Llywodraeth Cymru / Welsh Government

A487 New Dyfi Bridge

Environmental Statement - Volume 3: Appendix 3.2

WelTAG Stage 1 Appraisal Report

Final Issue | 18 August 2017

Contents

1 Introduction

1.1 Purpose of this Report

1.1.1 This report presents the results of the Welsh Transport Appraisal Guidance [1] (WelTAG) Stage 1 Scheme Appraisal for the A487 New Dyfi Bridge. Appraisal Summary Tables (ASTs) are provided for each of the transport options assessed at Stage 1 and a table summarising the comparative performance of the options is also provided. The report concludes with a summary of the outcomes of the appraisal, which will inform decisions as to which transport options might be taken forward for a WelTAG Stage 2 Scheme Appraisal.

1.1.2 The structure of this report is as follows:

- Section 1: Introduction
- Section 2: Scheme Appraisal;
- Section 3: Appraisal Summary Tables;
- Section 4: Conclusion.

1.2 WelTAG Overview

1.2.1 The current Welsh Transport Planning and Appraisal Guidance (WelTAG) was issued by Welsh Government in 2008[1] with the intention that it is applied to all transport strategies, plans and schemes being promoted or requiring funding from Welsh Government.

1.2.2 WelTAG has two primary purposes:

- "To assist in the development of proposals enabling the most appropriate scheme to be identified and progressed – one that is focused on objectives, maximises the benefits and minimises negative impacts; and
- To allow the comparison of competing schemes on a like-for-like basis, so that decision-makers can make funding decisions".

1.2.3 Paragraph 2.2.3 of WelTAG sets out the structure of the WelTAG process, which comprises the following stages:

- A planning stage, which includes problem and opportunity identification, proposal rationale, objective setting, possible solution identification and sifting, option development and option testing;
- A two stage appraisal process, with Stage 1 largely comprising a qualitative assessment and Stage 2 comprising a more detailed quantitative assessment;
- A post appraisal stage which involves on-going monitoring or performance and an evaluation/value for money assessment; and

[1] Welsh Assembly Government (2008) Welsh Transport Planning and Appraisal Guidance (WelTAG), June 2008

- Participation, including public consultation, which occurs at several stages in the planning and appraisal process.

1.2.4 The approach to the Stage 1 Appraisal is summarised in WelTAG as follows:

'The Stage 1 Appraisal is intended to screen and test the options against both the Transport Planning Objectives (TPOs) and the high-level strategic Welsh Impact Areas policy to ensure that proposals address the problems identified and adhere to the Wales Transport Strategy.'

1.2.5 WelTAG aims to ensure that transport proposals contribute to the wider policy objectives for Wales. Three pillars of sustainability, known as Welsh Impact Areas, underpin policy in Wales. These are:

- Economy: this reflects the importance of a strong and developing economy for Wales;
- Environment: this reflects both the legal requirements and desire to protect and enhance the condition of the built and natural environment; and
- Society: this reflects the desire to address issues of social exclusion and to promote social justice and a high quality of life for Welsh people.

1.2.6 WelTAG sets out that strategies and schemes need to be appraised against Transport Planning Objectives (TPOs) and the Welsh Impact Areas. For schemes, there is a formal and standardised two-stage appraisal process. Following Stage 1 appraisal, usually a small number of options will be further developed and then appraised at scheme level in detail in Stage 2.

1.2.7 This report documents the WelTAG appraisal of the proposed A487 New Dyfi Bridge to the north of Machynlleth at Stage 1 scheme level of appraisal.

1.3 Project objectives and reason for the project

Project objectives

1.3.1 The following Transport Planning Objectives (TPOs) for the scheme were developed during the WelTAG Planning Stage and reported in the WelTAG Planning Stage Report (April 2012).

TP01	To improve reliability of crossing the Afon Dyfi for people, freight and emergency vehicles on the A487 strategic corridor.
TP02	To improve efficient and reliable accessibility to key services including employment opportunities, healthcare and education.
TP03	To maintain the role of Machynlleth as a vibrant and sustainable local centre.
TP04	To preserve the long-term integrity of Pont-ar-Ddyfi
TP05	To reduce the number of severity of collisions and causalities on the A487 in the study area.
TP06	To ensure that flood risk to third parties is not increased.
TP07	To minimise the impact of transport improvements on the landscape, biodiversity, water resources and heritage.
TP08	To increase the opportunity for efficient, safe and reliable travel by walking and cycling on the A487 corridor within the study area.

The Existing Problem

1.3.2 The problems associated with the existing situation are set out below under the headings Existing Bridge, Flooding, Alignment and Geometry and Emergency Services.

Existing Bridge

1.3.3 A timber bridge crossing the Afon Dyfi was first erected at this location in 1533 and was replaced by a masonry structure in 1681. The present five span masonry arch bridge, Pont-ar-Ddyfi, was constructed in 1805.

1.3.4 In the last thirty years increased traffic and the continuing deterioration of the masonry structure has necessitated structural strengthening works and repairs to keep the bridge operational. In 1948, prior to its listed status, the bridge was locally 'widened' on the northern side to improve the geometry of the junction of the A493. Steel bracing and ties were installed in 1991 to the southernmost downstream pier to support the spandrel wall and prevent further movement until permanent strengthening could be carried out.

1.3.5 The bridge is classified by Cadw as a Category A site - being of 'national importance to be preserved and protected in situ'. The bridge was first designated as a Listed Structure in 1952 and is Grade II* listed. It is also a Scheduled Ancient Monument (ref. No. SAM Mg002). Before any work or alterations could be undertaken to Pont-

ar-Dyfi, Scheduled Monument Consent would need to be obtained from Welsh Government and this function is administered by Cadw.

Alignment and Geometry

1.3.6 The bridge is narrow, is without footways, has substandard height parapets and has substandard visibility due to poor geometry of the junction on the northern side. This poor geometry results in frequent damage to the parapets and spandrel walls. The narrow approach to the bridge from both Corris and Aberdovey exacerbates the problem. The bridge has been assessed as having a capacity of 13 tonnes gross vehicle weight, however, this can reduce to 3 tonnes during severe flood conditions as the structure becomes saturated.

1.3.7 The carriageway width on Pont-ar-Ddyfi itself varies between 5.61m and 5.57m whilst the carriageway widths on the northern and southern approaches to the bridge vary between 6.98m and 6.15m. This does not meet minimum width requirements for a single carriageway trunk road (7.3m).

Flooding

1.3.8 The Afon Dyfi frequently floods severing the local communities either side of the river. Local drainage improvements have been carried out over the last forty years but the fundamental problem of flooding between Machynlleth and Pont-ar-Ddyfi has remained.

1.3.9 Hydrological studies undertaken in 2001 suggest that a 1 in 2 year flood will result in the overtopping of the trunk road. Since 2006, the bridge has been closed for an average of four days per annum due to flooding and parapet strikes. The number of days that the route is severed is likely to increase in the future as a consequence of climate change. It is considered that there are significant costs to the economy associated with the regular closure of this strategic route due to the increasing journey times experienced by users of the bridge.

1.3.10 A separate flooding mechanism below the Cambrian Line Railway Bridge has been identified which occurs independently of the Afon Dyfi flooding and frequently interrupts the use of the A487.

1.3.11 A flood signing strategy was introduced in 2007 with Advanced Directional Signs amended to indicate the alternative route when the A487 was closed due to flooding.

Emergency Services

1.3.12 A diversion is used when the A487 is closed at this location and follows the trunk road network via the A489 to Cemmaes Road and the A470 at Cross Foxes. The length of this diversion is approximately 33 miles. A shorter diversion of approximately 11 miles is available via the non-trunk road B4404.

1.3.13 The Welsh Ambulance Services NHS Trust serves Machynlleth and south west Gwynedd with ambulances stationed in Machynlleth, Tywyn and Dolgellau. Although there are Cottage Hospitals in each of the towns, the main hospital for medical emergencies for the region is the Bronglais General Hospital in

Aberystwyth. The Trust is subject to performance standards which have set response targets to be met within time scales.

1.3.14 Consultations with North Wales Fire and Rescue Service have revealed that the severance of the A487, when the Afon Dyfi is in flood, does not affect their firefighting capability, since there are a sufficient number of appliances located either side of the river to meet the required level of service.

1.4 Previous Work

1.4.1 The text below provides an outline of the scheme development of the A487 New Dyfi Bridge.

1.4.2 The A487 trunk Road at Pont-ar-Ddyfi has been the subject of a number of studies into the operation and serviceability of the existing route and alternative crossing points that may be suitable to cross the Afon Dyfi floodplain. In the last thirty years increased traffic and the continuing deterioration of the masonry structure has necessitated structural strengthening works and repairs to keep the bridge operational.

1.4.3 Powys County Council, acting as Trunk Road Agents (TRA), commissioned a Feasibility Study and a Technical Assessment Report from RUST Consultants in 2002. In the study a number of on-line improvement options to Pont-ar-Ddyfi were evaluated, strengthening and alternate signalised one way operation emerged as the only viable solution. A preferred offline improvement was also identified crossing the river 200m upstream of the existing bridge on a skew bridge and re-connecting to the A487.

1.4.4 In November 2000 Powys TRA were directed to review the earlier work and produce a draft Stage II Technical Appraisal Report with an accompanying draft Environmental Assessment in 2002 /2003. This report concluded that for the trunk road to remain accessible to traffic at all times the recommended option was to construct an offline multi span viaduct across the floodplain. However, should regular flooding and resulting severance of the route be considered acceptable then strengthening of the bridge or a variant was the optimum solution.

1.4.5 CH2MHill, formerly Halcrow, were commissioned by Welsh Government (WG) in August 2011 to carry out WelTAG planning stage appraisal for the Dyfi Bridge and surrounding area. The purpose of the study being to identify, develop and sift transport options to resolve problems in the study area. Following stakeholder consultation, the WelTAG planning stage report recommended four options (ranked 1-4) to be taken forward for further detailed appraisal refer to Table 1 and Section 2.3.

Table 1 Prioritised Packages and Recommendations from WelTAG Planning Stage[2]

Rank	Ref	WelTAG Planning Package	Scheme Appraisal Options
1	UP1	New crossing 200-500m upstream	Option 1 New crossing 200m upstream Option 2 New crossing 500m upstream
2	DO1	New crossing 200-500m downstream	Option 3 New crossing 200-500m downstream
3	WS3	Widening & strengthening + flood mitigation + raise A487	Option 4 Widening and strengthening, flood mitigation and raising of A487
4	WS2	Widening & strengthening + flood mitigation	Option 5 Widening and strengthening plus flood mitigation
5	WS1	Widening & strengthening	N/A
6	UP2	New crossing approx 500m upstream, southern approach from station east of Eco Park	N/A
7	TM1	Traffic Management	N/A
8	ON1	Raise A487 + traffic management + flood mitigation	N/A
9	TM2	Traffic Management + flood mitigation	N/A

[2] A487 New Dyfi Bridge WelTAG Planning Stage Report (April 2012)

2 Scheme Appraisal

2.1 Appraisal Methodology

2.1.1 WelTAG recommends that the significance of impact for each criterion is assessed using a seven point scale detailed in Paragraph 3.7.1 of the guidance. This scale includes the assessment criteria show in Table 2.

Table 2 WelTAG Seven Point Scale

Large beneficial	(+++)
Moderate beneficial	(++)
Slight beneficial	(+)
Neutral	(0)
Slight adverse	(-)
Moderate adverse	(--)
Large adverse	(---)

2.1.2 Paragraph 5.3.1 of the WelTAG guidance states that the Stage 1 appraisal is intended to screen and test options against transport planning objectives (TPOs) and the Welsh Impact Areas (i.e. Economy, Environment and Society).

2.1.3 The Stage 1 appraisal focuses on those areas which are of concern and areas that differentiate the options. It has considered the environment and social criteria in accordance with the WelTAG guidance. Figures 2 to 9 in Appendix A identify environmental constraints within the area of each option.

2.1.4 The economic criteria of Transport Economic Efficiency (TEE) and Economic Activity and Location Impacts (EALI) have not been included in the assessment at Stage 1, since the results of the Cost Benefit Analysis (COBA) relate to complete routes and should not influence decisions on element choices. However an indication of Scheme costs has been included in the Appraisal Summary Tables (Appendix B)

for each Scheme option. The results of the COBA will be fully assessed as part of Stage 2.

2.2 Distribution

2.2.1 WelTAG also requires, in Paragraph 3.5.1, that the distribution of impacts is carefully considered. This part of the assessment refers to how impacts might be distributed geographically and how they might affect different groups in society.

2.3 Options for Stage 1 Scheme Appraisal

2.3.1 The primary aim of the Stage 1 appraisal is to filter and reduce the number of options in order to allow a more detailed assessment of routes in Stage 2.

2.3.2 The WelTAG Planning Stage report recommended the following packages to be taken forward to further detailed appraisal, these are also illustrated in Figure 1 in Appendix A. The upstream crossing UP1 performed best in the WelTAG planning stage therefore has been split into two options: one approximately 200m upstream and one approximately 500m upstream of the Pont ar Dyfi.

1. **New crossing 200m upstream**: This option consists of a new crossing 200m upstream of the existing Dyfi Bridge. The A487 southern approach would be on embankment or viaduct and the existing Dyfi Bridge would be de-trunked or closed (except for non-motorised users). This alignment allows for a transverse crossing of the river, with a single main bridge span crossing the river channel. The highway alignment would connect to the existing A487 route to the north of the Afon Dyfi via a roundabout. A roundabout would be require to accommodate the change in alignment. Flood channels and culverts would be incorporated beneath the embankment (unless viaduct). Flood protection bunds and walls to protect the Eco Park, Railway bridge, Pen-y-Bont Cottages would also be incorporated.
2. **New crossing 500m upstream:** This option consists of a new crossing 500m upstream of the existing Dyfi Bridge. The A487 southern approach would be on embankment or viaduct and the existing Dyfi Bridge would be de-trunked or closed (except for non-mortised users). This alignment allows for a transverse crossing of the river, with a single main bridge span crossing the river channel. Flood channels and culverts would be incorporated beneath the embankment (unless viaduct). Flood protection bunds and walls to protect the Eco Park, Railway bridge, Pen-y-Bont Cottages would also be incorporated. The highway alignment would accommodate a continuous free flowing connection to the existing A487 route without a requirement for a roundabout to change direction.
3. **New crossing 200-500m downstream:** This option consists of a new road and river crossing 200-500m downstream of the existing Dyfi Bridge. The A487 southern approach would be on embankment and the Dyfi Bridge would be de-trunked or closed (except for non-mortised users). Flood channels and culverts would be incorporated beneath the embankment. Flood protection bunds and walls to protect the Eco Park, Railway bridge, Pen-y-Bont Cottages would also be incorporated.

4. **Widening and strengthening, flood mitigation and raising of A487:** This option consists of raising the A487 south of Dyfi Bridge, widening the existing bridge on the downstream side to incorporate a wider carriageway and a new footway provision. The existing bridge will be widened by 7.6m to provide a 7.3m carriageway , a two metre hatched separation strip between traffic lanes and footways 2.0m wide on each side. This would result in a continuous walking and cycling route on the A487, including a footway on Dyfi Bridge. Flood mitigation would involve managing the flood plain to absorb more water and managing the speed of arrival of water into the catchment water. Flood channels and flood protection bunds and walls to protect the Eco Park, Railway bridge, Pen-y-Bont Cottages would also be incorporated.
5. **Widening and strengthening plus flood mitigation:** This option consists of widening the existing bridge on the downstream side to incorporate a wider carriageway and new footway provision. The existing bridge will be widened by 7.6m to provide a 7.3m carriageway , a two metre hatched separation strip between traffic lanes and footways 2.0m wide on each side. This would result in a continuous walking and cycling route on the A487, including a footway on Dyfi Bridge. Flood mitigation would involve removing flood water beneath the railway bridge, managing the flood plain to absorb more water and managing the speed of arrival of water into the catchment water. Flood channels and flood protection bunds and walls to protect the Eco Park, Railway bridge, Pen-y-Bont Cottages would also be incorporated.

3 Appraisal Summary Tables

3.1.1 As noted in Section 2, WelTAG Stage 1 requires the anticipated outcomes of each transport option to be presented using Appraisal Summary Tables (ASTs) for comparison of their performance. The best performing options to take forward to the Stage 2 Appraisal can then be identified.

3.1.2 All options were subjected to the same appraisal process by the design team. An AST summarising the results of the options appraisal conducted during the Stage 1 appraisal process has been prepared using the seven point scale of impact significance set out in Table 2. The higher the overall score indicated a better performing option. Copies of the ASTs follow in Appendix B. The ASTs are supported by Figures 2 to 10 illustrating the environmental constraints in Appendix A.

4 Conclusion

4.1 Summary

4.1.1 This report has acknowledged the outcome of the Stage 1 Scheme Appraisal and in the ASTs has provided an overview of the relative merits of each transport option. It has been used as a tool to select options that merit further consideration at a Stage 2 Appraisal but does not provide an absolute indication of which options are better than others.

4.1.2 Five options have been appraised as part of the Stage 1 Scheme Appraisal and an Appraisal Summary Table provided for each in Appendix B. A table comparing the performance of the options in Appendix C provides a summary of the outcomes and identifies the dominant proposals to be taken forward to a Stage 2 Appraisal.

4.2 Recommendation

4.2.1 The WelTAG Stage 1 Scheme Appraisal has resulted in four options being discarded for the reasons set out in their respective comparison of significance of appraisal summary tables.

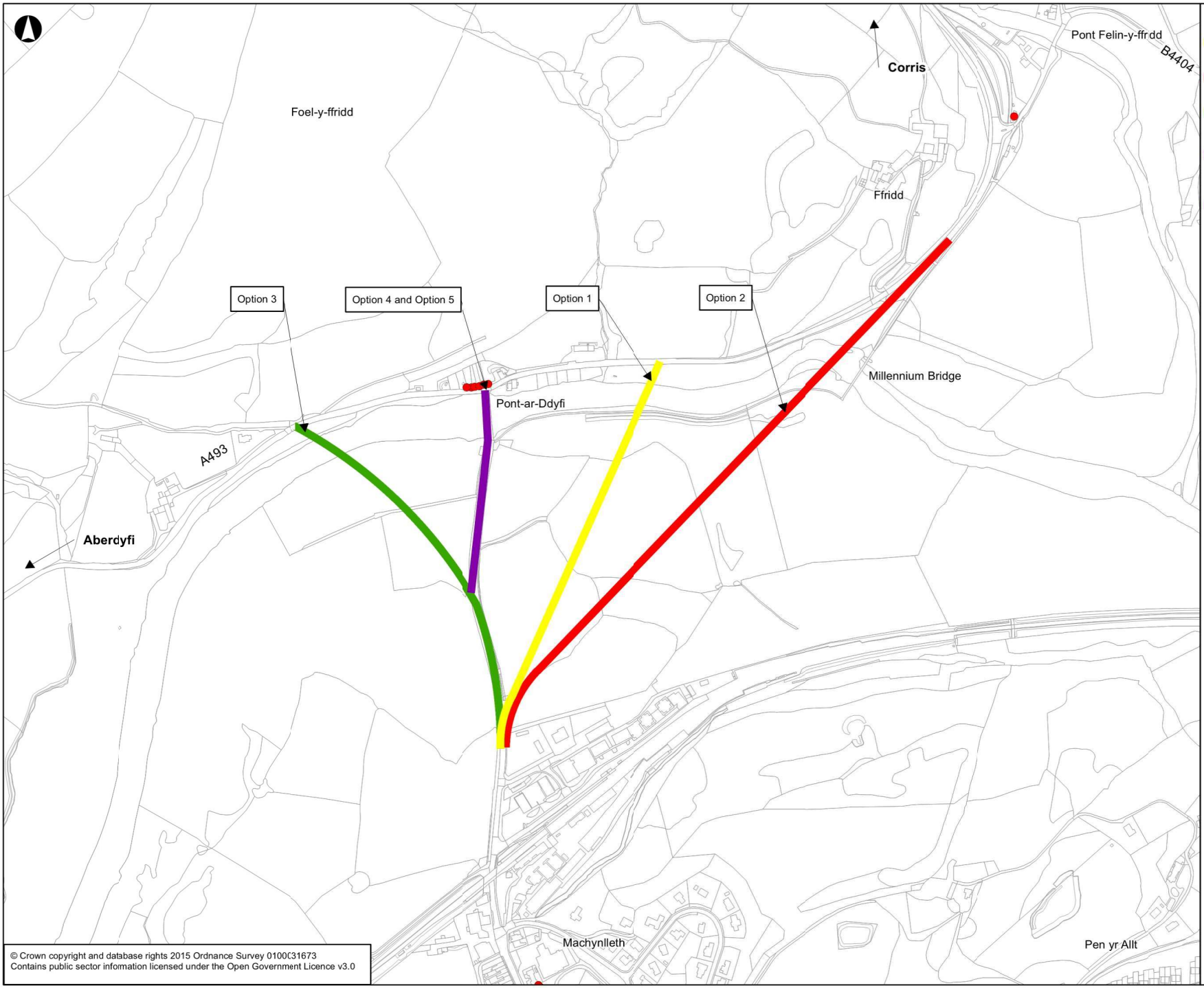
4.3 Next Step

4.3.1 Option No. 2 has scored the highest in all of the Welsh Impact Areas. This will therefore be taken forward for further detailed appraisal using the WelTAG Scheme Appraisal Guidance. This option will be assessed using quantitative evidence, where necessary, against Economic, Environment and Social criteria. The outcome will be a clear recommendation on the preferred option.

Appendix A

Figures

A3



Legend

- Option 1 New crossing 200m upstream
- Option 2 New crossing 500m upstream
- Option 3 New Crossing 200-500m downstream
- Option 4 Widening and Strengthening + flood mitigation + raise A487
- Option 5 Widening and Strengthening + flood mitigation
- Listed Cottages

Metres
0 65 130 260

Rev	Date	By	Chkd	Appd
P01.2	26/07/16	AH	AM	CF

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Solihull B90 8AE
Tel +44 121 213 3000 Fax +44 121 213 3001
www.arup.com

Client
Llywodraeth Cymru
Welsh Government

Project Title
A487 New Dyfi Bridge

Drawing Title
Figure 1
WelTAG Stage 1 Route Options

Scale at A3 **1:5,000**
Role Specialist Designer - Environmental
Suitability S0 - Initial non-contractual
Arup Job No **244562-00**
Rev **P01.3**
Name **900237-ARP-ZZ-ZZ-DR-YE-00065**

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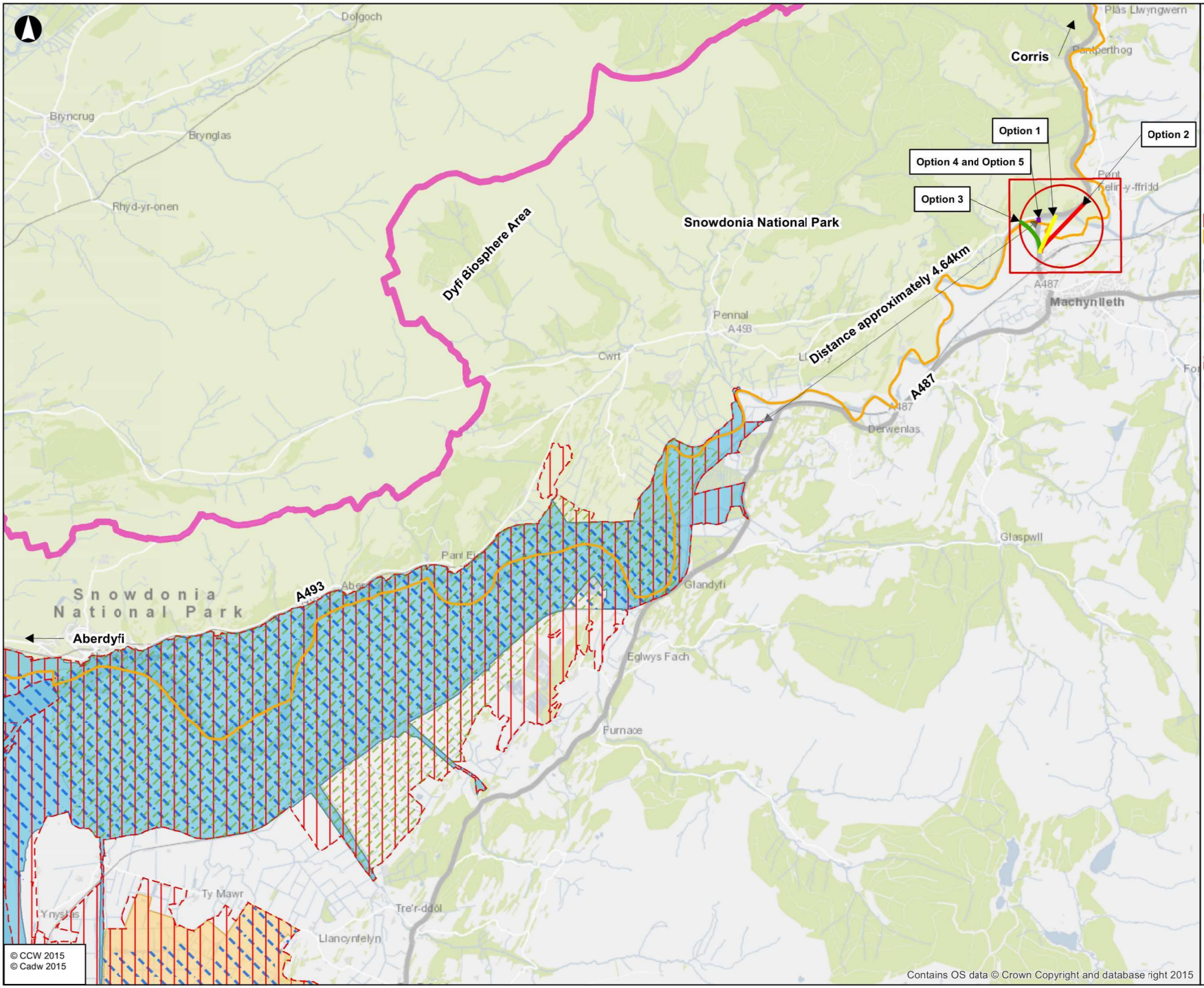

Legend

- Option 1 New crossing 200m upstream
- Option 2 New crossing 500m upstream
- Option 3 New Crossing 200-500m downstream
- Option 4 Widening and Strengthening + flood mitigation + raise A487
- Option 5 Widening and Strengthening + flood mitigation
- Pont-ar-Ddyfi (Listed/Scheduled Monument)
- Site Location
- Snowdonia National Park Boundary
- Pen Llyn a'r Sarnau / Lleyn Peninsula and the Sarnau Special Area of Conservation (SAC)
- Cors Fochno SAC
- Cors Fochno and Dyfi Ramsar site
- Dyfi Estuary / Aber Dyfi Special Protection Area (SPA)
- Dyfi Site of Special Scientific Interest (SSSI)
- Dyfi Biosphere Reserve

Metres

0 650 1,300 2,600

Rev	Date	By	Chkd	Appd
P01.2	12/05/16	AH	JP	CF

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Welsh Government

Project Title

A487 New Dyfi Bridge

Drawing Title

Figure 2
General Environmental Context

Scale at A3 **1:50,000**

Role Specialist Designer - Environmental

Suitability S0 - Initial non-contractual

Arup Job No **244562-00**

Rev **P01.2**

Name **900237-ARP-ZZ-ZZ-DR-YE-00016**

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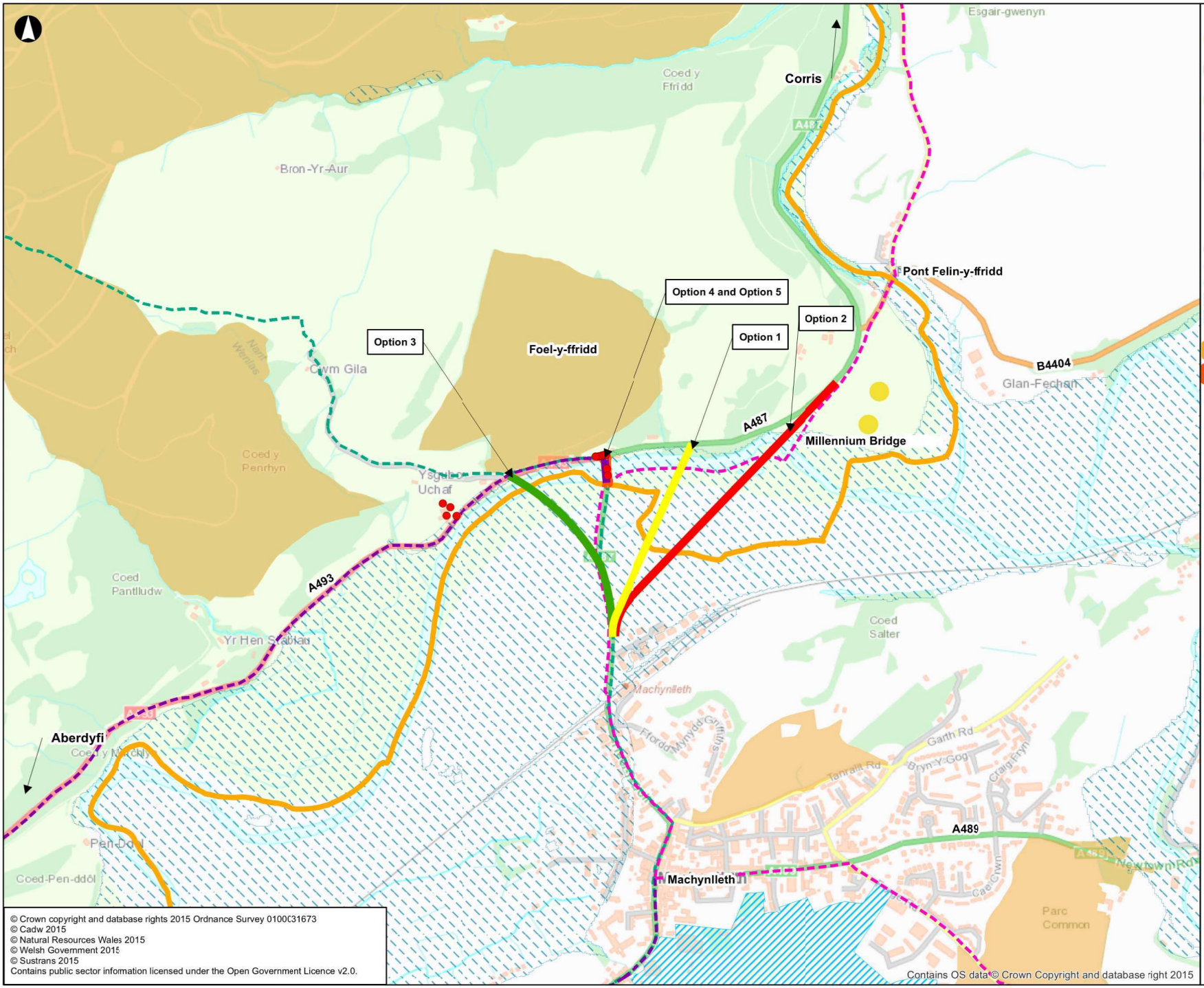

Legend

- Option 1 New crossing 200m upstream
- Option 2 New crossing 500m upstream
- Option 3 New Crossing 200-500m downstream
- Option 4 Widening and Strengthening + flood mitigation + raise A487
- Option 5 Widening and Strengthening + flood mitigation
- Listed Buildings (Within 500m of Proposed Scheme)
- Scheduled Ancient Monument (SAM)
- National Cycle Network Route No 8
- National Cycle Network Route No 82
- Wales Coastal Path
- TAN15 Flood Zones B and C2
- Plas Machynlleth Parkland (Cadw)
- Access Land
- Snowdonia National Park Boundary
- Pont-ar-Dyfi Listed Structure and SAM

Metres: 0 135 270 540

Rev	Date	By	Chkd	Appd
P01.2	12/05/16	AH	AM	CF

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Welsh Government

Project Title
A487 New Dyfi Bridge

Drawing Title
Figure 3
Local Environmental Context

Scale at A3 1:10,000
Role Specialist Designer - Environmental
Suitability S0 - Initial non-contractual
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Rev P01.2
Name 900237-ARP-ZZ-ZZ-DR-YE-00017

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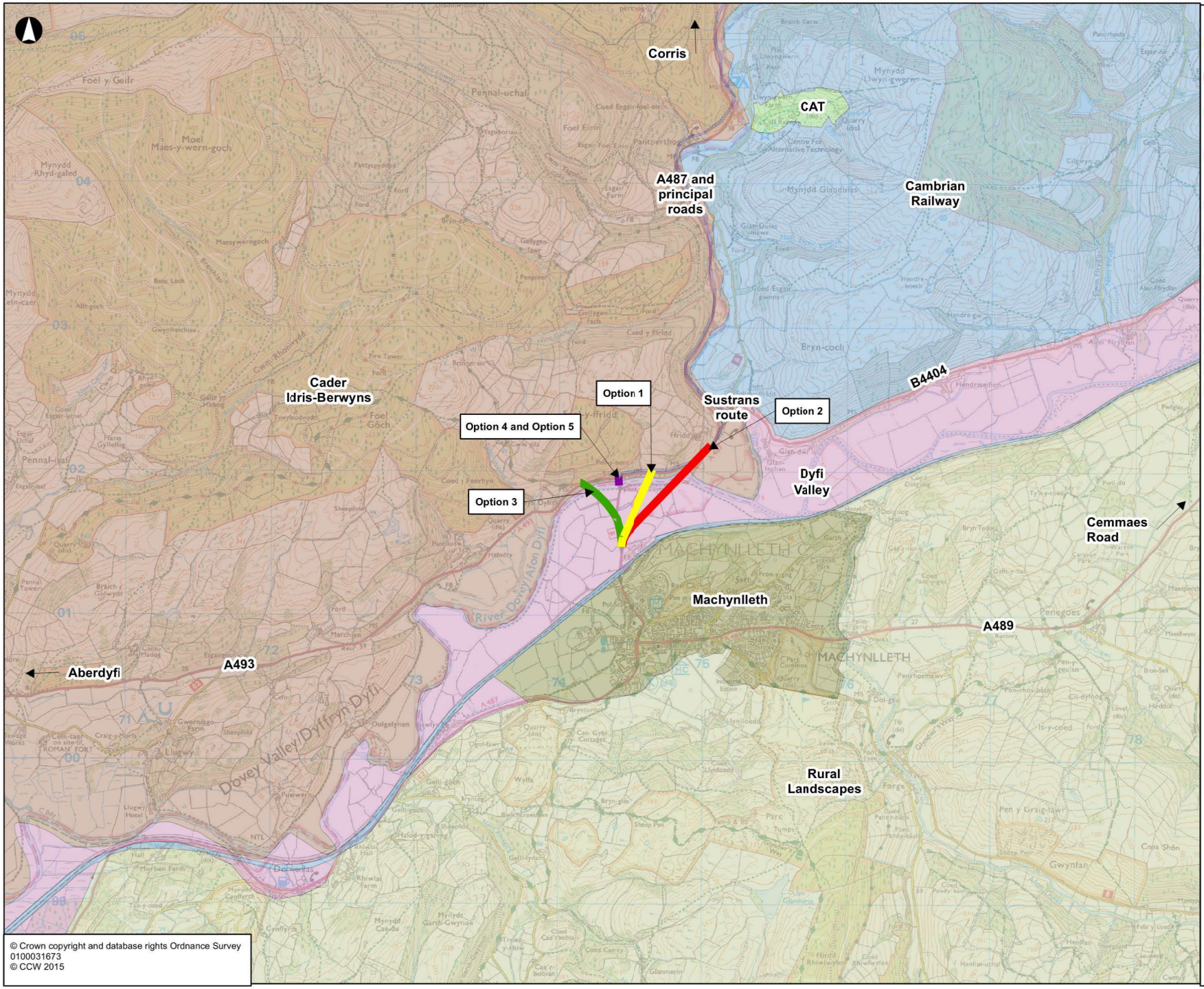

Legend

- Option 1 New crossing 200m upstream
- Option 2 New crossing 500m upstream
- Option 3 New Crossing 200-500m downstream
- Option 4 Widening and Strengthening + flood mitigation + raise A487
- Option 5 Widening and Strengthening + flood mitigation
- A487 and principal roads
- CAT
- Cader Idris-Berwyns
- Cambrian Railway
- Dyfi Valley
- Machynlleth
- Rural Landscapes
- Sustrans route

Metres

0 335 670 1,340

Rev	Date	By	Chkd	Appd
P01.2	12/05/16	AH	AM	CF

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Project Title

A487 New Dyfi Bridge

Drawing Title

Figure 4
LANDMAP - Cultural Aspect areas

Scale at A3 **1:25,000**

Role Specialist Designer - Environmental

Suitability S0 - Initial non-contractual

Arup Job No **244562-00** Rev **P01.2**

Name **900237-ARP-ZZ-ZZ-DR-LX-00007**

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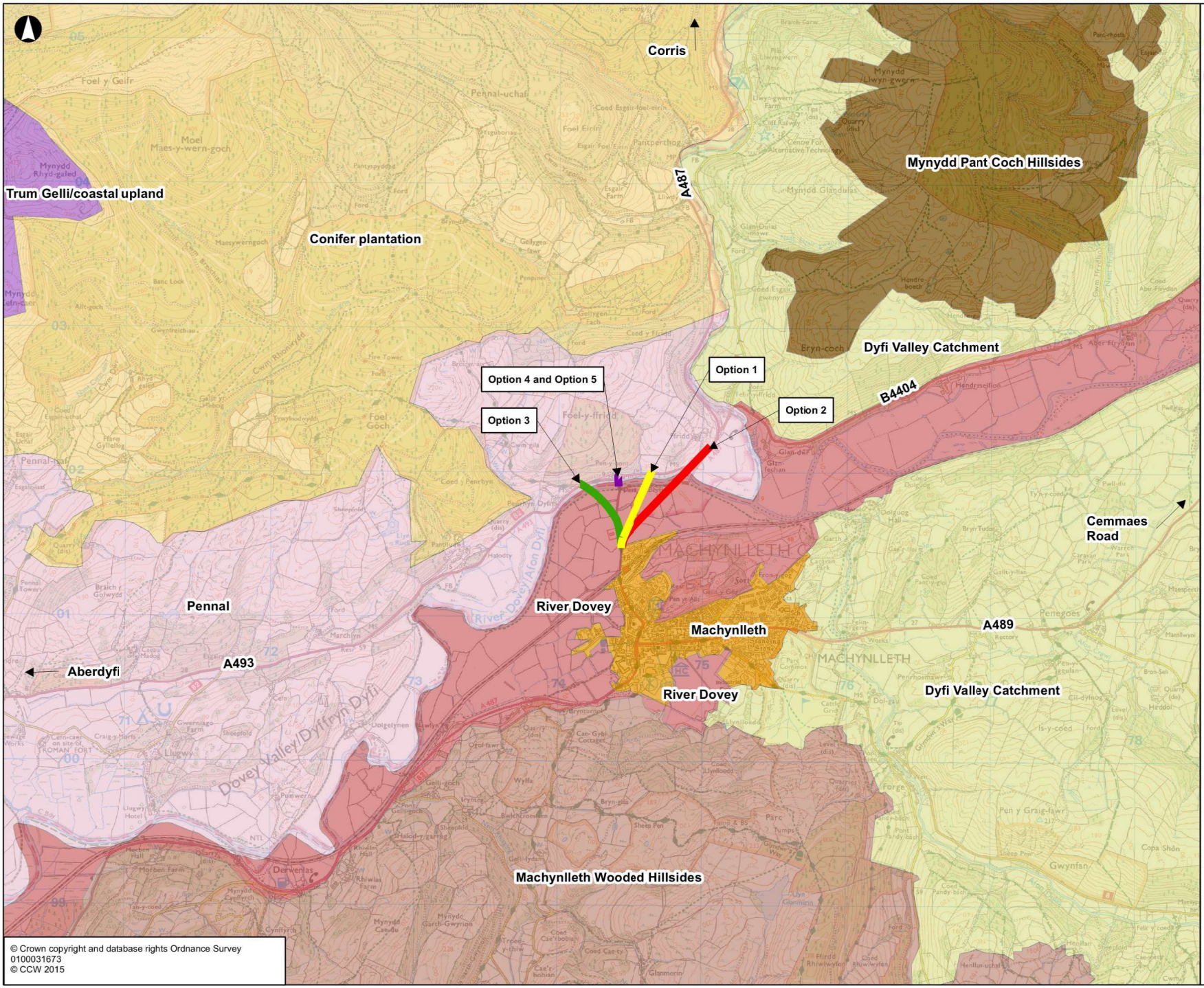

Legend

- Option 1 New crossing 200m upstream
- Option 2 New crossing 500m upstream
- Option 3 New Crossing 200-500m downstream
- Option 4 Widening and Strengthening + flood mitigation + raise A487
- Option 5 Widening and Strengthening + flood mitigation
- Conifer plantation
- Dyfi Valley Catchment
- Dyfi Valley Rolling Grazing
- Machynlleth
- Machynlleth Wooded Hillsides
- Mynydd Pant Coch Hillsides
- Pennal
- River Dovey
- Trum Gelli/coastal upland

Metres

0 335 670 1,340

Rev	Date	By	Chkd	Appd
P01.2	12/05/16	AH	AM	CF

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Project Title

A487 New Dyfi Bridge

Drawing Title

Figure 5
LANDMAP - Visual and Sensory

Scale at A3 **1:25,000**

Role Specialist Designer - Environmental

Suitability S0 - Initial non-contractual

Arup Job No **244562-00**

Rev **P01.2**

Name **900237-ARP-ZZ-ZZ-DR-LX-00006**

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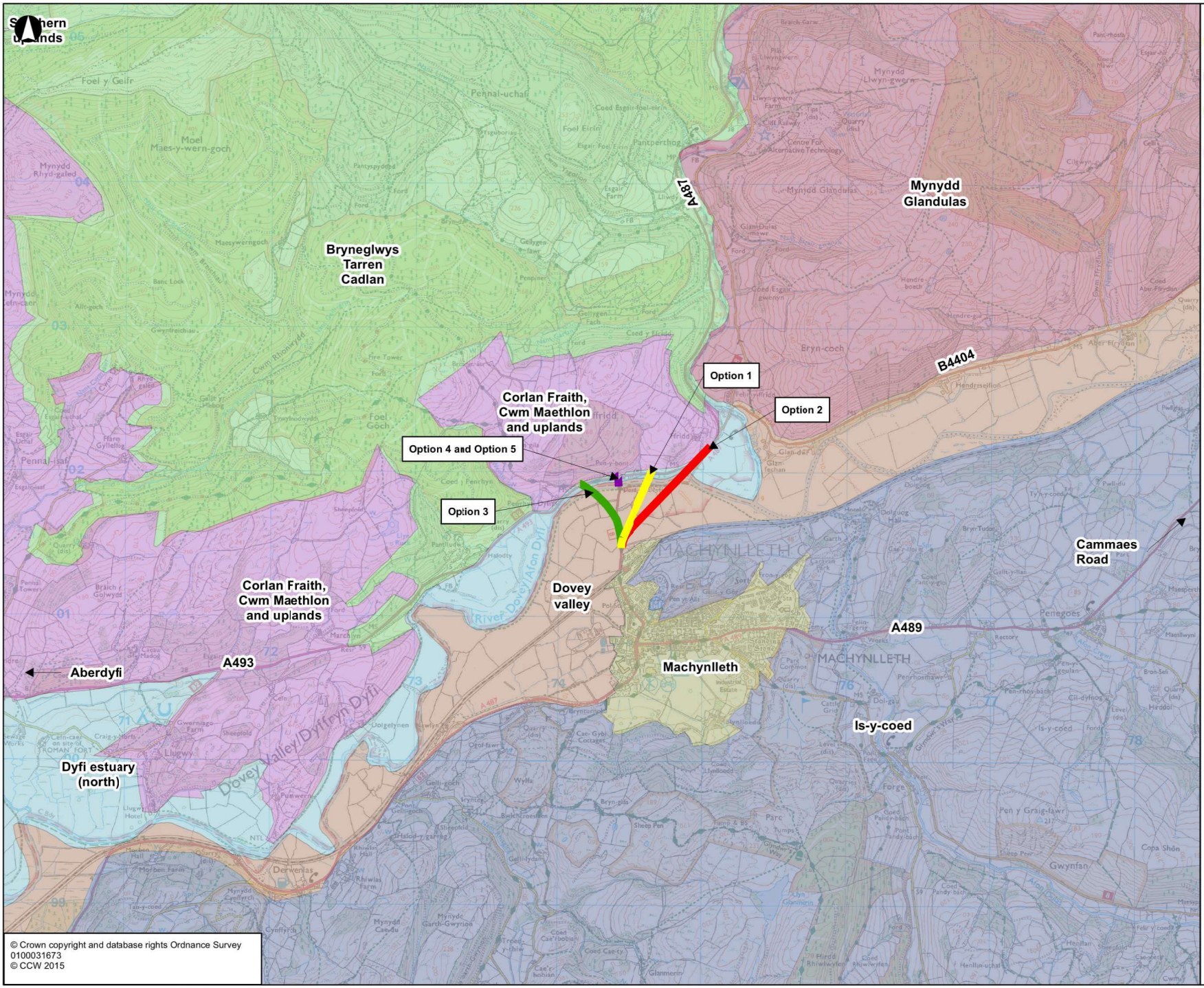

Legend

- Option 1 New crossing 200m upstream
- Option 2 New crossing 500m upstream
- Option 3 New Crossing 200-500m downstream
- Option 4 Widening and Strengthening + flood mitigation + raise A487
- Option 5 Widening and Strengthening + flood mitigation
- Bryneglwys Tarren Cadlan
- Corlan Fraith, Cwm Maethlon and uplands
- Dovey valley
- Dyfi estuary (north)
- Is-y-coed
- Machynlleth
- Mynydd Glandulas

Metres

0 335 670 1,340

Rev	Date	By	Chkd	Appd
P01.2	12/05/16	AH	AM	CF

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Project Title

A487 New Dyfi Bridge

Drawing Title

Figure 6
LANDMAP - Historic Aspect areas

Scale at A3 **1:25,000**

Role Specialist Designer - Environmental

Suitability S0 - Initial non-contractual

Arup Job No **244562-00**

Rev **P01.2**

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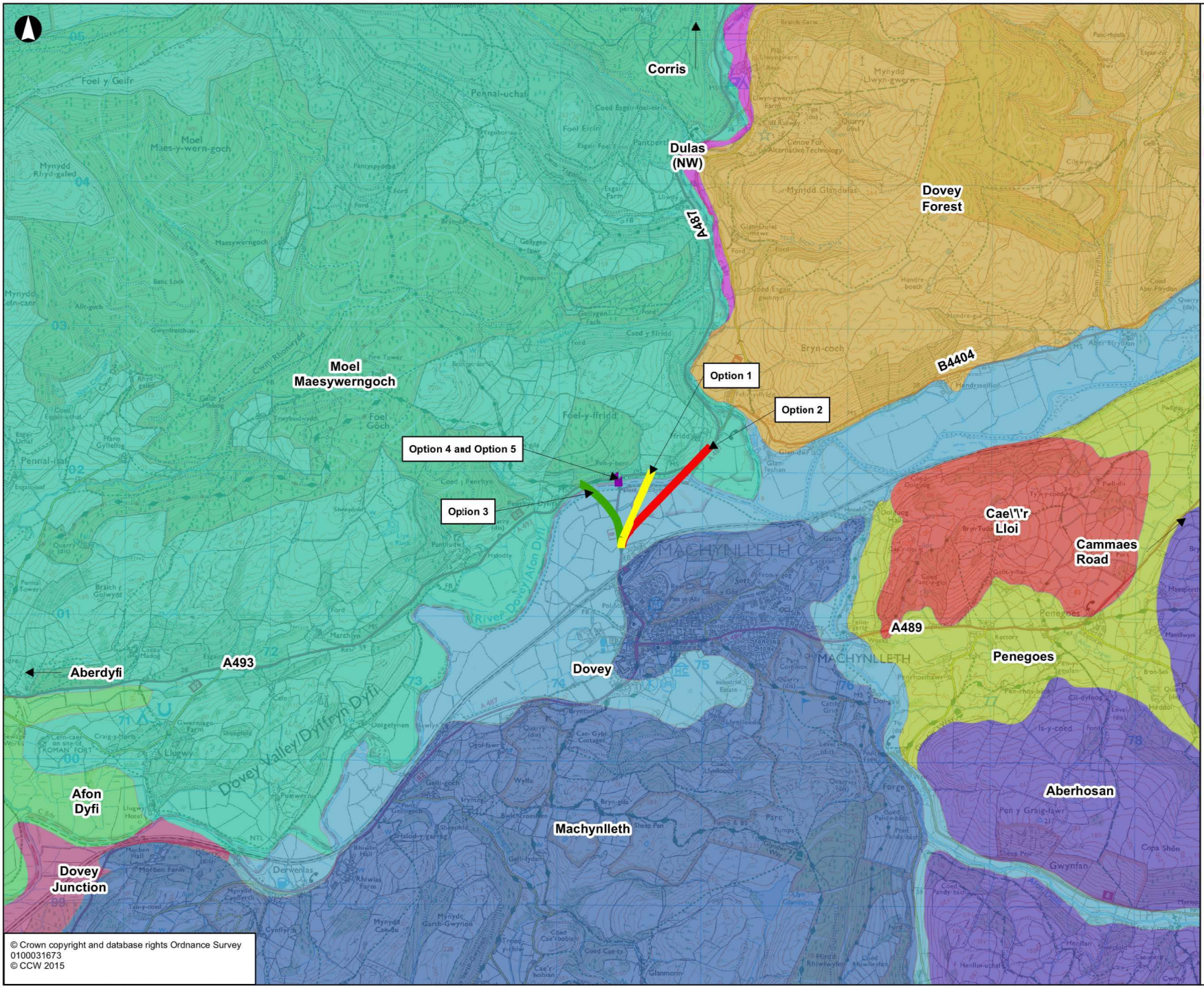

Legend

- Option 1 New crossing 200m upstream
- Option 2 New crossing 500m upstream
- Option 3 New Crossing 200-500m downstream
- Option 4 Widening and Strengthening + flood mitigation + raise A487
- Option 5 Widening and Strengthening + flood mitigation
- Aberhosan
- Afon Dyfi
- Cae\'\'r Lloi
- Dovey
- Dovey Forest
- Dovey Junction
- Dulas (NW)
- Machynlleth
- Moel Maesywerngoch
- Penegoes

Metres
0 335 670 1,340

Rev	Date	By	Chkd	Appd
P01.1	12/05/16	AH	AM	CF

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Client
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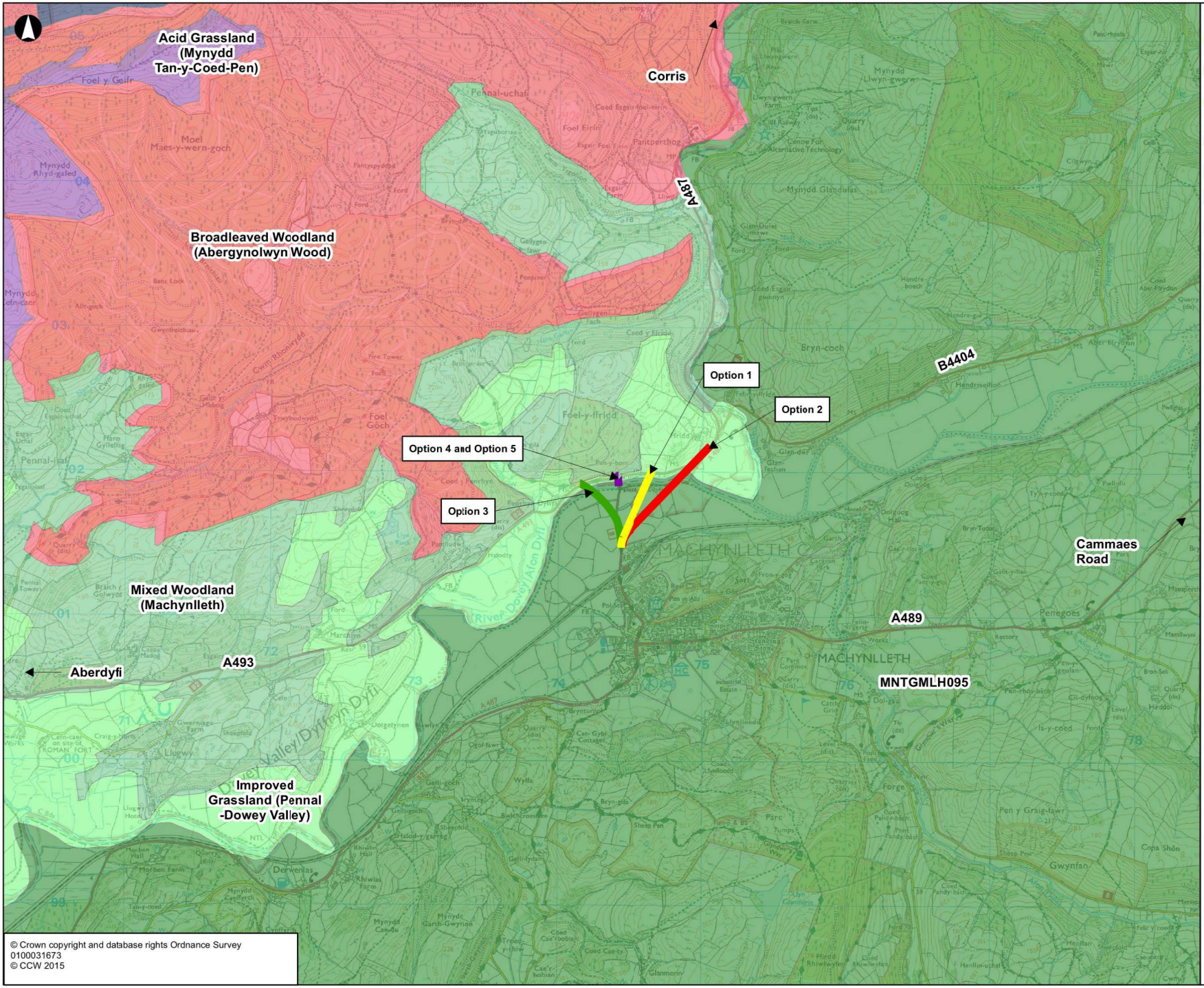
Welsh Government

Project Title
A487 New Dyfi Bridge

Drawing Title
Figure 7
LANDMAP - Geological

Scale at A3 **1:25,000**
Role Specialist Designer - Environmental
Suitability S0 - Initial non-contractual
Arup Job No **244562-00**
Rev **P01.1**
Name **900237-ARP-ZZ-ZZ-DR-LX-00021**

A3



Legend

- Option 1 New crossing 200m upstream
- Option 2 New crossing 500m upstream
- Option 3 New Crossing 200-500m downstream
- Option 4 Widening and Strengthening + flood mitigation + raise A487
- MNTGMLH095
- Acid Grassland (Mynydd Tan-y-Coed - Pen)
- Broadleaved Woodland (Abergynolwyn Wood)
- Improved Grassland / Bracken (Abergynol)
- Improved Grassland (Pennal - Dovey Valley)
- Mixed Woodland (Machynlleth)

Metres

0 335 670 1,340

Rev	Date	By	Chkd	Appd
P01.2	12/05/16	AH	AM	CF

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Client

Llywodraeth Cymru
Welsh Government

Project Title

A487 New Dyfi Bridge

Drawing Title

Figure 8
LANDMAP - Landscape Habitats

Scale at A3 **1:25,000**

Role Specialist Designer - Environmental

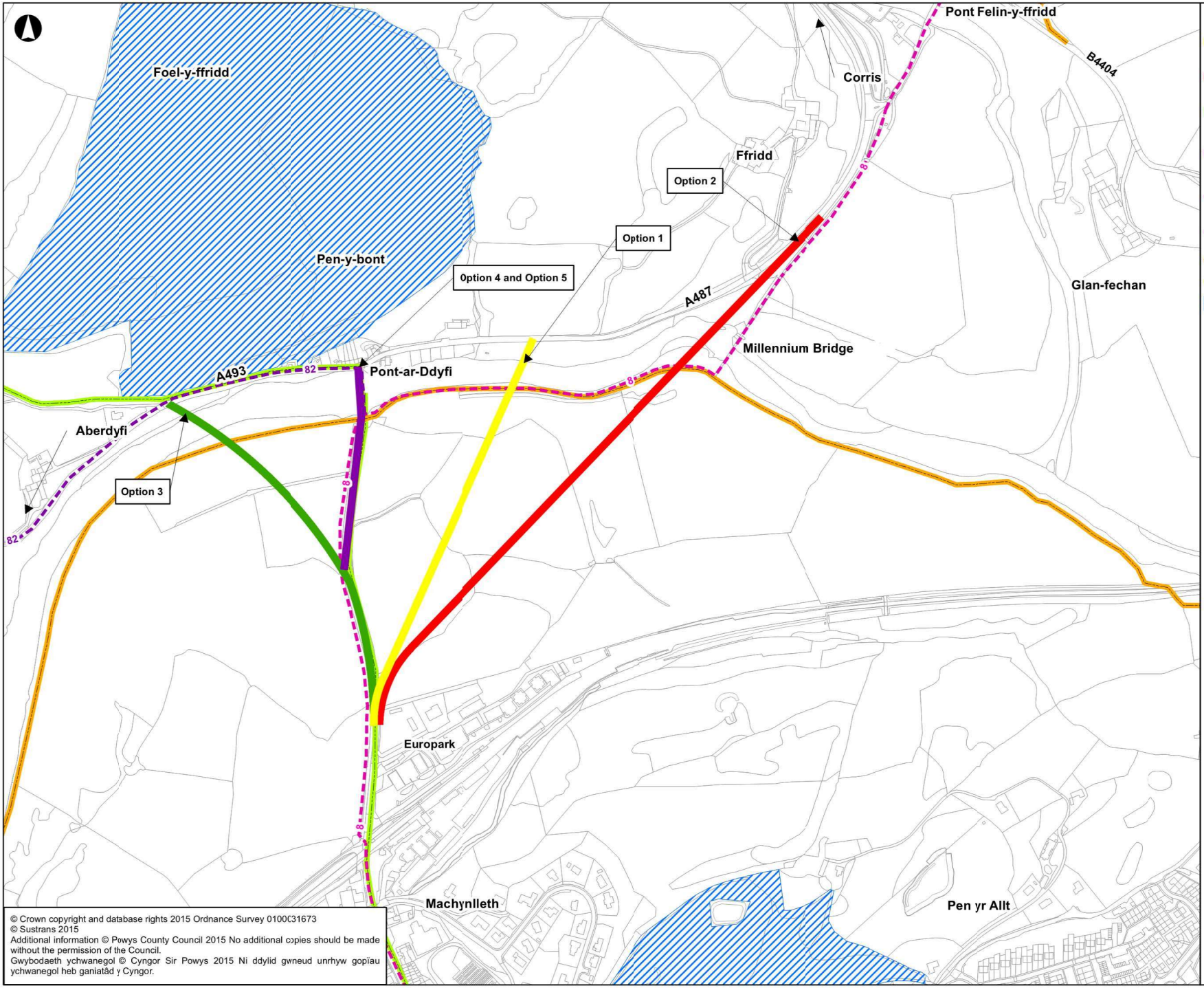
Suitability S0 - Initial non-contractual

Arup Job No **244562-00**

Rev **P01.2**

Name **900237-ARP-ZZ-ZZ-DR-LX-00022**

A3



Legend

- Option 1 New crossing 200m upstream
- Option 2 New crossing 500m upstream
- Option 3 New Crossing 200-500m downstream
- Option 4 Widening and Strengthening + flood mitigation + raise A487
- National Cycle Network Route No 8
- National Cycle Network Route No 82
- Public Rights of Way
- Wales Coastal Path
- Open Access

Metres
0 65 130 260

Rev	Date	By	Chkd	Appd
P01.2	26/07/16	AH	AM	PW

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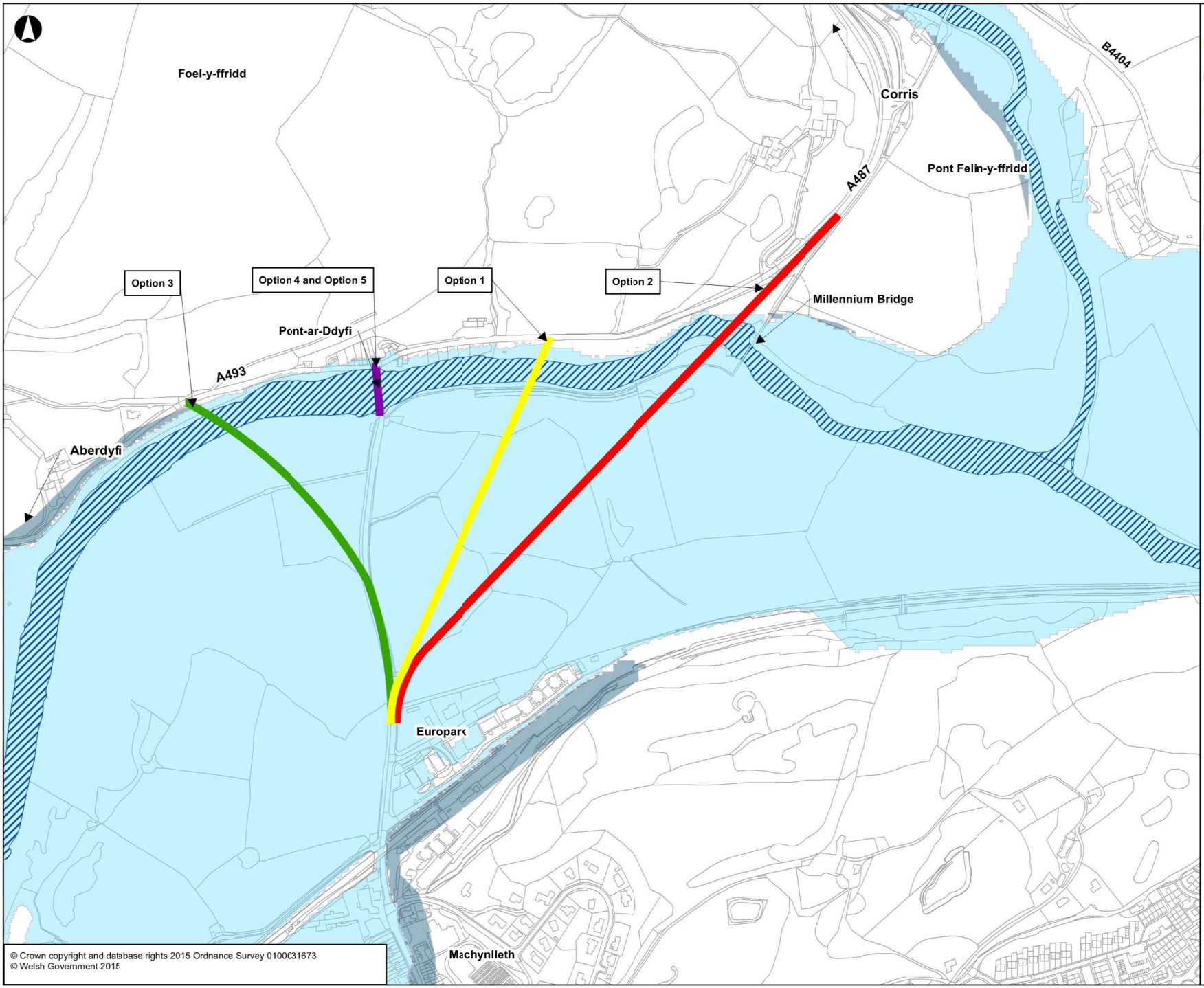
Welsh Government

Project Title
A487 New Dyfi Bridge

Drawing Title
Figure 9
Non Motorised User Routes

Scale at A3 1:5,000
Role Specialist Designer - Environmental
Suitability S0 - Initial non-contractual
Arup Job No 244562-00
Rev P01.2
Name 900237-ARP-ZZ-ZZ-DR-YE-00014

A3



Legend

- Option 1 New crossing 200m upstream
- Option 2 New crossing 500m upstream
- Option 3 New Crossing 200-500m downstream
- Option 4 Widening and Strengthening + flood mitigation + raise A487
- TAN15 Zone C2
- TAN15 Zone B
- Key Streams / Rivers

Metres
0 65 130 260

Rev	Date	By	Chkd	Appd
P01.2	12/05/16	AH	AM	CF

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Welsh Government

Project Title
A487 New Dyfi Bridge

Drawing Title
Figure 10
Flood Map

Scale at A3 **1:5,000**
Role Specialist Designer - Environmental
Suitability S0 - Initial non-contractual
Arup Job No **244562-00**
Rev **P01.2**
Name **900237-ARP-ZZ-ZZ-DR-YE-00015**

Appendix B

Appraisal Summary Tables

Option 1: New Crossing 200m Upstream

Criteria	Assessment	Distribution	Significance
Welsh Impact Area: *Economy*			
Transport Economic Efficiency (TEE)	Scheme Cost £21M (Q1 2014) Shorter route for majority of users but introduction of a roundabout at the northern end of the scheme would result in journey time delay for all traffic as drivers slow, negotiate the roundabout and then accelerate.	All road users (light and heavy vehicles) would be subject to journey time delay	Slight adverse
Economic Activity and Location Impact (EALI)	Local economy will experience a slight benefit due increased resilience of A487.		Slight beneficial
Welsh Impact Area: *Environment*			
Noise	A487 traffic will no longer travel past Dyfi Bridge Cottages, reducing exposure of residents to traffic noise.	No significant changes in noise distribution.	Slight beneficial
Local air quality	No significant local air quality effects are predicted during operation. A487 traffic will no longer travel past Dyfi Bridge Cottages, reducing exposure of residents to traffic pollutants. There is the potential for temporary local air quality to be affected during construction.	No significant changes in distribution of emissions.	Slight beneficial
Greenhouse gas emissions	No change in traffic volumes. Lengthy diversions from A487 being closed would be avoided. Overall marginal change in greenhouse gas emissions.	No significant distributional impacts.	Neutral
Landscape and townscape	New crossing would introduce a prominent feature into the landscape which would have a potential permanent, adverse effect on the character of the landscape and on the visual amenity of local receptors. The new crossing would predominantly be located in the Snowdonia National Park boundary. The roundabout required at the northern end of scheme would require significant earthworks and/or encroachment into the river. The roundabout would require street lighting which would impact local rural setting	Local impacts	Moderate adverse
Biodiversity	New crossing would have permanent impacts on ecology including habitat loss, fragmentation and loss of mature trees. During construction, temporary disturbance to protected species may be possible.	Local impacts.	Slight adverse
Heritage	New crossing would have a permanent adverse impact on the setting of Scheduled Ancient Monuments (SAMs) and Listed Buildings, however, the Pont-ar-Ddyfi would be restricted to non-motorised users. This would have the permanent operational benefit of removing traffic off the Pont-ar-Ddyfi, thus preserving the long term integrity of the bridge. During construction, potential direct adverse effect on undiscovered buried archaeological remains.	Local impacts.	Slight beneficial
Water environment	The new river crossing over the Afon Dyfi would not be in the active river channel. The new crossing over the floodplain would potentially have an impact on flood levels, although the new A487 would be elevated above the floodwater and remain open.	No significant distributional impacts.	Slight beneficial
Soils	New crossing would introduce the potential to encounter soil contamination associated with made ground materials during construction. Permanent effects of operation would include land take and severance of pastureland.	No significant distributional impacts.	Slight adverse
Welsh Impact Area: *Social*			
Transport safety	New crossing would be built to current trunk road standards and would be safer than the existing A487 route, decreasing accident frequencies and their severity. The route would however still utilise a sub-standard narrow section of A487 north of the river. Pont-ar-Dyfi would provide safe opportunities for non-motorised users by reducing pedestrian/vehicle conflict.	All road users	Slight beneficial
Personal security	Removal of traffic from the existing A487 and Pont-ar-Dyfi will potentially have a negative effect on perceived personal security for non-motorised users due to lack of street lighting. As this is no different from the current situation, personal security would remain the same.	All users	Neutral
Permeability	Improved permeability for both non-motorised users and motorised users as the new crossing would provide an efficient and reliable crossing of the Afon Dyfi for all users. Permeability will be enhanced through the safe opportunities for walking and cycling along the A487 corridor.	All users	Slight beneficial
Physical fitness	New crossing would provide an efficient and reliable crossing of the Afon Dyfi for all users and would introduce safe opportunities for walking and cycling along the A487 corridor. Free flowing route to trunk road standards would reduce driver stress and frustration.	All users	Moderate beneficial
Social inclusion	New crossing would provide an efficient and reliable crossing of the Afon Dyfi for all users and would introduce safe opportunities for walking and cycling along the A487 corridor. During construction, temporary closures and diversions of public rights of way and other routes will affect users.	All users	Moderate beneficial
Equality, diversity & human rights	The de-trunking of the Pont-ar-Dyfi would provide safe opportunities for non-motorised users by reducing pedestrian/vehicle conflict.	All users	Slight beneficial
Transport Planning Objectives			
TPO1	Large beneficial		
TPO2	Large beneficial		

TPO3	Moderate beneficial
TPO4	Moderate beneficial
TPO5	Slight beneficial
TPO6	Slight beneficial
TPO7	Slight adverse
TPO8	Slight beneficial
Public Acceptability	General support for scheme from local community. Relatively direct route with minimal impact on landowners would be acceptable, however the inclusion of a roundabout with street lighting would alter the landscape significantly, and introduce journey time delay so overall would be unpopular. Possible opposition from properties closest to the scheme north of the river.
Acceptability to other stakeholders	Snowdonia National Park may object due to the requirement for street lighting for roundabouts.
Technical and operational feasibility	Construction of the online northern roundabout would be very difficult in a confined narrow corridor resulting in extensive traffic management and/or diversions. Construction of the northern abutment would be very close to the main river channel increasing construction and future maintenance difficulties
Financial affordability and deliverability	Scheme costs will be met from national budget subject to Ministers approval
Risks	Funding risks are known and manageable Risk of stakeholder objections to scheme

Option No. 2: New Crossing 500m Upstream

Criteria	Assessment	Distribution	Significance
Welsh Impact Area: *Economy*			
Transport Economic Efficiency (TEE)	Scheme Cost £24M (Q1 2014) Shortest route for majority of users, and free flowing A487 alignment resulting in reduced journey times for majority of users. Slight increase in journey time for vehicles traveling from Machynlleth to A493 westbound & vice-versa	Majority of A487 road users (light and heavy vehicles) would be subject to reduced journey time	Neutral
Economic Activity and Location Impact (EALI)	Local economy will experience a slight benefit due increased resilience of A487		Slight beneficial
Welsh Impact Area: *Environment*			
Noise	A487 traffic will no longer travel past Dyfi Bridge Cottages, reducing exposure of residents to traffic noise.	No significant changes in noise distribution.	Moderate beneficial
Local air quality	No significant local air quality effects are predicted during operation. A487 traffic will no longer travel past Dyfi Bridge Cottages, reducing exposure of residents to traffic pollutants. There is the potential for temporary local air quality to be affected during construction.	No significant changes in distribution of emissions.	Slight beneficial
Greenhouse gas emissions	No change in traffic volumes. Lengthy diversions from A487 being closed would be avoided. Overall marginal change in greenhouse gas emissions.	No significant distributional impacts.	Neutral
Landscape and townscape	New crossing would introduce a prominent feature into the landscape which would have a potential permanent, adverse effect on the character of the landscape and on the visual amenity of local receptors. The new crossing would predominantly be located in the Snowdonia National Park boundary.	Local impacts.	Moderate adverse
Biodiversity	New crossing would have permanent impacts on ecology including habitat loss, fragmentation and loss of mature trees. During construction, temporary disturbance to protected species may be possible.	Local impacts.	Slight adverse
Heritage	New crossing would not have a permanent adverse impact on the setting of Scheduled Ancient Monuments (SAMs) and Listed Buildings as it will be located at a distance upstream. The Pont-ar-Ddyfi will be restricted to non-motorised users. This would have the permanent operational benefit of removing traffic off the Pont-ar-Ddyfi, thus preserving the long term integrity of the bridge. During construction, potential direct adverse effect on undiscovered buried archaeological remains.	Local impact	Moderate beneficial
Water environment	The new river crossing over the Afon Dyfi would not be in the active river channel. The new crossing over the floodplain would potentially have an impact on flood risk, although the new A487 would be elevated above the floodwater and remain open.	No significant distributional impacts.	Slight beneficial
Soils	New crossing would introduce the potential to encounter soil contamination associated with made ground materials during construction. Permanent effects of operation would include land take and severance of pastureland.	No significant distributional impacts.	Slight adverse
Welsh Impact Area: *Social*			
Transport safety	New crossing would be built to current trunk road standards and would be safer than the existing A487 route, decreasing accident frequencies and their severity. Pont-ar-Dyfi would provide safe opportunities for non-motorised users by reducing pedestrian/vehicle conflict.	All road users	Moderate beneficial
Personal security	Removal of traffic from the existing A487 and Pont-ar-Dyfi will potentially have a negative effect on perceived personal security for non-motorised users due to lack of street lighting. As this is no different from the current situation, personal security would remain the same.	All users	Neutral
Permeability	Improved permeability for both non-motorised users and motorised users as the new crossing would provide an efficient and reliable crossing of the Afon Dyfi for all users. Permeability will be enhanced through the safe opportunities for walking and cycling along the A487 corridor. New crossing will improve journey times and journey time reliability for motorised users.	All users	Slight beneficial
Physical fitness	New crossing would provide an efficient and reliable crossing of the Afon Dyfi for all users and would introduce safe opportunities for walking and cycling along the A487 corridor. Free flowing route to trunk road standards would reduce driver stress and frustration.	All users	Moderate beneficial
Social inclusion	New crossing would provide an efficient and reliable crossing of the Afon Dyfi for all users and would introduce safe opportunities for walking and cycling along the A487 corridor. During construction, temporary closures and diversions of public rights of way and other routes will affect users.	All users	Moderate beneficial
Equality diversity & human rights	The de-trunking of the Pont-ar-Dyfi would provide safe opportunities for non-motorised users by reducing pedestrian/vehicle conflict.	All users	Slight beneficial
Transport Planning Objectives			
TPO1	Large beneficial		
TPO2	Large beneficial		
TPO3	Moderate beneficial		
TPO4	Large beneficial		
TPO5	Moderate beneficial		
TPO6	Slight beneficial		

TPO7	Slight adverse
TPO8	Slight beneficial
Public Acceptability	General support for scheme from local community
Acceptability to other stakeholders	General support from stakeholders.
Technical and operational feasibility	Skew crossing increases length of viaduct and associated construction within floodplain, although proposed push launched construction method minimises these works.
Financial affordability and deliverability	Scheme costs will be met from national budget subject to Ministers approval
Risks	Funding risks are known and manageable Risk of stakeholder objections to scheme

Option No. 3: New Crossing 200-500m downstream

Criteria	Assessment	Distribution	Significance
Welsh Impact Area: *Economy*			
Transport Economic Efficiency (TEE)	Scheme Cost £18M (Q1 2014) Longest route for majority of users with A487 traffic diverted along narrow road past Pont-ar-Ddyfi cottages will increase journey distance, reduce speed and increase journey time.	All road users (light and heavy vehicles) would be subject to journey time delay	Slight adverse
Economic Activity and Location Impact (EALI)	Local economy will experience a slight benefit due increased resilience of A487		Slight beneficial
Welsh Impact Area: *Environment*			
Noise	Traffic will still pass Dyfi Bridge Cottages and Ffridd Farm, therefore there will be no change in exposure of residents to traffic noise. Minimal benefit would be provided by moving the junction away from these receptors however this would not be significant.	No significant changes in noise distribution.	Neutral
Local air quality	No significant local air quality effects are predicted during operation. Traffic will still pass Dyfi Bridge Cottages and Ffridd Farm therefore there will be no change in exposure of residents to traffic pollutants. Minimal benefit would be provided by moving the junction away from these receptors however this would not be significant. There is the potential for temporary local air quality to be affected during construction.	No significant changes in distribution of emissions.	Neutral
Greenhouse gas emissions	No change in traffic volumes. Lengthy diversions from A487 being closed now avoided. Overall marginal change in greenhouse gas emissions.	No significant distributional impacts.	Neutral
Landscape and townscape	New crossing would introduce a prominent feature into the landscape which would have a potential permanent, adverse effect on the character of the landscape and on the visual amenity of local receptors. Roundabout required at northern end of scheme due to sharp change in direction of A487 would require earthworks and/or encroachment into the river. The roundabout would require street lighting which would impact local rural setting	Local impacts	Slight adverse
Biodiversity	New crossing would have permanent impacts on ecology including habitat loss, fragmentation and loss of mature trees. During construction, temporary disturbance to protected species would be possible. This new crossing would be located closer to European and nationally designated sites.	Local impacts.	Moderate adverse
Heritage	The option would maintain current traffic flows and therefore the effect on the setting of the listed Pen-y-Bont cottages immediately to the north of the listed and scheduled Dyfi Bridge would be neutral. The bridge would experience a beneficial direct effect as a result of the large reduction in motor traffic using the bridge. There would be an adverse effect on the setting of the listed house and farm buildings at Penrhyn-Dyfi due to increased traffic. There would also be an adverse effect on the setting of Dyfi Bridge when viewed from the surroundings. There would be a direct adverse effect on buried archaeological remains that may exist beneath the current agricultural fields within the flood plain, over a shorter length than Options 1 and 2	Local impacts	Slight adverse
Water environment	The new river crossing over the Afon Dyfi would not be in the active river channel. The new crossing over the floodplain would have an increased impact on flood risk, although the new A487 would be elevated above the floodwater and remain open.	Local significant impact.	Slight beneficial
Soils	New crossing would introduce the potential to encounter soil contamination associated with made ground materials during construction. Permanent effects of operation would include land take and severance of pastureland.	No significant distributional impacts.	Slight adverse
Welsh Impact Area: *Social*			
Transport safety	New crossing would be built to current trunk road standards and would be safer than the existing A487 route, however route would continue to utilise sub-standard narrow section of A487 north or the river past Dyfi Cottages. Pont-ar-Dyfi would provide safe opportunities for non-motorised users by reducing pedestrian/vehicle conflict.	All road users	Slight beneficial
Personal security	Removal of traffic from the existing A487 and Pont-ar-Dyfi will potentially have a negative effect on perceived personal security for non-motorised users due to lack of street lighting. As this is no different from the current situation, personal security would remain the same.	All users	Neutral
Permeability	Improved permeability for both non-motorised users and motorised users as the new crossing would provide an efficient	All users	Slight beneficial

	and reliable crossing of the Afon Dyfi for all users. Permeability will be enhanced through the safe opportunities for walking and cycling along the A487 corridor. New crossing will improve journey times and journey time reliability for motorised users.		
Physical fitness	New crossing would provide an efficient and reliable crossing of the Afon Dyfi for all users and would introduce safe opportunities for walking and cycling along the A487 corridor. Free flowing route to trunk road standards would reduce driver stress and frustration.	All users	Moderate beneficial
Social inclusion	New crossing would provide an efficient and reliable crossing of the Afon Dyfi for all users and would introduce safe opportunities for walking and cycling along the A487 corridor. During construction, temporary closures and diversions of public rights of way and other routes will affect users.	All users	Moderate beneficial
Equality diversity & human rights	The de-trunking of the Pont-ar-Dyfi would provide safe opportunities for non-motorised users by reducing pedestrian/vehicle conflict.	All users	Slight beneficial
Transport Planning Objectives			
TPO1	Large beneficial		
TPO2	Large beneficial		
TPO3	Moderate beneficial		
TPO4	Moderate beneficial		
TPO5	Slight beneficial		
TPO6	Slight beneficial		
TPO7	Moderate adverse		
TPO8	Slight beneficial		
Public Acceptability	General support for scheme from local community. Directing A487 traffic past Dyfi Cottages would be very unpopular with the residents. Increased journey distance and time would not be acceptable with road users.		
Acceptability to other stakeholders	Snowdonia National Park may object due to the requirement for street lighting for northern roundabout.		
Technical and operational feasibility	Construction of the online northern roundabout would be very difficult in a confined narrow corridor resulting in extensive traffic management and/or diversions. A487 traffic would be directed along very narrow sub-standard section of road past Dyfi Cottages resulting in increased chance of vehicle collision.		
Financial affordability and deliverability	Scheme costs will be met from national budget subject to Ministers approval		
Risks	Funding risks are known and manageable Risk of stakeholder objections to scheme		

Option No. 4: Widening and Strengthening + flood mitigation + raise A487

Criteria	Assessment	Distribution	Significance
Welsh Impact Area: *Economy*			
Transport Economic Efficiency (TEE)	Scheme Cost £14M (Q1 2014) No change in journey distance.	All road users (light and heavy vehicles) would be subject to journey time delay	Neutral
Economic Activity and Location Impact (EALI)	Local economy will experience a slight benefit due increased resilience of A487		Slight beneficial
Welsh Impact Areas: *Environment*			
Noise	No change in impact on noise at nearby sensitive receptors (Dyfi Bridge Cottages and Ffridd Farm).	No significant distributional impacts.	Neutral
Local air quality	No significant local air quality effects are predicted during operation as no change in air quality at nearby sensitive receptors (Dyfi Bridge Cottages and Ffridd Farm). There is the potential for temporary local air quality to be affected during construction.	No significant distributional impacts.	Neutral
Greenhouse gas emissions	No change in traffic volumes hence no impact on greenhouse gas emissions.	No significant distributional impacts.	Neutral
Landscape and townscape	Modifying the bridge and raising the A487 would have some visual impact.	Local visual impact.	Moderate adverse
Biodiversity	Modifying the bridge and raising the A487 would have permanent impacts on ecology including habitat loss (due to land-take and flooding) and potential physical intrusion for migrating birds. During construction, temporary disturbance to protected species would be possible.	No significant distributional impacts.	Slight adverse
Heritage	Modifying the bridge will reduce the risk of damage caused by bridge strikes. Strengthening would mitigate long-term damage to the integrity of the structure from continued traffic use, however, widening the bridge is likely to adversely impact on the original character of the structure. Listed Building and Scheduled Ancient monument consent would be required.	No significant distributional impacts.	Large adverse
Water environment	Raising the A487 on an embankment would cause an obstruction to flood water, even with mitigation including flood channels and culverts. This would have an adverse impact on flood risk.	Local flooding impact.	Moderate adverse
Soils	No impact.	No significant distributional impacts.	Neutral
Welsh Impact Areas: *Social*			
Transport safety	Online widening would reduce the risk of vehicle collisions and decrease accident frequencies. A continuous walking and cycling route on the A487 would provide improved safe opportunities for non-motorised users by reducing pedestrian/vehicle conflict.	All road users	Slight beneficial
Personal security	No impact - online widening would not be expected to improve or deteriorate personal security.	All users	Neutral
Permeability	Improved permeability for both non-motorised users and motorised users due to the reduced frequency of closure and partial closure caused by flooding and vehicle strikes, however maintenance of the Pont-ar-Dyfi would still be required during operation. This option would improve journey times and journey time reliability for motorised users along the Pont-ar-Dyfi. During construction, temporary closures and diversions of public rights of way and other routes would affect users.	All users	Slight beneficial
Physical fitness	Modifying the bridge would provide improved crossing of the Afon Dyfi for all users and would introduce safe opportunities for walking and cycling along the A487 corridor. Free flowing route to trunk road standards would reduce driver stress and frustration, however this would remain during maintenance of the Pont-ar-Dyfi, which would still be required during operation.	All users	Moderate beneficial
Social inclusion	Reliability of access would improve due to the reduced frequency of closure and partial closure caused by flooding, vehicle strikes and maintenance. During construction, temporary closures and diversions of public rights of way and other routes would affect users.	All users	Slight beneficial
Equality diversity & human rights	Widening the bridge would provide safe opportunities for non-motorised users.	All users	Slight beneficial
Transport Planning Objectives			
TPO1	Moderate beneficial		
TPO2	Moderate beneficial		
TPO3	Moderate beneficial		
TPO4	Slight beneficial		

TPO5	Slight beneficial
TPO6	Slight adverse
TPO7	Moderate adverse
TPO8	Slight beneficial
Public Acceptability	General support for scheme from local community. Works to landmark Pont-ar-Ddyfi would be unacceptable to many locals.
Acceptability to other stakeholders	Listed Building and Scheduled Ancient monument consent would be required.
Technical and operational feasibility	Widening of the existing Pont-ar-Ddyfi would be very difficult due to uncertain construction of existing bridge and foundations. Construction works would be very difficult on very narrow bridge resulting in significant traffic management and diversions.
Financial affordability and deliverability	Scheme costs will be met from national budget subject to Ministers approval
Risks	Funding risks are known and manageable Risk of uncertainty of works required to existing structure.

Option No. 5: Widening and Strengthening + flood mitigation

Criteria	Assessment	Distribution	Significance
Welsh Impact Area: *Economy*			
Transport Economic Efficiency (TEE)	Scheme Cost £10M (Q1 2014) No change in journey distance.	All road users (light and heavy vehicles) would be subject to journey time delay	Neutral
Economic Activity and Location Impact (EALI)	No impact		Neutral
Welsh Impact Areas: *Environment*			
Noise	No change in impact on noise at nearby sensitive receptors (Dyfi Bridge Cottages and Ffridd Farm).	No significant distributional impacts.	Neutral
Local air quality	No significant local air quality effects are predicted during operation as no change in air quality at nearby sensitive receptors (Dyfi Bridge Cottages and Ffridd Farm). There is the potential for temporary local air quality to be affected during construction.	No significant distributional impacts.	Neutral
Greenhouse gas emissions	No change in traffic volumes hence no impact on greenhouse gas emissions.	No significant distributional impacts.	Neutral
Landscape and townscape	Modifying the bridge would have some visual and landscape character impact.	Local visual impact.	Moderate adverse
Biodiversity	Modifying the bridge would have limited permanent impacts on ecology including habitat loss. During construction, temporary disturbance to protected species would be possible.	No significant distributional impacts.	Neutral
Heritage	Modifying the bridge will reduce the risk of damage caused by bridge strikes. Strengthening would mitigate long-term damage to the integrity of the structure from continued traffic use, however, widening the bridge is likely to adversely impact on the original character of the structure. Listed structure and Scheduled Ancient Monument consent would be required.	No significant distributional impacts.	Large adverse
Water environment	Mitigation works to river channel and floodplain would prevent any increase in flood levels, but would be unable to reduce flood levels and risk of flooding of A487	Local flooding impact	Neutral
Soils	No impact.	No significant distributional impacts.	Neutral
Welsh Impact Areas: *Social*			
Transport safety	Online widening would reduce the risk of vehicle collisions and slightly decrease accident frequencies. A continuous walking and cycling route on the A487 would provide improved safe opportunities for non-motorised users by reducing pedestrian/vehicle conflict.	All road users	Slight beneficial
Personal security	No impact - online widening would not be expected to improve or deteriorate personal security.	All users	Neutral
Permeability	Slight improved permeability for both non-motorised users and motorised users due to the reduced frequency of closure and partial closure caused vehicle strikes, however A487 south of river would still be at risk of closure from flooding. Maintenance of the Pont-ar-Dyfi would still be required during operation. During construction, temporary closures and diversions of public rights of way and other routes would affect users.	All users	Neutral
Physical fitness	Modifying the bridge would provide improved crossing of the Afon Dyfi for all users and would introduce safe opportunities for walking and cycling along the A487 corridor. Free flowing route to trunk road standards would reduce driver stress and frustration, however this would remain during maintenance of the Pont-ar-Dyfi, which would still be required during operation.	All users	Moderate beneficial
Social inclusion	Reliability of access would improve due to the reduced frequency of closure and partial closure caused by vehicle strikes and maintenance, however A487 would still be at risk of closure from flooding. During construction, temporary closures and diversions of public rights of way and other routes would affect users.	All users	Neutral
Equality diversity & human rights	Widening the bridge would provide safe opportunities for non-motorised users.	All users	Slight beneficial
Transport Planning Objectives			
TPO1	Neutral		
TPO2	Neutral		
TPO3	Slight beneficial		
TPO4	Slight beneficial		
TPO5	Slight beneficial		
TPO6	Slight beneficial		
TPO7	Moderate adverse		

TPO8	Slight beneficial
Public Acceptability	Likely to be unacceptable to locals as risk of closure of A487 from flooding would still remain as current.
Acceptability to other stakeholders	Listed Building and Scheduled Ancient monument consent would be required.
Technical and operational feasibility	Widening of the existing Pont-ar-Ddyfi would be very difficult due to uncertain construction of existing bridge and foundations. Construction works would be very difficult on very narrow bridge resulting in significant traffic management and diversions.
Financial affordability and deliverability	Scheme costs will be met from national budget subject to Ministers approval
Risks	Funding risks are known and manageable Risk of uncertainty of works required to existing structure.

Appendix C

Comparison of Significance of Appraisal Impacts

Comparison of Significance of Appraisal Impacts

Appraisal Criteria / Element	Option 1	Option 2	Option 3	Option 4	Option 5
Element Description	**New Crossing 200m Upstream**	**New Crossing 500m Upstream**	**New Crossing 200-500m Downstream**	**Widening, Strengthening, Flood Mitigation, Raise A487**	**Widening, Strengthening, Flood Mitigation**
Welsh Impact Area: Economy					
Transport Economic Efficiency (TEE)	(-)	0	(-)	0	0
Economic Activity and Location Impact (EALI)	(+)	(+)	(+)	(+)	0
Welsh Impact Area: *Environment*					
Noise	(+)	(++)	0	0	0
Local Air Quality	(+)	(+)	0	0	0
Greenhouse Gas Emissions	0	0	0	0	0
Landscape & Townscape	(--)	(--)	(-)	(- -)	(- -)
Biodiversity	(-)	(-)	(--)	(-)	0
Heritage	(+)	(++)	(-)	(---)	(---)
Water environment	(+)	(+)	(+)	(--)	0
Soils	(-)	(-)	(-)	0	0
Welsh Impact Area: *Social*					
Transport safety	(+)	(++)	(+)	(+)	(+)
Personal security	0	0	0	0	0
Permeability	(+)	(+)	(+)	(+)	0
Physical fitness	(++)	(++)	(++)	(++)	(++)
Social inclusion	(++)	(++)	(++)	(+)	0
Equality, diversity & human rights	(+)	(+)	(+)	(+)	(+)
Transport Planning Objectives					
TPO1	(+++)	(+++)	(+++)	(++)	0
TPO2	(+++)	(+++)	(+++)	(++)	0
TPO3	(++)	(++)	(++)	(++)	(+)
TPO4	(++)	(+++)	(++)	(+)	(+)
TPO5	(+)	(++)	(+)	(+)	(+)
TPO6	(+)	(+)	(+)	(-)	(+)
TPO7	(-)	(-)	(--)	(--)	(--)
TPO8	(+)	(+)	(+)	(+)	(+)
Public Acceptability	(+)	(++)	(+)	(-)	(--)
Acceptability to other stakeholders	(-)	(+)	(-)	(--)	(--)

Technical and operational feasibility	(-)	0	(-)	(--)	(--)
Financial affordability and deliverability	0	0	0	0	0
Risks	0	0	0	(-)	(-)

Summary of Significance of Appraisal Impacts	**Symbol**
Large beneficial	(+++)
Moderate beneficial	(++)
Slight beneficial	(+)
Neutral	(0)
Slight adverse	(-)
Moderate adverse	(- -)
Large adverse	(- - -)