for recreation and to access facilities within Cookstown and the surrounding communities. The assessment has identified 12 locations where alternative routes would increase journey length. However, it has been concluded that none of these diversions would constitute a significant effect.

12.2.5 Pedestrian and cyclist provision as part of the Proposed Scheme includes a 3.0m wide shared footway/cycleway along the length of the bypass, 3.0m shared footway/cycleway on Sandholes Link Road connecting Sandholes Road to the A505 Drum Road, and a toucan crossing providing pedestrian access to Cabin Wood walk. Active travel crossings have been provided at five locations: Loughry Roundabout, Castle Road, Killymoon Roundabout Footbridge, Cloghog Road and the Moneymore Roundabout Footbridge. Two underpasses have also been provided along abandoned railway lines (between Moneymore Road and Old Coagh Road, and also south of Festival Park) for the potential future development of Greenways.

Human Health

12.2.6 The human health assessment focused on likely impacts and effects on the health outcomes within Cookstown and the surrounding communities associated with the Proposed Scheme, utilising information from other environmental topic chapters.

12.2.7 With respect to the construction of the Proposed Scheme, negative effects on health outcomes associated with physical activity, accessibility and social cohesion remains were identified where footways and cycleways would need to be temporarily closed. Negative health outcomes associated with the mental health of users of several of these routes were also identified, as construction works would create potentially unsightly views. However, both effects are likely to be temporary and limited to when construction is ongoing.

12.2.8 During construction, no effects were identified regarding health outcomes associated with respiratory, cardiovascular and other health outcomes relating to lower air quality or increased noise and vibration levels following the consideration of mitigation measures proposed through the air quality and noise and vibration assessments.

12.2.9 Regarding the operation of the Proposed Scheme, positive and negative effects were identified for a number of health outcomes related to physical activity, accessibility and active travel. The Proposed Scheme would promote positive outcomes through the provision of underbridges, overbridges, crossings at new junctions, and new shared footways and cycleways. However, the Proposed Scheme may also decrease the tranquility and sense of place east of Cookstown.

12.2.10 Using information gathered from the noise and vibration and air quality assessments, it was determined that there would be both positive and negative effects on their associated health outcomes during the operation of the Proposed Scheme. In many locations, overall air quality would improve, and noise and vibration levels would reduce during operation, however in a minority of locations air quality would decrease and noise levels would increase.

12.2.11 The landscape and visual amenity assessment identified locations where views may be negatively affected by the Proposed Scheme, resulting in negative effects on health outcomes associated with visual amenity and sense of place. However, the permanent changes on visual amenity are expected to reduce over time as landscaping matures and residents adapt to the changes.

12.3 Mitigation

12.3.1 The mitigation measures are described above and in other topic sections but in summary include:

- Ongoing discussions between the Department and Killymoon Golf Club and through Land and Property Services (LPS) to carry out an assessment of fair and equitable compensation;
- Maintaining or providing alternative accesses for businesses during construction including, preparation of a Traffic Management Plan and provision of appropriate signage;
- Provision of continued access and if necessary alternative farm accesses during construction and operation;
- Maintaining farm infrastructure such as water supply and drainage networks as far as practicable and providing alternative provision as necessary; and
- Provision of a shared footway/cycleways, a toucan crossing, active travel crossings and underpasses.

12.4 Conclusions

12.4.1 With regards to land use and accessibility:

- Permanent land take from seven private properties and one housing allocation (H24) would have a significant effect. There is also likely to be a significant effect to the Killymoon Golf Course;
- Certain business premises would experience a significant effect during the construction phase due to temporary disruption to access;
- 21 farms would be affected in total, with impacts ranging from slight to moderate adverse (significant); and
- Pedestrian and cyclist provision and active travel crossings would provide positive outcomes.

12.4.2 With regards to the human health assessment:

- Temporary negative effects relating to accessibility were predicted during the construction phase;
- The Proposed Scheme would promote positive outcomes through the provision of underbridges, overbridges, crossings at new junctions, and new shared footways and cycleways. However, the Proposed Scheme may also decrease the tranquillity and sense of place east of Cookstown;
- In many locations, principally due to the removal of traffic through Cookstown, overall air quality would improve, and noise and vibration levels would reduce during operation, however in a minority of locations air quality would decrease and noise levels would increase.

13 ROAD DRAINAGE AND THE WATER ENVIRONMENT (INCLUDING FLOOD RISK)

13.1 Methodology

13.1.1 The following key guidance and standards were used during the preparation of the EIAR chapter:

- Design Manual for Roads and Bridges (DMRB LA 113 Road Drainage and the Water Environment;
- DMRB CD 529 (Design of outfall and culvert details);
- DMRB CD 356 (Design of highway structures for hydraulic action);
- DMRB LA 104 Environmental assessment and monitoring;
- DfI Water & Drainage Policy Division (February 2019), Technical Flood Risk Guidance in Relation to Allowances for Climate Change in Northern Ireland.

13.1.2 A number of other guidance documents were also used including those published by DFI, NIEA, Construction Industry Research Information Association, Scottish Executive, Scottish Environment Protection Agency and Highways England (now National Highways). Full details are provided in the EIAR.

13.1.3 Consultation was undertaken with the Department for Infrastructure, Department for Economy, DAERA and Northern Ireland Water to inform the assessment.

13.2 Findings

13.2.1 The Proposed Scheme crosses the Ballinderry River and a number of its tributaries including the Fairy Burn. Further watercourses include Fountain Road and Molesworth stormwater drains. There are a number of undesignated watercourses in the vicinity of Claggan Lane towards the northern end of the Cookstown Bypass and in the vicinity of Old Coagh Road, collectively these groups of watercourses are known as Claggan Lane watercourses and Old Coagh Road watercourses, respectively. Two groundwater bodies are noted within the study area; Cookstown and Moneymore.

13.2.2 The design event for the scheme was agreed with DfI as the 1% Annual Exceedence Probability (AEP) event plus 35% climate change allowance.

13.2.3 The flood risk extent and depth for the 1% AEP event plus 35% climate change allowance was assessed using a hydraulic model of the Ballinderry River and tributaries. It was established that there are two distinct areas where the Proposed Scheme interacts with watercourses within the extent of the Ballinderry River and tributaries hydraulic model. The first area is centred on the confluence of the Fairy Burn with the Ballinderry River where

the proposed Ballinderry bridge crossing is located, and Fairy Burn will be diverted. The second area is further north around the confluence of Molesworth Road Stormwater Drain and Fountain Road Stormwater Drain where there are minor watercourse diversions and a new culvert under the Cookstown Bypass.

13.2.4 The results near the proposed crossing on the Ballinderry River indicate an increase of up to 147mm in maximum water level immediately upstream of the new structure. Downstream, the impact of the Proposed Scheme on peak flood depths is “Minor Adverse” or “Beneficial”. The Ballinderry River floodplain is adversely impacted, and this is classified as “Major Adverse” impact for magnitude of flood risk.

13.2.5 The impact of the Proposed Scheme on the diverted Fairy Burn has no change in peak water levels upstream of the existing Loughry roundabout culvert. Any increase is within the proposed diversion only and there are no properties impacted and no increase in flood extent. The overall significance is therefore “Neutral” for the Fairy Burn.

13.2.6 There are no surface or groundwater fed supplies within the study area.

13.2.7 The risk of flooding from sewers and artificial sources is assessed as low and should have no impact.

13.2.8 With the implementation of embedded and secondary mitigation, no significant impacts have been identified for almost all sensitive receptors, with the exception being fluvial geomorphological (river process and form) effects at a number of watercourses during the operational phase which would be significant

13.2.9 With appropriately designed crossing structures to minimise in-channel works and application of good site environmental management practice the likelihood, magnitude and timeframe of any construction pollution incidents would be reduced.

13.3 Mitigation

13.3.1 Embedded mitigation within the design of the Proposed Scheme includes three levels of treatment for the A29 mainline road drainage to remove pollutants and good practice principles applied to the design and construction of watercourse realignments to maintain flows and sediment processes within watercourses.

13.3.2 Other measures include temporary construction drainage and sediment control measures to avoid deterioration in water quality and measures to protect private water supplies.

13.3.3 Flood mitigation for the Ballinderry River consists of a 174m long flood wall to protect the property on the north bank of the Ballinderry River upstream of the proposed bridge crossing. The top wall level is at approx. 41.5m Above Ordnance Datum to protect against 1%AEP+35% climate change allowance water level with 600mm freeboard.

13.3.4 There would also be 3,166m^3 of compensatory flood storage created to offset the loss of floodplain due to the Proposed Scheme.

13.3.5 Alternative flood risk mitigation was considered to offset the impact of the scheme. These comprised of crossing and diversion options for the Ballinderry River and Fairy Burn and compensatory storage options.

13.3.6 Various bridge sizes were tested ranging from 27m-52m. The adverse impacts were not mitigated with the larger spans and the ground conditions are poor where the existing Fairy Burn watercourse flows into the Ballinderry River leading to construction constraints. The 27m span bridge option was taken forward as the most appropriate for the Scheme.

13.4 Conclusions

13.4.1 With the implementation of embedded and secondary mitigation the only significant effects on water quality and flood risk relate to fluvial geomorphological (river process and form) effects.

14 OVERALL CONCLUSION

14.1.1 The EIAR summarises the environmental assessment carried out in accordance with National and European regulatory requirements.

14.1.2 The environmental assessment has been undertaken following the standard methodologies set out in the DMRB Volume 11 (Environmental Assessment).

14.1.3 The gathering of baseline environmental data and subsequent assessment of the potential environmental impacts of the proposed development have been used to develop appropriate mitigation measures. Many of these mitigation measures are incorporated into the design of the Proposed Scheme and reduce the impacts of the proposal.

14.1.4 It is accepted that the proposed development would have various adverse environmental impacts, however given the nature and scale of the proposed development, with mitigation measures in place, it can be concluded that on balance these impacts overall are acceptable and the Proposed Scheme integrates relatively well into the existing environment.