Llywodraeth Cymru / Welsh Government

A487 New Dyfi Bridge

Environmental Statement – Volume 1: Chapter 8 Landscape and Visual

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8 Landscape and Visual

8.1 Introduction

8.1.1 This chapter provides an assessment of the landscape and visual effects arising from the Scheme including the changes to the character and quality of the site and surrounding landscape.

8.1.2 The proposed A487 New Pont-ar-Ddyfi (the Scheme) consists of a new viaduct structure across the floodplain and a river bridge to cross the Afon Dyfi approximately 480m upstream of the existing Pont-ar-Ddyfi. The length of the Scheme is approximately 1200m with approximately 725m being on structures. For further detail on the Scheme refer to Chapter 2 of this Environmental Statement (ES).

8.1.3 The existing landscape character and the visual environment have been separately surveyed and assessed. The landscape assessment identifies characteristics, features and elements which constitute this particular landscape and its character. The visual baseline identifies existing views to, from and across the Scheme, and identifies the visual receptors, such as nearby residents or users of Public Rights of Way (PRoWs) and roads which might be affected by the Scheme.

8.1.4 The Scheme lies partly within Snowdonia National Park (SNP) and partly within its landscape setting. The receiving environment is highly sensitive.

8.2 Legislation and Policy Context

Planning Policy Context

European Landscape Convention

8.2.1 The following paragraphs are quoted from IEMA and the Landscape Institute's Guidance on Landscape and Visual Impact Assessment, 3rd Edition (2013).

8.2.2 The UK has signed and ratified the European Landscape Convention (ELC) since 2002, when the last edition of this guidance was published. The recognition that government has thus given to landscape matters raises the profile of this important area and emphasises the role that landscape can play as an integrating framework for many areas of policy. The ELC is designed to achieve improved approaches to the planning, management and protection of landscapes throughout Europe and to put people at the heart of this process.

National Planning Policy Framework

8.2.3 National planning policy (Planning Policy Wales ed.8) which relates to National Parks and other relevant topics has been referred to and particular attention given to the following paragraphs:

- 4.11.10 - regarding design and use of materials in relation to designated and distinctive landscape and heritage assets;
- 5.3.3 - defining the statutory nature of the Snowdonia National Park designation;
- 5.3.4 and 5.3.6 - setting out the status and purposes of the National Park to, protect, conserve and enhance the Natural Beauty, wildlife and cultural heritage and the parks special qualities;
- 5.3.13 - regarding the use of LANDMAP to inform assessment and decision making; and
- 5.4.3 - on the importance of conserving and managing linear landscape features for wildlife.

8.2.4 The assessment and mitigation design has been carried out with reference to the Hedgerow Regulations and to legislation and guidance around the control of invasive plants such as Japanese Knotweed and Himalayan Balsam. Reference was made to EU Regulation (1141/2014) on invasive alien (non-native) species and to Section 14 and Schedule 9 of the Wildlife and Countryside Act 1981 (Variation of Schedule 9) (England and Wales) Order 2010.

Local Planning Policy

Snowdonia National Park

8.2.5 The Eryri Local Development Plan 2007- 2022 was adopted in July 2011 and is the document by which development proposals in the National Park would be judged. Policies of particular relevance to landscape and visual aspects include:

- SP:D Natural Environment
- DP:2 Development and Landscape
- SP:F Historic Environment
- DP:6 Sustainable Development and Materials
- DP:7 Listed and Traditional Buildings

8.2.6 Reference was also be made to the Snowdonia National Park Management Plan 2010-2015. This document is currently under review and its status and significance is uncertain, but for the purposes of this assessment it has been assumed valid.

8.2.7 SNP Authority has also approved Supplementary Planning Guidance. Of particular relevance to landscape and visual assessment of the Scheme is:

- 7. Landscapes and Seascapes of Eryri.

Powys County Council

8.2.8 Policies relevant to this Scheme include:

8.2.9 Strategic Part One Policies

- UDP SP3 - Natural, Historic and Built Heritage
- UDP SP6 - Development and Transport
- UDP SP14 - Development in Flood Risk Areas

8.2.10 Part Two – 4. Environment

- POLICY ENV 1: Agricultural Land
- POLICY ENV 2: Safeguarding the Landscape
- POLICY ENV 5: Internationally Important Sites
- POLICY ENV 6: Sites of Regional and Local Importance
- POLICY ENV 9: Woodland Planting
- POLICY ENV 17: Ancient Monuments and Archaeological Sites

8.2.11 Revised Deposit Draft Local Development Plan (LDP) (2015-2026) - Upon adoption, the LDP would replace the current UDP and form the basis for decisions on land use planning for the county of Powys.

8.2.12 Policies relevant to this Scheme include:

- Policy DM1 – Strategic Planning Matters
- Policy DM2 – Detailed and Site Specific Planning Matters
- Policy T1 – Transport Infrastructure

8.3 Assessment Methodology

Relevant Guidance

8.3.1 This assessment follows guidance and methodology set out in the following documents:

- IAN 135/10 (W) landscape and visual Effects Assessment (with particular reference to the guidance and method for a detailed landscape and visual effects assessment);
- DMRB Volume 10 Environmental Design and Management (2001);

- DMRB Volume 11 Environmental Assessment (1994 and 2008);
- IAN 125/09(W) Supplementary guidance for users of design manual for roads and bridges;
- Roads in Lowland Areas, Welsh Government (1993);
- Roads in Upland Areas, Welsh Government (1990);
- Institute of Environmental Management and Assessment and Landscape Institute, Guidance on Landscape and Visual Impact Assessment, Third Edition (2013); (GLVIA3)
- LANDMAP Methodology (2008);
- LANDMAP and the Cultural landscape (2013);
- Institute of Lighting Professionals Guidance Notes for the Reduction of Obtrusive Light GN01:2011 (2011).
- Photography and Photomontage in Landscape and Visual Impact Assessment, Landscape Institute (2011); and
- Visual representation of wind farms: good practice guidance, Scottish Natural Heritage, Version 2 (2014).

8.3.2 Existing background information on the study area has been sourced from:

- Ordnance Survey – 1:50,000 and 1:25,000 scale maps;
- Google Earth and Street View;
- Bing maps;
- GIS designation data sets;
- LANDMAP - http://test.landmap.ccw.gov.uk/; and
- Field work undertaken during the day and night in August 2015 and in January 2016.

Study Area

8.3.3 The Zone of Theoretical Visibility (ZTV) presented in Volume 2 Figure 8.1 was used to analyse the visibility of the Scheme within the surrounding landscape and highlight any potential viewpoint locations. In combination with a desktop study and field work, the ZTV was used to identify sensitive receptors and a selection of viewpoints. The study area has been set at a 5km radius of the site, as beyond this distance the potential for indirect landscape and visual effects is limited due largely to intervening topography.

8.3.4 Both the landscape and visual assessments undertaken have used this 5km study area.

Approach to Identification of Baseline Conditions

8.3.5 The following baseline studies have been carried out in order to inform the LVIA:

- Desk study, photographic study and visual analysis (ZTV as detailed below);
- Field work to familiarise with the landscape and its character and to select a set of representative viewpoints;
- Photography undertaken in line with best practice and current guidance (GLVIA, 2013); and
- Preparation of figures in Volume 2 including:
    - Figure 8.1 Site Location, Viewpoints and ZTV;
    - Figure 8.2 Landscape Constraints;
    - Figure 8.3 Landscape Character Areas (informed by LANDMAP, Appendix 8.1 in Volume 3);
    - Figure 8.4 Topography
    - Figure 8.5 Visual Receptors;
    - Figure 8.6 Night-time Character Darkness and Lighting;
    - Figure 8.7 Baseline Environmental Plans;
    - Figure 8.8 Photo Sheets.
    - Figure 8.9 Environmental Masterplans; and
    - Figure 8.10 Landscape Cross Sections.

8.3.6 For a description of the Baseline environment please refer to Section 8.4.

Consultation

8.3.7 The scope of the landscape and visual assessment was set out in the Environmental Scoping Report [1] (Arup/Welsh Government 2015) provided at Volume 3 Appendix 1.3 in this ES. The following statutory authorities were engaged and involved in the development of the Landscape and Visual scoping through Environmental Liaison Group Meetings and direct contact:

- Gwynedd County Council;
- Powys County Council;

[1] Llywodraeth Cymru / Welsh Government A487 New Pont-ar-Ddyfi, Scoping Report (March 2016)

- Snowdonia National Park Authority; and
- Natural Resources Wales.

8.3.8 Following feedback on the scope and methodology, the Scoping Report was revised and agreed. The method adopted and the scope of this assessment is in accordance with that set out in the scoping report.

8.3.9 The proposed extent of the visual assessment study area and the selection of representative viewpoints was presented at an Environmental Liaison Group meeting on Tuesday 19 January 2016.

8.3.10 The relevant officers at the statutory local authorities were separately engaged to agree the scope of the visual assessment, the study area and the approach for the landscape assessment. The details of these discussions are set out below.

Table 8.1: Consultation Record

Consultee	Date	Details	Response
Design Commission for Wales (DCfW)	14 January 2016	Following presentation of early design, including Landscape mitigation measures, DCfW were broadly complimentary of the design but highlighted the following areas for further work: Design 'Motto' - light-touch, simple and elegant; Consider thinner circular columns to viaduct; Consider aesthetic alternative to 'leaf' bridge piers; Preference for no lighting on bridge; Creative landscape input for SNP Gateway; Integration of northern bridge abutment and cattle track into landscape; and Sympathetic treatment of de-trunked A487 and existing Pont-ar-Ddyfi	The light-touch, Simple and elegant motto was adopted. The design was amended through an iterative process to: amend the design of the columns and piers; • integrate the cattle underpass and northern bridge abutment into the landscape; • limit lighting to only improved replacement lighting adjacent to and south of the Dyfi Eco Park; • downgrade the existing A487 route and integrate it better into the landscape: and • provide a simple, elegant landscape treatment to the northern junction as a gateway to SNP.
Gwynedd County Council	18 February 2016	Representative of the planning department advised that SNPA would be the relevant planning authority and that Gwynedd did not need to be consulted on the LVIA.	SNPA was engaged as detailed below.
CSP - Development Control officer at Powys County Council	18 February 2016	Viewpoints required from all Listed buildings within 1km of the Scheme, the nearest residential receptors. PRoW viewpoints acceptable.	Viewpoints have been included to represent all publicly accessible heritage assets, residential receptors and recreational receptors with the potential to receive significant visual effects.
Interim Head of Policy and Strategic Plans at Snowdonia National Park Authority	18 February 2016	No comment on the scope of the assessment proposed, understood the Scheme would not be lit and any temporary lighting should be designed to minimise the impact on the Dark-sky Reserve.	Proposed lighting is limited to improved replacement lighting adjacent to and south of the Dyfi Eco Park. The Dark Skies Reserve designation is dealt with in detail in the baseline and assessment.
Landscape Architect, Casework North and Mid Wales, Ecosystems, Planning and Partnerships at Natural Resources Wales	1 March 2016	No comment on the scope of the assessment proposed, but suggested an additional photomontage from Viewpoint 11 and recommended narrative discussing the landscape and visual effects of a strong straight Scheme in this rural setting with irregular pattern and form.	Additional Viewpoint Included. The linear nature of the Scheme and its textural and visual contrast within the sensitive receiving landscape has been assessed in this Chapter.

Extent of Visibility

8.3.11 The study area was determined by the Zone of Theoretical Visibility (ZTV). This is based on 2m digital surface modelling (DSM) data, which includes substantial vegetation and built form to identify areas from which the Scheme would theoretically be visible. The ZTV was generated by computer software which places 6m-high columns on the highest proposed point at either end and every 50m along the Scheme. 6m is estimated to be a worst case scenario for any vehicle or object likely to be using the Scheme. A typical articulated lorry or double decker bus would be approximately 4.5m tall. This data is presented on a map at Volume 2 Figure 8.1 showing the ZTV and viewpoints representing visual receptors whose views are considered likely to be affected.

8.3.12 As a result of the analysis of visibility within the surrounding landscape and as described above at paragraph 8.3.3, the study area was set at 5km. This is the distance within which it is considered that there are potentially significant landscape and visual effects from the Scheme.

Receptors

8.3.13 This study identifies the receptors within the landscape which may be affected by the Scheme. The types of receptors assessed are described below:

Landscape receptors

8.3.14 These are individual elements of the landscape fabric and the area's landscape character that may be affected by the Scheme. These are described below:

Landscape elements

8.3.15 Landscape elements include physical features such as trees and hedgerows, topography, water courses and structures. Impacts to these elements may arise where valued features are lost, gained or substantially modified as a result of the Scheme. The loss or depletion of important landscape features can adversely affect the condition and quality of the landscape as a resource in its own right and the overall character of the landscape. Conversely, the addition of significant beneficial features can constitute an improvement to landscape elements and overall character.

Landscape character

8.3.16 The LANDMAP system has been developed specifically for the assessment of character in the landscape of Wales. The system

has been promoted by CCW and implemented in partnership with Local Planning Authorities throughout Wales. Much of the methodology is underpinned by earlier work carried out by the Countryside Agency ('CA') -

"…single unique areas which are discrete geographical areas of a particular landscape type."

8.3.17 LANDMAP has evolved since it was introduced in 1997. The CCW (now NRW) website states that:

"LANDMAP, the Welsh approach to landscape assessment, would achieve complete quality assured coverage in 2008. LANDMAP, introduced in 1997, was revolutionised in 2003 with the introduction of a benchmark methodology and quality assurance process to ensure consistency, accuracy and accessibility of landscape information in Wales. The approach has matured through the continued input and experience from local authority LANDMAP Managers, the aspect specialists collecting the information and the steerage from the Quality Assurance Panel resulting in an outstanding nationally consistent resource for landscape planning and decision-making."

8.3.18 It should also be noted that the CCW arrived at a working definition of landscape as follows:

"The physical reality of the environment around us, the tangible elements that give shape and diversity to our surroundings. But landscape is also the environment perceived, predominantly visually but additionally through our senses of smell, touch and hearing. Our appreciation of landscape is affected, too, by our cultural backgrounds, and by personal and professional interests. For the Countryside Council for Wales's purposes, landscape is defined as the sum of all these components" (CCW, 2001).

8.3.19 Impacts on the landscape may arise where the landscape character of the area is modified by the Scheme. It is important to place the Scheme in its landscape context.

8.3.20 For this assessment effects on the landscape as a resource will be assessed and reported in terms of Landscape Character Areas (LCAs) as shown on Volume 2 Figure 8.3. Landscape Receptors include the LCAs listed at paragraph 8.4.62 below

Visual receptors

8.3.21 Visual receptors are people enjoying views from locations from which it is possible to obtain views of the Scheme. These views may be partial or full, glimpsed or direct. Impacts on the visual amenity of a particular receptor may arise where features intrude into or obstruct views, or where there is some other qualitative change to the view.

8.3.22 In accordance with IAN 135/10 (w) and as set out at 8.3.44 below, visual receptors include people in their homes, users of Public Rights of Way (PROW) and other areas of open space or recreational landscapes, people at work and people travelling along roads or railway lines.

8.3.23 Views from such receptors are illustrated by photographs taken from key viewpoints, which have been located on a plan presented at Volume 2 Figure 8.1. Receptors include private viewpoints, such as views from domestic residences, or public viewpoints like highways, footpaths or other places with public access. The scope and locations of these representative viewpoints was consulted upon with the relevant planning authorities as detailed in Table 8.1 under paragraph 8.3.10 above.

8.3.24 Types of viewpoints that can be selected for LVIA include:

- Representative viewpoints, which represent the experience of different types of visual receptors;
- Specific viewpoints, chosen because they are key , promoted viewpoints within the landscape; and
- Illustrative viewpoints, to demonstrate a specific visual issue.

8.3.25 For this assessment, the majority of viewpoints are representative viewpoints representing views from several houses and a PRoW for example. It also includes a selection of specific viewpoints for views available from; the Millennium Cycle Bridge, Dolguog Hotel, Machynlleth Train Station, a private dwelling off the A487 to the east of Pen-y-bont, the Wales Coast Path and Open Access Land at Mynydd Cynffyrch.

Assessment Criteria and Assignment of Significance

8.3.26 The Assessment has been carried out in accordance with guidance set out in Welsh Government's Interim Advice Note IAN 135/10(W) and in Guidelines for Landscape and Visual Impact Assessment (GLVIA3) (2013). The following pages have been extracted from IAN135/10(W) Annex 1 and 2 and are presented here as typical criteria used in making the judgements and assessments in this chapter.

8.3.27 For each receptor the baseline (existing condition) is described and its value assessed in terms of how valuable the receptor is (high, medium or low) and to what extent it is valued (individual, community, local, national or international).

8.3.28 The baseline is then reviewed alongside the description of the Scheme without mitigation measures.

8.3.29 The susceptibility of each receptor to the proposed changes is then assessed. Combining judgements on the value of the receptor and its susceptibility to the type of change proposed, gives its overall sensitivity to change (high, moderate or low). See Table 8.3 and 8.6.

8.3.30 For each receptor, the changes arising from the Scheme are described and quantified to give a magnitude of change (Major, moderate, minor, negligible or no change) and whether the change is adverse (negative) or beneficial (positive). See Table 8.7.

8.3.31 Next the judgements on sensitivity and magnitude of change are combined to give an overall assessment of significance of the effect (very large, large, moderate, slight or neutral) and are described as either adverse or beneficial in nature. See Table 8.5 and 8.8.

8.3.32 Once the effects are understood, mitigation measures are incorporated where possible to reduce the predicted effects.

8.3.33 Finally an assessment of the residual effects is made by reassessing the magnitude of change to each receptors once mitigation measures are in place.

8.3.34 Effects with levels of moderate or greater are considered to be material or 'significant' in terms of Environmental Impact Assessment. Effects of less than moderate significance, are likely to be 'insignificant', but may still be useful in informing the design of the Scheme or mitigation measures.

8.3.35 The detailed methodology for the assessment of the receptors is set out below. The methodology determines the degree of significance of the effect, the definitions for which are taken from IAN135/10(W) extracted and provided below.

Assessing Magnitude of Impact

8.3.36 Based on consideration of the Scheme, the magnitude of impact (which could be either adverse or beneficial) should be estimated. Depending on the complexity of the Scheme, this may need to be broken down into different sections depending on the nature and value of the different character areas affected. Indicative criteria are provided for guidance in Table 8.2.**Error! Reference source not found.**These are not prescriptive and in making judgements the landscape professional needs to be able to demonstrate a consistent and justifiable argument.

Table 8.2: Magnitude and Nature of Landscape Impact and Typical Descriptors

Magnitude of Impact	Typical Criteria Descriptors
Major Adverse	Total loss or large scale damage to existing character or distinctive features and elements, and/or the addition of new but uncharacteristic conspicuous features and elements.
Moderate Adverse	Partial loss or noticeable damage to existing character or distinctive features and elements, and/or the addition of new but uncharacteristic noticeable features and elements.
Minor Adverse	Slight loss or damage to existing character or features and elements, and/or the addition of new but uncharacteristic features and elements.
Negligible Adverse	Barely noticeable loss or damage to existing character or features and elements, and/or the addition of new but uncharacteristic features and elements.
No Change	No noticeable loss, damage or alteration to character or features or elements.
Negligible Beneficial	Barely noticeable improvement of character by the restoration of existing features and elements, and/or the removal of uncharacteristic features and elements, or by the addition of new characteristic elements.
Minor Beneficial	Slight improvement of character by the restoration of existing features and elements, and/or the removal of uncharacteristic features and elements, or by the addition of new characteristic elements.
Moderate Beneficial	Partial or noticeable improvement of character by the restoration of existing features and elements, and/or the removal of uncharacteristic and noticeable features and elements, or by the addition of new characteristic features.
Major Beneficial	Large scale improvement of character by the restoration of features and elements, and/or the removal of uncharacteristic and conspicuous features and elements, or by the addition of new distinctive features.

Assessing Landscape Sensitivity

8.3.37 The outputs from the landscape character assessment (i.e. landscape characteristics, their condition and value) should be considered to assess their sensitivity to changes arising from the project. 'Landscape receptors need to be assessed firstly in terms of their sensitivity, combining judgements of their susceptibility to the type of change or development proposed and the value attached to the landscape' (GLVIA para 5.39). Susceptibility to change means 'the ability of the landscape receptor to accommodate the proposed development without undue consequences for the maintenance of the baseline situation and / or the achievement of landscape policies and strategies' (GLVIA para 5.40. The 'value' of the landscape receptor is therefore identified using the above criteria and susceptibility to change. Landscape designations will reflect the value of the landscape receptors and the level of importance

which they signify, although there should not be over reliance on designations as the sole indicator of value.

8.3.38 Landscape sensitivity will depend on the character of the receiving landscape, the nature of the proposed project and the type of change. Indicative criteria are provided for guidance in Table 8.2. As with the determination of magnitude of impact, these are not prescriptive and in making judgements the landscape professional needs to be able to demonstrate to others a consistent and justifiable argument that can be linked back to evidence from the baseline study.

Table 8.3: Landscape Sensitivity and Typical Examples

Sensitivity	Typical Descriptors and Examples
High	Landscapes which by nature of their character would be unable to accommodate change of the type proposed. Typically these would be: • Of high quality with distinctive elements and features making a positive contribution to character and sense of place; • Likely to be designated, but the aspects which underpin such value may also be present outside designated areas, especially at the local scale; • Areas of special recognised value through use, perception or historic and cultural associations; • Likely to contain features and elements that are rare and could not be replaced.
Moderate	Landscapes which by nature of their character would be able to partly accommodate change of the type proposed. Typically these would be: • Comprised of commonplace elements and features creating generally unremarkable character but with some sense of place; • Locally designated, or their value may be expressed through non- statutory local publications; • Containing some features of value through use, perception or historic and cultural associations;. • Likely to contain some features and elements that could not be replaced.
Low	Landscapes which by nature of their character would be able to accommodate change of the type proposed. Typically these would be: • Comprised of some features and elements that are discordant, derelict or in decline, resulting in indistinct character with little or no sense of place. Not designated; • Containing few, if any, features of value through use, perception or historic and cultural associations; • Likely to contain few, if any, features and elements that could not be replaced.

Assessing Significance of Effects

8.3.39 The evaluation of the significance of the landscape effects of the project is derived by assessing the sensitivity of the landscape against the magnitude of impact, considered both with and without effective mitigation measures, as shown in the matrix in Table 8.4.

8.3.40 It should be noted that the categories in Table 8.4 can be either beneficial or adverse, and that in some circumstances the addition of new features (e.g. 'gateway features' such as art work or a distinctive bridge design) will enhance the landscape, resulting in a significant beneficial effect.

8.3.41 Typical descriptors of the significance of effect categories in the matrix are provided in Table 8.4.

8.3.42 These are not prescriptive and in making judgements the landscape professional needs to be able to demonstrate to others a consistent and justifiable argument. This is particularly important where a choice of categories is given in the matrix (e.g. where a landscape of high sensitivity experiences a moderate magnitude of impact, justification for the assessment of either a moderate or large degree of significance should be given).

Table 8.4: Significance of Effect Categories

		MAGNITUDE OF IMPACT				
		No change	Negligible	Minor	Moderate	Major
SENSITIVITY	High	Neutral	Slight	Slight / Moderate	Moderate / Large	Large / Very Large
	Moderate	Neutral	Neutral / Slight	Slight	Moderate	Moderate / Large
	Low	Neutral	Neutral / Slight	Neutral / Slight	Slight	Slight / Moderate

Table 8.5: Typical Descriptors of Significance of Landscape Effect Categories

Significance Category	Typical Descriptions of Effect
Very Large Beneficial (Positive) Effect.	The project would: Greatly enhance the character (including quality and value) of the landscape. Create an iconic high quality feature and/or series of elements. Enable a sense of place to be created or greatly enhanced.
Large Beneficial (Positive) Effect.	The project would: Enhance the character (including quality and value) of the landscape. Enable the restoration of characteristic features and elements lost as a result of changes from inappropriate management or development. Enable a sense of place to be enhanced.
Moderate Beneficial (Positive) Effect.	The project would: Improve the character (including quality and value) of the landscape. Enable the restoration of characteristic features and elements partially lost or diminished as a result of changes from inappropriate management or development.; Enable a sense of place to be restored.
Slight Beneficial (Positive) Effect.	The project would: Complement the character (including quality and value) of the landscape. Maintain or enhance characteristic features and elements. Enable some sense of place to be restored.
Neutral Effect	The project would: Maintain the character (including quality and value) of the landscape. Blend in with characteristic features and elements. Enable a sense of place to be retained.
Slight Adverse (Negative) Effect	The project would: Not quite fit the character (including quality and value) of the landscape. Be at variance with characteristic features and elements. Detract from a sense of place.
Moderate Adverse (Negative) Effect	The project would: Conflict with the character (including quality and value) of the landscape. Have an adverse impact on characteristic features or element; Diminish a sense of place.
Large Adverse (Negative) Effect	The project would: Be at considerable variance with the character (including quality and value) of the landscape; Degrade or diminish the integrity of a range of characteristic features and element. Damage a sense of place.
Very Large Adverse (Negative) Effect	The project would: Be at complete variance with the character (including quality and value) of the landscape. Cause the integrity of characteristic features and elements to be lost. Cause a sense of place to be lost.

Visual Receptors and their Sensitivity

8.3.43 An important part of the assessment is to determine the sensitivity of potential visual receptors (i.e. viewers) within the

ZTV. Sensitivity depends on the location, context and expectations of the viewer (e.g. the occupier of a residential property with open views would be highly sensitive, whereas an office worker within an urban context would be less so). The identification of various categories of visual receptor (viewer) and the assumed visual sensitivity of each forms part of the visual baseline against which the change in the view brought about by the proposed project can be assessed.

8.3.44 Visual receptors should be categorised by their sensitivity, and will include people in their homes, users of Public Rights of Way (PROW) and other areas of open space or recreational landscapes, people at work and people travelling along roads or railway lines. Indicative levels and examples are provided in Table 8.6, which are not prescriptive but intended for guidance.

Table 8.6: Visual Sensitivity and Typical Descriptors

Sensitivity	Typical Descriptors and Examples
High	Residential properties. Users of Public Rights of Way or other recreational trails (e.g. National Trails, footpaths, bridleways etc.). Users of recreational facilities where the purpose of that recreation is enjoyment of the countryside (e.g. Country Parks, National Trust or other access land etc.).
Moderate	Outdoor workers. Users of scenic roads, railways or waterways or users of designated tourist routes. Schools and other institutional buildings, and their outdoor areas.
Low	Indoor workers. Users of main roads (e.g. trunk roads) or passengers in public transport on main arterial routes. Users of recreational facilities where the purpose of that recreation is not related to the view (e.g. sports facilities).

Identification of Impacts and Assessment of the Significance of Visual Effects

8.3.45 The assessment of visual effects has been undertaken for the following scenarios:

- During the construction period, assuming a maximum visibility or maximum perceived change situation (i.e. when construction activity is at its peak for any given view), and noting how long that period would be likely to last;
- A winter's day in the year that the project would open to traffic or be fully operational (i.e. with noise/visual screens and mounds in place but before any planted mitigation has begun to take effect). This is usually a reflection of the operationally non-fully mitigated/maximum visibility scenario;

- A summer's day in the fifteenth year after opening (i.e. when the planted mitigation measures can be assumed to be substantially effective). This is usually a reflection of the near fully mitigated scenario under normal conditions. (Note however, that planting may be subject to adverse local conditions such as exposure or high altitude, which may require a longer assessment date to be determined).

Mitigation

8.3.46 The assessment of the visual effects of the project should take account of any mitigation measures proposed. These may be solid barriers, such as fences or earth mounds, which would be effective from the first day of opening, or screen planting which would take a number of years to become effective.

8.3.47 It should be noted that although such measures could effectively screen views of traffic from the receptor, the mitigation measures themselves could cause visual intrusion, thus, for example, a large mound designed to screen traffic from properties 1 to 9 Pen-y-Bont could itself block a currently open view with subsequent adverse visual effects.

Assessing Magnitude of Impact

8.3.48 It is important to recognise that the assessment records the degree of change in the composition of the view, from that which would exist if the Scheme were not completed to that which would result as a consequence of the Scheme. In determining the magnitude of impact, or degree of change, the following should be considered:

- Scale of change - a large scale project such as a new motorway would generate a greater magnitude of change than would a small scale change such as a junction improvement. This change can be in the form of the addition of new features into the view or the removal of existing features (such as trees, woodland or buildings). It should also be noted that a relatively small scale Scheme may cause a major change within a very restricted, enclosed view;
- Nature of change - the extent to which a given change is out of character with the existing view can influence the effects which it would produce. For example, it is likely that the introduction of a new road into a view already containing other busy roads would be more in keeping with the existing character than the introduction of the same road into a presently rural view with few signs of development;

- Duration of change - it is important to consider if the change is permanent or temporary, and to what extent it would reduce over time as mitigation planting matures. Change should be categorised as being short term (i.e. up to 1 year or during construction if the construction period exceeds one year), short/medium term (i.e. 1 to 5 years, during which time new planting will have little significant effect in most cases), medium/long term (5 to 15 years, when planted mitigation will begin to take increasing effect) or long term (i.e. lasting beyond 15 years);.
- Distance - the magnitude of any change would generally decrease with distance from its source, until a point is reached where there is no discernible change;
- Screening - intervening features may block the view completely (in which case there would be no change), or there may be a partial screen, in which case the magnitude of change would decrease. For instance, intervening features (e.g. other structures or vegetation) may filter a view, which in the case of vegetation may also change with the seasons, and this must be taken into account where appropriate;
- The direction and focus of the view - if the change occurs in the part of the landscape which is the principal area of existing visual interest, the effects are likely to be perceived to be greater than if the proposed change occurs away from the main area of visual interest. This is especially relevant in the context of views from within houses (which are effectively framed by their windows), or from gardens (where views are often restricted by vegetation), and from promoted or locally valued viewpoints;
- Removal of past mitigation or existing vegetation - for road widening or improvement projects, consideration must be given to the effects of any removal of planting or other mitigation provided as part of an earlier project or existing vegetation. Removal of such mitigation may increase effects from the original road, and a check should be made as to whether any commitments were made in a past environmental statement or at a Public Inquiry as to the provision and maintenance of that mitigation;
- Whether the receptor is static or moving - if the receptor is static (for example an occupier of a residential property) then the view will be constant and greater emphasis should be placed upon it. If however the receptor is moving (for example along a Public Right of Way) then the view will be constantly changing, and the proposed project may only be visible for part of the time. Some consideration should therefore be given to how the change in the view affects the overall experience of walking along a given Right of Way (or

for a long distance route, a discrete section of the Right of Way);

- Numbers and types of receptors potentially affected at a viewpoint (e.g. a popular viewpoint, busy trunk road, little-used path or minor lane).

8.3.49 The magnitude of impact, or degree of change, should be assessed using the indicative criteria in Table 8.7. These are not prescriptive and are intended for guidance, and in making judgements the landscape professional needs to be able to demonstrate to others a consistent, structured, transparent and justifiable approach.

Table 8.7: Magnitude of visual Impact and Typical Descriptors

Magnitude of impact	**Typical criteria descriptors**
Major	The project, or a part of it, would become the dominant feature or focal point of the view.
Moderate	The project, or a part of it, would form a noticeable feature or element of the view which is readily apparent to the receptor.
Minor	The project, or a part of it, would be perceptible but not alter the overall balance of features and elements that comprise the existing view.
Negligible	Only a very small part of the project would be discernable, or it is at such a distance that it would form a barely noticeable feature or element of the view.
No change	No part of the project, or work or activity associated with it, is discernible.

Assessing Significance of Visual Effects

8.3.50 The evaluation of the significance of the visual effects of the project is derived by assessing the sensitivity of the receptor (Table 8.6) against the degree of change in the view resulting from the project (Magnitude of Impact) (Table 8.7). These aspects can be combined to form a significance matrix as shown in Table 8.4. Typical descriptors of the significance levels in the matrix are provided in Table 8.8. As with the determination of receptor sensitivity and degree of change, these are not prescriptive and are intended for guidance.

8.3.51 In general terms a major magnitude of change on a highly sensitive receptor will produce an effect of high significance, and a minor magnitude of change on a less sensitive receptor will produce an effect of low or negligible significance. Major changes

for less sensitive receptors and minor changes for more sensitive receptors could also produce significant levels of effect.

8.3.52 It should be noted however that it is not possible to set out a precise formula for the determination of the significance of effect as every case is different, and it is therefore important that the significance level determined is supported by reasoned justification in the form of a written explanation (supported by photographs and other illustrations as appropriate), so that the basis for the assessment is clear. This is particularly important where a choice of categories is given in the matrix (e.g. where a highly sensitive receptor experiences a moderate magnitude of impact, justification for the assessment of either a moderate or large degree of significance should be given).

Table 8.8: Typical Descriptors of the Significance of Visual Effect Categories

Significance	Typical Descriptors of Effect
Very large Beneficial	The project would create an iconic new feature that would greatly enhance the view.
Large Beneficial	The project would lead to a major improvement in a view from a highly sensitive receptor.
Moderate Beneficial	The proposals would cause obvious improvement to a view from a moderately sensitive receptor, or perceptible improvement to a view from a more sensitive receptor.
Slight Beneficial	The project would cause limited improvement to a view from a receptor of medium sensitivity, or would cause greater improvement to a view from a receptor of low sensitivity.
Neutral	No perceptible change in the view.
Slight Adverse	The project would cause limited deterioration to a view from a receptor of medium sensitivity, or cause greater deterioration to a view from a receptor of low sensitivity.
Moderate Adverse	The project would cause obvious deterioration to a view from a moderately sensitive receptor, or perceptible damage to a view from a more sensitive receptor.
Large Adverse	The project would cause major deterioration to a view from a highly sensitive receptor, and would constitute a major discordant element in the view.
Very Large Adverse	The project would cause the loss of views from a highly sensitive receptor, and would constitute a dominant discordant feature in the view.

Temporal Scope

8.3.53 The landscape and visual impacts of the Scheme would vary through time. The assessment therefore considers the effects on landscape character and visual amenity arising during:

- The short-term temporary effects of construction phase (including any standard construction mitigation measures);
- The medium-term effects which would occur between completion in the winter of the first year of operation (including measures designed into the Scheme to reduce effects at source, but without mitigation) until the fifteenth year of operation when landscape mitigation has established; and
- The long-term residual effects with mitigation from the summer of the 15th year after opening, in accordance with IAN135/10 (W). This allows the assessment to take account of the mitigating effect of the proposed landscape mitigation once established).

8.3.54 The photographic survey and fieldwork was undertaken in summer and winter. First in August 2015 when trees were in full leaf and again in January 2016 when vegetation was out of leaf when visibility across the landscape is more open. This afforded an understanding of the seasonal effects on the landscape and visual environment through the year. The assessment is based on a worst case scenario in terms of visibility, but also considers the more visually contained landscape during summer months.

Limitations to survey methods

8.3.55 The landscape character and views have been assessed from field work and visiting public vantage points. Visual impact assessment protocol normally requires views from a private property to be considered. Access to private property was not sought, but all private receptors likely to receive effects have been represented from a similar nearby viewpoint for which access was possible. All survey work has been undertaken at ground level and on foot.

Photography and imaging

8.3.56 The photographic surveys were carried out by qualified Landscape Architects who are well versed with the methods and best practice required to produce verifiable photographs to be used in LVIA and visual representations.

8.3.57 Photographs illustrating views from each viewpoint were taken with a full frame Nikon D6100 digital camera using a fixed lens with a 50 mm focal length. Each frame was taken in landscape format, and up to five frames have been stitched together using

the 'Rotating Motion' setting in Microsoft Image Composite Editor software. This provides a panoramic image stitched in planar projection and should be viewed flat. The wide panoramic views are intended to give an understanding of the visual context. Theoretically, when printed at the correct size on an un-scaled A3 page and viewed at a distance of 380mm using one eye, the photographs closely represent the view experienced from each viewpoint by the viewer's naked eye. However, in practice it is difficult to view the photographs at the exact viewing distance. The choice of an A3 format is for ease of handling and reproduction. The images should be viewed with the paper flat and at a comfortable distance with the viewer's arms bent to around 90° (approximately 380mm). The annotated photographs provide a tool for assessment that can be compared with an actual view in the field; they should never be considered as a substitute to visiting a viewpoint in the field.

8.4 Baseline Environment

Landscape Related Designations

8.4.1 Land based designations are mapped on the following figures within Volume 2:

- **Figure 1.3, Volume 2 Planning Context** - This plan shows the UNESCO Dyfi Biosphere designation;
- **Figure 7.1, Volume 2 Cultural Heritage -** This plan shows sites designated as statutory and non-statutory heritage assets as well as non-designated assets including:
  - Listed Buildings;
  - Non-Designated Heritage Assets;
  - Conservation Areas; and
  - Scheduled Monument.
- **Figure 8.2 and 8.5, Volume 2 -** These plans show statutory and non-statutory landscape designations, including:
  - Listed Buildings;
  - National Cycle Network Route No 8 and No 82;
  - Wales Coast Path;
  - Cambrian Line Railway;

- Plas Machynlleth Parkland (CADW Grade II Listed on the Register of Landscapes Parks and Gardens of Special Historic Interest in Wales);
- Open Access Land;
- Scheduled Monuments; and
- Snowdonia National Park.

- **Figures 9.2 and 9.3, Volume 2** - These plans show European, National and locally designated nature conservation sites:
  - Special Areas of Conservation (Cors Fochno and Pen Llŷn a'r Sarnau / Lleyn Peninsula and the Sarnau);
  - Cors Fochno and Dyfi Ramsar site;
  - Special Protection Area (Dyfi Estuary / Aber Dyfi);
  - Site of Special Scientific Interest (Dyfi SSSI); and
  - Ancient Woodland.

Snowdonia National Park (SNP)

8.4.2 The northern half of the Scheme and the nearby part of the Dyfi Valley lie within the southern edge of Snowdonia National Park (SNP). Most of the Dyfi Valley lies outside the SNP boundary. However, locally the landscape of the valley and rising land to the south has a strong visual connection with the hills of SNP to the north. Despite being undesignated, this Dyfi Valley landscape is considered to be an important part of the setting of the SNP.

8.4.3 The defining and distinctive characteristics of the National Park should be safeguarded and enhanced. The Special Qualities are described in the Snowdonia National Park Management Plan 2010 to 2015. Those most relevant to this assessment are set out below:

- *"the diversity of high quality landscapes and coastal areas within a small geographic area - ranging from coast to rolling uplands to the rugged mountains for which Snowdonia is famed…;*
- *…the opportunity for people to understand and enjoy the National Park actively, whilst maintaining areas of tranquillity and solitude, thus promoting aspects of health, well-being and personal reflection;*
- *extensive opportunities for recreation, leisure and learning for people of all ages and ability; and*
- *varied biodiversity reflecting Snowdonia 's landscapes, geology, land management practices and climate. Some*

species and habitats are of national and international significance, for example species which are remnants of the last Ice-Age, providing a glimpse of semi-Arctic habitats. Snowdonia is the most southerly point in the UK for many such species."

8.4.4 As set out in Local Development Plan policies listed at paragraph 8.2.5 above, development would be expected to conserve and enhance these Special Qualities.

Snowdonia National Park Dark Skies Reserve

8.4.5 On 4 December 2015, Snowdonia National Park was designated an International Dark Sky Reserve (DSR) by the International Dark-Sky Association (IDA). This is a public or private land possessing an exceptional or distinguished quality of starry nights and nocturnal environment that is specifically protected for its scientific, natural, educational, cultural, heritage and/or public enjoyment. Reserves consist of a core area meeting minimum criteria for sky quality and natural darkness, and a peripheral area that supports dark sky preservation in the core.

8.4.6 In respect of the implications of the DSR designation, the SNP website states:

"We expect related supplementary guidance on external lighting to follow in due course. However, this would apply to new applications only, and not to existing developments. It would specify the need for responsible external lighting on new developments and not stipulate the absence of external lighting altogether. There would be a greater focus on new developments within the proposed core zones, which are generally scarcely populated and located away from the larger towns and villages in Snowdonia."

8.4.7 Being such a recent designation the only policy or guidance relating to the DSR we found is the Snowdonia National Park – Dark Sky Reserve External Lighting Master Plan (Ver.05 -2015) by Lighting Consultancy and Design Services Ltd.

8.4.8 The Scheme lies within approximately four miles of the nearest Southern Core Zone 3, centred on the Cadair Idris mountain range, two miles outside the Critical Buffer Zone, but partially within the remaining Buffer Zone, which extends to the SNP boundary.

8.4.9 Plan Statement Number 6: within the Masterplan stipulates that:

"Luminaires in the Buffer Zone using lamps greater than 500 lumens and operating continuously throughout the hours of darkness should be installed as a Fully Cut-Off (IDA "fully shielded") example.

8.4.10 For the purposes of this assessment, it has been assumed that development which leads to lighting that would lead to an undue negative effect on night-time darkness would not be acceptable.

8.4.11 The landscape of SNP is subject to a national scale designation and is thus highly valued on a national scale.

Dyfi Biosphere Reserve

8.4.12 This is a non-statutory international UNESCO designation with the objective of harmonising conservation of biological and cultural diversity through the three inter-connected functions of:

- *Conservation*: protecting cultural diversity and biodiversity, including genetic variation, species, ecosystems and landscapes and securing services provided by such diversity;
- *Developmen*t: fostering economic and human development that is environmentally and socially sustainable and culturally appropriate; and
- *Logistic support:* facilitating demonstration projects, environmental education and sustainable development education and training, research, and monitoring.

Landscape Receptors

8.4.13 Landscape receptors have been identified as defined Landscape Character Areas (LCAs) as described under *Landscape Character* below. These LCAs have been defined through a study of existing character assessments in LANDMAP and the constituent elements and characteristics which contribute to their character as set out below;

- landscape *elements*:
- topographic features such as rivers, landforms boundaries and rock outcrops;
- vegetation, such as woodland, hedgerows, trees, scrub;
- transport routes such as the train line and roads;
- recreation routes, such as footpaths and cycle routes;
- aesthetic and perceptual *characteristics* of the landscape such as:
    - scale;
    - Texture and complexity;
    - Openness;
    - Tranquillity and remoteness;
    - Historic and cultural aspect;

- darkness at night;

- the overall *character* and settings of the landscape and settlements made up of the components and characteristics above; and
- The character and settings of designated landscapes, such as Snowdonia National Park and Plas Machynlleth.

Landscape elements

Topography

8.4.14 The study area is located to the north of Machynlleth within a U-shaped valley with an approximately northeast-southwest orientation enclosed by steep valley slopes to the north and south. See Figure 8.4, Volume 2.

8.4.15 Locally, the valley floor is a broad, flat floodplain, defined on its northern side by the Afon Dyfi. To the east and west of the study area the River meanders along the valley floor.

8.4.16 A steep sided rock outcrop rising to 70m AOD defines the southern valley side at Pen yr Allt. Part of the northern face of this hill is a sheer exposed rock face. The outcrop creates a visual separation from the town of Machynlleth, leading to a distinctly rural character within the valley.

8.4.17 The northern valley side is very steep in its lower slopes (typically 1 in 3 to 5), initially rising to approximately 220m AOD and then beyond to the uplands of SNP.

8.4.18 To the northeast of the study area the steep sided hill of Bryn-coch forms a promontory on the southernmost extent of the uplands beyond.

8.4.19 Across the valley floor there are a series of low embankments and changes of level. Some of these are attributable to natural river processes, some as flood defences and one, heading south east from and following the alignment of the Millennium Cycle Bridge is a remnant of a dismantled railway line. For more detail on these please refer to The Cultural Heritage Chapter at Sections 7.5.8. and 7.5.9.

Vegetation

8.4.20 The vegetation pattern within the study area falls into broad forms defined by the valley topography; the valley floor and the valley slopes.

The Valley Floor

8.4.21 The valley floor is laid out in a series of grazed fields. The field pattern follows no particular orientation or form. Boundaries vary

from simple barbed wire fences, through fragmented scrubby hedges, to maintained dense hedgerows and significant individual trees. The fields are pasture grassland with isolated marshy areas.

8.4.22 The banks of the Afon Dyfi are vegetated with young trees and scrub. The southern bank is less densely vegetated, although a large bank of gorse defines part of the river corridor.

The Valley Slopes

8.4.23 The southern outcrop slopes that are not exposed rock comprise a mixture of broadleaf trees, scrub woodland and grazed fields. The junction of the valley side and floor is marked by a linear pattern of thin trees and scrub.

8.4.24 The northern valley side is chiefly under broadleaf woodland, primarily oak. A few minor areas of open grassland break up the woodland. Conifer plantations can be seen on the more distant and upper slopes. A character of dense enclosing woodland defines the northern valley side.

8.4.25 As described below at paragraph 8.4.109, an area of coniferous plantation woodland was recently felled. This is an isolated pocket of coniferous woodland and has been re-planted as mixed deciduous forestry.

8.4.26 The isolated hill of Bryn-coch to the east contrasts with the rest of the northern slopes where there are open grazed slopes with little boundary vegetation.

Transport Routes

8.4.27 See receptor references on Figure 8.5, Volume 2.

8.4.28 The Cambrian Railway Line that follows the southern side of the valley floor has limited visual presence within the study area, other than the station and bridge at Machynlleth and occasional trains can be seen travelling along it. The line is lined by a fragmented belt of trees and scrub.

8.4.29 Two main roads run through the study area, the A487 (trunk road) and the A493.

8.4.30 The A487 (Receptor R1) crosses the valley floor, in a northerly direction, from Machynlleth and crosses the Afon Dyfi on the old stone arch bridge of Pont-ar-Ddyfi. From here the road turns eastward and follows the base of the northern valley side, until turning north (Receptor R2) and running up the western side of Bryn-coch along the edge of Snowdonia National Park.

8.4.31 The A493 (Receptor R3) meets the A487 on the northern side of the Pont-ar-Dyfi and runs to the west, along the base of the northern valley side.

8.4.32 The minor rural B4404 (Receptor R4) turns off the A487 at Pont Felin-y-ffridd over the River Dulas and heads east along the northern edge of the Dyfi Valley.

8.4.33 These transport routes are often visually contained by mature landscape features and largely run along the edges of the valley. Therefore they are not prominent features in the landscape and only detract slightly from the tranquil, rural character of the landscape in their immediate vicinity. The most prominent section of any route is the A487 as if crosses the flat open Dyfi valley. This section of the route does not benefit from enclosure by vegetation or landform.

Recreational Routes

8.4.34 The Sustrans National Cycle Network Route 8 (NCN 8) runs through the study area, along the A487 from Machynlleth to the south side of Pont-ar-Ddyfi. From here it leaves the road and follows the southern bank of the river until it crosses again on the Millennium Cycle Bridge. The cycle route then re-joins the A487 just to the north of the Millennium Cycle Bridge and then turns off to the east on the B4404 (Receptor R1), over the River Dulas, west around the bottom of Bryn-coch and north along the east side of the River Dulas Valley.

8.4.35 Another National Cycle Network Route NCN 82, follows the A493 to the Pont-ar-Dyfi, turns south along the A487 (the same route as NCR 8) and then continues south into Machynlleth.

8.4.36 The Wales Coast Path (Long Distance Path) runs along ridge to the northwest, then comes down the valley side to meet the Pont-ar-Dyfi and south across the valley floor along the A487 into Machynlleth.

8.4.37 Glyndŵr's Way National Trail runs through the hills to the south and east of Machynlleth. There is one location along its entire length from which views are available across the Dyfi Valley. This is on the north facing valley slope, southwest of Machynlleth at Cae-Gybi Cottages, on the unnamed minor road (Receptor R5 Figure 8.5 Volume 2, See Viewpoint 8 on Figure 8.1 Volume 2 for location).

8.4.38 A public footpath (Receptor P5) runs from Garth where it crosses the Cambrian Railway and continues northwest across the valley floor to meet the southern end of the Millennium Cycle Bridge Views of the Scheme would be open and middle to short range from considerable lengths of this section of the PRoW. It then joins NCN 8 and continues west, passing directly under the

Scheme. Further than 100m east of the Scheme, existing vegetation contains views from the route as it continues along the southern bank of the river to meet the A487 immediately south of Pont-ar-Dyfi. The route then continues further west along the southern bank of the Afon Dyfi for 1.5km where the PRoW designation then ends, but anglers still walk the river's edge.

Settlements

8.4.39 The town of Machynlleth lies immediately to the south of the Scheme. It is visually separated from the Dyfi Valley by intervening topography and the Cambrian Railway embankment. The only parts of the town which have visual connection with, and thus an urbanising influence on the valley, is the area of built form around the Machynlleth Station and the Dyfi Eco Park and the Plas Dolguog Hotel . There is a single residential dwelling within the Dyfi Eco Park with views over the southern end of the Scheme.

8.4.40 There are other smaller settlements within the study area which contribute to the character of the area and comprise scattered dwellings and isolated farmsteads. Those nearest the Scheme and which reinforce the marginally settled rural character of the area include:

- a group of 10 dwellings at the north end of Pont-ar-Dyfi at Pen-y-bont;
- three isolated dwellings with outbuildings at Penrhyn Dyfi; and
- 12 scattered dwellings and farmsteads at Pont Felin-y-ffridd, Ffridd and Glan Dulas.

Perceptual Characteristics

Scale

8.4.41 This is a large scale valley landscape. The overriding characteristic is the prominent, broad 'U'-shaped valley topography surrounded by a back drop of impressive and often distant mountains.

Complexity and texture

8.4.42 This is a moderately complex richly textured landscape with a flat, rural valley floor with an irregular pattern of medium sized fields near the valley edges and fence bound fields in rough grazing closer to the river. The meandering river forms a strong focal feature unifying the linear valley landscape.

8.4.43 The steep valley sides are more complex with undulating topography, and irregular pasture interspersed by rough grazing and scrub and blocks of mixed woodland.

Openness

8.4.44 The valley floor is flat broad and open broken only by varied overgrown field boundary hedges away from the river.

8.4.45 The valley sides and hills beyond are moderately open with views often foreshortened by topography and woodland. Where views are available they are often expansive offering a connection to the wider landscape and a sense of openness.

Tranquillity and remoteness

8.4.46 The valley is moderately tranquil. The road and rail infrastructure and occasional nucleated settlements along the sides of the valley floor detract from the tranquillity and sense of remoteness. Locally, the concentration of rail infrastructure around Machynlleth Station and stabling yard coupled with the industrial and commercial built form of the Dyfi Eco Park detract further from the sense of remoteness.

8.4.47 The rising and more varied valley sides have more separation from these humanising influences. The land is less intensively farmed and woodland offers enclosure and a sense of protection. Where Machynlleth is visible this increased sense of remoteness is weakened.

8.4.48 Further up the valley sides views open out and focus on the impressive mountainous horizon diverts attention away from any humanising influences in the valley. This offers a strong sense of remoteness. Tranquillity here is compromised only by exposure to the wind and other elements.

Cultural and historic aspect

8.4.49 The baseline historic and cultural aspects of landscape character are assessed using LANDMAP Historic and Cultural Aspect Areas and confirmed via field work. These aspects of the landscape are ascribed values between moderate and outstanding in LANDMAP. Each of the LCAs defined for this assessment is considered to be highly valued and of national importance in terms of historic and cultural character.

Darkness at night

8.4.50 Night-time fieldwork was undertaken on 18 January 2016 from several elevated vantage points within the study area. This enabled an evaluation and mapping of the night-time environment across the study area.

8.4.51 The study area was classified according to the Institute of Lighting Professionals' Environmental Zones in order to identify and map the levels of lighting which occur within the survey area. Figure 8.6 illustrates the existing night-time character darkness and lighting within the study area. Table 8.2 below is extracted from the SNP External Lighting Masterplan, adapted from the Institute of Lighting Professionals *Guidance Notes for the Reduction of Obtrusive Light GN01:2011 (2011).*

Table 8.9: Lighting Environmental Zones

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks, *Typical of Core Zones*
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Natural Beauty etc. *Dark Sky Core Buffer Zones*
E2	Rural	Low district brightness	Village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Small town centres or suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night- time activity

8.4.52 The study area, including the relevant part of SNP, is largely within Zone E1 (Intrinsically Dark), with the exception of the following settlements:

8.4.53 Machynlleth, which has lighting levels of E3 (Small town, medium distinct brightness) and E4 (Town Centre, high distinct brightness);

8.4.54 Penegoes, just to the east of Machynlleth has lighting levels of E3 and four other small settlements at: Plas Dolguog, Glan-fechan, Pen-y-bont, Forge, Derwenlas, Pantperthog and the adjacent Centre for Alternative Energy, which all have E2 (Rural, low distinct brightness).

8.4.55 Figure 8.6 in Volume 2 illustrates the night-time character of the study area showing areas of darkness and lighting.

Landscape Character

8.4.56 As described in paragraph 8.3.17, LANDMAP is a GIS (Geographical Information System) based landscape resource where landscape characteristics, qualities and influences on the landscape are recorded and evaluated into a nationally consistent data set. It is divided into five layers of information, the Geological Landscape, Landscape Habitats, Visual & Sensory, Historic Landscape and Cultural Landscape.

8.4.57 For the purposes of this assessment, Landscape Character Areas (LCAs) have been defined using a combination of desktop study, LANDMAP and on site appraisals to group areas into broadly homogenous areas for the purpose of this assessment.

8.4.58 Given the scale and distribution of these LCAs and considering the location, nature and scale of the Scheme, the baseline and potential effects on landscape character are described and assessed in terms of:

- the local landscape, within approximately 200m of the Scheme, which may receive effects on physical components and perceptual characteristics; and
- the wider landscape beyond approximately 200m from *the Scheme, which is only likely to receive effects on* perceptual characteristics.

8.4.59 The impact of the Scheme on the character of the landscape has been assessed and described in terms of the effects on the LCAs listed and described below. Refer to Figures 8.3 in Volume 2 for a plan showing these LCAs.

8.4.60 Those within 200m of the Scheme with the potential to receive direct and indirect effects on character:

- a small portion across the full width of the Afon Dyfi LCA;
- the western most corner of the Pennal Valley Slopes LCA; and
- the northern extent of Machynlleth LCA.

8.4.61 Those beyond 200m of the Scheme with the potential to receive indirect effects on character:

- the remainder of the LCAs above;
- Penegoes LCA;
- Machynlleth Wooded Hillsides LCA;
- Mynydd Glandulas LCA; and
- Pennal Conifer Plantations LCA.

8.4.62 The text below summarises the characteristics and evaluation of the Landscape for each of these character areas.

8.4.63 The overall value of each of the LCAs is summarised below. This was done by combining judgements on the condition, quality and value of constituent landscape elements with the evaluation data for each of the component LANDMAP aspect areas. The tables below summarise and ascribe an overall value to the character of each LCA.

8.4.64 The corresponding detailed LANDMAP data is provided in detail in Appendix 8.1, Volume 3.

Afon Dyfi LCA

Description:

8.4.65 Flat open lowland farmland closely associated with the course of the Afon Dyfi, regular small to medium scale field patterns predominantly livestock and dairy farming in a picturesque landscape setting with rolling farmland rising steeply to the north and southern upland moorlands and mountains. Safe and settled area with a high proportion of domesticity in its cultivated field pattern and incidence of settlements. Contains the transport routes of the west coast rail line and the A486 and A489 meeting at Machynlleth and the A470 heading north in the upper valley.

8.4.66 In line with LANDMAP's overall visual and sensory evaluation of this LCA, it is of high picturesque quality in its association with the meandering form of the Afon Dyfi and its context within a greater valley formation that is bounded by highly picturesque rising upland and the SNP to the north.

8.4.67 Outlined below are the LANDMAP Aspect Areas and Values which are within this character area.

Table 8.10: LANDMAP Aspect Areas Values within LCA Afon Dyfi

Aspect	Aspect Area No.	Name	Value
Geological Landscapes	MNTGMGL249	Dyfi	High
Landscape Habitats	MNTGMLH095	*Unnamed*	Moderate
Visual and Sensory	MNTGMVS673	Afon Dyfi	High
Historic Landscapes	MNTGMHL288	Dyfi Valley	High
Cultural Landscapes	MNTGMCL052	Cambrian Railway	High

8.4.68 Combining the value of the LANDMAP Aspect Areas, the value of Afon Dyfi LCA is considered to be High.

Pennal Valley Slopes LCA

Description:

8.4.69 Gently undulating attractive pastoral landscape with frequent clumps of woodland. Field boundaries comprise post and wire fencing with some stone walls. Pennal is a small village with traditional and picturesque qualities. The meandering Afon Dyfi adds sense of place. The only visual detractor within this Aspect Area is a telecom mast.

8.4.70 Outlined below are the LANDMAP Aspect Areas and Values which are within this character area.

Table 8.11: LANDMAP Aspect Areas Values within LCA Pennal Valley Slopes

Aspect	Aspect Area No.	Name	Value
Geological Landscapes	SNPGL045	Moel Maesywerngoch	High
Landscape Habitats	SNPLH402	Improved Grassland (Pennal - Dyfi Valley)	Moderate
Visual and Sensory	SNPVS011	Pennal	High
Historic Landscapes	SNPHL207	Dyfi estuary (north)	High
Cultural Landscapes	SNPCL043	Cader Idris-Berwyns	Outstanding

8.4.71 Combining the value of the LANDMAP Aspect Areas, the value of Pennal Valley Slopes LCA is considered to be High.

Machynlleth LCA

Description:

8.4.72 A traditional largely stone built town and focal settlement with a historic commercial centre for the surrounding farming and slate industries. Historic town centre with a fine array of stone, slate, rendered and painted buildings of high quality. The main street is still the key distribution and focal point of the town with a fine clock tower standing at the junction of the A487 and A489. Modern development has been kept to the outskirts of the town and although not of particularly high quality it is relatively small in scale and does not detract from the picturesque quality of the town centre. Industrial development is also limited with the key units being small in scale and well screened from the A487. The town lies within a highly picturesque valley setting and borrows from the high aesthetic qualities of its surroundings.

8.4.73 Outlined below are the LANDMAP Aspect Areas and Values which are within this character area.

Table 8.12: LANDMAP Aspect Areas Values within LCA Machynlleth

Aspect	Aspect Area No.	Name	Value
Geological Landscapes	MNTGMGL247	Machynlleth	High
Landscape Habitats	MNTGMLH106	*Unnamed*	Low
Visual and Sensory	MNTGMVS543	Machynlleth	High

Aspect	Aspect Area No.	Name	Value
Historic Landscapes	MNTGMHL979	Machynlleth	High
Cultural Landscapes	MNTGMCL031	Machynlleth	High

8.4.74 Combining the value of the LANDMAP Aspect Areas, the value of Machynlleth LCA is considered to be High.

Penegoes LCA

Description:

8.4.75 A very extensive network of valleys containing tributaries leading into the Afon Dyfi. The area has a dramatic backdrop to the south with the underlying landform falling from the upland moorlands of the Trannon and Plynlimon Moors. To the north, picturesque views are available over traditionally farmed landscape edged by sporadic rock exposure and marginal grazing land facing onto the meandering Dyfi Valley. The northern backdrop comprises steeply rising upland and the edge of the Snowdonia National Park. Settled safe, and domestic in scale, the traditional farmed elements make a stunning foreground for the picturesque hill and mountainscape of the Snowdonia National Park.

8.4.76 Outlined below are the LANDMAP Aspect Areas and Values which are within this character area.

Table 8.13: LANDMAP Aspect Areas Values within LCA Penegoes

Aspect	Aspect Area No.	Name	Value
Geological Landscapes	MNTGMGL394	Aberhosan	Moderate
	MNTGMGL249	Dyfi	High
Landscape Habitats	MNTGMLH067	*Unnamed*	High
	MNTGMLH095	*Unnamed*	Moderate
Visual and Sensory	MNTGMVS276	Dyfi Valley Catchment	High
	MNTGMVS673	Afon Dyfi	High
Historic Landscapes	MNTGMHL289	Is-y-coed	High
	MNTGMHL979	Machynlleth	High
Cultural Landscapes	MNTGMCL051	Rural Landscapes	High

8.4.77 Combining the value of the LANDMAP Aspect Areas, the value of Penegoes LCA is considered to be High.

Machynlleth Wooded Hillsides LCA

Description:

8.4.78 An undulating hillside landscape forming part of the transitional scarp slopes falling from the south towards the Dyfi floodplain. Wide range of vegetation cover with scattered groups of broadleaf trees are typical features to the west of the Aspect Area. Open extensive and marginal livestock farming with rough grazing, bracken and heather scrub with frequent outcrops of rock cross the landscape. Field patterns become more dominant to the east of the Aspect Area and closely follow the landform. The landscape forms settled but marginal land at the edge of wilderness.

8.4.79 Outlined below are the LANDMAP Aspect Areas and Values which are within this character area.

Table 8.14: LANDMAP Aspect Areas Values within LCA Machynlleth Wooded Hillsides

Aspect	Aspect Area No.	Name	Value
Geological Landscapes	MNTGMGL247	Machynlleth	High
Landscape Habitats	MNTGMLH084	*Unnamed*	High
Visual and Sensory	MNTGMVS738	Machynlleth Wooded Hillsides	High
Historic Landscapes	MNTGMHL289	Is-y-coed	High
Cultural Landscapes	MNTGMCL051	Rural Landscapes	High

8.4.80 Combining the value of the LANDMAP Aspect Areas, the value of Machynlleth Wooded Hillsides LCA is considered to be High.

Mynydd Glandulas LCA

Description:

8.4.81 A weakly enclosed upland grazing landscape that closely relates to the undulating and rolling landform beneath. The Aspect Area comprises rough and semi-improved grazing with frequent rock outcrops and isolated patches of mixed oak woodland on slopes. Clear views available to the south overlooking the Dyfi Valley and the traditionally farmed and well enclosed landscape of the Machynlleth farmlands. The landscape character begins to transform into an exposed upland and marginally farmed landscape in this location and as such has a more remote and wild quality to it.

8.4.82 Outlined below are the LANDMAP Aspect Areas and Values which are within this character area.

Table 8.15: LANDMAP Aspect Areas Values within LCA Mynydd Glandulas

Aspect	Aspect Area No.	Name	Value
Geological Landscapes	MNTGMGL488	Dyfi Forest	Moderate
Landscape Habitats	MNTGMLH068	*Unnamed*	Moderate
Visual and Sensory	MNTGMVS276	Dyfi Valley Catchment	High
	MNTGMVS916	Mynydd Pant Coch Hillsides	High
Historic Landscapes	MNTGMHL478	Mynydd Gladulas	Moderate
Cultural Landscapes	MNTGMCL052	Cambrian Railway	High

8.4.83 Combining the value of the LANDMAP Aspect Areas, the value of Mynydd Glandulas LCA is considered to be Moderate-High.

Pennal Conifer Plantations LCA

Description:

8.4.84 South facing rounded slopes of Dyfi valley. Dense coniferous forest on upper valley side and hills. A popular tourist and visitor focal point with car parks, picnic sites and forest trails. Predominantly geometric shape with sharp coniferous edge.

8.4.85 Outlined below are the LANDMAP Aspect Areas and Values which are within this character area.

Table 8.16: LANDMAP Aspect Areas Values within LCA Pennal Conifer Plantations

Aspect	Aspect Area No.	Name	Value
Geological Landscapes	SNPGL045	Moel Maesywerngoch	High
Landscape Habitats	SNPLH391	Broadleaved Woodland (Abergynolwyn Woodland)	High
Visual and Sensory	SNPVS012	Conifer plantation	Moderate
Historic Landscapes	SNPHL065	Bryneglwys Tarren Cadlan	Moderate
Cultural Landscapes	SNPCL043	Cader Idris-Berwyns	Outstanding

8.4.86 Combining the value of the LANDMAP Aspect Areas, the value of Pennal Conifer Plantations LCA is considered to be High.

Summary of landscape baseline

Local landscape

8.4.87 The local landscape within approximately 200m of the Scheme is host to several national and local landscape, nature conservation and heritage designations foremost of which is the National Park. The Scheme crosses the southern boundary of Snowdonia National Park. The northern half of the Scheme lies within the park and the southern half is within its setting. This is a nationally important and highly valued landscape.

8.4.88 It is a large scale rural valley with a distinctive pattern and texture of irregular small and medium grazed fields separated by varied and often overgrown hedgerows. There are large stands of ancient deciduous and coniferous plantation woodland on the steep undulating valley slopes to the north and south. An area of deciduous woodland above Pen-y-bont has recently been felled and been replanted. Refer to paragraph 8.4.109 for detail. The Afon Dyfi forms a focal feature meandering through the sheltered, safe and picturesque valley.

8.4.89 Recreational use is frequent with popular national and long distance cycle and walking routes concentrated in the area. The otherwise rural and tranquil feel is compromised by the presence of road traffic on the A487 and A493 and the presence of the Dyfi Eco Park industrial area and Machynlleth Train station and Stabling Yard.

8.4.90 The valley is predominantly dark at night, punctuated by vehicle lights on the main roads, lighting at Dyfi Eco Park and train station and limited low district level lighting from small nearby settlements such as Pen-y-bont, Felin-y-ffridd, Glan Fechan and Garth.

8.4.91 This is a highly valued landscape.

Wider landscape

8.4.92 The wider landscape, beyond approximately 200m from the Scheme, is also host to several national and local landscape, nature conservation and heritage designations. Plas Machynlleth is another designated landscape, situated 750m top the south of the Scheme. This is also a nationally important and highly valued landscape, but there is no potential for physical effects on this landscape nor any visual or perceptual connection between the two.

8.4.93 Land to the north and south rises steeply and becomes medium in scale to large scale within SNP to the north, rough in texture and undulating. The valley slopes on both sides are often clothed by stands of coniferous and deciduous woodland bestowing a sense of enclosure and shelter. On higher ground without considerable woodland cover the landscape is open and exposed.

8.4.94 The Dyfi valley extends becoming more enclosed to the northeast and widening and opening out to the southwest beyond the promontory at Dolgelynen, Pumwern and Llugwy. Within the Study area, the characteristics and overall character of the valley remains consistent with that described above.

8.4.95 The wider landscape is also well used for recreation with the sense of tranquillity and remoteness only slightly reduced where the A487, A493, the built form of Machynlleth, wind turbines, the Cambrian Line Railway and communications masts are noticeable.

8.4.96 Night skies are intrinsically dark to the south and east, with the whole of SNP to the north and northwest internationally designated for its dark skies.

8.4.97 This is a highly valued landscape.

Visual Baseline

8.4.98 As described in paragraphs 8.4.18 to 8.4.22 above, the strong valley topography dictates the extent of visibility of the Scheme. The topography is illustrated in Volume 2 Figure 8.4 and the Zone of Theoretical Visibility of the Scheme is shown in Volume 2 Figure 8.1. With the exception of views from Machynlleth Train Station and from the Dyfi Eco Park, there are no visual receptors in Machynlleth which have views of the Scheme. This is due to the intervening railway embankment, built form and topography around the Train Station.

8.4.99 A selection of specific and representative viewpoints (Vps) has been proposed, consulted upon and agreed as described at Paragraphs 8.3.7 to 8.3.9. These locations are mapped at Volume 2 Figure 8.1 and the photographs for each one presented as Volume Figure 8.8. Each numbered Vp is also referenced below in respect of which receptors they relate to. The baseline views from each receptor and the value of each receptors visual amenity is described in the Visual Assessment Tables in Volume 3 Appendix 8.2.

8.4.100 The following sensitive visual receptors were identified from a desktop study and field work. Visual Receptors are shown on a map presented in Volume 2 Figure 8.5 and for ease of reference several are assigned receptor identification codes (e.g. R1, P5).

Recreational receptors

- Walkers and cyclists on the Millennium Cycle Bridge enjoying views of the river and the surrounding valley (Vp 2);
- Walkers and cyclists enjoying views south and east from Pont-ar-Ddyfi (Vp 13);

- Recreational users of Open Access Land (O1, Vp 17) in SNP, (O3, Vp 8) and (O4, Vp 18) on the southern valley slopes with limited middle distant to distant views of the Scheme. Open Access land at Pen yr Alt (O2) does not afford any views of the Scheme;
- Users of a short elevated length of Glyndwr's Way Long Distant Recreational Route (LDR) and PRoW (P8, Vp 8) on the hill side southwest of Machynlleth;
- Users of the Wales Coast Path National Trail as it crosses the valley on the A487 (R1, Vps, 11, 12, and 13) and for a short section rising up the northern valley slope above Pen-y-bont and Penrhyn Dyfi, Vp 17);
- User of the National Cycle Routes 8 and 82 along the A487 R1, Vp 11, 12 and 13) and A493 (R3 VP 16) and between the Millennium Cycle Bridge and Pont-ar-Ddyfi (P5, Vp 1);
- Users of PRoW (P5, Vp 5, 6 and 15) adjacent to Afon Dyfi and within SNP; and
- Recreational users and anglers along the Afon Dyfi (Vp 5, 6 and 15).

8.4.101 Due to the fact that many of these routes are designated of National Importance (and those that are not are within SNP or its landscape setting), it is considered that the visual amenity of each of these receptors is highly valued.

Transport receptors

- Road users on the fast A487 (R1 - Vp 11, 12 and 13 and R2 - Vp 3) and the A493 (R3 – VP 16) within SNP are of national importance and medium value;
- Road users on the minor B4144 (R4, Vp 4) east from Pont felin-y-ffridd and on the Un-named minor lane (R5, Vp 8) near Cae-gybi Cottages are of local importance and of high value due to their lower speed and their elevation and relative availability and amenity of views; and
- The visual amenity of passengers on the Cambrian Line Railway (VP 6) and at Machynlleth Station (Vp 9) are considered to be highly valued.

Residential receptors

8.4.102 Residential receptors within a number of private dwellings with views of the site are outlined in Table 8.17.

Table 8.17: Residential visual receptors

Receptor ID (Figures 8.5 and 8.1)	Summary Description and value of visual amenity	Visual amenity value
A (Vp 4)	Single dwelling at Glan Fechan - Views oriented away from Scheme and otherwise screened	High
B	Ten scattered dwellings and farmsteads at Pont Felin-y-ffridd - Views screened by vegetation and topography or oriented east, away from Scheme	High
C (Vp 14)	Single property, north of the A493, northeast of Pont-ar-Dyfi - Partial middle distant views of Scheme	High
D, E and F (Vp 13)	D) Two dwellings south of the A493 and east of Pont-ar-Dyfi- Partial middle distant views of Scheme E) Single property, in an old school house north of the A493, northeast of Pont-ar-Dyfi – Very restricted partial views of Scheme F) Six terraced cottages at Pen-y-bont, northwest of Pont-ar-Dyfi - Partial middle distant views of Scheme	High
G and H (Vp16)	Two dwellings at Penrhyn Dyfi – Restricted, partial middle distant views of Scheme	High
I	Single Dwelling on the track to Dolgelynen and Dolgelynen Farmhouse - No View to Scheme	High
J and L	Individual dwellings at Brynturnol and Ogof Fawr - No View to Scheme	High
K (Vp 8)	Cae-Gybi Cottages - Oblique partial and distant views to Scheme	High
M (Vp 10)	Single Dwelling at west end of Dyfi Eco Park - Close views to southern end of Scheme	High

Business Receptors

8.4.103 There are two groups of business receptors, identified on Figure 8.5 in Volume 2 with purple triangles (B). These include:

- Workers and visitors at Plas Dolguog Hotel (B1, Vp 7) with partial and distant views of the northern end of the Scheme and considered to have highly valued views; and
- Workers and visitors to the Dyfi Eco Park (B2, VP 10) with partial close and middle distance views of the Scheme, considered to have views of medium value.

Heritage receptors

8.4.104 There are a number of Listed Buildings, Scheduled Monuments and undesignated heritage features within the study area. See Figure 8.2. Their baseline setting and assessment of the Scheme's effects on the significance of the assets and their settings as a result of the proposed changes is discussed in detail in Chapter 7 of this Environmental Statement.

8.4.105 There is no public access to the pair of round barrows in the field to the east of the Scheme's northern junction, designated as Scheduled Monuments. These barrows are not noticeable in

views available to nearby public receptors including the A487, B4404 and NCN route 8.

8.4.106 The views from and visual amenity of people enjoying the settings of the following publicly accessible heritage assets is represented by viewpoints as set out below:

- Pont-ar-Ddyfi and Listed buildings in Pen-y-bont - VP 13; and
- Listed Buildings at Penrhyn Dyfi - VP 16

Viewpoints

8.4.107 The desktop study and fieldwork identified the selection of viewpoints below to represent visual receptors identified with the potential to be significantly affected by the Scheme.

8.4.108 In line with the recommendations at Sections 3.2 to 3.6 in IAN 135/10(W), all receptors expected to receive visual effects are shown on a map in Volume 2 Figure 8.5 and the selection of viewpoints chosen to represent the receptors is listed below in Table 8.18.

8.4.109 As mentioned at paragraph 8.4.25, there is an area of coniferous forestry on part of the Foel-y-ffridd hillside above and directly north of Pen-y-bont, which was recently felled. To the South of this area, in the direction of views towards the Scheme, a substantial area of mature deciduous vegetation was retained. From the more elevated parts of the felled area, there are likely to be unobscured views over the retained woodland to more distant parts of the Scheme. It has been confirmed by NRW that this area was planted in the winter (2015/ 2016), with a mixture of native broadleaf species including sessile oak, wild cherry, small leaved lime and aspen. Therefore its current felled status is a temporary condition. Over a period of approximately ten to fifteen years views out from this part of the Open Access land will once again be enclosed year round.

Table 8.18 Selection of Viewpoints

Viewpoint **(Refer to Figure8.1)**	**Location.**	**Reason for selection and receptors represented**
Viewpoint 1	View looking east from the foot and cycle path on the southern bank of the Afon Dyfi, 20m from the Scheme. Grid Ref: SH 74749 01923	This view is representative of those available from highly sensitive receptors including pedestrians and cyclists using the footpath and NCR 8.
Viewpoint 2	View looking northwest from the middle of Millennium Cycle Bridge 50m from the Scheme. Grid Ref: SH 74920 01985	This view is representative of those available from highly sensitive receptors including pedestrians and cyclists using the footpath and NCR 8.
Viewpoint 3	View looking west from the footpath and NCR 8, adjacent to the A487, just north of the Scheme Grid Ref: SH 74533 01993	This view is representative of those available to highly sensitive receptors including pedestrians and cyclists using the NCR 8 and to users of the A487 within the SNP.
Viewpoint 4	View looking southwest from the B4404 adjacent to Glan-fechan, 500m northeast of the Scheme Grid Ref: SH 75465 02249	This view represents that available to residents and workers at the farm and to users of a short length of the B4404.
Viewpoint 5	View looking west from the footpath, 300m from the Scheme Grid Ref: SH 75057 01846	This view is representative of those available to walkers and anglers from the highly sensitive footpath on the southern bank of the Afon Dyfi.
Viewpoint 6	View from the Cambrian Line Railway, 600m southeast of the Scheme. Grid Ref: tbc	Represents views available to rail passengers.
Viewpoint 7	View looking northwest from Plas Dolguog Hotel, 1.3km from the Scheme Grid Ref: SH 76107 01775	This view is representative of those available to hotel residents.
Viewpoint 8	View looking north-northeast from Cae-Gybi Road, 1.8km from the Scheme Grid Ref: SH 73998 00033	This view is representative of those available from the highly sensitive (LDR) – Glyndwr's Way National Trail, the road and Cae-Gybi Cottages.
Viewpoint 9	View north from the Platform of Machynlleth train station on the bridge above the A487, 200m south of the Scheme Grid Ref: SH 74419 01284	Represents views available to rail passengers.

Viewpoint (Refer to Figure8.1)	Location.	Reason for selection and receptors represented
Viewpoint 10	Looking northwest from the entrance to the Dyfi Eco Park off the existing A487. Grid Ref: SH 7444 0141	Representative of road users on the A487, workers and visitors to the Dyfi Eco Park and residents in the single private dwelling on the west edge of the Dyfi Eco Park.
Viewpoint 11	View northeast from the point along the A487 at which the proposed new route ties into the existing road. Grid Ref: SH 74435 01526	Road users and recreational users of NCN 8 and the LDR Wales Coast Path.
Viewpoint 12	View east from the A487 (section to be de-trunked), 100m west of the Scheme Grid Ref: tbc	Road users and recreational users of NCN 8 and the LDR Wales Coast Path.
Viewpoint 13	View looking east from Pont-ar-Ddyfi, 50m from the Scheme Grid Ref: SH 74414 01907	This view is representative of those available from the highly sensitive receptors including pedestrians and cyclists using the long distance recreational route and NCN 8 as well as residential properties 1-9 Ben y Bont on the northern side of the bridge. Also representative of the visual amenity of people enjoying the visual setting of Pont-ar-Ddyfi and the nearby Grade II Listed Buildings in Pen-y-bont.
Viewpoint 14	View looking south from property 1km north of the site on the A487. Grid Ref: SH 74533 01993	This view is representative of those available to residents.
Viewpoint 15	View east from the PRoW adjacent to the Afon Dyfi, 500m west of the Scheme Grid Ref: SH 73945 01713	Walkers and on the PRoW outside the SNP on the east side of the river.
Viewpoint 16	View east from the A493 adjacent to the Afon Dyfi, 500m west of the Scheme Grid Ref: SH 73945 01713	Eastbound road users on the A487 within the SNP on the west side of the river. Also representative of the visual amenity of people enjoying the visual setting of Pont-ar-Ddyfi and the nearby Grade II Listed Buildings in Penrhyn Ddyfi.
Viewpoint 17	View looking southeast from the unnamed track north of the A487, 150m northeast of Penrhyn Dyfi. 0.5km from the Scheme Grid Ref: SH 74038 01893	This view is representative of those available from the highly sensitive Long Distance Route (LDR) and broadly representative of occasional glimpsed views from tracks within the adjacent wooded Open Access Land on Foel-y-ffridd.

Viewpoint **(Refer to Figure8.1)**	**Location.**	**Reason for selection and receptors represented**
Viewpoint 18	View northeast from a PRoW in Open Access Land at the top of Mynydd Cynffyrch, 3.6 km southwest of the Scheme Grid Ref: SN 71850 98925	Distant view representing walkers enjoying views from this elevated viewpoint.

8.5 Assessment of Potential Construction Effects - Before Mitigation

8.5.1 The Construction phase of the Scheme and inbuilt measures to minimise adverse effects at source is described in detail in Section 2.3 in Chapter 2 of this ES.

8.5.2 The construction phase of the Scheme is expected to last approximately 25 months, including 6 months advance works/utility diversions, archaeological testing etc. and approximately three months of inspections and handover on completion of the Scheme.

8.5.3 The working day would vary between the seasons. However, it would typically be Monday - Friday 7am to 7pm in the summer months and 7am to 5pm in the winter. Weekend or night work would be required in some instances, typically for works on or adjacent to existing highways.

8.5.4 In order to avoid double counting of effects, the assessment of construction effects identifies and assesses only temporary adverse effects which arise as a result of activities and elements that are unique to the construction phase. For example, the permanent removal of vegetation is assessed as part of the operational Scheme, but the works, such as the noise and disruption caused by construction plant and chainsaws used during site clearance are assessed as part of the construction effects. Another example relates to earthworks and landforms. The final landforms such as the northern cuttings or the southern embankments are permanent features of the operational scheme. Landscape and visual effects arising from their presence are assessed under operational effects. The earthworks including excavation, aggregate and earth movements, and stock piling during the works are assessed construction effects in this section.

8.5.5 As the Scheme is gradually built throughout the construction phase, permanent effects would increasingly become part of the landscape and views. These effects are assessed as part of the operational phase in Section 8.6. They include, for example, permanent removal of trees or hedgerows, introduction of permanent earthworks and the presence of built elements, such as bridge piers, decks and road surfaces.

8.5.6 Sources of construction effects include:

- temporary construction compounds with associated lighting and fencing;
- temporary haul roads;
- stockpiling and storage of materials;

- Excavation and handling of materials;
- on and off-site construction traffic;
- the gradual building out (or 'push launching') of the viaduct section and the bridge sections of the Scheme over the landscape; and
- on site plant, such as:
    - chainsaws and excavators for site clearance;
    - articulated dump trucks, excavators up to 35T capacity, dozers and rollers for bulk earthworks;
    - cranes, telescopic boom lifts, piling rigs and telescopic forklifts for construction of structures; and
    - Task lighting at structure locations during the winter months only, and intermittently at other locations where required, would also be provided.

8.5.7 Measures inbuilt into the construction phase with the intention or avoiding or reducing adverse effects at source are described at 2.3.10to 2.3.37 in Section 2 of this report.

8.5.8 The construction sequence is described in more detail in Section 2.3 of Chapter 2 of this report. The sequence of activities is summarised below.

- Advance/preparatory works likely to be undertaken prior to construction;
- Site establishment and vegetation clearance;
- Main construction works involved in the Scheme drainage, earthworks including the northern cuttings, works to the river bank and the southern embankments;
- Main viaduct and bridge structure construction;
- Road works and other associated structures; and
- Final tie-ins and soft landscape works.

8.5.9 The southern approach embankment would then be constructed, and the temporary platform/embankment to allow the erection and push launch of the main viaduct.

8.5.10 The flood plain viaduct would then be constructed and launched from the southern end of the Scheme. Appendix 2.1 in Volume 3 provides an illustration of the push launch construction sequence.

8.5.11 The main river bridge spans would then be constructed from both the north and south of the river.

Direct and Indirect Local Landscape Construction Effects – parts of the Afon Dyfi, Machynlleth and Pennal Valley Slopes LCAs within 200m before mitigation

8.5.12 South of the Afon Dyfi the Scheme lies within the Afon Dyfi LCA. North of the river, the Scheme lies within the Pennal Valley Slopes LCA. The southern end of the Scheme lies adjacent to the Machynlleth LCA. The Construction works to the Scheme would not directly affect this LCA, but traffic through Machynlleth would be affected as described at paragraph 8.5.30 below.

8.5.13 The southwest edge of the Mynydd Glandulas LCA lies within 200m of the Scheme adjacent to its southern end, however, there would be no physical effects on these LCAs. Effects on perceptual characteristics of the settings of these LCAs are discussed below under Wider Landscape.

Effects on Physical and Perceptual Characteristics of the Landscape.

Land cover

8.5.14 The Scheme would result in the loss of vegetation, including several short sections totalling 624 linear metres of field boundary hedges and 26 no. mature deciduous trees. The permanent effects associated with this are assessed below under operational effects. All other structural vegetation would be protected and retained in accordance with BS 5837: 2012 Trees in relation to design, demolition and construction – Recommendations. A table quantifying the different types of vegetation lost is provided at Table 8.21 in Section 8.7 below.

8.5.15 As shown on Figure 2.4 in Volume 2, the construction phase would also require the introduction of the following temporary installations:

- construction compounds and laydown areas, one in the field to the east of the northern tie in and another between the southern end of the viaduct and the northern edge of the Dyfi Eco park; and
- a crane lifting pad and associated laydown adjacent to the bridge crossing point on the southern bank of the Afon Dyfi.

8.5.16 The temporary construction compound in the field to the east of the northern tie in will not directly impact the Scheduled Monuments ‘Round Barrows’, within the same field. The compound has been designed to occupy the furthest corner of this field and arranged so as not encroach on the heritage assets.

The nearest edge of the compound is at least 75m from the Barrows.

8.5.17 Once construction is complete, hard standings and elements associated with compounds, haul roads crane pads or other temporary installations would be completely removed from site, the ground made good and topsoil replaced, cultivated and re-seeded with an appropriate lowland meadow grass mix. Where these areas lie outside the permanent highway boundary they would be reinstated to their existing condition and use as permanent pasture. There would be a 5m easement either side of the viaduct kept clear of obstacles for maintenance access. The permanent solution is shown on Figure 8.9 in Volume 2.

8.5.18 For the duration of the works or until the temporary hard standings can be removed, any disturbed topsoil would be handled and stored on site in accordance with *BS 3882:2015 Specification for topsoil, Annex A Recommendations for stripping, handling and preparing topsoil*. Following construction the build up to these areas would be removed and the ground regraded and de-compacted, re-topsoiled, cultivated and seeded with appropriate Species rich grassland seed mixes to reinstate the existing conditions (see Figure 8.9 Environmental Masterplan in Volume 2).

Invasive Species

8.5.19 Within field boundaries across the Scheme and locally across the valley floor Himalayan/Indian balsam (Impatiens glandulifera) is occasionally present in small isolated pockets along field boundary ditches, particularly to the east of the Scheme.

8.5.20 Japanese knotweed (Fallopia japonica) is also present in a large stand on the north bank of the Afon Dyfi at the point the Scheme crosses it and in several other stands across the Scheme.

8.5.21 For the locations of these invasive species refer to Figure 8.7 Baseline Environmental Plans and Figure 8.9 Environmental Masterplans in Volume 2.

8.5.22 These invasive species would be treated as part of the construction process in accordance with best practice guidance. This is described in the Chapter 17. If excavation and burial of material on-site is required as part of the eradication of invasive species, it will be incorporated into the Scheme earthworks and will not give rise to additional visual or landscape effects. In the unlikely event that this is not possible or there is a surplus of material contaminated with invasive species which cannot be accommodated within the proposed earthworks, this would be dealt with responsibly by disposing of it to a licenced tip off-site. The nearest Licenced tip identified that is capable of accommodating waste contaminated with invasive species is:

Biffa Waste Services
Trecatti Landfill Site
Merthyr Tydfil
CF48 4A
Tel. 0185 721 882

8.5.23 The method and ongoing management and monitoring of this process would be detailed in an Invasive Species Management Plan within the pre-Construction Environment Management Plan (pre-CEMP), provided at Appendix 17.1, Volume 3. This would be adhered to during the construction phase and aftercare period.

Pattern and Texture

8.5.24 The proposed works areas are shown at Figure 2.4 in Volume 2**.** The construction phase would inevitably occupy an area larger than the finished Scheme. However, in line with best practice and through adherence to the methods agreed and set out in the draft pre-CEMP, the construction phase has been planned to occupy as small an area as possible in order to minimise disruption to the landscape.

8.5.25 For instance, to minimise the loss of landscape features, the construction haul route is aligned to run parallel and adjacent to the viaduct utilising the route of the post construction viaduct maintenance access easement.

8.5.26 The construction compounds have been limited to one at either end of the Scheme and would be as compact as possible.

8.5.27 During the temporary construction phase, these temporary facilities, disturbed ground, stock piled materials and the gradual build out of the main Scheme structures including the viaduct and bridge, would locally disrupt the pattern and texture of the landscape.

Access and Recreation

8.5.28 During the works to construct the viaduct and bridge, cycle route NCN8 and PRoW (P5) passing west under the Scheme from the southern end of the Millennium Cycle Bridge would need to be diverted in a loop, 150m to the south, around the temporary crane pad and laydown area. As the Scheme is constructed using push launching, with little direct effect in the ground, this PRoW can remain open during the works with managed crossings for the haul road.

8.5.29 The main works would be phased in such a way as the existing A487 would remain open for vehicular and recreational use until the new route is open for vehicular use. Once the new road is open, the works to de-trunk the existing A487 would be undertaken. The relatively minor works required for de-trunking

the A487 would be organised so as to maintain non-motorised use of the existing route throughout the work.

Lighting

8.5.30 At various times and locations along the Scheme (especially the southern and northern tie-ins), construction task lighting would be required during winter months.

8.5.31 The construction compounds would need periodic task lighting on winter evenings. The temporary construction compounds would also require a low level of lighting for security throughout the hours of darkness.

8.5.32 Any lighting in this intrinsically dark area, especially within SNP, designated as a dark Sky Reserve, is likely to give rise to negative impacts on the night-time environment. Construction activities would be programmed as far as possible to minimise the need for lighting. Where it can't be avoided, proposed lighting would be kept to a minimum and as described at **Chapter 2 Section 2**, would be designed using fully cut off / shielded luminaires in order to minimise light spill.

Sense of Scale

8.5.33 The scale of the construction works would be small in comparison to the large scale of the broad, 'U'-shaped valley landscape. The construction activities would not noticeably harm the sense of scale of the landscape of the receiving LCAs and could be accommodated by the large scale and dramatic topography.

Topography

8.5.34 Construction activities would necessitate some medium scale earth works to create the proposed landforms, The earthworks to form the cuttings at the northern tie-in would be up to 7m deep adjacent to the Afon Dyfi and to the north of the A493 junction, but on average around 1m deep. These earthworks would extend over an area of approximately 1.2Ha. To form the embankment and bunds at the southern tie-in and Dyfi Eco Park, Earthworks would cover an area of approximately 1.4Ha and would be up to 2,5m deep, with the exception of the northern end of the embankment leading up to the viaduct abutment, which would be up to 4m deep. These works would involve temporary storage and movement of soils and aggregate materials around the construction site.

8.5.35 The northern bank of the Afon Dyfi, where the Scheme crosses, is currently infested with Japanese knotweed (*Falopia japonica)*. Eradication of this is likely to involve excavation of soil from the riverbank and the subsequent transport and disposal of this

within the proposed southern embankment in accordance with the current Environment Agency guidance.

8.5.36 Given the large scale and dramatic nature of the topography of the construction site and the surrounding landscape, the effects arising as a result of these works would be relatively minor in scale. The construction works required to make these topographical changes would be temporary, very short term (isolated to within short sub phases of the construction) and would be reversible.

Tranquillity.

8.5.37 As identified in the LANDMAP Visual and Sensory Data sheet for the 'River Dovey' Aspect Area, the Dyfi Valley is a sheltered, safe attractive and settled valley, but noisy as a result of traffic using the A487 and to a lesser extent the A493. This detracts from the tranquillity of the local landscape.

8.5.38 The construction activities on site are likely to involve a considerable amount of moving plant and machinery. The most disruptive of these to the tranquillity of the valley are likely to be site clearance, excavating and compaction of soils and aggregates, piling activities and the movement of large plant around the construction site to build the viaduct and bridge.

8.5.39 The Machynlleth LCA sits adjacent to the southern end of the Scheme. For the duration of the works, construction traffic accessing the Scheme from the south would need to arrive via the main roads (Heol Maengwyn (A489) and Heol Pentrerhedyn (A487)) in Machynlleth. This would increase the volume of traffic and the size of vehicles in the LCA. Traffic management measures required to accommodate the construction phase would vary as the works progress, but are likely to result in congestion at peak times in Machynlleth the and the likelihood for traffic disruption as a result of roadworks would increase traffic load in Machynlleth.

8.5.40 The noise and dynamic visual environment created by traffic and the construction activities is likely to give rise to a prominent degradation of the tranquillity of the valley within around 200m of the Scheme. Further detail on these effects can be found in Chapter 12 Noise and Vibration.

8.5.41 As with all construction effects these would be temporary short term and reversible. The distinction between temporary construction effects and operational effects are described at paragraph above 8.5.4.

Effect on Overall Landscape Character

8.5.42 The Scheme lies within Afon Dyfi LCA, Machynlleth LCA and the Pennal Valley Slopes LCAs have direct and physical effects on the landscape of the small portions of these character areas within the 200m buffer indicated on Figure 8.3 in Volume 2. The other wider parts of these and other more distant LCAs would not receive direct or physical effects and so are discussed separately below, between paragraphs 8.5.41 and 8.5.49.

Afon Dyfi and Pennal Valley Slopes LCAs

8.5.43 As described at Section 8.4, the overall character of these LCAs is highly valued in their own right, but particularly locally as they lie partially within or form part of the setting of the SNP. These LCAs are moderately able to accommodate changes of the type and scale anticipated and their susceptibility to the proposed change is considered to be medium to high. Combining a high national value with a moderate to high susceptibility to change, the sensitivity of this landscape to the proposed change is considered to be high.

8.5.44 As part of the works to construct the main Scheme, and de-trunk the existing A487, features such as haul roads, disturbed ground, vegetation clearance, dynamic and noisy construction plant, lighting and construction compounds would be temporarily present in the landscape. During construction, these would locally disrupt and contrast with the pattern and texture of the landscape. Within 200m of the construction site these activities would prominently detract from the tranquillity of the landscape. They would be noticeable further afield. Temporary lighting, although minimal, would contrast with and detract from the intrinsically dark and protected night time environment. These effects would be adverse temporary, short term and entirely reversible.

8.5.45 Therefore, in line with the criteria for judging the magnitude of impact on landscape receptors provided in Section 8.3 above (IAN135/10(W)), the magnitude of change to the character of the receiving LCAs as a result of the construction works would be adverse and minor.

8.5.46 Thus combining a high sensitivity with a minor magnitude of change, the Scheme is predicted to have an insignificant temporary and reversible, **slight to moderate** adverse effect on the character of the local character landscape within the Afon Dyfi and Pennal Valley Slopes LCAs.

Machynlleth LCA

8.5.47 As described at Section 8.4 the overall character of the LCA is highly valued. Locally given the presence of road and rail

infrastructure and industrial built form, its susceptibility to the proposed change is considered to be medium. Combining a high value with a medium susceptibility to change, the sensitivity of this landscape to the proposed change is considered to be moderate to high.

8.5.48 There would be no physical changes to this LCA as a result of the proposed construction works, but indirect effects would arise as a result of an increase to the volume of traffic using the main roads through the town. This increase in traffic and associated disruption and noise would detract slightly from the character of the already busy town centre. Temporary traffic management works on the Scheme would also exacerbate this impact by causing congestion during busy periods, especially where they coincide with peaks in construction traffic flows. The scale and duration of these effects are difficult to predict, but is judged that they would be adverse in nature, intermittent, temporary, short-term and reversible. The magnitude of these impacts is considered to be minor.

8.5.49 Thus combining a moderate to high sensitivity with a minor magnitude of change, the Scheme is predicted to have an insignificant, **slight to moderate** adverse effect on the character of the townscape of the Machynlleth LCA.

Localised Construction Effects on Designated Landscapes

Snowdonia National Park

8.5.50 Locally, within 200m of the Scheme, the landscape construction effects predicted above will adversely affect the character and setting of this sensitive designated National Park landscape and its setting. These effects will be localised, adverse and up to **slight to moderate** in level and therefore insignificant.

8.5.51 There is no physical, visual or perceptual connection between the Scheme and the designated Plas Machynlleth landscape or its setting. There will not therefore be any construction effects on this designated landscape.

Indirect Wider Landscape effects – on the wider parts of the Afon Dyfi and Pennal Valley Slopes LCAs and Penegoes, Machynlleth Wooded Hillsides, Pennal Conifer Plantations and Mynydd Glandulas LCAs before mitigation

Perceptual Changes to the Characteristics of the Wider Landscape

8.5.52 The wider landscape would not receive any direct changes to physical characteristics as a result of the construction phase. The only effects on the character of these LCAs would be as a result of the influence of construction activities on the landscape setting.

8.5.53 The aesthetic and perceptual characteristics of the wider landscape with the potential to be affected are discussed below.

Lighting

8.5.54 As described in **Chapter 2 Section 2.2**, the construction phase would require temporary task and security lighting. Any such necessary temporary lighting would be carefully designed to first avoid and then minimise light spill.

8.5.55 As this lighting would be perceived from considerable distances and within the context of lighting in and around Machynlleth, the impact of temporary low level lighting on the wider landscape is considered to be negligible.

Scale

8.5.56 The construction works would be barely noticeable as a distant element within the settings of these wider LCAs. They would not impact noticeably on the medium to large scale steep undulating landscapes of the valley slopes LCAs further afield.

Tranquillity

8.5.57 With the prominence of existing roads in the area coupled with the presence of the Cambrian Line railway and Machynlleth in the setting of these Wider LCAs, there would not be a noticeable change to the wider landscape beyond 200m from the construction site. The centre of Machynlleth would temporarily become more congested along with the consequent increase to noise levels and pollution as a result of the increased traffic levels.

Access and recreation

8.5.58 The Scheme would not affect the use of the wider landscape for recreational purposes.

Landscape Character

8.5.59 The character of all these LCAs is considered to be highly valued. These LCAs are generally tranquil with a remote feel away from scattered settlements and roads. There are humanising features; trunk roads along valley floors, the Cambrian Line Railway, occasional wind turbines and masts interrupt distant skylines. The susceptibility of these LCAs to change is nevertheless considered to be high. Combining their high value and susceptibility, they are all considered to be highly sensitive to change.

8.5.60 The changes arising from construction of the Scheme would only be perceived from parts of each LCA as a small and distant detracting feature within their settings. The magnitude of change to the LCAs would be negligible. Thus combining high sensitivity and negligible magnitude of change, the effects of the construction works on the character of the wider landscape is predicted to be temporary, slight adverse.

Wider Effects on Designated Landscapes

8.5.61 The wider landscape assessed within 5km of the Scheme is also within or forms part of the setting of the Snowdonia National Park. Construction effects on these landscape receptors are predicted to be adverse but of no worse than **slight** levels and are therefore **insignificant**.

8.5.62 There is no physical, visual or perceptual connection between the Scheme and the designated Plas Machynlleth or its setting. There will not therefore be any effects on this designated landscape.

Table 8.189: Summary of landscape effects arising from the construction phase

Landscape Character Area (see Figure8.3)	Sensitivity	Nature of Unmitigated Construction Changes	Effect During Construction Phase
Direct effects on landscape features elements			
Topographic features	**Moderate**	**Minor adverse**	**Slight adverse**
Vegetation,	**Moderate**	**Minor adverse**	**Slight adverse**
Transport routes	**Moderate**	**Minor adverse**	**Slight adverse**
Recreation routes	**High**	**Minor adverse**	**Slight to moderate adverse**
Indirect effects on perceptual Characteristics			
Scale	**Moderate**	**Negligible**	**Neutral to Slight adverse**
Openness	**Moderate**	**Minor**	**Slight adverse**
Tranquillity and remoteness	Moderate	Minor	**Slight adverse**
Texture and complexity	Moderate	Minor adverse	**Slight adverse**
Historic and cultural aspect;	High	Minor adverse	**Slight to moderate adverse**
Darkness at night	High	Negligible	**Slight adverse**
Direct effects within 200m and indirect effects on the character of the local landscape			
Afon Dyfi LCA	High	Minor	**Slight to moderate**
Machynlleth LCA	Moderate to high	Minor	**Slight**
Pennal Valley Slopes LCA	High	Minor	**Slight to moderate**
Snowdonia National Park	High	Minor	**Slight to moderate**
Indirect effects on the wider landscape beyond 200m			
Afon Dyfi LCA	High	Negligible	**Slight adverse**
Machynlleth LCA	Moderate to high	Negligible	**Slight adverse**
Pennal Valley Slopes LCA	High	Negligible	**Slight adverse**
Penegoes LCA	High	Negligible	**Slight adverse**
Machynlleth Wooded Hillsides LCA	High	Negligible	**Slight adverse**
Pennal Conifer Plantations LCA	High	Negligible	**Slight adverse**
Mynydd Glandulas LCA	High	Negligible	**Slight adverse**
Snowdonia National Park	High	Negligible	**Slight adverse**

Visual Effects before Mitigation

8.5.63 Table 8.20 below summarises the effects on all visual receptors assessed. The detailed assessments of visual effects arising as a result of the construction phase can be found tabulated in Appendix 8.2, Volume 3**.**

Table 8.20: Summary of visual effects arising from the construction phase

Vp. No.	Receptors Represented (receptor ID on Figure 8.5)	Sensitivity	Nature of unmitigated Changes	Effect During Construction Phase
	Recreation Receptors			
1, 2	Walkers and anglers using the PRoW (P5) along the Afon Dyfi as it passes under the Scheme and within 100m either side and crossing the Millennium Cycle Bridge.	High	Moderate to minor	**Moderate adverse**
5	Footpath users and anglers on the riverside PRoW (P5), within 250m to the east and west of the new bridge.		Minor	**Slight to moderate adverse**
6, 15	Footpath users and anglers on the riverside PRoW (P5), beyond 250m to the east and west of the new bridge.		Negligible	**Slight adverse**
17	Users of a 50m long section the Wales Coast Path on the minor lane rising up the valley side, 500m to the northwest of the Scheme	High.	Minor	**Slight to moderate adverse**
8	Walkers using a 200m stretch of the Wales Coast Path and Glyndwr's Way Long distance Recreational path on the minor lane rising up the valley side, 1.3km to the southwest.		Negligible	**Slight adverse**
18	People using the PRoW at Mynydd Cynffyrch above Derwenlas.	High	Negligible	**Slight adverse**
1	Cyclists using NCN 8 on the southern bank of the Afon Dyfi within 100m of the new bridge and crossing the Millennium Cycle Bridge.	High	Moderate to minor	**Moderate adverse**
3	Cyclists on NCN 8, north of the Millennium Cycle Bridge		Moderate to minor	**Moderate adverse**
16	Cyclists on NCN 8 on the A493, 450m west of the Scheme.		Negligible	**Slight adverse**
11, 12, 13	Cyclists and pedestrians, NCN 8 and 82 on the existing A487 to the south of Pont-ar-Ddyfi		Minor, and moderate depending on their proximity to the Scheme	**Ranging between Moderate/large and Slight/moderate**
17	Users of Open Access land at Foel-y-ffridd	High.	Minor	**Slight to moderate adverse**
18	People using Open Access Land at Mynydd Cynffyrch above Derwenlas.		Negligible	**Slight adverse**
	Transport receptors			
3	Road users on a 500m stretch of the A487 (R2) to the north of the Scheme.	Moderate	Moderate to minor	**Slight to moderate adverse**
10	Road users on a 100m stretch of the A487immediately to the south of the Scheme.		Moderate to minor	**Slight/moderate adverse**
16	Road users on a 600m stretch of the A493 (R3) to the west of the Scheme.		Negligible	**Neutral to slight adverse**

4	West-bound road users on a 400m stretch of the minor rural road (B4404) (R1) above Glan Fechan.	Moderate	Minor	**Slight adverse**
8	Road users on a 200m stretch of the minor rural lane (R5) rising up the valley side 1.3km to the southwest.	Moderate	Negligible	**Neutral to slight adverse**
6	Passengers on a 900m long stretch of the Cambrian Line scenic railway (T1).	High	Negligible	**Slight adverse**
9	Passengers stationary on Cambrian Line trains or using the platforms at Machynlleth Station.	Moderate to high	Minor	**Slight to Moderate adverse**
	Private receptors			
4	Residents in the single dwelling (A) at Glan-fechan.	Moderate	Negligible	**Neutral to Slight adverse**
	Residents in nine scattered dwellings and farmsteads at Pont Felin-y-ffridd and the Farm house at Ffridd.	High	No Change	**None**
3	Residents in a single dwelling at the Junction of A487 and B4404 (B).	High	Negligible	**Slight adverse**
14	Residents in a property off the A487 to the east of Pen-y-bont (C).	High	Negligible	**Slight adverse**
13	Residents in properties 1 to 9 Pen-y-Bont (D, E and F).	Moderate to high	Minor	**Slight to Moderate adverse**
16	Residents in two dwelling at Penrhyn Dyfi (G +H).	High	Negligible	**Slight adverse**
	Residents in a single Dwelling on the track to Dolgelynen and Dolgelynen Farmhouse (I).	High	No Change	**None**
	Residents in two individual dwellings at Brynturnol and Ogof Fawr (J + L).	High	No Change	**None**
8	Residents in two properties at Cae-Gybi Cottages (K).	High	Negligible	**Slight Adverse**
10	Residents in the single private dwelling on the west edge of the Dyfi Eco Park (M).	Moderate	Moderate to minor	**Slight to moderate adverse**
4	Farm workers at Glan-fechan (A).	Low	Negligible	**Neutral to Slight adverse**
10	Workers and visitors to the Dyfi Eco Park (B1).	Low	Moderate to minor	**Slight adverse**
7	Hotel Guests at the Plas Dolguog Hotel (B2).	Moderate	Negligible	**Neutral to slight adverse**
Heritage receptors				
13	People enjoying the visual setting of Pont-ar-Ddyfi and listed buildings at Pen-y-bont	High	Minor	**Slight to Moderate adverse**
16	People enjoying the visual setting of listed buildings at Penrhyn Dyfi	High	Negligible	**Slight adverse**

8.6 Assessment of Potential Operational Effects - Before Mitigation

8.6.1 The Scheme consists of a new viaduct structure across the floodplain and a river bridge to cross the Afon Dyfi approximately 480m upstream of the existing Pont-ar-Ddyfi. The length of the Scheme is approximately 1200m with approximately 725m being on structures.

8.6.2 The Scheme consists of a new section of single carriageway road, with a typical overall width of 14.3m. The typical carriageway width would be the same on the proposed structures across the flood plain and river, although with a reduced verge width on the eastern side of the carriageway from 2.5 m to 0.6 m on the viaduct and bridge. The viaduct would accommodate a shared footway/cycleway and associated 1.4m high parapet.

8.6.3 For most of its route, the Scheme would be elevated across a generally flat floodplain and at its highest point (on the river bridge) it would be some 9m above ground level.

8.6.4 During the early design and options appraisal stages of the project, and throughout the iterative design process, several interventions have been made and integrated into the Scheme with the primary purpose of avoiding or reducing adverse effects at source and to make the Scheme fit better into its setting.

8.6.5 The Scheme has been designed to be light touch, simple and elegant in line with the design Motto suggested by Design Commission for Wales. For example:

- The bridge piers were changed from leaf piers to simple round columns to match the rest of the viaduct;
- The concrete for the supporting columns will be darkened to reduce their visual prominence and reduce visual contrast with the landscape back drop;
- The concrete for the supporting columns will have a fine vertical ribbed finish to direct water vertically and encourage even weathering and colouration of the columns;
- Lighting has been limited to replacement lighting adjacent to and south of Dyfi Eco Park. This replacement lighting will be low energy white LED lighting which is directional in order to reduce light spill in comparison to the existing luminaires. No new lighting is proposed anywhere else on the Scheme;
- The steel beams supporting the viaduct and bridge deck would be either weathered steel or a dark brown painted finish to mimic natural steel to give a natural and recessive colour that will not contrast with the landscape;

- The bridge and viaduct parapet will be formed to appear as a simple linear clean fair faced concrete line when seen in elevation;
- The visible walls of the northern bridge abutment and the southern viaduct abutment will be faced in coursed masonry to match that present in local structures such as the railway bridge and stone walls; and
- The embankments and cuttings will be carefully graded with a maximum gradient of 1 in 2 but with gently rounded top and bottom 'S' shaped profiles to better tie them back into the adjacent landscape.

8.6.6 These measures are considered integral to the Scheme rather than as mitigation measures. Along with other measures, they are described in more detail under Environmental Measures at the end of Section 2.2 in paragraphs 2.2.40 to 2.2.74 of Chapter 2 of this ES.

8.6.7 This Section considers the medium term effects which will exist between the opening year and the fifteenth operational year whilst the proposed landscape mitigation is establishing. Paragraph 8.3.53 sets out the temporal scope of this assessment.

8.6.8 Landscape mitigation has been proposed. This comprises soft landscape planting and is described at Section 8.7 below. Its effectiveness in reducing long term residual effects beyond operational year fifteen is assessed at Section 8.8.

Direct and Indirect Local Landscape Effects including parts of the Afon Dyfi and Pennal Valley Slopes LCAs within 200m of the Scheme before mitigation

8.6.9 South of the Afon Dyfi, the Scheme lies within the Afon Dyfi LCA and to the north it lies within the Pennal Valley Slopes LCA. The southwest edge of the Mynydd Glandulas LCA lies within 200m of the Scheme and the Machynlleth LCA lies adjacent to its southern end. There would be no physical effects on these LCAs. Effects on perceptual characteristics of these LCAs are discussed below under Wider Landscape.

Effects on Physical elements and Perceptual Characteristics of the Local Landscape

Land cover

8.6.10 The Scheme would result in the loss of vegetation, including several sections totalling 624 linear metres of field boundary

hedges and 26 no. mature deciduous trees. The vegetation to be removed to accommodate the Scheme is detailed in the Environmental Masterplans at Figure 8.9 in Volume 2. A table quantifying the different types of vegetation lost is provided at Table 8.21 in Section 8.7.

8.6.11 Loss of this structural vegetation would cause a minor reduction in the contribution these features make to the overall character of the landscape. Once construction is complete, the land under and around the Scheme would be reinstated with topsoil made good to match adjacent natural levels and seeded with an appropriate open grassland seed mix, to re-establish a grass sward of permanent pasture.

Pattern and Texture

8.6.12 The southern junction on embankment would alter the size and change the shape of two fields adjacent to the northern edge of Machynlleth.

8.6.13 Where the Scheme is elevated above the ground on a viaduct, the prevailing field pattern beneath and around it would remain substantially unchanged, but it would be over-sailed and dominated by the Scheme. Directly underneath the viaduct it is unlikely to be possible to re-establish the field boundary hedgerow planting that would be lost. These boundaries would be re-formed on or near their existing alignment, but with post and wire stock proof fencing where vegetation is not planted.

8.6.14 The Scheme would contrast strongly with the medium sized and irregular mosaic field pattern and the soft texture of this rural landscape.

Access and Recreation

8.6.15 The local landscape is host to a strong network of public recreational routes and features. These include the Afon Dyfi, National, regional and local walking and cycling routes. As described at Chapter 2 Section 2.2 of this ES, the Scheme has been designed in order to avoid impacts on these routes and where possible enhance their usability and value. The length of the existing A487 crossing the valley floor between Machynlleth and Pont-ar-Ddyfi, also the Wales Coast Path and NCN routes 8 and 82, would be de-trunked (downgraded from a highway to a route dedicated to recreational use with only occasional vehicular use for access). Users of these recreational routes are predicted to benefit from improvements to the safety, usability and amenity experienced on this length.

Lighting

8.6.16 Introduction of lighting in the rural section of the Scheme is not proposed as this would increase light pollution and create an

undesirable sky glow impact which would conflict with Snowdonia National Park's International Dark Sky Reserve status.

8.6.17 It is proposed that in keeping with the existing, highway lighting is only provided to replace that already in the proposed 30mph urban section of the Scheme. This section continues approximately 200m north beyond the railway bridge and ends at the interface with the viaduct.

8.6.18 The luminaires proposed to replace the existing lighting would be LED white light lamps. This light source is directional, and would concentrate light onto the highway. This would reduce the amount of light which is currently emitted in unwanted directions below, resulting in a slight beneficial effect on the character of the night-time environment.

Sense of Scale

8.6.19 The scale of the operational Scheme would be small in comparison to the large scale of the broad, 'U'-shaped valley landscape. The Scheme is 1.2 km long and bisects the valley floor. The tallest part of the Scheme will be the parapet railings of the bridge crossing the Afon Dyfi which will be approximately 9 m above the existing terrain. The Scheme is described in detail in Chapter 2 of this ES. It would comprise a locally prominent change across the entire width of the valley floor, but would not noticeably change or contrast strongly with the sense of scale of the large scale valley landscape. The Scheme could be accommodated by the large scale and dramatic topography.

Topography

8.6.20 The proposed embankment at the southern tie-in would be at grade just to the north of the railway bridge at the very southern end of the Scheme and would rise gradually to a height of approximately 4m at the southern end of the viaduct. Refer to cross section A-B on Figure 8.10 in Volume 2. This embankment has been designed to extend north as little as possible past the northwest corner of Dyfi Eco Park into the floodplain. This is principally to reduce its impact on floodwater storage capacity. This has the added advantage of minimising any impact on the topography of the flat valley floor by restricting the change in levels to an area adjacent to existing built form and artificial landforms.

8.6.21 A proposed 2.0-2.5m high flood bund would be introduced, one adjacent to the northern edge of the Dyfi Eco Park. There would be another 1.5m high bund extending south from the southern tie in to the Cambrian Line railway embankment. These would be minor features, gently graded with 'S' shaped side slopes, and would follow existing boundaries at the edge of the floodplain.

They would not detract noticeably from the valley or floodplain topography.

8.6.22 At the northern end of the Scheme the bridge section lands at the top of the river bank. The top of the river bank falls in a northwest to southeast direction, perpendicular to the Scheme. The level cross section of the road would necessitate a slight cutting into the up-slope on its northwest side and building up on a slight embankment as land falls away to the southeast. Refer to cross section I-J on Figure 8.10 in Volume 2.

8.6.23 The cattle underpass would require cutting down 3.5m into the top of the riverbank and would be incorporated into the bridge abutment design. Refer to long section E-F on Figure 8.10 in Volume 2. The proposed farm track leading to the underpass would need cutting into the land as it approaches from the northwest See cross section I-J on Figure 8.10, Volume 2**.** The section of the A493 realigned to form its junction with the New A487 and the private access to Ffridd would need cutting further into the hillside to the north. This would extend the existing slight cutting and increase its depth to up to 5m. The cutting would be finished with a 1 in 2 batter, rounded slightly to top and bottom. If solid rock is encountered the opportunity to create natural looking rock faces would be taken. At its western end this cutting would be locally steepened and tied into the existing stone retaining wall north of the A493.

Tranquillity

8.6.24 As identified in the LANDMAP Visual and Sensory Data sheet for the 'River Dovey' Aspect Area, the Dyfi valley is a sheltered, safe, attractive and settled valley, but noisy as a result of traffic using the A487 and to a lesser extent the A493. This detracts from the tranquillity of the local landscape. The existing road would remain in place during operation of the Scheme, but it would be de-trunked and reduced in width. Its use would be restricted to Non-Motorised Users (NMU) and occasional farm and utilities maintenance access. It would be perceived more as a minor lane and recreational route than a busy trunk road.

8.6.25 The Scheme would comprise a new elevated road through the landscape further east than the existing route. The volume and speed of traffic using the new route is likely to increase nominally as a result of the Scheme offering a more convenient and less congested route, but would remain broadly similar to that using the existing road. Because the route is elevated the traffic would be more readily seen and heard in the landscape than it currently is at ground level on the existing road. The Scheme would locally cause a moderate adverse change to the tranquillity of the Landscape.

Overall Effect on the Character of the Local Landscape

Afon Dyfi LCA

8.6.26 As described at paragraph 8.4.68, the overall character of the LCA is highly valued in its own right, but particularly locally as it lies partially within and forms part of the setting of the SNP.

8.6.27 This is a large scale, open, sheltered and picturesque landscape with an attractive setting defined by dramatic hills. It has a complex textural mosaic pattern of moderately well managed and sometimes overgrown field boundaries. The dynamic and meandering Afon Dyfi provides a strong harmonising and focal element to the landscape. There are a number of human influences, including the A487, A493, the Cambrian Line Railway and Dyfi Eco Park which detract locally from the unspoilt rural feel and tranquillity of the valley. Other human influences such as the existing Pont-ar-Dyfi and the Millennium Cycle Bridge confer a strong cultural quality to the landscape. Locally this LCA is moderately able to accommodate change of the type and scale proposed and its susceptibility to the proposed change is considered to be medium to high. Combining a high national value with a medium to high susceptibility to change, the sensitivity of this landscape to the proposed change is considered to be high.

8.6.28 As described in paragraphs 8.6.8 to 8.6.22, the strong, linear and modern form of the Scheme, in particular the viaduct and bridge would contrast with the texture and pattern of the landscape, but would not detract markedly from the large scale and dramatic topography of the valley. There would be small changes to landscape elements, including some vegetation loss where field boundaries and the northern river bank are interrupted. Traffic currently using the existing A487 would instead use the Scheme. The existing route would be modified to reduce its width and limit it to recreational and occasional access use. Tranquillity of the local landscape would be noticeably affected.

8.6.29 In line with the typical criteria for judging the magnitude of impact on landscape receptors provided in Section 8.3 above (IAN135/10(W)), the magnitude of change to the character of the local landscape within 200m of the Scheme is predicted to be moderate.

8.6.30 Thus combining a high sensitivity with a moderate magnitude of change, the Scheme is predicted to have a significant, permanent, medium-term, moderate to large adverse effect on the character of this LCA within 200m.

Pennal Valley Slopes LCA

8.6.31 As described at paragraph 8.4.71, the overall character of the LCA is highly valued. This LCA sits almost entirely within the Nationally Designated SNP.

8.6.32 This is a medium scale, undulating, sheltered and picturesque landscape with an attractive setting defined by intermittent visual connection with the Dyfi Valley and Machynlleth Wooded Hillsides further south. It has a complex textural mosaic pattern of well managed field boundaries. The southern edge of the LCA is dominated by the busy A487 and A493. The only human influences, which detract locally from the unspoilt rural feel and tranquillity of the LCA, are these roads and the communications masts near Dolgelynen. Other human influences such as the existing Pont-ar-Dyfi and the Millennium Cycle Bridge confer a strong cultural quality to the southern edge of the LCA. Locally this LCA is moderately able to accommodate change of the type and scale proposed and its susceptibility to the proposed change is considered to be medium to high. Combining a high national value with a medium to high susceptibility to change, the sensitivity of this landscape to the proposed change is considered to be high.

8.6.33 The Scheme's proposed junction with the A493 and the cattle underpass at the eastern end of the LCA would comprise a small increase in the prominence and humanising influence of highways infrastructure at the edge of the character area. It would also necessitate the removal of a small area of mature woodland vegetation on the northern bank of the Afon Dyfi and a length of hedgerow defining the existing boundary alongside the A493. In line with the typical criteria for judging the magnitude of impact on landscape receptors provided in Section 8.3 above (IAN135/10(W)), the magnitude of change to the character of the local landscape within 200m of the Scheme is predicted to be minor.

8.6.34 Thus combining a high sensitivity with a minor magnitude of change, the Scheme is predicted to have an insignificant permanent medium-term, slight to moderate adverse effect on the character of the LCA within 200m.

Localised Effects on Designated Landscapes

Snowdonia National Park

8.6.35 Locally, within 200m of the Scheme, the landscape effects predicted above will adversely affect the character and setting of this sensitive designated National Park landscape and its setting. These effects will be localised, adverse and of up to **moderate to large** significance.

8.6.36 There is no physical, visual or perceptual connection between the Scheme and the designated Plas Machynlleth or its setting. There will not therefore be any effects on this designated landscape

Indirect Wider Landscape effects– Wider parts of Afon Dyfi and Pennal Valley Slopes LCAs and Machynlleth, Penegoes, Machynlleth Wooded Hillsides, Pennal Conifer Plantations and Mynydd Glandulas LCAs before mitigation

Effects on the Perceptual Characteristics of the Wider Landscape

8.6.37 The wider landscape would not receive any direct changes to physical characteristics as a result of the Scheme. The only effects on the character of these LCAs would be as a result of the Scheme's influence on their perceived settings.

8.6.38 The perceptual characteristics with the potential to be affected are discussed below.

Lighting

8.6.39 The Scheme would not be introducing new lighting to the landscape. The only lighting proposed is within the 30mph zone at the southern end of the Scheme, which is currently lit on the existing A487. The prominence of vehicle headlights using the road would not increase noticeably. There would not be a noticeable change to lighting as perceived from the wider landscape.

Scale of change

8.6.40 The Scheme would be perceived as a small barely noticeable element within the settings of these wider LCAs. It would not impact on the sense of scale of the built form in Machynlleth LCA, or the medium to large scale steep undulating landscapes of the valley slopes LCAs further afield.

Tranquillity

8.6.41 With the prominence of existing roads in the area coupled with the fact that the Scheme would only be accommodating traffic displaced from the existing route, there would be a noticeable but minor adverse effect on the tranquillity of the wider landscape.

Access and recreation

8.6.42 The Scheme would not affect the use of the wider landscape for recreational purposes.

Effects on Wider Landscape Character

Wider parts of Afon Dyfi and Pennal Valley Slopes LCAs and Penegoes, Machynlleth Wooded Hillsides, Pennal Conifer Plantations and Mynydd Glandulas LCAs

8.6.43 The character of all these LCAs is considered to be highly valued. These LCAs are tranquil with a remote feel away from scattered settlements and roads. There are few other humanising features. Occasional wind turbines and masts interrupt distant skylines. The susceptibility of these LCAs to change is considered to be high. Combining their high value and susceptibility, they are all considered to be highly sensitive to change.

8.6.44 The Scheme would only be perceived from parts of each LCA as a small and distant humanising feature within their settings. The magnitude of change to the LCAs would be negligible. Thus combining high sensitivity and negligible magnitude of change, the effects on the wider landscape is predicted to be **slight and adverse**.

Machynlleth LCA

8.6.45 The character of this LCA is highly valued. Given the predominantly urban form of the LCA and the existence of the Railway and A487, the LCA is considered to have a low susceptibility to the change proposed. Its sensitivity to the proposed change is therefore assessed to be moderate.

8.6.46 The southern end of the Scheme sits adjacent to the northern edge of this LCA. There would not be any direct effects on the urban form or other characteristics that make up the townscape character. The Scheme would effectively be a realigned and partially elevated replacement for the existing A487 to the north of the Cambrian Line railway embankment and adjacent to the Dyfi Eco Park. The Scheme would not noticeably alter the setting of this LCA. The magnitude of change to the character of the Machynlleth LCA is predicted to be negligible. Thus combining a medium sensitivity with a negligible degree of change, the effects on this LCA would be **neutral to slight** adverse.

Wider Effects on Designated Landscapes

8.6.47 The wider landscape assessed within 5km of the Scheme is also within or forms part of the setting of the National Park, Effects on these landscape receptors are predicted to be adverse but of no worse than **slight** levels and are therefore **insignificant**.

8.6.48 There is no physical, visual or perceptual connection between the Scheme and the designated Plas Machynlleth or its setting. There will not therefore be any effects on this designated landscape.

Summary

8.6.49 For a summary of the Landscape effects predicted before mitigation, alongside residual effects predicted after mitigation has established, please refer to Table 8.14 at Section 8.9 below.

Visual effects before mitigation

8.6.50 For a summary of the Visual effects predicted on receptors before mitigation, alongside residual effects predicted after mitigation has established, please refer to Table 8.15 at Section 8.9.

8.6.51 For the detailed visual assessment tables please refer to Volume 3, Appendix 8.2.

8.6.52 For Viewpoint photographs and Photomontage visualisations please refer to Volume 2, Figure 8.8.

8.7 Mitigation and Monitoring

8.7.1 The landscape mitigation measures described below are considered essential to mitigate the landscape and visual effects identified in Section 8.6 above. Where significant environmental effects have been identified through the iterative design and assessment process, changes have been adopted and built into the Scheme design. The Environmental Masterplan drawings (EMPs) at Figure 8.9 in Volume 2, have been prepared using the guidance set out in DMRB Volume 10, Section 1. They use the DMRB system of 'Functions' and 'Elements' to describe environmental features. The use of this system enables environmental data to be recorded and developed in a consistent manner, linked through all stages of the Scheme, from initial design through to construction and management.

8.7.2 Landscape mitigation proposals have been described below in sequence starting at the southern end of the Scheme and progressing northwards.

8.7.3 All areas of disturbed ground resulting from the construction of the Scheme will be graded, cultivated and profiled to tie smoothly back into the surrounding fields. Apart from where specified below and as shown on the Environmental Masterplans the majority of these areas will be cultivated and seeded with an appropriate open grassland seed mix to restore grazing pasture. These areas will be protected by fencing and retained by the employer during the three year aftercare period or sooner as

agreed with the landowner to re-establish a grass sward robust enough to graze and manage through normal agricultural practices. These areas and the protective fences are shown on Figure 8.9 in Volume 2.

8.7.4 Where cultivated and reinstated ground is on a slope and is at risk of damage from storm events or flooding before seeding establishes, it will be protected by an appropriate bioengineering system of pre-seeded coir matting as indicated on the EMPs above such as:

- the northern side of the flood bund north of the Dyfi Eco Park;
- The inner slopes of the newly formed or re-profiled ditches along the de-trunked A487;
- the western side of the embankments and flood bund to the west of the southern tie in;
- Parts of the northern and southern banks of the Afon Dyfi under the new bridge;
- South-western flood bund and new farm access along the railway;
- Scattered native clear stem trees at the bottom of the slopes to the proposed flood bund to replace trees lost and to integrate the Scheme at its interface with the surrounding landscape; and
- Mixed native hedgerow at bottom of flood bund slope to define new field boundary and integrate the Scheme into the landscape.

8.7.5 Ch. 0+000 – 0+125 Dyfi Eco Park Frontage with the A487

- Swathes of native bulb planting with scattered, native standard clear stem trees to integrate the Scheme into the landscape and to provide an appropriate aesthetic to the setting to Dyfi Eco Park.
- Native aquatic and marginal plug planting to proposed ditches to improve wildlife value and integrate the Scheme into the landscape.

8.7.6 Ch. 0+280 – 0+200, the southern tie-in and embankment.

- Scattered native feathered trees within native hedgerow to the north westerly boundary to provide amenity value and to integrate the Scheme into the surrounding countryside.
- Scattered native feathered trees along the edges of the mown verge to provide amenity value and to integrate the Scheme into the surrounding countryside.

- Mixed native hedgerow to bottom of westerly embankment to define new field boundary and integrate the Scheme into the landscape.
- Mixed native hedgerow to top of easterly embankment to screen views of the A487 from the NMU route and receptors further west and northwest.

8.7.7 Ch. 0+100.000 – 0+240.000, encompassing the beginning of the A487 Pont-ar-Ddyfi and the proposed length of associated flood bunding to the east, running alongside the edge of Dyfi Eco Park and the railway line.

- Mixed native hedgerow with groups of native feathered trees to provide amenity value and to integrate the Scheme into the surrounding countryside and to filter views from the entrance to the Dyfi Eco Park and the adjacent residential property.
- Proposed ditch lined with erosion control coir matting pre-seeded with native aquatic and marginal seed mix to improve wildlife value and integrate the Scheme into the landscape
- Mixed native hedgerow along the edge of the viaduct to screen views and control access under viaduct.

8.7.8 Ch. 0+000.000 – 0+200.000 of the NMU route as it re-joins the de-trunked A493.

- Mixed native hedgerow along edge of existing ditch to tie into existing boundaries to screen views and to control access under viaduct.
- Proposed ditch lined with erosion control coir matting pre-seeded with native aquatic and marginal seed mix to improve wildlife value and integrate the Scheme into the landscape.

8.7.9 Ch. 0+200.000 – 0+300.000, the southern embankment (south of the viaduct)

- Mixed native hedgerow along both edges of the viaduct to screen views and to control access under viaduct.
- Proposed ditch lined with erosion control coir matting pre-seeded with native aquatic and marginal seed mix to improve wildlife value and integrate the Scheme into the landscape.

8.7.10 The section of the de-trunked A487 between its tie-in at Ch. 0+000 and the southern end of the Pont-ar-Ddyfi.

- Gaps in existing hedgerow reinforced with new transplant planting within scheme boundary to reinforce and enhance existing field boundary.

- Erosion control coir matting pre-seeded with native aquatic and marginal planting to existing ditch to improve wildlife value and integrate the Scheme into the landscape.

8.7.11 Pont-ar-Ddyfi and the adjoining stretch of the A493.

- No soft landscape mitigation proposed.

8.7.12 Ch. 0+300 – 0+900, the viaduct.

- Native feathered tree planting to reinforce and enhance existing field boundaries.
- Mixed native hedgerow with trees to define new field boundaries and integrate scheme into the landscape.
- Mixed native hedgerow to define existing field boundary and to integrate scheme into the landscape.
- Areas on the southern gently sloping river bank planted densely with appropriate native mix scrub to stabilise riverbank and prevent scour downstream of new bridge, provide bat foraging habitat and soften views across the river towards the proposed abutment wall.
- Erosion control coir matting pre-seeded with willow scrub to locally reinstate and protect an existing scour pocket immediately to the north of the southern end of the Millennium Cycle Bridge.

8.7.13 Ch. 0+900 – 1+000, the A487 bridge over the Afon Dyfi and the proposed cattle, pedestrian and cycle underpass.

- Areas on the northern steep riverbank disturbed by the proposed works and tree removal to be covered with an erosion control hessian matting pre-seeded with woodland ground flora mix.
- Either side of the Bridge, the northern river bank will be seeded with native woodland ground flora seed mix pre-seeded into erosion control coir matting and planted with scattered native feathered trees. This will stabilize the steep riverbank, provide bat foraging habitat and soften views across the river towards the proposed abutment wall and integrate the Scheme into the landscape.
- Mixed native hedgerow at the top of embankments define field boundaries and integrate the Scheme into the receiving landscape.
- Scattered native feathered trees across the slope of the embankment to provide amenity value and integrate the Scheme into the surrounding countryside.
- Mixed native woodland and shrub planting across the length of the southbound embankment to replace trees lost as a

result of construction of the Scheme, to screen views from the southeast, and to integrate the Scheme with the surrounding landscape.

8.7.14 Ch. 1+000 – 1+100, A493 Junction / northern tie In.

- Mixed native hedgerow to top of embankment to reinstate and tie into existing field boundaries and to integrate the Scheme into the landscape.
- Scattered native feathered trees and hedgerow along the top of the embankment southbound to provide visual separation between the National Cycle Route and the Scheme and to replace trees lost.
- Stand of specimen sessile oak trees (Quercus petrea) planted in a species rich meadow with native spring flowering bulbs to form an attractive landscape feature at the gateway into Snowdonia National Park.

8.7.15 A493 Ch. 0+000 – 0+180. Ffrid Farm access Ch. 0+000 – 1+125.884.

- Mixed native hedgerow to top of cutting and to tie into existing woodland boundary to define new field boundary and integrate scheme into the landscape.
- Species rich grassland to form a low maintenance meadow as an attractive and wildlife friendly ground cover to the verges and cuttings around this junction.

8.7.16 Ch. 1+100 – 1+220, northern tie-in.

- Mixed native hedgerow to top of cutting northbound cutting and to bottom of southbound embankment to reinstate and tie into existing field boundary hedgerows and integrate scheme into the landscape.

8.7.17 The types of habitats and landscape features to be removed have been calculated and quantified alongside landscape mitigation to be proposed in Table 8.21. For a more detailed comparison of habitat types lost and proposed refer to Table 9.12 in Chapter 9 of this ES.

Table 8:21 Quantity of existing habitat types & landscape features to be removed and proposed landscape mitigation measures

Existing Features / Habitat Types	Quantity removed	Proposed landscape planting	Quantity proposed
Amenity grass	0	Amenity grass	1,172 m2
Improved and poor semi-improved grassland	56,000m2	Open grassland	56,001m2
		Grassland with bulbs	834m2

Existing Features / Habitat Types	Quantity removed	Proposed landscape planting	Quantity proposed
Semi improved neutral grassland	1,632m2	Species rich grassland	11,768m2
Marshy grassland	691m2	Marginal planting to banks & ditches	2,375m2
Scrub including scattered scrub	1,516m2	Scrub	194m2
		Scrub with understory woodland seeding	807m2
Existing trees	26	Trees	144 no.
Existing hedgerows	624 linear m	Hedgerow	1,270 linear m

8.8 Environmental Masterplans

8.8.1 The Landscape Elements (LEs) proposed as mitigation for this Scheme and their respective Environmental Functions (EFs) are illustrated and described on the EMPs in Volume 2, Figure 8.9. The mitigating effect that the measures designed into the Scheme have on the landscape and views is described under Section 8.9 for landscape effects and in the detailed Assessment of visual effects arising from the operational phase in Appendix 8.2 in Volume 3.

8.8.2 Each proposed environmental feature on or adjacent to the highway may be a combination of ‘Elements’ and may have multiple 'Functions'. For example a hedgerow may provide visual screening, but may also be intended to form a highway boundary, provide nature conservation value and also integrate the Scheme into the surrounding landscape.

8.8.3 Features that are relevant to achieving the non-landscape environmental objectives in respect of noise, water quality, ecology and nature conservation are classified as Environmental Elements.

8.8.4 Within the overall environment of the highway and its surroundings there are many elements that influence the design and maintenance. The elements are divided into broad classification types such as Landscape Elements (LE), Environmental Elements (EE) and Planning and Policy Elements (PE). These broad classifications are then sub-divided into more specific elements e.g. under the Landscape Elements, grassed areas can then be subdivided again according to their detailed design or management needs, in conjunction with the stated function.

8.9 Photomontage Visualisations

8.9.1 8.1.2 For viewpoint photographs and photomontage visualisations showing the Scheme and proposed landscape mitigation at year 1 and year 15 or operation, please refer to Figure 8.8, Volume 2.

Landscape Elements (LE)

8.9.2 DMRB Volume 10 Environmental Design and Management, Section 0 Environmental Objectives, Part 3 Ha 88/01 Landscape Elements Summary describes the range of Landscape Elements (LEs) that form the major components of the Highway's soft estate.

8.9.3 Landscape Elements can encompass both hard landscape features and elements of the soft estate.

8.9.4 Those landscape elements which help to mitigate the adverse impacts of the Scheme will require regular maintenance and inspection to achieve their long term objectives.

Environmental Functions

8.9.5 Environmental Functions (EF) are defined as the intended purpose of proposed features within the highway estate in environmental terms.

8.9.6 A summary description of each of the Environmental Functions as given in DMRB Volume 10 and used within the EMP figures in Volume 2 is provided in the following paragraphs as follows:

- EFA Visual Screening;
- EFB Landscape Integration;
- EFC Enhancing the Built Environment ;
- EFD Nature Conservation and Biodiversity ;
- EFE Visual Amenity;
- EFF Heritage;
- EFH Water Quality;
- EFG Auditory Amenity;
- EFJ Agricultural/Highway Boundary; and
- EFK Access.

EFA Visual Screening

8.9.7 These features have been included to mitigate against adverse visual impacts by screening views of the Scheme from properties

and public viewpoints, including rights of way and public open space. This may be achieved by proposed planting, earthworks or structures.

8.9.8 Screening elements themselves need to be visually acceptable. Visual barriers such as hedgerows for example would be designed to ensure visual amenity to visual receptors including road users and to integrate the Scheme with the surrounding landscape character.

EFB Landscape Integration

8.9.9 These measures have been included in the design to ensure integration of the Scheme into views to and from it and into the pattern and character of the existing landscape.

8.9.10 Wherever possible along the periphery of the Scheme the existing vegetation would be retained.

8.9.11 To ensure integration in the longer term, planting has been proposed to meet the ecological and protected species requirements including the use of plant species of local provenance.

EFC Enhancing the Built Environment

8.9.12 These would be developed to enhance the landscape and built elements of the highway with surrounding features and to reflect their scale, character and materials.

8.9.13 This also covers the needs and amenity of the public living and or working in or visiting the area, including pedestrians and cyclists.

EFD Nature Conservation and Biodiversity

8.9.14 These measures have been included specifically to provide mitigation (protection, management or enhancement) for potential impacts on nature conservation and biodiversity and to ensure the highway estate integrates with and protect adjacent habitats and locations containing protected species, or other locally important species or habitats.

8.9.15 All retained, translocated and/or created habitats within the highway land would be managed to conserve and enhance their nature conservation value, without prejudicing the other functions these features may have. For example the native scrub under and around the northern bridge abutment is intended to reinstate and stabilise a natural looking river bank whilst also encouraging bats to fly and forage under the structure rather than over it and potentially into conflict with passing vehicles.

EFE Visual Amenity

8.9.16 Visual amenity EFE seeks to create interest, variety and an acceptable visual appearance for public receptors, including road users, by creating or maintaining views to the wider landscape, providing seasonal variation and creating a 'sense of place' via landmark features appropriate to the local landscape.

EFF Heritage

8.9.17 These measures have been included to ensure that features of cultural heritage importance and their settings are protected. In DMRB this is defined as - conserve and enhance the physical nature and appearance and setting of existing features within and adjacent to the highway, where they are either afforded statutory protection, or make a material contribution to the quality and character of the local area.

8.9.18 For example, Fixed and de-mountable bollards would be used to control vehicular access onto Pont-ar-Ddyfi. These would be carefully selected in agreement between the landscape architect and the heritage consultant to ensure their design (scale, colour and materials) complements the fabric and historic setting of Pont-ar-Ddyfi and nearby dwellings

EFH Water Quality

8.9.19 These measures are included to mitigate the impact on areas sensitive to flooding or hydrological changes, local water courses and ground waters from construction works, run-off from the road and spillages.

8.9.20 The final detail of the water pollution control measures would be designed in consultation with NRW.

EFK Access

8.9.21 These measures typically include fencing, gates and styles. They have been included to ensure that private and public land access is managed correctly.

Long term management

8.9.22 The Contractor would carry out environmental monitoring, aftercare and management for the three year Aftercare Period following completion of the works. This would be undertaken in accordance with the agreed Environmental, Landscape and Ecology, Monitoring, Aftercare and Management Plan (refer to Chapter 17 - Environmental Management for details).

8.9.23 During the Aftercare Period, the Contractor would review the effectiveness of the environmental mitigation against their intended function as identified within the ES and would provide any remedial actions if required.

8.9.24 At the completion of this three year Aftercare Period, the management of the soft estate and environmental mitigation measures would be transferred to the North and Mid Wales Trunk Road Agent (NMWTRA). The Contractor would prepare a ten year Handover Environmental Management Plan (HEMP), which would set out on-going management and monitoring actions (refer to Chapter 17 - Environmental Management for details).

8.10 Assessment of Construction Effects - With Mitigation

8.10.1 For the construction phase mitigation measures have been developed as part of the iterative design and accounted for in the assessment of effects without mitigation. These environmental measures incorporated into the construction strategy are described in Chapter 2 of this ES.

8.10.2 Due to the short-term and temporary nature of the construction effects identified, it is not considered feasible to include any landscape mitigation measures to further reduce the construction phase effects.

8.11 Assessment of Operational Effects - With Mitigation

Direct and Indirect Residual Effects on the Local Landscape including parts of Afon Dyfi and Pennal Valley Slopes LCAs within 200m

Physical and Perceptual Characteristics of the Landscape

Land cover, Pattern, Texture and Topography

8.11.1 The proposed landscape mitigation measures have been designed to replace vegetation lost as a result of the Scheme. Replacement hard and soft landscape features, such as fencing, hedgerows, grassland and tree cover has been designed to be in keeping with the character and type of those elements already present in the landscape. Further mitigation planting is proposed, beyond just replacement planting, to augment and reinforce positive landscape characteristics. Over time, the proposed mitigation measures listed below will contribute to an increasingly

beneficial effect on the quality of physical landscape elements and the overall condition of the local landscape. :

- removal of invasive weed species;
- re-establishment of species rich grass sward on all disturbed ground;
- wildflower meadows to cuttings and soft estate around southern and northern junctions;
- new specimen, woodland and hedgerow tree planting;
- reconnection and reinforcement of hedgerows around the northern abutment;
- enhancement of the Dyfi Eco Park frontage;
- re-profiling and planting to soften the drainage ditch along the existing route;
- introduction of a landscape feature comprising a copse of specimen native oak trees set within a swathe of native bulb and wildflowers at the northern junction to highlight the gateway to SNP. See Figure 8.9 in Volume 2, sheet 6 of 7;
- re-stitching field boundaries with characteristic post and wire fences under the viaduct; and
- planting proposed to reinforce and protect the banks of the Afon Dyfi.

8.11.2 Refer to Figure 8.9 in Volume 2. Environmental Masterplans for detail.

8.11.3 As these proposed features establish over the first 15 years, there will be an improvement in the condition and quality of the local landscape, with a resulting residual beneficial effect and a partial neutralisation of the adverse effects on the overall character of the local landscape predicted without mitigation.

Access and Recreation

8.11.4 Over time as the proposed hedgerows and re-profiled ditch banks along the existing de-trunked route mature the recreational user experience of this route will improve.

8.11.5 Similarly, the new pedestrian and cycle link connecting the northern end of the proposed bridge, under the cattle underpass, with the Millennium Cycle Bridge will improve access and be especially valued during flood events. As the proposed seeding and planting around the northern junction and the river bank mature the recreational user experience of this route will improve.

Sense of Scale and Tranquillity

8.11.6 As the proposed mitigation measures establish, particularly those concentrated around the northern and southern ends of the

Scheme, will slightly reduce the perception of its large scale. The moderate adverse impact on the tranquillity of the area will not be noticeably reduced by the proposed mitigation.

Local Landscape Character

Afon Dyfi LCA and Pennal Valley Slopes LCA within 200m

8.11.7 The proposed replacement and mitigation planting will noticeably improve the condition and quality of local landscape. There will also be slight improvements to local access and recreation routes as described above. As they establish, these improvements will partially neutralise the direct adverse effects of the Scheme on the character of the local landscape. At year fifteen, the magnitude of change to the overall character landscape is predicted to have reduced noticeably.

8.11.8 In the case of the Afon Dyfi LCA, this is predicted to reduce the magnitude to the lower end of the moderate category and so is assessed as minor to moderate. Thus combining this with a high sensitivity, the residual adverse effect on the character of the Afon Dyfi landscape is predicted to be **moderate.**

8.11.9 The minor magnitude of change predicted in respect of the Pennal Valley Slopes LCA will reduce slightly, but remain within the minor category resulting in a **minor** residual adverse effect.

Localised Effects on Designated Landscapes

Snowdonia National Park

8.11.10 Locally, within 200m of the Scheme, the landscape effects predicted above will adversely affect the character and setting of this sensitive designated National Park landscape. The improvements to the night time environment as a result of the improved replacement lighting to the southern 200m of the Scheme would confer a slight beneficial effect on this designated landscape and Dark Skies Reserve. Overall, the residual effect on the character of the designated landscape will be localised, adverse and of **moderate** significance.

8.11.11 There is no physical, visual or perceptual connection between the Scheme and the designated Plas Machynlleth or its setting. There will not therefore be any effects on this designated landscape

Indirect Residual Effects on the Wider Landscape – including wider parts of the Afon Dyfi and Pennal Valley Slopes LCAs and Machynlleth, Penegoes,

Machynlleth Wooded Hillsides, Pennal Conifer Plantations and Mynydd Glandulas LCAs

Perceptual Characteristics of the Wider Landscape

Land cover, Pattern, Texture and Topography

8.11.12 The proposed landscape mitigation measures have been designed to replace any vegetation lost as a result of the Scheme. As these proposed features establish over the first 15 years, the condition and quality of the local landscape will improve. This effect will be perceived as a very slight improvement to the setting of the wider landscape.

Sense of Scale and Tranquillity

8.11.13 As they establish, the proposed mitigation measures will do little to alter the perception of the scale of the Scheme. The minor adverse impact on the tranquillity of the wider landscape will be slightly improved by the mitigation measures as they establish.

Wider Landscape Character

Afon Dyfi, Pennal Valley Slopes, Machynlleth LCA, Penegoes LCA, Machynlleth Wooded Hillsides LCA, Pennal Conifer Plantations LCA and Mynydd Glandulas LCAs

8.11.14 The Scheme and mitigation measures would be perceived as a humanising element in the wider landscape. As they establish over 15 years the mitigation planting would very slightly reduce the visibility and perception of the Scheme from the wider landscape.

Wider Effects on Designated Landscapes

8.11.15 The wider landscape assessed within 5km of the Scheme is also within or forms part of the setting of the National Park. As they mature over 15 years, mitigation measures proposed would very slightly reduce the Scheme's impacts on the landscape, but not so much as to alter the Magnitude of effect from the negligible category. Effects on these landscape receptors are predicted to be adverse but of no worse than **slight** levels and are therefore **insignificant**.

8.11.16 There is no physical, visual or perceptual connection between the Scheme and the designated Plas Machynlleth or its setting. There will not therefore be any effects on this designated landscape.

Table 8.192: Summary of landscape effects arising from the Operational phase

Landscape Character Area	Sensitivity	Magnitude of Unmitigated Operational Change	Effect at Winter of Yr1	Magnitude of effect at year 15 (for details of Mitigation please refer to Environmental Masterplans, Figure 8.9 and descriptive text above.)	Residual Effect at Summer of Yr 15
Direct effects on landscape features elements within the local landscape within 200m					
Topographic features	Moderate	Minor adverse	**Slight adverse**	**Minor adverse**	**Slight adverse**
Vegetation	Moderate	Minor adverse	**Slight adverse**	Proposed planting described above and shown on Figure 8.9 is intended to mitigate the loss of some vegetation and to re-stitch the field boundaries where these are affected. The quality and condition of vegetation within the Scheme boundary will improve over the first 15 years. **Minor beneficial**	**Slight beneficial**
Transport routes	Moderate	Moderate beneficial	**Moderate beneficial**	As it establishes the proposed planting will integrate the Scheme into the landscape as perceived by people using the Scheme and adjoining road and path network **Moderate beneficial**	**Moderate beneficial**
Recreation routes	High	Moderate beneficial	**Moderate to major beneficial**		**Moderate to major beneficial**
Indirect effects on perceptual Characteristics of the Local landscape within 200m					
Scale	Moderate	Negligible	**Neutral to Slight adverse**	**Negligible**	**Neutral to Slight adverse**
Openness	Moderate	Moderate	**Moderate adverse**	**Moderate**	**Moderate adverse**
Tranquillity and remoteness	Moderate	Moderate	**Moderate adverse**	**Moderate**	**Moderate adverse**
Texture and complexity	Moderate	Minor adverse	**Slight adverse**	**Minor adverse**	**Slight adverse**
Historic and cultural aspect	High	Minor to moderate beneficial	**Moderate beneficial**	As it establishes the proposed planting will integrate the Scheme into the landscape and improve the experience of people enjoying the settings of local historic assets. **Minor to moderate beneficial**	**Moderate beneficial**

Darkness at night	High	Negligible	**Slight adverse**	**Negligible**	**Slight adverse**
Direct and indirect effects on the character of the local landscape within 200m					
Afon Dyfi	High	Moderate	**Moderate to large adverse**	**Minor to moderate adverse**	**Moderate adverse**
Pennal Valley Slopes	High	Minor adverse	**Slight to moderate**	**Minor**	**Slight to moderate adverse**
Snowdonia National Park	High	Moderate	**Moderate to large adverse**	**Minor to moderate adverse**	**Moderate adverse**
Indirect effects on the wider landscape beyond 200m					
Machynlleth	Moderate	Negligible adverse	**Neutral to slight**	The proposed mitigation measures described above and shown on Figure 8.9 are principally intended to mitigate visual effects and direct landscape effects on the local landscape. Whilst there will be some incremental reduction to adverse indirect effects on the wider landscape these would not reduce the **negligible magnitude** of change assessed.	**Neutral to slight**
Penegoes	High	Negligible adverse	**Slight adverse**		**Slight**
Machynlleth Wooded Hillsides	High	Negligible adverse	**Slight adverse**		**Slight**
Pennal Conifer Plantations	High	Negligible adverse	**Slight adverse**		**Slight**
Mynydd Glandulas	High	Negligible adverse	**Slight adverse**		**Slight**
Snowdonia National Park	High	Negligible	**Slight adverse**		**Slight**

Visual Effects

8.11.17 Visual effects on all affected receptors have been assessed before and after the proposed landscape mitigation measures have established. Details of the judgements made in assessing the sensitivity of each receptor, the magnitude of change each would experience and the significance of the overall effects and residual effects are provided in Section 8.3 above, Visual Assessment Tables. For a summary of the effects on each receptor please refer to Table 8.23 below.

8.11.18 For Viewpoint photographs and photomontage visualisations showing the Scheme and proposed landscape mitigation at year 1 and year 15 or operation, please refer to Figure 8.8 in Volume 2.

Table 8.23: Summary of visual effects arising from the operational phase.

Vp. No.	Receptors Represented (receptor ID on Figure 8.4)	Sensitivity	Magnitude of Unmitigated Operational Change	Effect at Winter of Yr1	**Magnitude of effect at year 15** (for details of Mitigation please refer to Environmental Masterplans, Figure 8.9 and narrative in Visual Assessment Tables in Appendix 8.2)	Residual Effect at Summer of Year 15
	Recreation Receptors					
1, 2	Walkers and anglers using the PRoW (P5) along the Afon Dyfi as it passes under the Scheme and within 100m either side and crossing the Millennium Cycle Bridge.	High	Major	**Very large adverse**	Moderate to major	**Large adverse**
5	Footpath users and anglers on the riverside PRoW (P5), within 250m to the east of the new bridge.		Moderate	**Moderate to Large adverse**	Minor to moderate	**Moderate adverse**
6,	Footpath users and anglers on the riverside PRoW (P5), beyond 250m to the east and west of the new bridge.		Minor to moderate	**Moderate adverse**	Minor	**Slight to moderate adverse**
15	Footpath users and anglers on the riverside PRoW (P5), beyond 250m to the west of Pont-ar-Ddyfi.		Neutral	**Neutral**	Negligible beneficial	**Slight beneficial**
17	Users of a 50m long section the Wales Coast Path on the minor lane rising up the valley side 500m to the northwest of the Scheme	High	Minor	**Slight to moderate adverse**	Negligible	**Slight adverse**
8	Walkers using a 200m stretch of the Wales Coast Path and Glyndwr's Way Long Distance Recreational Path on the minor lane rising up the valley side, 1.3km to the southwest.		Negligible	**Slight adverse**	Negligible	**Slight adverse**
18	People using the PRoW at Mynydd Cynffyrch above Derwenlas.	High	Negligible	**Slight adverse**	Negligible	**Slight adverse**

1	Cyclists using NCN 8 on the southern bank of the Afon Dyfi within 100m of the new bridge and crossing the Millennium Cycle Bridge.	High	Major	**Very large adverse**	Moderate to Major	**Large adverse**
3	Cyclists on NCN 8 north of the Millennium Cycle Bridge		Moderate to minor	**Moderate adverse**	Minor	**Slight to moderate adverse**
16	Cyclists on NCN 8 on the A493, 450m west of the Scheme.		Negligible	**Slight adverse**	Negligible beneficial	**Neutral to slight beneficial**
11, 12, 13	Cyclists and pedestrians travelling along NCN 8 and 82 on the existing A487 to the south of Pont-ar-Ddyfi.		Minor, moderate and moderate to major depending on their direction of travel and proximity to the Scheme	**Ranging between Slight/moderate and Large adverse**	Moderate and minor depending on their direction of travel and proximity to the viaduct	**Ranging between Slight/moderate and Moderate/large adverse**
17	Users of Open Access Land at Foel-y-ffridd.	High	Minor	**Slight to moderate adverse**	Negligible	**Slight adverse**
18	People using Open Access Land at Mynydd Cynffyrch above Derwenlas.		Negligible	**Slight adverse**	Negligible	**Slight adverse**
	Transport receptors					
3	Road users on a 500m stretch of the A487 (R2) to the north of the Scheme.	Moderate	Moderate to minor	**Slight to moderate adverse**	Minor	**Slight adverse**
10	Road users on a 100m stretch of the A487 immediately to the south of the Scheme.		Moderate	**Moderate adverse**	Minor	**Slight adverse**
16	Road users on a 600m stretch of the A493 (R3) to the west of the Scheme.		Negligible	**Neutral to slight adverse**	Negligible beneficial	**Neutral to slight beneficial**

4	West-bound road users on a 400m stretch of the minor rural road (B4404) (R1) above Glan Fechan.	Moderate	Minor	**Slight adverse**	Negligible	**Neutral to slight adverse**
8	Road users on a 200m stretch of the minor rural lane (R5) rising up the valley side 1.3km to the southwest.	Moderate	Negligible	**Neutral to slight adverse**	Negligible	**Neutral to slight adverse**
6	Passengers on a 900m long stretch of the Cambrian Line scenic railway (T1).	High	Minor to moderate	**Moderate adverse**	Minor	**Slight to moderate adverse**
9	Passengers stationary on Cambrian Line trains or using the platforms at Machynlleth Station.	Moderate to high	Minor	**Slight to Moderate adverse**	Minor	**Slight adverse**
	Private receptors					
4	Residents in the single dwelling (A) at Glan-fechan.	Moderate	Negligible	**Neutral to Slight adverse**	Negligible	**Neutral to slight adverse**
	Ten scattered dwellings and farmsteads at Pont Felin-y-ffridd - (B).	High	No change	**None**	No change	**None**
3	Residents in a single dwelling at the Junction of A487 and B4404 (B).	High	Negligible	Slight adverse	Negligible	**Slight adverse**
14	Residents in a property off the A487 to the east of Pen-y-bont (C).	High	Moderate	**Moderate to large adverse**	Moderate	**Moderate to large adverse**
13	Residents in properties 1 to 9 Pen-y-Bont (D, E and F).	Moderate to high.	Minor	**Slight Adverse**	Minor	**Slight adverse**
16	Residents in two dwelling at Penrhyn Dyfi (G +H).	High	Negligible	**Slight adverse**	Negligible beneficial	**Neutral to slight beneficial**
	Residents in a single dwelling on the track to Dolgelynen and Dolgelynen Farmhouse (I).	High	No Change	**None**	No change	**None**
	Residents in two individual dwellings at Brynturnol and Ogof Fawr (J + L).	High	No Change	**None**	No change	**None**

8	Residents in Cae-Gybi Cottages (K).	High	Negligible	**Slight Adverse**	Negligible	**Slight adverse**
10	Residents in the single private dwelling on the west edge of the Dyfi Eco Park (M).	Moderate	Moderate	**Moderate adverse**	Minor	**Slight adverse**
4	Farm workers at Glan-fechan (A).	Low	Negligible	**Neutral to Slight adverse**	Negligible	**Neutral to slight adverse**
10	Workers and visitors to the Dyfi Eco Park (B1).	Low	Moderate	**Slight adverse**	Minor	**Neutral to slight adverse**
7	Hotel guests at the Plas Dolguog Hotel (B2).	Moderate	Negligible to minor	**Slight adverse**	Negligible to minor	**Slight adverse**
	Heritage Receptors					
13	People enjoying the visual setting of Pont-ar-Ddyfi and listed buildings at Pen-y-bont	High	Minor	**Slight to Moderate adverse**	Minor	**Slight adverse**
16	People enjoying the visual setting of listed buildings at Penrhyn Dyfi	High	Negligible	**Slight adverse**	Negligible beneficial	**Neutral to slight beneficial**

8.12 Assessment of Cumulative Effects

8.12.1 No developments have been identified which could generate cumulative effects with the Scheme during the construction or operation phase.

8.13 Summary of Effects

8.13.1 Effects with levels of moderate or greater are considered to be material or 'significant' in terms of consenting. Effects of less than moderate significance, are likely to be immaterial or 'insignificant' in terms of consenting, but have still been useful in informing the design of the Scheme or mitigation measures.

8.13.2 Landscape Character Area receptors (LCAs) are mapped on Figure 8.3 in Volume 2.

8.13.3 The letters in brackets following some of the visual receptors below refer to their locations identified on Figure 8.5 in Volume 2, Visual Receptors.

Construction Effects

8.13.4 Effects arising from the construction phase are assessed as being short term during the 23 month construction phase.

Landscape

8.13.5 There are no significant effects on the character of the landscape as a result of the proposed construction works. This is due largely to the fact that the measures described under Environmental Design, at Section 2.2 of this report, have been incorporated into the design of the construction phase and that the works are temporary, short term and reversible.

8.13.6 The character of the local landscape within the Dyfi Valley LCA and the Pennal Valley Slopes LCA, and Snowdonia National Park within 200m of the Scheme, is predicted to receive the worst construction effects. These would be insignificant adverse effects of **slight to moderate** levels for the duration of the construction phase.

8.13.7 The effects on the wider landscape beyond 200m but within 5km of the Scheme including and Snowdonia National Park and all other LCAs and including the Machynlleth LCA, within 200m of the Scheme, are predicted to receive insignificant **slight** adverse effects from the construction phase.

Visual

8.13.8 The following visual receptors are predicted to receive significant adverse effects on their visual amenity of **moderate** and **moderate to large** levels which are assumed would last for the entire 23 month period of the construction phase:

- Walkers, anglers and cyclists using recreational routes within 100m of the proposed new bridge; and
- Walkers, anglers and cyclists using the Wales Coast Path, and NCR 8 and 82 along the existing A487 and those crossing and enjoying the setting of Pont-ar-Ddyfi.

8.13.9 No other visual receptors are predicated to experience significant adverse effects. Those assessed range in level from neutral/slight through to slight to moderate.

Unmitigated Operational Effects

8.13.10 Unmitigated effects are defined as those arising from the early operational phase of the Scheme and are assessed as medium-term, between the completion of construction in year 1 and the establishment of the landscape mitigation measures in the fifteenth year following construction.

Landscape

8.13.11 Locally, within 200m of the Scheme, the character of the landscape of the Afon Dyfi LCA and Snowdonia National Park would experience significant **moderate to large** adverse, direct and indirect effects on its character from the Scheme.

8.13.12 The Pennal Valley slopes LCA, within 200m of the Scheme, and further afield would receive insignificant, slight to moderate adverse, direct and indirect effects on its character upon completion of the Scheme.

8.13.13 All other wider LCAs and parts of Snowdonia National Park assessed within 5km would receive insignificant indirect effects, of no worse than slight adverse, upon completion of the Scheme.

Visual

8.13.14 See Year 1 photomontage visualisations at Figure 8.8 in Volume 2.

8.13.15 The following visual receptors are predicted to receive significant **very large** adverse effects on their visual amenity:

- Walkers, anglers and cyclists using recreational routes including NCR 8 crossing the Millennium Cycle Bridge and along the Afon Dyfi, within 100m of the proposed new bridge.

8.13.16 The following visual receptors are predicted to receive significant **large** adverse effects on their visual amenity:

- Walkers, and cyclists using the Wales Coast Path, and NCR 8 and 82 at the southern end of the existing A487, within 100m of the Scheme's proposed viaduct and southern junction.

8.13.17 The following visual receptors are predicted to receive significant adverse effects on their visual amenity of **moderate** and **moderate/large** levels:

- Footpath users and anglers on the riverside PRoW (P5), between 100m and 250m from the Scheme to the east of the new bridge and to the west of Pont-ar-Ddyfi;
- Cyclists on NCR 8 north of the Millennium Cycle Bridge;
- Cyclists and pedestrians travelling along NCR 8 and 82 at the southern end of the existing A487, between 100m and 200m from the Scheme's proposed viaduct and southern junction;
- Road users on a 100m stretch of the A487, immediately to the south of the Scheme;
- Passengers on a 900m long stretch of the Cambrian Line scenic railway (T1);
- Residents in a property off the A487 to the east of Pen-y-bont (C); and
- Residents in the single private dwelling on the west edge of Dyfi Eco Park (M).

8.13.18 All other visual receptors, including those enjoying views to and from historic assets, are predicated to experience insignificant adverse and beneficial effects ranging in level from neutral/slight through to slight to moderate.

Mitigation

8.13.19 The mitigation measures described above at Section 8.7 above and illustrated on Figure 8.9 are designed to address these effects, with treatment of embankment and cutting slopes, planting, Soft landscaping around the northern abutment, and other landscape measures, to integrate the Scheme with the surrounding landscape pattern and character.

8.13.20 These mitigation measures would be effective in reducing the worst adverse effects, but those set out below would remain significant and adverse.

Residual Operational Effects

8.13.21 Residual effects are those assessed as being permanent and long-term (beyond 15 years) once the proposed mitigation measures have established.

Landscape

8.13.22 Locally, within 200m of the Scheme, the character of the landscape of the Afon Dyfi LCA and the character and setting of Snowdonia National Park would benefit from mitigation to the extent that the level of significant residual direct and indirect effects on its character would be reduced from Moderate/large to **moderate** adverse.

8.13.23 Upon establishment of the proposed landscape mitigation, all other LCAs and the wider parts of the National Park assessed within 5km of the Scheme would receive insignificant indirect adverse effects of no worse than slight levels, with the exception of the Pennal Valley Slopes LCA, which would receive insignificant slight to moderate adverse effects.

Visual

8.13.24 See Year 15 photomontage visualisations at Figure 8.8 in Volume 2.

8.13.25 The following visual receptors are predicted to receive significant **large** adverse residual effects on their visual amenity:

- Walkers, anglers and cyclists using recreational routes including NCR 8 crossing the Millennium Cycle Bridge and along the Afon Dyfi within 100m of the proposed new bridge.

8.13.26 The following visual receptors are predicted to receive significant **moderate to large** adverse residual effects on their visual amenity:

- Cyclists and pedestrians travelling along NCR 8 and 82 at the southern end of the existing A487 within 100m of the Scheme's proposed viaduct and southern junction;
- Residents in a property off the A487 to the east of Pen-y-bont (C).

8.13.27 The following visual receptors are predicted to receive significant adverse residual effects on their visual amenity of **moderate** levels:

- Footpath users and anglers on the riverside PRoW (P5), between 100m and 250m from the Scheme, to the east of the new bridge and to the west of Pont-ar-Ddyfi; and
- Cyclists and pedestrians travelling along NCR 8 and 82 at the southern end of the existing A487, between 100m and 200m from the Scheme's proposed viaduct and southern junction.

8.13.28 All other visual receptors, including people enjoying views to and from heritage assets, are predicated to experience insignificant effects ranging from slight beneficial through neutral to slight/moderate adverse.