5. Overview of the Assessment Process

5.1. Introduction

5.1.1. This chapter outlines the general approach followed for the Environment Impact Assessment (EIA) of the Proposed Scheme in accordance with the Design Manual for Roads and Bridges (DMRB) and other relevant guidance.

5.2. Scope and Guidance

5.2.1. The aims of EIA are to:

- gather information about the existing environmental conditions in the study area and identify environmental constraints and opportunities which may influence, or be affected by the Proposed Scheme
- identify and assess potential environmental impacts that may arise from the construction and/or operation of the Proposed Scheme and
- identify and incorporate into the Proposed Scheme design, operation and maintenance, features and measures to avoid or mitigate adverse impacts.

Design Manual for Roads and Bridges (DMRB)

5.2.2. DMRB Volume 5, Section, Part 2, TD37/93 'Scheme Assessment Reporting' sets out the general requirements for the reporting of scheme assessments at the various stages of scheme development. The document provides guidance on the assessment objectives of each stage, the topic areas that are to be assessed and how the information should be presented. TD37 outlines three stages of assessment, comprising Stage 1, Stage 2 and Stage 3.

5.2.3. DMRB TD37 'Scheme Assessment Reporting' sets out the process to be followed for the preparation of major trunk road projects. This considers three levels of assessment, comprising Stage 1, Stage 2 and Stage 3. The environmental objectives of each stage are identified in Table 5.1 - DMRB Stages of EIA.

Table 5.1 - DMRB Stages of EIA

Stage	Objectives
Stage 1	Identify the environmental, engineering, economic and traffic advantages, disadvantages and constraints associated with broadly defined improvement strategies.
Stage 2	Identify the factors to be taken into account in choosing alternative routes or improvement schemes and to identify the environmental, engineering, economic and traffic advantages, disadvantages and constraints associated with those routes or schemes.
Stage 3	Identify clearly the advantages and disadvantages, in environmental, engineering, economic and traffic terms, of the Overseeing Department's preferred route or scheme option. A particular requirement at this stage is an assessment of the significant environmental effects of the project, in accordance with the requirements of section 105A of the Highways Act 1980 (England and Wales), Section 20A and 55A of the Roads (Scotland) Act 1984, or Article 39B of the Roads (Northern Ireland) Order 1980, implementing EC Directive 85/337.

5.2.4. It is noted that DMRB TD37 has been withdrawn from the suite of DMRB standards, however it is still applicable to trunk road projects in Scotland.

5.2.5. Further guidance on the EIA process which has been adhered to throughout the EIA is contained in Transport Scotland's Environmental Impact Assessment Guidance.

EIA Screening

5.2.6. The EIA screening process was undertaken taking into account the provisions of the EIA Regulations and this process confirmed and recorded the requirement for a statutory EIA for the Proposed Scheme. Volume 4, Appendix 1.1 Record of Determination formally records the screening process.

Scope of the Environmental Impact Assessment

5.2.7. In accordance with the DMRB, assessment has been undertaken of the environmental topics presented in Table 5.2 and reported in chapters 7 to 20. The scope of the assessment was detailed in the EIA Scoping Report which was issued to the statutory consultees for their review and comment (further detail can be found in Chapter 6: Consultation and Scoping).

5.2.8. The following standards provide guidance on EIA for trunk roads including the level of assessment at key stages of development and reporting of environmental effects:

- DMRB LA 101 – Introduction to environmental assessment
- DMRB LA 102 – Screening projects for Environmental Impact Assessment
- DMRB LA 103 – Scoping projects for environmental assessment
- DMRB LA 104 – Environmental assessment and monitoring
- DMRB LA 120 – Environmental management plans

5.2.9. Concerning the structure of the assessment, DMRB LA 104 provides guidance on the approach to environmental assessment in line with the requirements of the EIA Directive. Consistent with DMRB LA 104, consideration of relevant policies and plans has been undertaken within technical chapters.

Table 5.2 - Environmental Topics Assessed in Chapters 7 to 20 and the relevant DMRB Standards

Chapter / Topic	Relevant DMRB Standards
Chapter 7 – Air Quality	DMRB LA 105 – Air quality
Chapter 8 – Cultural Heritage	DMRB LA 106 – Cultural heritage assessment DMRB LA 116 – Cultural heritage asset management plans
Chapter 9 – Landscape	DMRB LA 107 – Landscape and visual effects

Chapter / Topic	Relevant DMRB Standards
Chapter 10 – Visual Effects	DMRB LA 107 – Landscape and visual effects
Chapter 11 – Biodiversity	DMRB LA 108 – Biodiversity DMRB LA 115 – Habitats Regulations assessment
Chapter 12 – Geology and Soils	DMRB LA 109 – Geology and soils
Chapter 13 – Materials and Waste	DMRB LA 110 – Material assets and waste
Chapter 14 – Noise and Vibration	DMRB LA 111 – Noise and vibration
Chapter 15 – Population and Human Health	DMRB LA 112 – Population and human health
Chapter 16 – Effects on Climate	DMRB LA 114 – Climate
Chapter 17 – Climate Vulnerability	DMRB LA 114 – Climate
Chapter 18 – Major Accidents and Disasters	No specific DMRB Standard relevant, best practice guidance has been utilised given the nature of the Proposed Scheme and its location
Chapter 19 – Road Drainage and the Water Environment	DMRB LA 113 – Road drainage and the water environment
Chapter 20 – Cumulative Effects	DMRB LA 104 – Environmental assessment and monitoring

5.2.10. It should be noted that LA 104 'Environmental assessment and monitoring' states that "*Heat and Radiation is unlikely to be relevant to the scope of most motorway*

and all-purpose trunk road projects". No significant environmental effects are expected in relation to the emission of heat and radiation and as such this topic is not covered further within this EIA Report.

5.2.11. The design life of the proposed structures would be 120 years in accordance with structural Eurocodes. Should the Proposed Scheme be decommissioned at the end of its operational life, effects are expected to be similar to construction phase effects. Therefore, effects for decommissioning phase of the Proposed Scheme have not been assessed further within this EIA Report.

Study Area

5.2.12. The study area used varies depending on the environmental factors being assessed and has been determined based on the requirements or recommendations of the DMRB, good practice guidelines and the use of professional judgement. Study areas are described in relevant chapters for each of the environmental factors, where appropriate.

5.3. The Assessment Chapters

Chapter Structure

5.3.1. The assessment of impacts in Chapters 7 to 19 has been undertaken in accordance with the following process:

- an introduction which outlines the subject area
- approach and methods of assessment, which outlines the regulations and guidance that have been taken into account during the assessments and details the methodologies adopted for the various assessments of the baseline environment and potential impacts. Any assumptions / limitations to the work undertaken are also detailed.
- a description of the baseline conditions of the study area
- a description of the predicted beneficial and adverse effects and an assessment of their significance
- identification of mitigation measures and

- a description of residual effects, inclusive of any measures required to monitor any residual significant effects.

General Approach

Baseline Conditions

5.3.2. The impact assessment for each environmental factor has been undertaken in comparison with the 'baseline' situation. The 'baseline' refers to the existing site conditions and how these are predicted to change if the Proposed Scheme did not proceed. Baseline information has been gathered through site visits, the review of maps, data collection, consultation with statutory and non-statutory organisations, and field surveys. Details of field surveys and modelling requirements are set out in each of the technical chapters of the EIA Report.

5.3.3. In accordance with DMRB LA 104 the assessment has considered how the current baseline conditions may change in the future without the presence of the Proposed Scheme (with assumptions), known as the future baseline. Consideration has been given, in descriptive terms, within each topic chapter to likely significant effects arising in relation to the future baseline. Full details of the methodology and future baseline scenarios are provided in Chapters 7 to 19 as appropriate.

Defining Assessment Years / Scenarios

5.3.4. Effects have been assessed and reported by comparing a scenario with the Proposed Scheme against one without the Proposed Scheme with the temporal scenarios reported in each of the technical chapters with the EIA Report. The baseline year and future year assumptions are reported in the methodology section of each technical chapter with the baseline representing the conditions prior to implementation of the Proposed Scheme.

Potential Impacts

5.3.5. Potential impacts arising from the Proposed Scheme during construction and operation have been identified and described, and an assessment of the level of significance for each impact determined as far as practical. Impacts during construction are considered to be those resulting from the removal of road,

construction of debris flow shelter and associated catch-pits, new carriageway and associated junction, redevelopment of the Rest and Be Thankful (RABT) car park, construction of Proposed Scheme drainage etc. operational impacts are those following Proposed Scheme opening, resulting from the presence of the renewed carriageways and infrastructure.

5.3.6. Significance varies according to the environmental aspect and the context in which the assessment is made and depends to a large degree on the availability of data relating to existing environmental conditions and the value applied to these conditions. However, in general, the level of significance of effect has been defined using a combination of the sensitivity of the environmental feature and the magnitude of impact. The significance of effect has been defined for each environmental factor in the relevant chapter of the EIA Report.

5.3.7. Sensitivity has generally been defined according to the relative value or importance of the feature/receptor, and the magnitude of impact has been determined by reference to any legislative or policy standards or guidelines, and the following factors:

- the degree to which the environment is affected, e.g. whether the quality is enhanced or impaired
- the scale of the change, e.g. the size of land area or number of people affected and degree of change from the existing situation
- the scale of change resulting from impacts and
- whether the effect is temporary or permanent.

5.3.8. Where alternative approaches to the above were considered to be more appropriate these are described in the respective chapters.

5.3.9. The nature of impacts may vary and may be direct or indirect, secondary, short, medium or long-term, permanent or temporary and positive or adverse. These types of impacts have all been considered. Consideration has also been given to the potential for cumulative/interactive effects associated with the Proposed Scheme (refer to Volume 2, Chapter 20: Cumulative Effects). In a broad sense, cumulative effects refer to the accumulation of effects on the environment relative

to other past, present or foreseeable actions that occur in an additive or interactive manner.

5.3.10. Tables 5.3 to 5.6 set out the criteria defined in DMRB LA104 for assigning value, magnitude of impact and significance. It should be noted that where relevant individual environmental topics have defined any variations to these criteria within their respective assessment chapters.

Table 5.3 – Typical Environment value (sensitivity) and descriptions

Value (Sensitivity) of Receptor / Resource	Typical Description
Very High	Very high importance and rarity, international scale and very limited potential for substitution.
High	High importance and rarity, national scale, and limited potential for substitution.
Medium	Medium or high importance and rarity, regional scale, limited potential for substitution.
Low	Low or medium importance and rarity, local scale.
Negligible	Very low importance and rarity, local scale.

Table 5.4 – Typical magnitude of impact and typical descriptions

Magnitude of Impact (Change)	Typical Description
Major Adverse	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements
Moderate Adverse	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements.
Minor Adverse	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.
Negligible Adverse	Very minor loss or detrimental alteration to one or more characteristics, features or elements.
No Change	No loss or alteration of characteristics, features or elements; no observable impact in either direction.
Negligible Beneficial	Very minor benefit to or positive addition of one or more characteristics, features or elements.
Minor Beneficial	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Moderate Beneficial	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Major Beneficial	Large scale or major improvement of resource quality; extensive restoration; major improvement of attribute quality

Table 5.5 – Significance categories and typical descriptions

Significance Categories	Typical Description
Very Large	Effects at this level are material in the decision-making process.
Large	Effects at this level are likely to be material in the decision-making process.
Moderate	Effects at this level can be considered to be material decision-making factors
Slight	Effects at this level are not material in the decision-making process.
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Table 5.6 – Significance matrix (Value / Impact Magnitude)

No data	Magnitude – No Change	Magnitude – Negligible	Magnitude – Minor	Magnitude – Moderate	Magnitude – Major
Value – Very High	Neutral	Slight	Moderate / Large	Large / Very Large	Very Large
Value – High	Neutral	Slight	Slight / Moderate	Moderate / Large	Large / Very Large
Value – Medium	Neutral	Neutral / Slight	Slight	Moderate	Moderate / Large
Value – Low	Neutral	Neutral / Slight	Neutral / Slight	Slight	Slight / Moderate
Value – Negligible	Neutral	Neutral	Neutral / Slight	Neutral / Slight	Slight

Mitigation

5.3.11. The approach to the mitigation of adverse environmental effects has been to avoid them wherever possible. This can be achieved by consideration of ways in which to prevent adverse effects through an iterative approach to the design process, rather than relying on measures to mitigate the effects (e.g. careful design of earthworks, or incorporation of access arrangements for vehicles or pedestrians into the design).

5.3.12. The hierarchy of mitigation measures has been developed based on guidance provided in the DMB LA 104 as reproduced in Table 5.7 – Hierarchy of Mitigation below.

Table 5.7 - Hierarchy of Mitigation

Level of Mitigation	Definition
Avoidance and Prevention	Design and mitigation measures to prevent the effect (e.g. alternative design options or avoidance of environmentally sensitive sites)
Reduction	Where avoidance is not possible, then mitigation is used to lessen the magnitude or significance of effects.
Remediation	Where it is not possible to avoid or reduce a significant adverse effect, these are measures to offset the effect.

5.3.13. In addition to the mitigation hierarchy the EIA Report also includes details of the following categories of mitigation:

- Embedded - project design principles adopted to avoid or prevent adverse environmental effects and
- Essential - measures required to reduce and if possible offset likely significant adverse environmental effects, in support of the reported significance of effects in the environmental assessment.

5.3.14. Where complete prevention of potential impacts is not feasible, measures are proposed to minimise or reduce potentially significant effects through abatement

measures either at source, at the site, or at the receptor (for example, planting to screen elements of infrastructure which may adversely affect views from sensitive receptors). The level at which effects are considered 'significant' depends on the environmental parameter assessed, but generally effects of 'Moderate' or greater significance are identified as priorities for mitigation.

5.3.15. Where potentially adverse effects cannot be prevented or reduced, consideration has been given to the specification of measures to be included in subsequent Contract Requirements that offset or, in certain circumstances, compensate for any damage.

Environmental Enhancement

5.3.16. Enhancement measures are considered to be over and above any avoidance, mitigation and compensation measures required to remove the adverse impacts of the Proposed Scheme. Where possible opportunities for environmental enhancements have been explored as part of the Proposed Scheme and have been reported within the relevant technical chapter of the EIA Report (refer to chapters 7 to 19 for detail).

Residual Effects

5.3.17. The residual effects sections report the significance of the impacts remaining with the adoption of the mitigation measures specified in the EIA Report. Where there is any uncertainty as to whether a specific measure can be successfully implemented, or the precise details of mitigation cannot be defined at present (for example, if the results of further investigations are required), this is clearly stated, and the range of potential impacts with and without mitigation are defined.

Monitoring

5.3.18. Where the technical assessments conclude that significant adverse environmental effects are likely to occur, proportionate monitoring of associated mitigation measures has been detailed. The purpose of monitoring is to:

- ensure measures envisaged to avoid, prevent or reduce and, if possible, offset significant adverse effects on the environment are delivered

- build data on the effectiveness of design and mitigation measures thereby driving improvement in environmental performance for future projects
- satisfy licence / permit requirements (where applicable) and
- identify remedial action as a consequence of underperformance or failure of mitigation.

5.4. Proposed Scheme Design Modifications

5.4.1. The assessment of impacts and the identification of mitigation measures are based on the DMRB Stage 3 Proposed Scheme design. This design information, provided in Volume 2, Chapter 4: The Proposed Scheme, may be refined during a subsequent detailed design stage and prior to and during construction. This may result in some changes to the design and the environmental mitigation measures defined in the EIA Report to address predicted environmental effects. However, the design of the Proposed Scheme must be developed in a manner such that there is no material change to the effects of the Proposed Scheme on the environment as reported in this EIA Report. The design will still be deemed to comply with this EIA Report provided that any refinements are subject to environmental review to ensure that the effects would be no worse than those reported in this EIA Report. The findings of any such review should be subject to approval by Transport Scotland and where necessary opinions should be sought from the statutory bodies.

5.5. Coordinated Assessment with Habitats Regulations Appraisal

5.5.1. Whilst the overarching objectives of EIA and Habitats Regulation Appraisal (HRA) are similar, the scope, level of detail and terminology vary. However, assessment presented within the EIA Report has been developed to ensure that the needs of the HRA process has been considered to ensure a coordinated assessment compliant with other regulatory requirements.

5.5.2. HRA is required in Scotland by Regulation 48 of The Conservation (Natural Habitats, &.c) Regulations 1994 (as amended) (The 'Habitats Regulations') for all plans and projects which may have a 'likely significant effect' (LSE) on a European Site either 'alone' or 'in combination' with other plans or projects and are not

directly connected with or necessary to the management of the European Site. The HRA for the Proposed Scheme is reported in Volume 4, Appendix 11.1 Report to Inform Habitats Regulations Appraisal.

5.6. Limitations and Assumptions

5.6.1. DMRB LA 104 stipulates that the EIA Report must include:

- "1) a description of the main difficulties encountered in compiling the required information and
- 2) the main uncertainties involved in the forecasting methods or evidence".

5.6.2. Where there are uncertainties, limitations or assumptions used within the preparation of the EIA Report technical chapters these are clearly identified (refer to chapters 7 to 19 for further information). The key assumptions that have been made in producing this EIA Report are set out below:

- Information received from third parties is accurate, complete and up to date unless stated otherwise.
- Potential impacts and their effects cannot be predicted with absolute certainty. The assessments carried out are based on the best information available at the time of writing and have followed appropriate, industry recognised guidance and techniques wherever possible.
- The assessments presented in this EIA Report have been based on the description of the Proposed Scheme as presented in Chapter 4: The Proposed Scheme. There is the potential for some variations to the Proposed Scheme as part of detailed design. In some instances, a worst-case assessment has been undertaken to account for potential design variation. Information on these can be found within technical chapters 7 to 19.
- The construction elements (detailed in Chapter 4: The Proposed Scheme), are indicative and based on the available information at the time of writing, which will be revised by the Appointed Contractor.
- The location of site compounds for the Proposed Scheme has not been determined nor assessed within this EIA Report as these will be identified and

decided by the Appointed Contractor. The Appointed Contractor will be required to negotiate with the relevant landowner should land be required outwith the land identified for the Proposed Scheme itself and the Contractor's proposals shall be subject to appropriate planning permission.

5.6.3. The exact procurement route and form of contract is still to be determined, however it is anticipated that a Design and Build (D&B) style contract is used. The nature of the style contract means that the Appointed Contractor has the opportunity to bring innovation or cost savings and further develop the design, but within the stipulations of the Contract which include environmental commitments as well as other construction and design commitments. Additionally, as the EIA and EIA Report have been completed prior to ground investigation being completed, there is a degree of uncertainty relating to the current design assumptions.

5.6.4. To assist with this uncertainty, the design and EIA have been undertaken based upon a 'realistic worst case' scenario in order to determine the environmental impacts of the Proposed Scheme. As long as the technical and engineering designs fall within the boundaries of the Proposed Scheme as defined in Chapter 4: The Proposed Scheme, and the EIA process has considered the impacts of that design and associated Proposed Scheme boundary and provides robust and justifiable conclusions, then it is considered the conclusions are permissible within the terms of any consent granted, i.e. if consent is granted based upon the Proposed Scheme design and associated land-take requirements then any deviations to this that are considered equal to or less than those assessed is permitted to be constructed.