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A487 New Dyfi Bridge

Environmental Statement –
Volume 1, Chapter 16
Assessment of Cumulative
Effects

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16 Assessment of Cumulative Effects

16.1 Introduction

- 16.1.1** Cumulative effects result from multiple actions on receptors or resources occurring in combination over time. This chapter presents an analysis of two types of cumulative effect.
- 16.1.2** The first type concerns inter-related effects from the Scheme on receptors or receptor groups, such as local residents, users of local rights of way or services, which may be affected simultaneously or concurrently by different environmental effects.
- 16.1.3** The second type concerns cumulative effects of the Scheme together with other developments that are either already built, proposed (but not yet built) or are reasonably foreseeable. Cumulative effects may occur where there is the potential for impacts to overlap by virtue of their geography (spatially) or due to them existing in a common timeframe (temporally).

16.2 Legislation and Policy Context

Relevant Legislation

- 16.2.1** The Environmental Impact Assessment (EIA) Directive requires the EIA to consider cumulative effects. Cumulative effects result from multiple actions on receptors and resources and over time and are generally additive or interactive (synergistic) in nature. Cumulative impacts as described in the Directive are summarised as:

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

Policy Context

- 16.2.2** The adopted Powys Unitary Development Plan (UDP) 2001 – 2016 highlights the importance of considering cumulative effects of development in Powys in relation to the development of wind farms (Policy E3), house extensions (Policy HP15), agricultural development (Policy EC9), livestock units (Policy EC10), development in conservation areas (Policy ENV12), and Mineral and waste disposal (Policy MW1)
- 16.2.3** The adopted Gwynedd Unitary Development Plan (UDP) 2001-2016 does not make reference to cumulative effects.

16.2.4 The adopted Eryri Local Development Plan (LDP) 2007-2022 makes reference to the importance of cumulative effects in relation to wind turbine proposals and telecommunications developments.

16.3 Methodology

16.3.1 The approach to assessing cumulative impacts is set out within DMRB Volume. 11, Section 2, Part 5 (HA 205/08) (Highways Agency et al., 2008). This draws on guidelines for assessing indirect, cumulative and impact interactions, published by the European Commission. 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'.

16.3.2 HA 205/08 recognises two principle types of cumulative impacts to be addressed in EIAs as follows:

- Cumulative impacts from a single project (e.g. combined effects of differing environmental impacts on a single receptor or resource); and
- Cumulative impacts from different projects (in combination with the project being assessed).

16.3.3 Both types of cumulative impacts are consistent with those described in Section 16.1 of this Chapter.

16.3.4 The guidance above states that in the first type (impacts from a single project) the impacts arise from the 'combined action of a number of environmental topic specific impacts upon a single receptor/resource'.

16.3.5 For the second cumulative impact assessment type (cumulative impacts from other projects) the guidance states that:

16.3.6 'For the purposes of this guidance, 'reasonably foreseeable' is interpreted to include other projects that are 'committed'. These should include (but not necessarily be limited to):

- Trunk road and motorway projects which have been confirmed (i.e., gone through the statutory processes); and
- Development projects with valid planning permissions as granted by the Local Planning Authority, and for which formal EIA is a requirement or for which non-statutory environmental impact assessment has been undertaken.

16.3.7 This assessment does not aim to assign a level of significance effect to any of the cumulative effects identified. Rather, a

judgement has been made on whether the cumulative effects are likely to be more or less significant than the effects identified for the Scheme alone.

16.4 Limitations and Assumptions

16.4.1 Assessment of cumulative effects is limited by the level of information that is available for each of the topic assessments. For combined effects from a single project (i.e. interrelated effects), this is not usually a limiting factor as information and assessment outcomes are readily available from the project team. However, when consideration is given to effects that may arise as a result of impacts from other committed projects, the assessment becomes limited by the amount of information that is made publically available.

16.4.2 All the information used in the cumulative assessment has been taken from the topic assessments. Information has been based on the topic assessment and is considered accurate at the time of writing.

16.5 Cumulative effects relevant to the scheme

16.5.1 The cumulative effects of the Scheme in conjunction with other proposed developments have been assessed and are presented here as a separate chapter within the ES. Discipline-specific cumulative effects are also set out within each of the ES topic chapters where appropriate.

16.5.2 Major developments considered for the cumulative effects assessment have been identified within the following categories:

- Development under construction;
- Application(s) permitted but which are not yet implemented;
- Submitted applications not yet determined, but which if permitted, may add cumulative effects to the project; and
- Development identified in the adopted and emerging development plan (with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited.

16.6 Review of available information

16.6.1 An initial review of the following sources has been undertaken in order to identify any likely future development projects in the area that may cause cumulative effects:

- Powys Unitary Development Plan 2001-2016;

- Draft Powys Local Development Plan 2011-2026;
- Eryri Local Development Plan 2007-2022 Written statement Adopted Version; and
- Wales National Transport Finance Plan (Welsh Government, 2015).

Assessment of Inter-related effects from the Scheme on Single Receptors or Resources

16.6.2 Sections 6.0 to 15.0 of this Environmental Statement have addressed predicted impacts of the Scheme in relation to certain environmental topic areas (e.g. air quality, noise and vibration, landscape and visual etc.) on certain receptors. These impacts associated with various topics have the potential to interact and combine with one another to have a greater impact on certain receptors. Several impacts that may have been insignificant by themselves may also combine to have a significant adverse effect.

16.6.3 In terms of the Scheme, effects that may lead to heightened effects on receptors include those related to air quality, visual impact, noise and vibration. Potential receptors of these inter-related effects are nearby residents (highest sensitivity), users of the PROW (medium sensitivity) and local workers and road users (low sensitivity). This assessment considers the two most sensitive receptors groups. These are as follows:

- Closest long term receptors - people living at dwellings within 350 metres of construction activities and within 1km of the Scheme; and
- Closest intermittent receptors - people using PROW (and other linear routes) within 350 metres of construction activities and within 1km of the Scheme¹.

16.6.4 The majority of assessments within this ES inherently consider the inter-related effects of the Scheme on receptors or receptor groups which are therefore already taken account of within the topic chapter assessments. These are not repeated in this chapter and have been scoped out of the inter-related cumulative effects assessment. A list of the topics that have been scoped out of the assessment due to inter-related effects already being intrinsically covered within the topic assessments include:

- Cultural heritage;
- Nature Conservation;

¹ These distances have been arbitrarily derived to cover what is considered to be reasonably appropriate to the scale of the development

- Geology and Soils;
- Materials; and
- Community and Private Assets.

16.6.5 Tables 16.1 and 16.2 list the inter-related effects that are predicted during construction and operation of the Scheme. The tables present the Scheme lifetime inter-related effects. Where a topic has not been presented, this is because they have been scoped out of the cumulative assessment because no effects have predicted within the topic assessments.

Table 16.1 Potential Inter-related effects for people living near the Scheme

Receptor	Closest long-term receptors - people living at dwellings within 350 m of construction activities and within 1 km of the alignment of the Scheme				
Phase	Construction phase		Operation and maintenance phase		Project Lifetime Inter-related Effects
Impact type	Source of impact	Significance of individual Cumulative Effects effect with mitigation	Source of impact	Significance of individual effect with mitigation	
Dust soiling surfaces, particularly window sills, cars and laundry.	Dust generating construction activities such as excavating and moving earth.	A temporary, short term effect which would be a negligible effect and not significant.	Not applicable.	Not applicable.	Through the project lifetime the receptors living closest to the existing A487 would experience limited construction related effects (construction noise, dust) followed by a minor reduction in traffic noise and traffic related emissions once traffic starts using the new A487 as well as changes in views (both day and night). Through the project lifetime the people living closest to the new A487 may experience noise and dust during construction alongside changes in views (both day and night). At the majority of receptors the inter-related effect of the Scheme on local air quality, noise/vibration and
Air quality	Exhaust emission impacts from construction traffic on human health.	A temporary, short term effect which would not be significant.	Traffic emission impacts on human health.	The Scheme does not result in a large change (>4µg/m ³) in pollutant concentrations. No exceedences of air quality objectives are predicted as a result of the Scheme	
Noise change	Noise generating construction activities such as excavation activities, piling, working machinery, construction traffic, etc.	The assessment has shown that it is unlikely that there would be significant noise effects around the Scheme during construction. Therefore, no residual	Noise from traffic on the new section of A487.	No significant operational effects were indicated from the assessment based upon the noise change impacts, therefore, no residual significant effects are assessed.	

Receptor	Closest long-term receptors - people living at dwellings within 350 m of construction activities and within 1 km of the alignment of the Scheme				
Phase	Construction phase		Operation and maintenance phase		Project Lifetime Inter-related Effects
Impact type	Source of impact	Significance of individual Cumulative Effects effect with mitigation	Source of impact	Significance of individual effect with mitigation	
		significant effects are assessed			views is not predicted to be significant.
Vibration	Vibration generating construction activities such as blasting or piling.	A temporary, short term adverse effect which would be neutral and would not be significant	Vibration generated from traffic moving on the new A487.	No ground-borne vibration impacts are forecast therefore a neutral effect (not significant) and scoped out of the noise and vibration assessment as a result.	This assumes that the same people (receptors) would remain in the same properties from the start of the Scheme construction through to operation.
Changes to views	Visibility of the construction activities.	A temporary, short term effect ranging between slight and moderate/large adverse effect, which would be significant.	Visibility of the new section of A487.	Neutral to very large adverse (significant) effect at year one and neutral to very large adverse (significant) effect at year 15.	

Table 16.2 Potential inter-related effects for people using public rights of way (PRoW)

Receptor	Closest intermittent receptors - people using PRoWs (and other linear routes) affected by the Scheme or within 350 m of construction activities and within 1 km of the Scheme				
Phase	Construction phase		Operation and maintenance phase		Project Lifetime Inter-related Effects
Impact type	Source of impact	Significance of individual Cumulative Effects effect with mitigation	Source of impact	Significance of individual effect with mitigation	
Changes to the Public Rights of Way network	Temporary stopping up and diversions: temporary stopping up affecting route for Wales Coastal Path and PRoW along the south bank of the Afon Dyfi. Temporary effects on ability to access local routes: temporary stopping up of a section of National Cycle Route 8 resulting in effects on route integrity.	Slight adverse medium temporary effect of minor adverse significance.	The introduction of the new A487 close to and over existing routes. De-trunking of existing A487 south of Pont-ar-Ddyfi and realignment at southern tie in.	A minor adverse effect for users of the PRoW along the south bank of the Afon Dyfi and National Cycle Route 8. A moderate benefit for users of the Wales Coastal Path. All effects are long term and permanent.	Project lifetime inter-related cumulative effects would only be experienced by regular users of the routes affected by the Scheme and the combination of types of impacts and levels of effects would be highly variable depending on
Noise change	Noise generating construction activities such as excavation activities, piling, working machinery, construction traffic, etc.	A temporary, short term effect is expected for users of public rights of way in the vicinity of construction activities.	Noise from traffic on the new section of A487.	Users of the public rights of way and cycle route in the vicinity of the existing and new A487 may notice an increase in traffic noise with traffic on the new A487 but this would not be significant.	

Receptor	Closest intermittent receptors - people using PRowS (and other linear routes) affected by the Scheme or within 350 m of construction activities and within 1 km of the Scheme				
Phase	Construction phase		Operation and maintenance phase		Project Lifetime Inter-related Effects
Impact type	Source of impact	Significance of individual Cumulative Effects effect with mitigation	Source of impact	Significance of individual effect with mitigation	
Changes to views	Visibility of construction activities.	A temporary, short term effect ranging between slight and moderate/large adverse effect, which would be significant.	Visibility of the new section of A487.	Neutral to very large adverse (significant) effect at year one and neutral to very large adverse (significant) effect at year 15.	the route itself. Based on these variables, it is considered that there would not be a significant inter-related effect.

Assessment of Cumulative Effects from the Scheme and Other Proposed Developments

- 16.6.6** Following consultation with Gwynedd Council, Powys County Council and Snowdonia National Park Authority along with searches of their planning websites, there are no developments which may have a cumulative effect with the Scheme.
- 16.6.7** Planned trunk road projects in Wales are included in the Wales National Transport Finance Plan (Welsh Government, 2015). In terms of ‘trunk road and motorway projects which have been confirmed’, there are none which are likely to have a cumulative effect with the Scheme.
- 16.6.8** As well as planned developments that have been consented or which are currently in the planning system, consideration has also been given to projects that may be included within the relevant development plans. It is unlikely that sufficient information would be available to make a useful assessment; however, it can be helpful to give an indication of potential future development in the area. The sections below identify projects identified within the following:
- Powys Unitary Development Plan (UDP) 2001-2016;
 - Powys Local Development Plan (LDP) 2011-2026;
 - Eryri Local Development Plan (2007 - 2022); and
 - Welsh Government National Transport Finance Plan 2015.

Powys Development Plans

Powys Unitary Development Plan (UDP) 2001-2016

- 16.6.9** The Powys Unitary Development Plan (UDP) 2001-2016 was formally adopted by Powys County Council on March 1st 2010.
- 16.6.10** There were 4No. sites allocated for housing development in the Machynlleth Planning Area of the Powys UDP, with one additional land allocation to cater for employment uses. These are identified in Table 16.3.

Table 16.3 Developments in Machynlleth Planning Area of Powys UDP 2001-2016

	Powys UDP 2001-2016 Allocated Sites for the Machynlleth Planning Area	Development Type	Size	Comment
1	M172 HA1 - Mynydd Griffiths, Phase 2	Housing development	0.92Ha	Small housing developments of less than 1 hectare – no cumulative effect with the Scheme.
2	M172 HA2 – Garsiwn	Housing development	0.15Ha	
3	M172 HA3 - Land to the east of the Vicarage, Newtown Road	Housing development	0.55Ha	
4	M172 HA4 - OS1546, Aberystwyth Road	Housing development	1.33Ha	Now P42 HA1 in LDP
5	M172 EA1 - Land at Treowain	Special Employment Site	1.35Ha	Partially developed. Now taken forward in LDP as P42 EA1.

16.6.11 Of the allocated sites, three are small housing developments of less than 1 hectare. It is considered these have no cumulative effect with the Scheme.

16.6.12 The remaining two allocated sites have been taken forward in the draft Powys Local Development Plan.

Powys Local Development Plan (LDP) 2011-2026

16.6.13 The Powys Local Development Plan (LDP) (2011-2026) will replace the current Unitary Development Plan and form the basis for decisions on land use planning for the County of Powys. The Council consulted on the revised Deposit Local Development Plan (LDP) documents from the 8th June to 20th July 2015. The LDP was submitted to the Welsh Government for examination in January 2016, and a Public Consultation on a Schedule of Proposed Focussed Changes was held between 29th January 2016 and 11th March 2016. It underwent Independent Examination in May 2016. The LDP is due to be adopted in December 2016.

16.6.14 The Powys LDP identifies five allocated sites. There are no committed sites. The Powys “LDP Site Status Report with Officer Recommendations June 2015” identifies which sites have been taken forward (see Table 16.4).

Table 16.4 Abstract from Powys LDP Site Status Report with Officer Recommendations (June 2015)

Towns	Inset Map	Site Ref	Site Name	Site Area (Ha)	No. Units	Affordable Housing Target (%)	Affordable Housing Target (No.)	Area Emp/ Other (Ha)	Issues/ Infrastructure/S106 Requirements (Base date for planning permission information – 31/12/2013)
Machynlleth	P42	HA1	OS1546, Aberystwyth Road	1.4	29	10	4.0	N/A	Site awaiting signing of s106 (P/2013/0144). Off-site sewers would be required to connect to the public sewerage network and can be provided through the sewer requisition scheme under Sections 98-101 of the Water Industry Act 1991. "Project level HRA screening maybe required – Dyfi Estuary SAC, Llyn Peninsula and Sarnau SAC, Cors Fochno SAC and Meirionydd Oakwood and Bat sites.
Machynlleth		HA4	Newtown Road	0.3	5	0	0.0	N/A	Proposed permanent site to accommodate a gypsy family residing in the local area. Please note that the precise location of the site within the allocation is to be determined. Alterations to the local highway network would be required to allow satisfactory access to be achieved. Project level HRA screening may be required – Dyfi estuary SAC. Llyn Peninsula and Sarnau SAC. Cors Fochno SAC and Meirionydd Oakwood and bat sites.
Machynlleth		EA1	Land at Treowen	1.3	N/A	N/A	N/A	1.3	Project level HRA screening may be required – Dyfi estuary SAC. Llyn Peninsula and Sarnau SAC. Cors Fochno SAC and Meirionydd Oakwood and bat sites.
Machynlleth		HA2	Land adjacent HA1, Aberystwyth Rd	0.5	13	10	1.3	N/A	Ecological survey will be required to inform enhancements. Road access via adjoining site access to the east on to the roundabout. Off-site sewers would be required to connect to the public sewerage network and can be provided through the sewer reclamation scheme under section 98- 101 of the Water Industry Act 1991. Project level HRA screening may be required – Dyfi estuary SAC. Llyn Peninsula and Sarnau SAC. Cors Fochno SAC and Meirionydd Oakwood and bat sites.

Towns	Inset Map	Site Ref	Site Name	Site Area (Ha)	No. Units	Affordable Housing Target (%)	Affordable Housing Target (No.)	Area Emp/ Other (Ha)	Issues/ Infrastructure/S106 Requirements (Base date for planning permission information – 31/12/2013)
Machynlleth		HA3	Mid Wales Storage Depot	0.4	15	10	1.5	N/A	Ecological survey will be required to inform enhancements. Transport assessment will be required to support any development proposals. Site is a brownfield site and may therefore require land contamination investigation and remediation. There are isolated incidents of flooding in the public sewerage system that will need to be resolved to allow development to proceed. Potential developers can either wait for DCWW to resolve the flooding, subject to funding being approved by Ofwat, or progress the improvements through the sewerage requisition of the Water Industry Act 1991 or s106 of the Town and Country Planning Act 1990. Existing building on site contributes to character and appearance of Conservation Area. Project level HRA screening may be required – Dyfi estuary SAC. Llyn Peninsula and Sarnau SAC. Cors Fochno SAC and Meirionydd Oakwood and bat sites. The boundary of the site abuts the flood zone – a FCA will be required to demonstrate that the consequence of flooding on access / egress can be managed.

Source:http://pstatic.powys.gov.uk/fileadmin/Docs/Planning/LDP/LDP_2015/LDP_Stages/2015_revised_Deposit_Draft/English/Sites_Status_Master_-_Deposit_2_2015.pdf

- 16.6.15** The five allocated sites in the emerging Powys LDP do not constitute major developments and at this stage are not ‘reasonably foreseeable.’ They have therefore not been considered further for this cumulative effects assessment.

Snowdonia Development Plans

Eryri Local Development Plan (2007 - 2022)

- 16.6.16** The Eryri Local Development Plan was adopted by Snowdonia National Park Authority on the 13th of July, 2011. Snowdonia National Park Authority has a role to regulate and facilitate planning decisions. There are no proposed major developments within the plan of relevance to the cumulative assessment.

Gwynedd Development Plans

- 16.6.17** The Dyfi Bridge site is within Snowdonia National Park and therefore all planning issues are dealt with by Snowdonia National Park Authority. Gwynedd development plans are not relevant to this assessment as it is spatially too far from the site to have any cumulative effect.

Welsh Government National Transport Finance Plan 2015

- 16.6.18** The Welsh Government National Transport Finance Plan, 2015 lists is the Welsh Government’s investment plan for transport and infrastructure services in Wales. It identifies which projects are likely to be funded upto 2020 and beyond.
- 16.6.19** There are no schemes within the National Transport Finance Plan that are relevant to the cumulative assessment for Dyfi Bridge.

16.7 Summary of Inter-related effects from the Scheme on people living locally

- 16.7.1** There is a low density of dwellings near the existing and new A487 and at the majority of receptors the effect of the Scheme on local air quality and noise is not predicted to be significant.
- 16.7.2** Changes in views from dwellings nearby would result from the introduction of the new section of A487 and would also be a new effect for these receptors. The adverse inter-related effects have been assessed as not being significant to people living near the new A487.

16.8 Summary of Inter-related effects from the Scheme on people using Public Rights of Way

16.8.1 Users of PRow and other routes near the Scheme during construction may be simultaneously affected by the dust and noise generated during construction activities as well as the visual effects (change in views). Users could also experience a temporary diversion or closure of a route. Such effects would only combine where users of PRow are in close proximity to the Scheme's construction activities. The receptors (i.e. the people using the routes) are transient through the landscape along the paths or routes and are unlikely to experience a long term effect. Inter-related effects on people using PRow during construction are therefore considered to be not significant.

16.8.2 During operation, users of Public Rights of Way and other routes may be simultaneously affected by changes in the amount of traffic noise and air quality from the new section of A487 as well as the visual effects (change in views). Users may also experience a permanent realignment of a route. Such effects would only combine where users of PRow are in close proximity to the Scheme. The receptors are transient through the landscape along the paths or routes and effects are therefore more likely to be felt intermittently. Inter-related effects on people using PRow during operation are therefore considered to be not significant.

16.9 Summary of Cumulative Effects from the Scheme and Other Proposed Developments

16.9.1 As none of the proposed developments considered during the desk study exercise have 'a valid planning permission granted by the local planning authority and for which formal EIA is a requirement or for which non-statutory environmental impact assessment has been undertaken' the guidance given within the HA 205/08 suggests that the cumulative impacts of these projects do not need to be assessed.

16.10 Mitigation and Monitoring

16.10.1 Environmental effects from the construction of the Scheme would be mitigated and monitored through good construction practice and with the use of the CEMP. A pre-CEMP is provided in Volume 3 Appendix 17.1 of this ES.

16.10.2 Operational environmental effects from the Scheme would be mitigated and monitored as set out in this ES, including the commitments register set out in Volume 3 Appendix 17.2.

16.10.3 No other mitigation measures are considered necessary.