

Welsh Government

**A40 Llanddewi Velfrey to Penblewin
Improvements**

Environmental Statement Chapter 4:

Environmental Impact Assessment

Methodology

A40LVP-RML-EGN-SWI-RP-LE-0002

P11 | S4

12/03/19

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4 Environmental Impact Assessment Method

4.1 Introduction to the chapter

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. Further details of topic specific methodologies, such as survey methods, are provided in each topic chapter of this ES.

4.2 Legislative Framework

4.2.1 From May 2017 EIA Directive EC2014/52/EU amended the existing 2011 Directive 2011/92/EU and applies to all projects covered by the EIA process. The regulations to transpose the 2014 Directive for projects under the Highways Act came into force in December 2017 and are called the Harbours, Docks, Piers and Ferries Environmental Protection - The Environmental Impact Assessment (Miscellaneous Amendments Relating to Harbours, Highways and Transport) Regulations 2017 (EIA Regulations 2017). These regulations changed the way Screening and Scoping are carried out and require additional topics to be considered in the scope of the EIA.

4.2.2 As set out in Chapter 1 Introduction of this ES, there is no statutory provision to the form of an ES. Section 105A of the Highways Act states that the ES must contain the information referred to in Annex IV of the EIA Directive 2014/52/EU. Annex IV is included in Appendix 4.4.

4.2.3 In accordance with Regulation 61 of the Conservation of Habitats and Species Regulations 2010 and Regulation 63 of the Conservation of Habitats and Species Regulations 2017 and the Habitats Directive (92/43/EEC), an Assessment of Implications on European Sites (AIES) was also prepared to consider the possible effects of the Scheme on European sites. The findings of the AIES are reported separately.

- 4.2.4 In accordance with the Water Framework Directive, an assessment of effects on Water Framework Directive watercourses was undertaken and provided in Volume 3 Appendix 7.1 of this ES.
- 4.2.5 This ES provides the information required by the Highways Act 1980, as amended, together with other relevant information listed in the EIA Directive (as amended). Together, the information supplied within this ES is considered to provide a clear understanding of the main or likely significant effects of the Scheme on the environment.
- 4.2.6 The Scheme design development and publication of the ES and Draft Orders were delayed due to the demise of the contractor (Carillion) in January 2018. The delay - which continued from January until July 2018 - meant that this ES needed to be revised to take account of the new Directive and new 2017 EIA Regulations. The Screening and Scoping stages of the EIA process had previously been completed but to ensure compliance with the new legislation, both documents were retrospectively revised to take the ES content into consideration.
- 4.2.7 The scope of this ES has considered: the legislative requirements, the nature, size and location of the Scheme and the consultation responses provided. Table 4.2 sets out the agreed scope and chapter headings.

4.3 Screening (Determination)

- 4.3.1 An EIA is an iterative process that occurs in a series of stages, alongside a development proposal. The process includes the following sequence: screening, scoping, assessment and reporting.
- 4.3.2 An EIA is a means of identifying and collating information to inform an assessment of the likely significant environmental effects of a project. The process requires consideration of the likely changes to the environment, where these arise because of the proposed development, through comparison with the existing and likely future baseline conditions in the absence of the proposed development.
- 4.3.3 The requirement to complete a statutory EIA and publish an ES only applies to certain projects that are deemed to exceed certain thresholds and are predicted to have a significant effect on the environment. The process for deciding whether it is necessary to carry out an EIA and publish an ES is called Screening.

- 4.3.4 The screening exercise was carried out in April 2017 to decide whether the project falls below or above the thresholds stated within the EIA regulations. The conclusion was that an EIA would be required and that the Employer should be informed that a Record of Determination and Notice of Determination should be published alongside this ES, to ensure legal compliance. The Record of Determination was submitted to the Employer (Welsh Government) in October 2017.
- 4.3.5 Because of the liquidation of Carillion in January, there was a delay to the project of several months. In the meantime, the new EIA Regulations 2017 were published which changed the requirements of the Screening and Scoping process and reporting. In the interests of addressing these new regulations, the Screening Report and the Record of Determination were revised and resubmitted in October 2018. The effects of the new regulations on the EIA are set out in Section 4.5. The full Screening Report and Record of Determination are included in Volume 3 Appendix 4.3.
- 4.3.6 DMRB (2008) Volume 11 Environmental Assessment Section 2 Environmental Impact Assessment Part 3 ‘Screening a Project’ sets out four steps to appropriate screening. These are summarised in Table 4.1.

Table 4.1 The steps to screening a project

Step	Requirements of screening	Result for this Scheme
1	Does the Project fall within Annex I or II of the EIA Directive?	The Scheme falls below the Annex II because it would not involve the construction of a motorway or express road of four or more lanes, nor would it constitute a realignment or widening of a two-lane road or less to provide four lanes over a continuous length of 10km.
2	Deciding if the Annex II Project is a 'Relevant Project'	The Scheme exceeded the Annex II threshold of 1 hectare and was therefore a 'Relevant project' for constructing or improving a highway where the area exceeds 1 hectare or where any such area is situated in whole or in part in a sensitive area.
3	The Determination of a 'Relevant Project' for the Purposes of the EIA Regulations	Based on the criteria set out in Annex III, an assessment of the Scheme indicated that the Scheme was considered likely to have significant effects on the environment.
4	Reporting the Determination	A Record of Determination was prepared based on the results of the screening assessment.

4.4 Scoping

- 4.4.1 With the results of the screening assessment demonstrating that an EIA should be carried out, a scoping assessment was completed.
- 4.4.2 The process of identifying the matters to consider within the EIA process is known as scoping. Scoping is an important preliminary procedure, which sets the context for the EIA.
- 4.4.3 A draft Scoping Report was issued to the statutory consultees - in August 2015 - who attend Environmental Liaison Group (ELG) meetings. These included Natural Resources Wales (NRW), Cadw, South Wales Trunk Road Agency (SWTRA), Pembrokeshire County Council and the Welsh Government Environmental Co-ordination and Advice Team (ECAT).
- 4.4.4 A copy is provided at Volume 3 Appendix 4.1 of this ES. The purpose of the Scoping Report was to 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. Comments on the draft were considered in the production of the final Scoping Report. However, completion of the process was also affected by the Carillion liquidation (see paragraph 4.3.5).

- 4.4.5 In the interests of addressing the new regulations, the Scoping Reports was revised and distributed to the relevant statutory environmental consultees who are represented on the ELG in October 2018. The effects of the new regulations on the EIA are set out in Section 4.5.

Table 4.2 Scope of this Environmental Statement

Non-Technical Summary: Summary of the ES using non-technical terminology	
Volume 1 Environmental Statement	
Chapter 1	Introduction
Chapter 2	The Project
Chapter 3	Alternatives Considered
Chapter 4	Environmental Impact Assessment Methodology
Chapter 5	Legislation and Policy Context
Chapter 6	Geology and Soils
Chapter 7	Road Drainage and the Water Environment
Chapter 8	Ecology and Nature Conservation
Chapter 9	Landscape and Visual Effects
Chapter 10	Archaeology and Cultural Heritage
Chapter 11	Community and Private Assets (excluding agricultural land)
Chapter 12	Community and Private Assets: Agricultural Assessment
Chapter 13	Air Quality
Chapter 14	Noise and Vibration
Chapter 15	All Travellers
Chapter 16	Materials
Chapter 17	Population and Human Health
Chapter 18	Climate Change
Chapter 19	Assessment of Cumulative Effects: Introduction
Chapter 20	Assessment of Cumulative Effects: Same scheme effects
Chapter 21	Assessment of Cumulative Effects: different scheme effects
Chapter 22	Management of Environmental Effects
Chapter 23	Conclusions
Volume 2 Figures	
Including all figures and drawings to accompany the text	
Volume 3 Appendices	
Including specialist reports forming technical appendices to the main text in Volume 1	

Responses to the Scoping

- 4.4.6 Volume 3 Appendix 4.2 of this ES provides an overview of the key points raised by consultees during the scoping process. Chapters 6 to 22 of this ES also provide a summary of the key points raised during consultation with both statutory and non-statutory consultees.

Content of the ES

- 4.4.7 Based on the scoping report and the requirements of the Design Manual for Roads and Bridges (DMRB), the volumes and chapters that make up the content of the ES is set out in Table 4.2.

4.5 Increased scope for EU Directive EC2014/52/EU

- 4.5.1 From May 2017, the new EIA Directive EC2014/52/EU, which amended the existing 2011 Directive 2011/92/EU, must be applied to all projects covered by the EIA process. The new Directive and the new EIA Regulations, which came into force in December 2017, require additional topics to be considered in the EIA. Topics are addressed in the manner set out in the following paragraphs. Several the new topics were scoped out of the assessment.

Assessments of Health-related matters

- 4.5.2 The 2014 Directive states that an EIA should consider the effects of a project on Population and Human Health. An assessment of the health impacts associated with the Scheme was undertaken. This report is discussed in ES Chapter 17 Population and Human Health.
- 4.5.3 Health Impact Assessment (HIA) and Equality Impact Assessment (EqIA) are a key part of the appraisal process for major transport schemes in Wales. The Welsh Government has statutory duties to promote well-being and racial, disability and gender equality, and has set up a Public Health Strategic Framework to improve the quality and length of life for all members of the community. Social Impact Assessment (SIA) is often developed as an independent SIA report; however, social, health and equality impacts are intrinsically linked.
- 4.5.4 A combined Health, Social and Equalities Impact Assessment has therefore been undertaken for the Scheme. This assessment considers how the Scheme may influence public health and well-being in the

areas surrounding the proposed road improvement through environmental and socio-economic pathways. The assessment also considers, where possible, the distribution of impacts and any potential disproportionate impacts of the Scheme on sensitive community groups.

Assessments of Climate Change

4.5.5 The 2014 amendments to the EIA Directive place an emphasis on climate change. Although the provisions of Directive 2011/92/EU remain the relevant consideration for the Scheme, the requirements of the amended Directive in relation to climate change were considered, as a matter of best practice. Therefore, the following aspects of climate change were considered within this ES.

4.5.6 **Changes to Future Environmental Conditions and Climate Change Resilience:** climate change was considered during the Scheme design process. The design has considered future flood risk and resilience. The resilience of the Scheme to climate change was reported within ES Chapter 18 Climate Change.

4.5.7 **Effects of the Scheme on Climate:** atmospheric emissions associated with use of the Scheme are assessed within Chapter 13 Air Quality, but a carbon assessment was undertaken and is reported in Chapter 18 Climate Change. This report sets out carbon emissions associated with the construction and operation of the Scheme.

Assessments of Material Assets

4.5.8 Annex IV of the EIA Directive includes reference to ‘material assets’. The phrase ‘material assets’ has a broad scope, which may include assets of human or natural origin, valued for socio-economic/community or heritage reasons. Material assets are in practice considered across a range of topic areas within an ES, in the Chapter 10 Archaeology and Cultural Heritage; and Chapter 11 and 12, the Community and Private Assets chapters. Materials associated with construction are considered in Chapter 16 Materials, therefore, no separate consideration of material assets is considered necessary.

Assessments of Radiation and Heat

- 4.5.9 Given the nature of the Scheme, no significant radiation or heat effects are anticipated, and these effects were scoped out of the assessment.

Risk of Major Accident and Disaster

- 4.5.10 Given the nature of the Scheme, no significant effects on the environment, arising from risks of major accident or disaster, are anticipated. Scoping identified that if a serious road accident with fatalities or casualties resulted in the closure of the road, the effect would be of short duration and traffic diverted onto other roads. Closing the road and these effects were scoped out of the assessment.
- 4.5.11 If the major accident resulted in spillage of pollutants these would be contained by the road drainage and treated by the emergency services. The risk of the pollution not being contained is low and therefore not considered significant.

4.6 Environmental Assessment guidance

Relevant EIA Guidance

- 4.6.1 The EIA process has considered relevant guidance, including the following documents:
- a) **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).
 - b) **DMRB Volume 11, Section 2** General Principles of Environmental Assessment, including HA 201/08, HA 202/08, HA 204/08, HA 205/08 and HD 48/08 (Highways Agency et al., 2008 b, c, d, e, f).
 - c) **DMRB Volume 11, Section 3** Environmental Assessment Techniques, (Highways Agency et al., 2008).
 - d) **Interim Advice Note 125/09(W)** Supplementary Guidance for Users of DMRB Volume 11 'Environmental Assessment'. Wales Only (Welsh Assembly Government, 2010).
 - e) **Guidelines for Environmental Impact Assessment 3rd Edition (GLVIA3)** (Institute of Environmental Management and Assessment, 2004 - updated 2006).

- f) **The State of Environmental Impact Assessment Practice in the UK.** Special Report (Institute of Environmental Management and Assessment, 2011).

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

4.7 Assessment for each environmental topic

4.7.1 The assessment of each environmental topic forms a single chapter within this ES, and will contain details of:

- a) Legislation and policy relevant to the topic;
- b) Assessment method used (Section 4.6);
- c) Description of the baseline environmental conditions (Section 4.8);
- d) Identification of potential effects (including those arising during the construction and operational phases) (Section 4.9 to 4.12);
- e) Identification of mitigation and monitoring measures, where appropriate. (Section 4.13);
- f) Evaluation and assessment of the significance of identified effects. (Section 4.14);

4.7.2 Each topic chapter provides details of the methodology for baseline data collection and the approach to the assessment of effects. Each environmental topic was considered by a specialist in that area. The identification and evaluation of effects was based on the information set out in the Scheme description and construction details contained within Chapter 2 The Project and Chapter 3 Alternatives Considered of this ES, EIA good practice guidance documents and relevant topic specific guidance where available.

4.7.3 Cumulative effects with other proposed developments and interrelationships between topic areas are assessed within Chapter 19 to 21 of this ES.

4.8 Identification of Baseline Conditions

4.8.1 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. Where appropriate, study areas were agreed in

consultation with statutory consultees (for example, the study areas for ecology survey were developed in consultation with Natural Resources Wales). In some instances, more than one study area was defined in accordance with relevant standards and guidance for that topic.

- 4.8.2 The following baseline scenarios were considered (without the Scheme), where relevant, for comparison against the situation with the Scheme in place:
- a) The existing baseline conditions at the time of survey/writing (2016-2018) depending on the availability of existing data and new surveys.
 - b) Likely start of construction in 2020.
 - c) A future year when the A40 Llanddewi Velfrey to Penblewin Scheme would be open to traffic in 2021.
 - d) The design year - Autumn 2036.
- 4.8.3 Baseline data was 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 was informed by data from these sources.
- 4.8.4 A programme of ecological surveys and a ground investigation were commissioned by Welsh Government from Arcadis and Mott MacDonald in 2016 and the data from these were provided to the contractor at commencement of the previous Carillion contract. Further surveys were then carried out in 2017 to provide additional data for the design and the EIA. These included noise and air quality baseline surveys, further ecological surveys, summer and winter landscape and visual surveys, further ground investigation, an archaeological geophysical (magnetometer) survey, farm surveys and interviews, non-motorised users and traffic surveys and water resources surveys. All surveys were completed by November 2017.
- 4.8.5 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.

4.9 Assessment of Effects

- 4.9.1 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.
- 4.9.2 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.
- a) Environmental value (or sensitivity) of a resource or receptor.
 - b) The level of impact.
 - c) The level of significance of an effect.
- 4.9.3 These aspects are discussed in the following sections.

4.10 Sensitivity or Value of Receptors

- 4.10.1 **Definition of ‘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.
- 4.10.2 Sensitivity is defined within each ES topic chapter and considers factors including the following:
- a) Vulnerability of the receptor to change.
 - b) Recoverability of the receptor (ability to recover from a temporary impact).
 - c) Importance of the receptor.
- 4.10.3 As a general guide, the definitions set out in Table 2.1 of HA205/08 were considered (except where topic guidance requires otherwise). This included a five-point scale for assigning environmental sensitivity as shown in Table 4.3.

Table 4.3 Criteria and DMRB Definitions of Sensitivity (or value)

Sensitivity/Value	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 et al., 2008e)

4.11 Magnitude of Impact

4.11.1 The DMRB defines an ‘impact’ as: ‘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)

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

4.11.3 The categorisation of the magnitude of impact is topic specific but generally considers factors such as the following:

- a) Extent;
- b) Duration;
- c) Frequency; and
- d) Reversibility

4.11.4 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 was used as a guide within this assessment, unless defined separately within the topic assessments.

- a) Short-term: one to three years;
- b) Medium-term: four to nine years;

c) Long-term: greater than nine years.

4.11.5 Where environmental impacts are episodic, the frequency of the events was predicted.

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

- a) **Direct:** Arise from activities associated with the Scheme. These tend to be either spatially or temporally concurrent.
- b) **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.

4.11.7 As a general guide, the definitions set out in Table 2.2 of HA205/08 were considered (except where topic guidance requires otherwise). This includes a five-point scale for assigning impact magnitude as shown in Table 4.4.

Table 4.4 The five-point scale for assigning impact magnitude

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

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

4.12 Significance of Effects

- 4.12.1 **Definition of ‘Effect’:** The DMRB defines an ‘effect’ as a ‘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).
- 4.12.2 An ‘effect’ is therefore 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.
- 4.12.3 The assessment process examines how the proposed Scheme will impact on environmental receptors (people, heritage, air, water soils and species). Each receptor was identified in baseline surveys and desk studies and is given a value based on rarity or sensitivity to change (see Table 4.3). For example, a designated Scheduled Ancient Monument (SAM) would be considered as more important than an undesignated heritage site.
- 4.12.4 The magnitude of the impact is ascribed to a receptor where it is influenced by the Scheme (see Table 4.4). For example, an area of habitat might be unaffected, partially affected or destroyed.
- 4.12.5 The magnitude of impact on a receptor is combined with the value/sensitivity/importance of that receptor to determine the significance (see Table 4.5). 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.
- 4.12.6 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 4.5). The evaluation of significance for each topic will consider 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.

The evaluation of significance.

Table 4.5 Approach to evaluating Significance of Effect

		Magnitude of Impact Degree of change)				
		No change	Negligible	Minor	Moderate	Major
Sensitivity (or value)	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)

- 4.12.7 Where more than one significance level is provided, professional judgement was used to determine the significance of effect. Slight, moderate, large or very large effects may be beneficial or adverse.
- 4.12.8 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 4.6.
- 4.12.9 In terms of the EIA Regulations, significant effects are generally those where the significance of the effect is ‘moderate’ or greater. It should be noted however that, as described in Table 4.6, a significant effect in EIA terms simply means that the effect should be given careful consideration in the decision-making process.

Table 4.6 DMRB Descriptors of Significance of Effects 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 enter this category.
Large	These beneficial or adverse effects are likely 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 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)

4.13 Mitigation and Monitoring Measures.

4.13.1 The development of mitigation and monitoring measures is part of an iterative EIA process. Measures included in the Scheme was developed throughout the EIA process in response to the findings of initial assessments. In some cases, these measures may result in enhancement of environmental conditions. Mitigation measures can include the following:

- a) Measures included as part of the Scheme design, such as those measures shown on the Environmental Masterplans (included in Volume 3 Appendix 2.5;
- b) Normal good practice measures to be adopted during construction to avoid and minimise environmental effects, such as pollution control measures;
- c) Additional measures identified during the EIA process to further prevent, reduce and, where possible, offset any adverse effects on the environment.
- d) Enhancement measures, these are not strictly mitigation because they go beyond what is required to mitigate. Enhancement is described in Section 4.15.

4.13.2 Some forms of mitigation require a controlling mechanism or legal undertaking to be implemented but are under the control of the

‘Applicant’ and therefore are regulated and have greater certain of delivery.

4.14 Assessment of Environmental Impacts

- 4.14.1 The purpose of an EIA is to identify and evaluate the environmental effects associated with the proposed development. These are assessed based on the magnitude of the effect (following mitigation) and the sensitivity of the receiving environment.
- 4.14.2 In Wales, HA 205/08 recommends assignment of significance before and after the consideration of mitigation measures is undertaken to allow for the case or reason for, and effectiveness of mitigation to be described (Highways Agency et al., 2008e).
- 4.14.3 The determination of impact significance will be undertaken against the environmental baseline and be based on the significance matrix included in Table 4.5 of this chapter.
- 4.14.4 Cumulative Impacts of the proposed Scheme and other developments will be covered in ES Chapters 19 to 21.
- 4.14.5 For the purposes of the assessment, certain measures are integral to the Scheme and are therefore taken into consideration in the 'without mitigation' assessment. The integral measures include small changes to the vertical and horizontal alignment, or the location of junctions, culverts and the extent of earthworks, for example, to avoid or minimise potential impacts.

Monitoring of proposed mitigation

- 4.14.6 The requirement for monitoring during construction or following completion of construction was considered. A description of proposed monitoring measures is provided within each topic chapter of this ES. Monitoring will be reported in Annual Environmental Monitoring Reports and on completion of the five-year aftercare a final environmental monitoring report will be prepared.
- 4.14.7 Mitigation and monitoring measures proposed during the construction phase are set out in the Pre-Construction Environmental Management Plan in Volume 3 Appendix 2.2. The Register of Environmental Actions and Commitments in Volume 3 Appendix 2.3 provides an

overview of the key mitigation and monitoring proposed for the Scheme.

4.15 Benefits of the Scheme

- 4.15.1 Enhancements of the Scheme would go further than the conventional approach to mitigation. Normally an ES will include measures such as avoidance of an impact, or if the impact cannot be avoided, it will include mitigation or replacement for the consequences. Enhancement goes further to improve on the circumstances that existed before the Scheme is implemented to provide benefits. The delivery of these benefits is encouraged by the following two items of legislation.

Environment (Wales) Act 2016

- 4.15.2 Central to this Act is the need to adopt a new, more integrated approach to managing natural resources in order to achieve long-term sustainability and improved resilience of natural systems. The Act provides an iterative framework that ensures that managing our natural resources sustainably will be a core consideration in decision-making.
- 4.15.3 The Act includes a new biodiversity duty (Section 6 Duty) intended to reverse the decline and secure the long-term resilience of biodiversity in Wales. The Environment Act replaces and enhances the Natural Environment and Rural Communities Act 2006 (NERC) duty to require all public authorities, when carrying out their functions in Wales, to seek to “maintain and enhance biodiversity” where it is within the proper exercise of their functions. In doing so, public authorities must also seek to “promote the resilience of ecosystems”. This ensures that biodiversity is an integral part of the decisions that public authorities take in relation to Wales. The new duty requires public authorities to report on the actions they have taken to improve biodiversity and promote ecosystem resilience.

Well-being of Future Generations Act 2015

- 4.15.4 In Wales, the Well-being of Future Generations Act 2015 places a duty on public organisations to achieve seven sustainability goals.

- 4.15.5 Part 2, Section 2 of the Act defines the relevant meaning of ‘sustainable development’; it means ‘the process of improving the economic, social, environmental and cultural well-being of Wales by taking action, in accordance with the sustainable development principle, aimed at achieving the well-being goals.’ Public Bodies are required to set objectives for their actions which should be ‘in accordance with the ‘sustainable development principle’, which means the body ‘must act in a manner which seeks to ensure the needs of the present are met without compromising the ability of future generations to meet their own needs’.

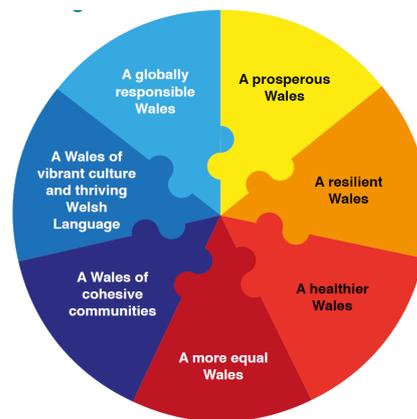


Figure 4 1 The Well-being Goals of the Future Generations Act 2015

- 4.15.6 The Scheme would include measures, that could contribute to achieving the goals of both acts of the Welsh Government. For example, improving the network of routes for non-motorised users in the local community and using habitats that would be provided for visual screening and landscape integration to benefit biodiversity.

4.16 Assessment of Cumulative Effects

- 4.16.1 EIA Directive 2011/92/EU, as amended by Directive 2014/52/EU, 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.’¹ The Directive 2014/52/EU requires that EIA should cover ‘the cumulation of effects with other existing and/or approved projects, taking into account any

¹ European Commission, 1999.

existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;'.

- 4.16.2 Major developments for consideration within the cumulative effects assessment were identified within the following categories:
- a) Development under construction.
 - b) Application(s) permitted but which are not yet implemented.
 - c) Submitted applications not yet determined, and which, if permitted, would affect the proposed development in the scoping request.
 - d) Development identified in the adopted and emerging development plan (with appropriate weight being given as they move closer to adoption), recognising that information on any relevant proposals will be limited.
- 4.16.3 A review of the following sources was undertaken to identify developments:
- a) Local planning authority websites, with particular emphasis on proposed developments (including transport or minerals related developments) in closest proximity to the site located within the administrative boundaries of Pembrokeshire County Council and Carmarthenshire County Council.
 - b) Adopted and emerging Local Plans
 - c) Planning Inspectorate website, in order to identify any Nationally Significant Infrastructure Projects in the vicinity of the Scheme.
- 4.16.4 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' (Welsh Assembly Government, 2010).
- 4.16.5 Relevant guidance considered in the assessment of cumulative effects includes:
- a) HA205/08 Principles of Environmental Assessment – Assessment and Management of Environmental Effects (Highways Agency et al., 2008).

- b) Welsh Assembly Government (2010) Interim Advice Note 125/09(W) Supplementary Guidance for Users of DMRB Volume 11 'Environmental Assessment' Wales Only.
- c) Advice Note 17: Cumulative effects assessment relevant to nationally significant infrastructure projects (Planning Inspectorate, 2015).
- d) Advice Note 9: Using the Rochdale Envelope (Planning Inspectorate, July 2017). The Rochdale Envelope is an approach to consenting and environmental impact, named after a UK planning law case, which allows a project description to be broadly defined, within several agreed parameters, for the purposes of a consent application. This allows for a certain level of flexibility while a project is in the early stages of development. As development progresses and more detail and certainty are available, further information regarding potentially impactful elements of the project can be provided.

4.16.6 The cumulative effects of the Scheme in conjunction with other proposed developments were assessed and the findings are presented within Chapters 19, 20 and 21.

4.17 Interrelationships

4.17.1 Consideration of interrelationships is a requirement of the EIA Directive. Interrelationships 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). Interrelationships are considered within Chapter 20 Assessment of Cumulative Effects: Same scheme effects.

4.18 Consultation

4.18.1 This section summarises the consultation undertaken with stakeholders at key stages during the development of the Scheme. Further details of the comments received (where relevant to the EIA process) are set out within each topic chapter of this ES and in the Volume 3 Appendix 4.2 Scoping Responses.

4.18.2 During development of the Scheme, consultation was undertaken with, or information requested from, several organisations including (but not limited to) Statutory and Non-Statutory consultees, interest groups, commercial, industrial and business operators, the general

public (mainly the local community of Llanddewi Velfrey and surrounding communities).

- 4.18.3 The process also centred on engagement with key stakeholders in order to establish the proposed scope and level of detail required for the draft assessments. Key stakeholders (listed in Table 4.7 and Table 4.8) included statutory consultees and those with a stake or significant interest in transport issues relevant to the economy, environment and society in south-west Wales.

Table 4.7 Statutory and public stakeholders

Organisation	Representative or department
Welsh Assembly	Local Assembly Member
Welsh Government	Technical Approvals Authority Technical Standards and Departures Lands and Orders Network Management Route Manager Environmental Science Advisor
Pembrokeshire County Council	Chief Executive Officer Head of Services Leader of the Council Infrastructure Cabinet Member Councillor for Llanddewi Velfrey Head of Highways Landscape Officer Transport Planner Ecologist
Llanddewi Velfrey Community Council	Clerk to the Council
Natural Resources Wales	Liaison Officer and Protected Species team
Cadw	Conservation Officer
South Wales Trunk Road Agency	Road and soft estate maintenance
Design Commission for Wales	Reviewers
Utilities	Various

Table 4.8 Other key stakeholders

Other key stakeholders
Farm businesses (affected by the Scheme)
British Horse Society
Ramblers Association
National Farmers Union Cymru
Preseli Service Station and Car Sales, Llanddewi Velfrey
Road Haulage Association
Freight Transport Association
Emergency Services
Silcox Coaches
Taff Valley Coaches
Businesses in Narberth and Whitland
Farm Businesses
Haven Waterways Enterprise Zone
Associated British Ports

- 4.18.4 A Public Information Exhibition (PIE) was undertaken over two days in May 2017, based in the community hall in Llanddewi Velfrey. A bilingual Information Leaflet about the Scheme was delivered in advance to residents. Exhibition boards were displayed and members of the project team, including technical experts, were available to answer any questions and explain how the public could express their opinions formally.
- 4.18.5 Feedback at the exhibition was invited from those who attended the exhibition through a questionnaire survey and enquiry forms provided. The feedback was taken into consideration during the design of the Scheme, which was then shown to the community at a Public Exhibition in September 2017. Further feedback was invited at the Public Exhibition and many were received.
- 4.18.6 In June 2017, an article about the Scheme was published in the community newsletter, which is widely distributed.
- 4.18.7 A public consultation was carried out in Autumn 2017, with a Public Exhibition in the community hall in Llanddewi Velfrey undertaken over three days in October. A bilingual Information Leaflet about the Scheme was delivered in advance to residents. Exhibition boards were displayed and members of the project team, including technical

experts, were available to answer any questions and explain how the public could express their opinions using the questionnaire.

- 4.18.8 An integral part of the Consultation process are the Environmental Liaison Group meetings. These were held with key environmental consultees during the evolution of the Scheme design. Those who attended were invited to comment on the Scheme Objectives and Environmental Objectives and subsequently to comment on the EIA Scoping Report. The Scoping Report sets out the proposed scope of the EIA, and the assessment methodologies.
- 4.18.9 Meetings with farm owners and tenants were organised throughout the process, including completion of a questionnaire relating to existing land uses. Many of these owners and tenants attended the PIE and were able to provide comments using the exhibition questionnaire and through discussions with technical staff who attended.
- 4.18.10 The approach to consultation during the EIA process built on the consultation undertaken at previous stages. Statutory bodies were consulted throughout the development of the Scheme and meetings held with key consultees. Comments in relation to EIA matters were considered in the preparation of this ES.