5 Approach and Methods

5.1 Legislation and Guidance

5.1.1 This ES has been prepared in accordance with the requirements of the Roads (Scotland) Act 1984 and Directive 2011/92/EU on the effects of certain public and private projects on the environment. The Directive is implemented in Scotland through the Environmental Impact Assessment (Scotland) Regulations 2011.

5.1.2 The Design Manual for Roads and Bridges Volumes 10 and 11 have been used to guide the level and methods of assessment undertaken. Relevant Interim Advice Notes (IANs) have also been used where applicable.

5.2 Environmental Impact Assessment

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 scheme.
- Identify and incorporate into scheme design and operation, features and measures to avoid or mitigate adverse impacts

5.2.2 Determination of the topics included in the ES was identified through the Scoping process, as described in Chapter 6. The following environmental parameters are considered:

- Air Quality
- Cultural Heritage
- Landscape
- Nature Conservation
- Geology and Soils
- Materials
- Noise and Vibration
- Effects on All Travellers
- Community and Private Assets
- Road Drainage and the Water Environment

5.3 Format of the Assessment Chapters

5.3.1 The assessment of impacts has been undertaken in accordance with the following process for all environmental parameters:

- Scope of the assessment which introduces the surveys and assessment that have been undertaken specific to the environmental parameter reported in the chapter.
- Legislative context which describes regulations and guidance that are relevant to the environmental parameter reported in the chapter and that have been taken into account during the assessments.
- Methods of assessment which details the methodologies adopted for the various assessments of the baseline environment and predicted impacts.
- A description of the baseline conditions of the site and its environs.
- A description of the predicted beneficial and adverse impacts and an assessment of their significance.
- Identification of mitigation measures in light the evaluation of predicted impacts.
- A description of residual effects, inclusive of any mitigation measures.

Baseline Conditions

5.3.2 The impact assessment for each environmental parameter 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 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.

Predicted Impacts

5.3.3 Predicted impacts arising from the scheme have been identified and described and an assessment of the level of significance for each effect determined as far as practical.

5.3.4 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 impacts has been defined using a combination of the sensitivity of the environmental feature and the magnitude of impact. The significance of impacts has been defined for each environmental parameter in the appropriate sections.

5.3.5 Sensitivity has generally been defined according to the relative value or importance of the feature, i.e. whether it is of national, regional or local importance or by the sensitivity of the receptor.

5.3.6 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.
- Whether the effect is temporary or permanent.

5.3.7 The nature of impacts may vary and may be direct or indirect, secondary, cumulative, short, medium or long-term, permanent or temporary and positive or adverse. These types of impacts have all been considered.

5.3.8 Consideration has also been given to the potential for cumulative/interactive impacts associated with the proposed scheme. In a broad sense, cumulative impacts 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.

5.3.9 A separate chapter (Chapter 17) has been included to consider cumulative effects for all topics.

5.3.10 Mitigation measures have been developed based on guidance provided in Planning Advice Note 58 on EIA as illustrated in Table 5.1 below. This considers mitigation as a hierarchy of measures ranging from prevention of environmental effects by avoidance, through to compensatory measures for effects that cannot be remedied.

Table 5.1 Hierarchy of Mitigation Measures

Level of Mitigation	Definition
Prevent	To prevent adverse environmental effects at source for example through choice of site or specification of construction equipment.
Reduce	If adverse effects cannot be prevented, steps taken to reduce them through such methods as minimisation of cause of impact at source, abatement on site and abatement at receptor.
Remedy/offset	When effects remain that cannot be prevented or reduced, they are offset by such remedial or compensatory action as provision of environmental improvements, opportunities for access and informal recreation, creation of alternative habitats and prior excavation of archaeological features.

5.3.11 The approach to the mitigation of adverse environmental impacts has been to avoid them wherever possible. This can be achieved by consideration of ways in which to prevent adverse effects during the scheme design stage, rather than relying on measures to mitigate the effects. Where avoidance of impacts is not feasible (due to engineering or economic requirements), measures are proposed to minimise or reduce potential adverse impacts through abatement measures either at source, at the site (for example, by the use of noise attenuation measures or screen planting and landscaping), or at the receptor (for example, translocation of plant species). Where adverse effects cannot be prevented or reduced, consideration has been given to the specification of measures that offset or, in certain circumstances, compensate for any damage. These would require further specifications and incorporation into the detailed scheme design and/or Contract Documents.

Residual Effects

5.3.12 The assessment of residual effects takes into account mitigation measures to be adopted. 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.

5.4 Scheme Design Modifications

5.4.1 The assessment of impacts and the proposed mitigation measures are based on an outline scheme design. This design and the environmental mitigation measures defined in the ES to address predicted environmental effects would be further developed together during the detailed design stage and prior to construction. This may result in some changes to the design information provided in Chapter 4, however, it is anticipated that the outline design would be developed in a manner such that it has no material change to the effects of the scheme on the environment. In addition, there may be opportunities to reduce predicted impacts.

5.4.2 Any design development that would result in a significant adverse change to an environmental impact as already assessed or a new significant impact, not currently assessed, would require consideration and possibly the production of an Addendum to the Environmental Statement.