Llywodraeth Cymru / Welsh Government

A487 New Dyfi Bridge

Environmental Statement – Volume 1: Chapter 4 Approach to Environmental Impact Assessment

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Contents

4 Approach to Environmental Impact Assessment

4.1.1 This chapter of the Environmental Statement (ES) sets out the approach taken to the Environmental Impact Assessment (EIA) of the Scheme. The chapter sets out the overall approach to the assessment of the likely effects of the Scheme and includes details of the consultation undertaken including the process of EIA Scoping to agree the methodology for the EIA. Further details of topic specific methodologies, such as survey methods, are provided in each relevant topic chapter of this ES.

4.2 Legislative Framework

4.2.1 The legislative framework for EIA is set by the EIA Directive (European Directive 2011/92/EU, as amended). As set out in Chapter 1 Section 1.6 of this ES, the requirements of the EIA Directive for highway schemes are transposed by the Highways Act 1980, as amended by The Highways (Assessment of Environmental Effects) Regulations 1999 and The Highways (Environmental Impact Assessment) Regulations 2007 (collectively referred to hereafter as the EIA Regulations).

4.2.2 Directive 2014/52/EU requires Member States to transpose its requirements into national law by 16 May 2017 and sets out arrangements for a transitional period from the regime laid down by Directive 2011/92/EU. These transitional measures require that the provisions of Directive 2011/92/EU apply to schemes for which the EIA process has been initiated or for which the ES has been submitted within the transitional period. Therefore, for the purposes of the Scheme, Directive 2011/92/EU remains the relevant consideration.

Scoping

4.2.3 EIA is the process of identifying and assessing the significant effects likely to arise from a proposed development. The process requires consideration of the likely changes to the environment, where these arise as a consequence of the proposed development, through comparison with the existing and likely future baseline conditions in the absence of the proposed development. The resulting ES enables the Overseeing Organisation to make an informed decision as to whether a project should proceed with or without amendments.

4.2.4 Scoping is a critical stage early in the EIA process. Scoping is used to identify the issues to be considered in detail during the EIA process for a particular project. Although not a statutory

requirement, scoping is an important preliminary procedure, which sets the context for the EIA.

4.2.5 A draft Environmental Scoping Report was issued to Statutory Environmental Bodies and other key stakeholders in September 2015. The purpose of issuing the draft Environmental Scoping Report for consultation was to provide an opportunity to outline surveys to be undertaken, to identify and assess the key environmental impacts and issues of concern, identify the proposed scope of the EIA process and to set out the proposed assessment methodologies for comment. It also identified areas proposed to be scoped out of the assessment. This ensured that all the relevant environmental information would be presented in this ES.

4.2.6 This report was circulated to the following statutory consultees for their comment:

- Natural Resources Wales (NRW);
- Cadw;
- Snowdonia National Park Authority (SNPA);
- Powys County Council (PCC);
- Gwynedd Council; and
- North & Mid Wales Trunk Road Agency (NMWTRA).

4.2.7 Comments arising from the consultation process were incorporated into the assessment where appropriate and confirmation as to how they were taken forward was fed back to the statutory bodies.

4.2.8 An Environmental Liaison Group (ELG) meeting was held to ensure the main environmental issues were identified and to facilitate thorough consultation on the Environmental Scoping Report with both statutory environmental bodies and other key stakeholders. This enabled the team to actively engage with the stakeholders and provided an opportunity for them to ask questions and raise concerns about the Scheme and the Environmental Scoping Report. Engagement at this early stage in the EIA process provides an opportunity for stakeholders to raise any significant issues and influence the Scheme design through provision of good advice.

4.2.9 Comments were recorded in the ELG notes of meeting and were used to establish further survey and assessment work required along with measures to mitigate potential impacts. Notes from this ELG meeting are available in Volume 3, Appendix 4.1.

4.2.10 The scope of this ES has taken into account the legislative requirements, the nature, size and location of the Scheme and the consultation responses provided.

4.3 Environmental Assessment Methodology

Relevant EIA Guidance

4.3.1 The EIA process has taken into account relevant guidance, including the following.

- Design Manual for Roads and Bridges (DMRB) Volume 11, Section 1 Aims and Objectives of Environmental Assessment HA 200/08 (Highways Agency *et al*., 2008a, as amended).
- DMRB Volume 11, Section 2 General Principles of Environmental Assessment, including HA 201/08, HA 202/08, HA 204/08, HA 205/08, HD 48/08 and HD 218/08 (Highways Agency *et a*l., 2008 b, c, d, e, f, g).
- Interim Advice Note 125/09(W) Supplementary Guidance for Users of DMRB Volume 11 'Environmental Assessment'. Wales Only (Welsh Assembly Government, 2010).
- Guidelines for Environmental Impact Assessment (IEMA, 2004).
- The State of Environmental Impact Assessment Practice in the UK. Special Report (IEMA, 2011).

4.3.2 Other topic specific legislation and good practice guidance has been considered and details of these can be found in the topic chapters within this ES.

Key Elements of the General Approach

4.3.3 The assessment of each environmental topic forms a separate chapter of this ES. For each environmental topic chapter within this ES, the following has been addressed in conformity to the DMRB and EIA Regulations.

- Legislation and policy context;
- Definition of the study area;
- Assessment methodology;
- Description of the baseline environmental conditions;
- Identification of potential effects (including effects arising during the construction and operational phases);
- Identification of mitigation and monitoring measures, where appropriate;
- Evaluation and assessment of the significance of identified effects.

4.3.4 Each topic chapter provides details of the methodology for baseline data collection and the approach to the assessment of effects. Each environmental topic has been considered by a specialist in that area. The identification and evaluation of effects has been based on the information set out in the Scheme description contained within Chapter 2 of this ES, EIA good practice guidance documents and relevant topic specific guidance where available.

4.3.5 Cumulative effects with other proposed developments and inter-relationships between topic areas are assessed within Chapter 17 of this ES.

4.4 Identification of Baseline Conditions

4.4.1 An ES requires sufficient data to form the basis of the assessment. Each topic chapter includes a description of the current (baseline) environmental conditions. This is based on the study area identified for each topic chapter.

4.4.2 The following baseline scenarios have been considered (without the Scheme), where relevant, for comparison against the situation with the Scheme in place.

- The existing baseline conditions at the time of survey/writing (2015-2016), depending on the availability of existing data and new surveys.
- The start of construction –2017.
- A future year when the Scheme would be open to traffic and the reclassification of the existing A487 is complete – Spring 2019.
- The design year, 15 years after opening – Spring 2034.

4.4.3 Baseline data has been obtained from existing sources (including desk study and previous surveys), from surveys commissioned specifically for the Scheme, or both. The identification of existing baseline conditions has been informed by data from these sources. Future baseline scenarios have been informed by extrapolation of the currently available data by reference to, for example, Government policy, other planning applications, climate change and expert judgement of the individual topic specialists. Clearly the more distant a future baseline is, the greater the uncertainty is in relation to the conditions that would pertain at that time.

4.4.4 Each topic chapter identifies the limitations of the assessment and whether there were any difficulties encountered in compiling the information that is presented in this ES.

4.5 Assessment of Effects

4.5.1 The EIA process requires the identification of the likely significant environmental effects of the Scheme. This includes consideration of the likely effects during the construction and operational phases of the Scheme.

4.5.2 Volume 11, Section 2 of the DMRB (HA 205/08) (Highways Agency *et al.*, 2008e) provides guidance on the determination of significance of environmental effects for highway schemes. This includes consideration of the following.

- Environmental value (or sensitivity) of a resource or receptor;
- The level of impact; and
- The level of significance of an effect.

4.5.3 These aspects are discussed in the following sections.

Sensitivity or Value of Receptors

4.5.4 Receptors are defined as individual environmental features that have the potential to be affected by a scheme (Highways Agency *et al.*, 2008g). For each topic, baseline studies have informed the identification of potential environmental receptors. Some receptors will be more sensitive to certain environmental effects than others. The sensitivity or value of a receptor may depend, for example, on its frequency, extent of occurrence or conservation status at an international, national, regional or local level.

4.5.5 Sensitivity is defined within each ES topic chapter and takes into account factors including the following:

- Vulnerability of the receptor to change;
- Recoverability of the receptor (ability of recover from a temporary impact); and
- Importance of the receptor.

4.5.6 As a general guide, the definitions set out in Table 2.1 of HA205/08 have been taken into account (except where topic guidance requires otherwise). This includes a five-point scale for assigning environmental value or sensitivity as shown in Table 4.1.

Table 4.1: Criteria and DMRB Definitions of Sensitivity (or Value)

Value /Sensitivity	Typical Descriptors
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	High or medium importance and rarity, regional scale, limited potential for substitution.
Low (or Lower)	Low or medium importance and rarity, local scale.
Negligible	Very low importance and rarity, local scale.

Based on Table 2.1 of HA205/08 (Highways Agency *et al.*, 2008e)

Magnitude of Impact

4.5.7 The DMRB defines an 'impact' as:

4.5.8 *'Change that is caused by an action; for example land clearing (action) during construction which results in habitat loss (impact)*' (Highways Agency *et al.*, 2008g).

4.5.9 For each topic, the likely environmental impacts have been identified. The likely environmental change arising from the Scheme has been identified and compared with the baseline (the situation without the Scheme). Impacts are divided into those occurring during the construction and operation phases.

4.5.10 The categorisation of the magnitude of impact is topic specific but generally takes into account factors such as the following.

- Extent;
- Duration;
- Frequency; and
- Reversibility.

4.5.11 When undertaking an EIA, environmental impacts are classified as either permanent or temporary, as appropriate. Permanent changes are those which are irreversible (e.g. permanent land take) or will last for the foreseeable future (e.g. noise from generated road traffic). With respect to temporary impacts, the following has been used as a guide within this assessment, unless defined separately within the topic assessments.

- Short-term: one to three years;
- Medium-term: four to nine years; and
- Long-term: greater than nine years.

4.5.12 Where environmental impacts are episodic, the frequency of the events has been predicted as far as possible.

4.5.13 Impacts are also defined as either adverse or beneficial. Depending on discipline, they may also be described as follows.

- Direct: Arise from activities associated with the Scheme. These tend to be either spatially or temporally concurrent.
- Indirect: Impacts on the environment that are not a direct result of the Scheme, often produced away from the Scheme or as a result of a complex pathway.

4.5.14 As a general guide, the definitions set out in Table 2.2 of HA205/08 have been taken into account (except where topic guidance requires otherwise). This includes a five-point scale for assigning impact magnitude as shown in Table 4.2.

Table 4.2: Criteria and DMRB Definitions of Impact Magnitude

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

Based on Table 2.2 of HA205/08 (Highways Agency et al., 2008e)

Significance of Effects

4.5.15 The DMRB defines an ‘effect’ as:

4.5.16 '*Term used to express the consequence of an impact (expressed as 'significance of effect'), which is determined by correlating the magnitude of the impact to the importance, or sensitivity, of the receptor or resource in accordance with defined significance criteria. For example, land clearing during construction results in habitat loss (impact), the effect of which is the significance of the habitat loss on the ecological resource'* (Highways Agency et al., 2008g).

4.5.17 The term 'effect' is therefore used to express the consequence of an impact (expressed as the 'significance of effect'). This is identified by considering the magnitude of the impact and the sensitivity or value of the receptor.

4.5.18 The magnitude of an impact does not directly translate into the significance of effect. For example, a significant effect may arise as a result of a relatively modest impact on a resource of national value/sensitivity, or a large impact on a resource of local value/sensitivity. In broad terms, therefore, the significance of the effect can depend on both the impact magnitude and the value or sensitivity or importance of the receptor.

4.5.19 Each chapter defines the approach taken to the assessment of significance. Where appropriate, topic chapters have adopted the general approach set out in DMRB HA 205/08 (see Table 4.3). The evaluation of significance takes into account industry and professional guidance; codes of practice; policy objectives regulations or standards; advice from statutory consultees and other stakeholders, as well as expert judgement of the EIA practitioners, based on specialist experience. For some topics, a simplified or quantitative approach is considered appropriate.

Table 4.3: Approach to Evaluating Significance of Effect

		Magnitude of Impact (Degree of Change)				
Environmental Value (Sensitivity)		**No Change**	**Negligible**	**Minor**	**Moderate**	**Major**
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight
	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or Moderate
	Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or Large
	High	Neutral	Slight	Slight or moderate	Moderate or Large	Large or Very large
	Very High	Neutral	Slight	Moderate or large	Large or Very large	Very large

Based on Table 2.4 of HA205/08 (Highways Agency *et al.*, 2008e)

4.5.20 Where more than one significance level is provided, professional judgement has been used to determine the significance of effect. Slight, moderate, large or very large effects may be beneficial or adverse.

4.5.21 Except where guidance requires otherwise, the significance of effect is described using the terms very large, large, moderate, slight and neutral. The broad definitions of these terms are provided in Table 4.4.

Table 4.4: DMRB Descriptors of Significance of Effect Categories

Significance Category	Typical Descriptors of Effect
Very Large	Only adverse effects are normally assigned this level of significance. They represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a major change in a site or feature of local importance may also enter this category.
Large	These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process.
Moderate	These beneficial or adverse effects may be important, but are not likely to be key decision-making factors. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse effect on a particular resource or receptor.
Slight	These beneficial or adverse effects may be raised as local factors. They are unlikely to be critical in the decision-making process, but are important in enhancing the subsequent design of the project.
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Based on Table 2.3 of HA205/08 (Highways Agency *et al.,* 2008e)

4.5.22 In terms of the EIA Regulations, significant effects are generally those where the significance of the effect is 'moderate' or greater.

4.5.23 In Wales, HA 205/08 recommends assignment of significance before and after the consideration of the effectiveness of the design and committed mitigation measures is undertaken to allow for the case or reason for, and effectiveness of mitigation to be described (Highways Agency *et al.*, 2008e). Each topic chapter of this ES therefore provides consideration of the likely effects before and after mitigation.

4.6 Mitigation and Monitoring

4.6.1 One of the key requirements of an EIA is that measures are taken in order to avoid, reduce and, if possible, remedy significant adverse environmental effects. These are termed mitigation measures and their development is part of an iterative EIA process. Measures have been developed in response to findings of surveys and initial assessments.

4.6.2 The Scheme assessed within this ES includes a number of measures designed to avoid or reduce significant adverse environmental effects arising, where practicable.

4.6.3 Those measures forming part of the Scheme design are summarised within Chapter 2. The assessment of effects has taken into account the following measures:

- Measures included as part of the Scheme design, such as those measures shown on the Scheme General Arrangement Figure in Volume 2 Figure 2.1;
- Measures to be adopted during construction to avoid and minimise environmental effects, such as pollution control measures.

4.6.4 Where required, mitigation measures have been identified within topic chapters. These are measures that could further prevent, reduce and, where possible, offset any adverse effects on the environment. Where such measures are identified, these have been set out within each topic chapter, together with an assessment of the effects with the mitigation measures in place.

4.6.5 Monitoring of mitigation measures during construction and operation of the Scheme has also been considered as part of the EIA process. This is essential to determine if effects occur as predicted or if operations remain within acceptable limits, and if mitigation measures are as effective as predicted. A description of any proposed monitoring measures is provided within each topic chapter of this ES.

4.7 Assessment of Cumulative Effects

4.7.1 The consideration of potential cumulative effects is an important aspect of the EIA process. EIA Directive 2011/92/EU, as amended, requires the EIA to consider cumulative effects. Cumulative effects result from multiple actions on receptors and resources over time and are generally additive or interactive (synergistic) in nature. Cumulative impacts can also be considered as:

'…impacts resulting from incremental changes caused by other past, present or reasonably foreseeable actions together with the project.' (European Commission, 1999).

4.7.2 DMRB Volume 11 guidance states "*a cumulative impact may arise as the result of: a) the combined impact of a number of different environmental topic-specific impacts from a single environmental impact assessment project on a single receptor/resource; and b) the combined impact of a number of different projects within the vicinity (in combination with the environmental impact assessment project) on a single receptor/resource.*"

4.7.3 The assessment of cumulative effects within this report is based on current best practice guidance and consultation with Statutory Environmental Bodies.

4.7.4 Advice and guidance on the assessment of cumulative effects is given in HA 205/08 and HD 48/08 (Highways Agency *et al.*, 2008e and 2008f). Additionally, IAN 125/09(W) acknowledges that *'as yet there is no industry standardised approach*' to the assessment of cumulative effects. However, the cumulative assessment should nevertheless *'differentiate between permanent, temporary, direct, indirect and secondary effects, positive and negative'*.

4.7.5 Where there is an absence of topic specific guidance for the assessment of cumulative effects, the standardised criteria outlined in DMRB have been taken into account as a framework for determining significance of cumulative effects, as shown in Table 4.5 below.

Table 4.5: DMRB Significance of Cumulative Effects Criteria

Significance	Effect
Severe	Effects that the decision-maker must take into account as the receptor/resource is irretrievably compromised.
Major	Effects that may become key decision-making issues.
Moderate	Effects that are unlikely to become issues on whether the project design should be selected, but where future work may be needed to improve on current performance.
Minor	Effects that are locally significant.
Not Significant	Effects that are beyond the current forecasting ability or are within the ability of the resource to absorb such change.

Based on Table 2.6 of HA205/08 (Highways Agency *et al.*, 2008e)

4.7.6 The assessment of cumulative impacts of the Scheme in conjunction with other proposed developments and in combination effects is addressed in Chapter 16 of this ES. Topic

specific cumulative effects are also set out within each of the ES topic chapters.

Inter-relationships

4.7.7 Consideration of inter-relationships is a requirement of the EIA Directive. Inter-relationships refer to the combined effect on individual (or groups of) receptors or resources from more than one source or type of environmental effect (e.g. noise, loss of amenity, visual impact on a dwelling).

4.7.8 Inter-relationships between topics are presented within Chapter 16 of this ES.

4.8 Consultation

4.8.1 A proactive approach has been taken to consultation undertaken during the EIA process to ensure that issues have been addressed during the design development phase wherever possible. Consultation with statutory environmental bodies and other stakeholders has been key in determining the work required to inform the ES and the measures required to mitigate potential environmental impacts. This consultation has been carried out on both a formal and informal basis.

4.8.2 The Environmental Liaison Group (ELG) consists of a number of statutory environmental bodies and stakeholders. The ELG has met on four occasions during Key Stage 3 (KS3) - the outline design, on the following dates:

- 11 November 2014;
- 16 September 2015;
- 19 January 2016; and
- 8 August 2016.

During the statutory process (KS4) meetings would be held with the statutory environmental bodies and others as and when required. During the pre-construction and construction (KS6 of the contract) ELG meetings would continue to be held on a regular basis. Following completion of the Scheme, the ELG would generally meet on an annual basis during the three-year post construction aftercare and monitoring period. Notes of the ELG meetings are available in Volume 3, Appendix 4.1.

4.8.3 In addition to the formal ELG meetings, there have also been meetings with Natural Resources Wales (NRW) water resources team on 15 December 2015 and 13 January 2016 and to discuss specific flooding and hydrogeomorphological related issues.

4.8.4 A public information exhibition was held to inform the public about the Scheme. The exhibition was held in Y Plas, Machynlleth on 7 October 2015.

4.8.5 A design review was held with the Design Commission for Wales (DCfW) on 19 January 2016. A report was then provided by DCfW, containing some recommendations for the Scheme design (refer to Appendix 4.2). These recommendations have been considered and incorporated in the design where considered appropriate. No further meetings with DCfW are anticipated.

4.8.6 In addition to the formal meetings there has been close liaison between the environmental specialists and statutory, non-statutory and interest groups as appropriate, to request baseline information, obtain their views and concerns with regards the design development of the Scheme, confirm methodologies and discuss mitigation measures. Technical Working Groups were held where detailed topic-specific discussions were required.

4.8.7 A draft version of the ES was issued to the statutory environmental bodies listed under 1.8.1 in July 2016 for their comment.

4.8.8 Meetings have been held with landowners and local residents whose properties or private accesses would be directly affected by the Scheme. Presentations have also been made to Machynlleth Town Council, and to a group meeting of members from Tywyn and Aberdyfi Town Councils including Bruncug and Arthog Community Councils to obtain their views and address their concerns wherever possible. Meetings have also been held with both Powys County Council and Gwyneth Council to discuss the Scheme proposals and de-trunking.

4.8.9 Consultations have also been undertaken with Network Rail (NR) and Arriva Trains Wales (ATW).

4.8.10 The following utility companies have been consulted regarding diversions and protection of infrastructure:

- WWU Wales and West Utilities;
- Dwr Cymru / Welsh Water;
- Openreach – BT; and
- SP Networks;

4.8.11 The following key aspects of the design have changed following consultation with various parties, for further information please refer to Appendix 4.3 Public Consultation document:

- Inclusion of Railway Bridge Flooding problem within the Scheme – this was a major issue highlighted at the Public Information Exhibition;
- Extension of the viaduct addresses major flooding issues which ultimately has helped to address NRW concerns on flooding;
- Inclusion of a shared footway/cycleway on the viaduct initially came from both the Public Information Exhibition and Sustrans;
- Northern Abutment detail developed to include both access for farmer and address comments/observations from DCfW;
- Pier shape was adjusted to columns following DCfW comments;
- Concrete colour was adjusted following comments from DCfW and NRW;
- Safety comments in terms of vehicle drivers were raised at the Public Information Exhibition - a 40mph buffer has been included at the southern end of the viaduct; and
- Pollution control/interceptors – greater pollution control measures on the Scheme have been included following ELG comments.