

5 Overview of Assessment Process

5.1 Introduction

5.1.1 This chapter outlines the general approach followed for the EIA of the proposed scheme in accordance with DMRB and other relevant guidance. More detailed methodologies are provided in the respective chapters.

5.1.2 The aims of the environmental assessment are to:

- gather information about the environment of the study area and identify environmental constraints and opportunities associated with the area which may influence, or be affected by the proposed scheme;
- identify and assess potential environmental impacts; and
- identify and incorporate into scheme design and operation, features and measures to avoid, reduce or offset adverse impacts and enhance beneficial impacts.

5.2 Scope and Guidance

Trunk Road EIA

5.2.1 The term ‘trunk road’ in Scotland refers to the strategic system of major roads and associated structures (including bridges), for which the Scottish Ministers have responsibility. The proposed scheme would form part of the trunk road network.

5.2.2 Annex E of Circular 8/2007 ‘The Environmental Impact Assessment (Scotland) Regulations 1999’ (Scottish Government, 2007) provides guidance on EIA of trunk road projects. The circular makes reference to DMRB, first published in 1993 (Highways Agency et al., 1993) and subsequently amended and updated.

DMRB

5.2.3 DMRB sets out governmental guidance on the development of trunk road schemes including motorways and is applicable to the Forth Replacement Crossing. Volume 11 of DMRB specifically provides guidance on EIA, including the level of assessment at key stages of development and reporting of environmental effects.

5.2.4 DMRB considers three levels of assessment, comprising Stage 1, Stage 2 and Stage 3. The objectives of each stage are identified in Table 5.1.

Table 5.1: DMRB Stages of EIA

Stage	Objectives
Stage 1	Identification of environmental advantages, disadvantages and constraints associated with broadly defined route corridors.
Stage 2	Identification of the factors and effects to be taken into account in the selection of route corridor options and in the identification of the environmental advantages, disadvantages and constraints associated with these route corridors.
Stage 3	Assessment to be undertaken in accordance with EIA (Scotland) Regulations 1999 which implements EC Directive 85/337, with publication of an Environmental Statement or Environmental Assessment Report.

5.2.5 It should be noted that some recent DMRB guidance updates no longer refer specifically to assessment stages as listed above in Table 5.1 (such as HA 213/08: Noise and Vibration, August 2008 which refers to ‘simple’ and ‘detailed’ assessment). However, for the purposes of consistency and clarity, this ES refers to ‘Stage 3 assessment’ throughout.

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5.2.6 As set out in Section 3.3 of Chapter 3 (Alternatives Considered), nine route corridor options were identified and considered according to environmental advantages, disadvantages and constraints in early 2008. The preferred route corridor options were then subject to a Stage 2 environmental assessment in 2008, with the results published in a DMRB Stage 2 Corridor Report in March 2009 (Jacobs Arup, 2009). This ES presents the findings of the Stage 3 environmental assessment.

Scope of Environmental Assessment

5.2.7 Consultation for the Forth Replacement Crossing is being undertaken according to the guidance provided in Planning Advice Note (PAN) 58: Environmental Impact Assessment (Scottish Executive, 1999) and with cognisance of PAN 81: Community Engagement (Scottish Executive, 2007). Chapter 6 (Consultation and Scoping) describes the consultation process in detail.

5.2.8 In accordance with DMRB Volume 11, assessment has been undertaken of the following environmental parameters (reported in chapters 7 to 21 respectively):

- Land Use;
- Geology, Contaminated Land and Groundwater;
- Water Environment (Hydrodynamics, Surface Water Quality and Hydrogeology);
- Terrestrial and Freshwater Ecology;
- Estuarine Ecology;
- Landscape;
- Visual;
- Cultural Heritage;
- Air Quality;
- Noise and Vibration;
- Pedestrians, Cyclists, Equestrians and Community Effects;
- Vehicle Travellers;
- Disruption Due to Construction;
- Policies and Plans; and
- Cumulative Impacts.

Study Area

5.2.9 Field and desk-based survey by Jacobs Arup to inform the DMRB Stage 2 and Stage 3 assessment commenced in January 2008, although surveys for breeding and wintering birds began in 2007 (by MBEC; Mackenzie Bradshaw Environmental Consulting, on behalf of Transport Scotland) to ensure that the appropriate level of seasonal information was available.

5.2.10 The study area required or recommended by DMRB and best practice guidance varies depending on the specific environmental parameter being assessed, but is typically 500m in each direction from the centreline of the proposed scheme. However, baseline environmental surveys commenced in parallel with the consideration of a wide range of route corridor options, and accordingly baseline data were collected for a wider study area to enable flexibility in the progression of the route corridor options.

5.3 Environmental Reporting

Chapter Structure

- 5.3.1 Chapters 7 to 18 as listed in Section 5.2 (Scope and Guidance) provide the following:
- an introduction to the subject area;
 - approach and methods used in the assessment;
 - baseline conditions (i.e. the 'existing' situation or for certain assessments the anticipated future situation in the absence of the proposed scheme);
 - potential impacts of the proposed scheme;
 - proposed mitigation for the proposed scheme;
 - residual impacts of the proposed scheme (taking account of proposed mitigation); and
 - references.
- 5.3.2 Chapters 19 to 21 have a slightly modified structure appropriate to the topic area. Chapters 22 to 24 are presented in tabular format.

General Approach

Baseline Conditions

- 5.3.3 This EIA assesses proposed scheme impacts on each environmental parameter in comparison to baseline conditions, which were determined through field survey, desk-based review and consultation. Baseline conditions describe the environmental conditions at the site (and in the wider area as pertinent to the particular environmental parameter) in the absence of the proposed scheme (i.e. the 'Do-Minimum' scenario).
- 5.3.4 For impact assessments based on traffic data (such as drainage water quality, air quality, noise and vibration), the assessment takes into account of predicted changes in traffic flows over the years. Traffic volumes for the Do-Minimum scenario were derived from the Transport Model for Scotland (TMfS:05A), which is a strategic forecasting model. The model was developed and is maintained by MVA Consultancy for Transport Scotland, for use as a planning and forecasting tool for projects such as this. Further information with regard to traffic data is provided in Chapter 4 (The Proposed Scheme), with predicted traffic flows in 2017 and 2032 shown on Figure 4.3.
- 5.3.5 Do-Minimum and reference case infrastructure as defined by Transport Scotland in August 2007 is incorporated with TMfS:05A. For the purposes of this ES, the reference case has been taken as the do-minimum, and reflects the continued operation of the existing road network in tandem with the Forth Road Bridge. This provides an understandable baseline against which to assess the impacts of the scheme. It assumes an extension of the existing situation, i.e. that in the absence of a new crossing, the Forth Road Bridge will continue to operate as it does at the moment.
- 5.3.6 Although the existing bridge remaining open to traffic is perhaps the most understandable scenario for a Do-Minimum, it is not the most likely scenario. The Forth Replacement Crossing project is unusual in that it is driven by uncertainty over the future viability of the existing Forth Road Bridge, and it is likely that, in the absence of a replacement crossing, there will be a need for substantial repairs and refurbishment to the bridge. However, the uncertainties surrounding the extent and timing of the repairs required to the existing bridge are such that the range of refurbishment/closure scenarios is so great that to attempt to utilise these as Do-Minimum scenarios could result in significant over or under-estimation of impacts. It would also be difficult to present impacts in a meaningful way which is clear to stakeholders.

5.3.7 To address this dilemma, a supplementary assessment has been carried out of a do-minimum scenario, setting out in a reasonable level of detail, a qualitative statement of the likely impacts of partial closure of the Forth Road Bridge for an extended period to allow for cable replacement, and how this relates to the impacts reported in this ES. An additional assessment has also been made of an alternative Do-Minimum relating to a full closure of the Forth Road Bridge. These assessments are provided in Appendix A5.1.

Potential Impacts

5.3.8 The general approach to assessment is based on the determination of impact significance from a combination of the sensitivity or importance of the baseline conditions (i.e. the current site and its environs, including the sensitivity of receptors) and the magnitude of potential impacts. This process is described in the respective environmental chapters, and where alternative approaches were considered more appropriate (e.g. consideration of ecological impacts in accordance with Institute of Ecology and Environmental Management (IEEM) guidance in Chapter 10 (Terrestrial and Freshwater Ecology, and Chapter 11: Estuarine Ecology), these alternative approaches are described and justified.

5.3.9 It should be noted that the magnitude and significance reported within the ‘Potential Impacts’ section of each chapter have been considered in the absence of mitigation. The ‘Residual Impacts’ section then takes into account potential mitigation as described below.

5.3.10 Chapters 7 to 18 describe and assess the envisaged impacts of the proposed scheme during its operation, i.e. following scheme opening. Impacts which occur during the construction phase but which are either long-term or permanent changes that persist once the proposed scheme is operational are also considered in Chapters 7 to 18. This applies to the majority of construction impacts on geology, contaminated land and groundwater (Chapter 8), water (Chapter 9), ecology (Chapters 10 and 11) and cultural heritage (Chapter 14). Any impacts that are generally temporary in nature occurring either prior to or during construction are reported separately in Chapter 19 (Disruption due to Construction).

Mitigation

5.3.11 PAN 58: Environmental Impact Assessment (Scottish Executive, 1999) presents mitigation as a hierarchy of measures ranging from prevention of environmental effects by avoidance, to measures to offset any effects that cannot be remedied. The mitigation hierarchy is summarised in Table 5.2.

Table 5.2: Mitigation Hierarchy (from PAN 58)

Level of Mitigation	Definition
Prevent	To prevent adverse environmental effects at source (e.g. building design or specification of construction equipment).
Reduce	If adverse effects cannot be prevented, steps taken to secure a reduction of impacts (e.g. 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 should be offset by remedial or compensatory action (e.g. provision of environmental improvements, opportunities for access and informal recreation, creation of alternative habitats and prior excavation of archaeological features).

5.3.12 Mitigation takes into account best practice, legislation, guidance, and professional experience. The principles identified in the Forth Replacement Crossing Study Strategic Environmental Assessment (SEA) (Jacobs et al., 2007) and SEA Post Adoption Statement (Jacobs et al., 2008) were also considered.

5.3.13 Where possible, potential adverse environmental impacts of the proposed scheme have been prevented through an iterative approach to the design process, rather than relying on measures to mitigate the effects (e.g. incorporation of access arrangements for vehicles or pedestrians into the design).

- 5.3.14 Where complete prevention of potential impacts was not feasible, measures have been proposed to reduce potentially significant impacts through abatement measures either at source, at the site (e.g. noise attenuation measures or visual screen planting and landscaping), or at the receptor (e.g. relocation of badger setts). The level at which impacts are considered 'significant' depends on the environmental parameter assessed, but generally potential impacts of 'Moderate' or greater significance would be identified as priorities for mitigation.
- 5.3.15 Where adverse effects cannot be prevented or reduced, consideration has been given to the specification of measures to be included in the Contract Documents that offset or, in certain circumstances, compensate for any damage. Measures as stipulated in this ES will form contractual requirements on the Contractor (or Transport Scotland where applicable).

Residual Impacts

- 5.3.16 Residual impacts report the anticipated effect the proposed mitigation would have on reducing the potential impacts identified in the ES.

Summary of Impacts and Mitigation

- 5.3.17 Chapter 21 (Cumulative Impact Assessment) considers the cumulative impacts of the proposed scheme, and also of the proposed scheme along with other reasonably foreseeable projects.
- 5.3.18 Chapters 22 and 23 provide a summary of potential impacts and proposed mitigation as reported in the ES Chapters 7 to 20. Chapter 24 provides a summary of those impacts still considered significant after successful implementation of any proposed mitigation.

Changes to Scheme Design

- 5.3.19 The assessment of impacts, the prediction of environmental effects and the mitigation measures in the ES are based on the proposed scheme design as described in Chapter 4 (The Proposed Scheme). The design of the proposed scheme may be refined but will still be deemed to comply with this ES provided that such refinements to this design will be subject to environmental review to ensure that the impacts would be no worse than those reported in this ES.

5.4 References

Highways Agency et al. (1993). DMRB Volume 11, June 1993. The Highways Agency, Scottish Government, Welsh Assembly Government and Department for Regional Development Northern Ireland.

Highways Agency et al. (2008). DMRB Volume 11, August 2008, Section 3, Part 7, HA213/08. The Highways Agency, Scottish Government, Welsh Assembly Government and Department for Regional Development Northern Ireland.

Jacobs Arup (2009). Forth Replacement Crossing: DMRB Stage 2 Corridor Report, March 2009.

Jacobs/Faber Maunsell/AECOM (2007). Forth Replacement Crossing Study Strategic Environmental Assessment (SEA). Prepared on behalf of Transport Scotland.

Jacobs/Faber Maunsell/AECOM (2008). Forth Replacement Crossing Study - Strategic Environmental Assessment – Post Adoption Statement. Prepared on behalf of Transport Scotland by Jacobs/Faber Maunsell/AECOM.

Scottish Executive (1999). Planning Advice Note (PAN) 58: Environmental Impact Assessment.

Scottish Executive (2007). Planning Advice Note (PAN) 81: Community Engagement.

Scottish Government (2007). Circular 8/2007: Environmental Impact Assessment (Scotland) Regulations 1999.