Adran yr Economi a'r Seilwaith
Department for Economy and Infrastructure

Llywodraeth Cymru
Welsh Government

THE CHESTER TO BANGOR TRUNK ROAD (A55) (JUNCTIONS 16 AND 16A IMPROVEMENT REALIGNMENT AND SLIP ROADS) ORDER 202-

THE CHESTER TO BANGOR TRUNK ROAD (A55) (JUNCTIONS 16 AND 16A IMPROVEMENT REALIGNMENT AND SLIP ROADS) (SIDE ROADS) ORDER 202-

THE WELSH MINISTERS (THE CHESTER TO BANGOR TRUNK ROAD (A55) (JUNCTIONS 16 AND 16A IMPROVEMENT REALIGNMENT AND SLIP ROADS)) COMPULSORY PURCHASE ORDER 202-

PROOF OF EVIDENCE

ANDREW SUMNER CMLI

WELSH GOVERNMENT, ENVIRONMENT

DOCUMENT REFERENCE: WG 1.06.02

Contents

1. Author

1.1 I am Andrew Sumner, a Chartered Landscape Architect with 39 years of working experience and 33 years as a full or chartered member of the Landscape Institute. I qualified in 1981 with the four-year Diploma in Landscape Architecture (Honours Degree and Post-graduate Diploma equivalent).

1.2 Following graduation, I spent eight years working as a landscape architect in local government, gaining professional membership of the Landscape Institute in 1987.

1.3 In 1988 I joined Richards Moorehead & Laing Ltd. (RML), as Senior Landscape Architect and since 1990 as Principal Landscape Architect.

1.4 My relevant highways experience includes the following projects, on which I was Project Landscape Architect (a to c below) and subsequently Environmental Coordinator (e to m below):

a) A5 Padog Bends Improvements (Key Stage 1 to 3) Welsh Office – 1989 to 1992.

b) A55 Anglesey, Llanfairpwllgwyngyll to Nant Turnpike (Key stages 1 to 5) for the Welsh Office - 1992 to 1998.

c) A53 Hodnet Bypass in Shropshire (Key Stages 1 to 4) for Shropshire County Council - 1993 to 1996.

d) A487 Penygroes Improvements (Key Stages 2 to 4) for the Welsh Office – 1990 to 1993.

e) A470 Blaenau Ffestiniog to Cancoed Design and Build Contract (Key Stage 6) for Welsh Government - 2006 to 2009.

f) A5 Ty Nant to Dinmael Rock Cutting Remediation Design and Build Contract (Key Stage 6) for North Wales Trunk Road Agency – 2006.

g) M4 Widening Junction 29 to 32 Early Contractor Involvement (Key Stage 1 to 6) for Welsh Government - 2005 to 2014.

h) A487 Glandyfi Improvements Design and Build Contract (Key Stage 6) for Welsh Government – 2011 to 2013.

i) A40 Llanddewi Velfrey to Penblewin Improvements (Key Stages 3 and 4) Welsh Government – 2017 onwards.

j) A55 Third Menai Crossing Consultancy Contract (Key Stages 1 and 2) Welsh Government 2017 to 2019.

k) A55 Junctions 14 and 15, and 16 and 16A Improvements Consultancy Contract (Key Stage 3 to 4) for Welsh Government - 2016 onwards.

l) A40 Penblewin to Redstone Cross (Key Stages 3 and 4) Welsh Government - 2019 onwards.

m) Green Corridors Initiative North Wales Trunk Road Strategy Plan for North and Mid Wales Trunk Road Agent 2018 to 2020.

1.5 I am the Environmental Coordinator for the A55 Junctions 16 and 16A Improvements scheme. My role involves the key tasks of:

a) Coordinating activities of environmental specialists in design of the Scheme and the identification of environmental mitigation or avoidance measures.

b) Coordinating the production of the Environmental Statement (ES).

c) Coordinating meetings, consultations, and liaison on environmental aspects of the Scheme.

d) Working towards achieving the environmental Project Objectives and compliance with environmental quality standards.

1.6 The project for improvements at Junction 15 and 16 has developed so that it encompasses Junctions 14 and 16A as well. Furthermore, the two sets of junctions, namely Junctions 14 and 15 to the west at Llanfairfechan, and Junctions 16 and 16A to the east at Dwygyfylchi and Penmaenmawr, are being treated under different sets of draft Orders and Environmental Statements. This proof of evidence addresses Junctions 16 and 16A, at Llanfairfechan, hereby referred in this proof of evidence as the 'Scheme' or the 'Junction 15 Scheme' as appropriate.

1.7 My specialist field is landscape architecture. However, in my role as Environmental Coordinator, I have outlined the key points that I think should be communicated in all topics. The opinions expressed are my own unless I state otherwise.

1.8 My Proof of Evidence provides an overview of the environmental aspects of the Junction 15 Scheme and sets out the reasons for the proposed environmental mitigation and associated requirement for the compulsory purchase of land for that purpose.

1.9 It is not my intention to reproduce text from the ES but simply to cross refer to highlight or summarise key procedural and technical matters that are pertinent to the assessment of the published Scheme. Consequently, I will refer in this Proof of Evidence to supporting material contained within the ES and the ES Supplements where relevant.

1.10 I have been assisted by colleagues from within the project team in the various tasks that are reported in this document. Proofs of evidence have been

prepared by those environmental specialists and they will be presenting their evidence within their expertise.

1.11 My Proof of Evidence covers a wide spread of environmental topics and is structured in the following manner:

- Part 2 Environmental Impact Assessment process – This addresses screening, scoping, environmental surveys and consultations.
- Part 3 Appropriate Assessment.
- Part 4 Environmental Impact Assessment by topic – a brief summary of key environmental topics reported in the ES. Where a topic is covered in detail by the proof of evidence of another specialist, I provide a cross reference to the relevant proof.
- Part 5 Preliminary design of the Scheme – the environmental objectives and key environmental considerations in the appraisal of options and environmental surveys carried out to determine the baseline conditions.
- Part 6 Description of the preferred option – a summary description of the scheme and some of its main impacts on the setting.
- Part 7 Mitigation and Environmental management – explains the role of environmental management in the Scheme through construction, aftercare, and handover.
- Part 8 Development of the preferred option design and environmental mitigation – environmental considerations in refining the route to minimise or avoid environmental impacts, and the development of mitigation.
- Part 9 Land taken for Essential Mitigation - refers to each plot and explains why mitigation is needed.
- Part 10 Objections to the Scheme – a summary of the matters raised in the objections that are relevant to my Proof of Evidence.
- Part 11 Conclusion and Declaration.

Links with other Proofs of Evidence

1.12 Because environmental coordination, landscape and ecology are interlinked topics, there will be some crossover between my proof and that of Donna Hall, the ecological expert and Jon Stoddard, the landscape expert.

1.13 I have worked closely with other members of the team in the development of the design for the Scheme and there will be cross referencing and cross over between our proofs. I am not an expert in engineering and so my references

to design apply to avoidance of environmental impacts and design of mitigation.

1.14 I will rely on the following expert witnesses to cover their respective specialist fields:

a) Jonathan Bayliss (Engineering) (WG 1.05)

b) Nigel Roberts (Traffic and Economics) (WG 1.03)

c) Donna Hall (Ecology) (WG 1.08)

d) Jon Stoddard (Landscape) (WG 1.07)

e) Graham Harker (Air Quality) (WG 1.10)

f) Craig Barson (Noise) (WG 1.09)

g) Shân Jones (Planning) (WG 1.04)

h) Philip Studds (Geology and Soils) (WG 1.12)

i) Simon Price (Climate and Carbon) (WG 1.02)

j) Steve Cox (Road Drainage and Water Environment) (WG 1.11)

2. Environmental Impact Assessment Process

2.1 An Environmental Impact Assessment (EIA) has been completed in accordance with EIA Directive EC2014/52/EU[1] (Document Ref WG 4.01.160), which amended the existing 2011 Directive 2011/92/EU[2] (Document Ref WG 4.01.149). The European Union (Withdrawal) Act 2018[3] (Document Ref WG 4.01.161) provides a new constitutional framework for the continuity of 'retained EU law' in the UK and the EIA Directive is included as it applied in the UK on 31 December 2020.

2.2 In December 2017, the Harbours, Docks, Piers and Ferries Environmental Protection - The Environmental Impact Assessment (Miscellaneous Amendments Relating to Harbours, Highways and Transport) Regulations 2017 (EIA Regulations 2017)[4] (Document Ref WG 4.01.84) came into force, transposing the 2014 Directive for projects under the Highways Act 1980[5] (Document Ref WG 4.01.10). These regulations change the way Screening and Scoping are carried out and require additional topics to be considered in the scope of the EIA.

EIA Screening and Scoping

2.3 The Regulations require that an EIA is carried out if a scheme is determined to be a 'relevant project'. A screening exercise was completed in 2018 and 2019 was reported in the Notice of Determination (Document reference WG 2.01.05) published by the Welsh Ministers. The Screening Report is included within the appendices to the ES Appendix 4.2 (Document Ref WG 3.01.03). The Scheme, not considered to be an Annex I project, falls within the scope of Annex II, because it involves highway construction or widening and the aggregate area of the temporary construction and completed works would exceed 1 hectare. The Scheme was therefore subject to Determination by the Welsh Ministers.

[1] Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (Text with EEA relevance) (legislation.gov.uk)

[2] Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (codification) (Text with EEA relevance) (legislation.gov.uk)

[3] European Union (Withdrawal) Act 2018 (legislation.gov.uk)

[4] The Environmental Impact Assessment (Miscellaneous Amendments Relating to Harbours, Highways and Transport) Regulations 2017, SI 2017/1070 (legislation.gov.uk)

[5] Highways Act 1980 c.66 c.16 (legislation.gov.uk)

2.4 Annex II projects require a determination to be undertaken to confirm whether the project is considered likely to have a significant environmental effect. The selection criteria are set out in Annex III of the EIA Directive. The selection criteria include the characteristics of the project, its location, and its potential impacts. The Welsh Ministers determined that the proposed works, whilst not set within a sensitive location, are of more than local importance, and are anticipated to have significant adverse effects on the receiving and surrounding environment. To ensure that all environmental effects are considered during the design process, a Statutory EIA has been completed.

2.5 The scope of the EIA was examined, and the findings set out in the Scoping Report, which is included within the ES Appendix 4.3 (Document Ref WG 3.01.03).

2.6 New topics were listed in the EIA Directive EC2014/52/EU and the Harbours, Docks, Piers and Ferries Environmental Protection - The Environmental Impact Assessment (Miscellaneous Amendments Relating to Harbours, Highways and Transport) Regulations 2017 (EIA Regulations 2017). The Screening and Scoping Report considered these new topics and included those that were considered relevant.

2.7 The ES structure and chapters were prepared in accordance with the new Design Manual for Roads and Bridges (DMRB) Volume 11 Section 1 Introduction and Section 2 General Principles of Environmental Impact Assessment, which were published in July 2019[6] (Document Ref WG 4.01.162). This has meant that the new topics, including Population and Human Health, Climate Change, Major Accidents and Disasters, and Heat and Radiation have been considered separately. The latter topic was scoped-out of the ES and the reasoning, which is set out in the EIA Scoping Report, is that heat and radiation would not result in significant effects on the Scheme or on the receiving environment. The sources of heat and radiation are minor and no different to the existing Trunk Road. The scoping demonstrated that there are no accidents and disasters that are likely to occur of sufficient scale or consequence to be considered significant.

2.8 The timing of the DMRB 2019 publication has overlapped with the environmental assessments carried out for this project. The following table sets out the timing and reasoning for adoption or otherwise of the new DMRB 2019 guidance[7]. An explanation of how the guidance has been applied is set out in Table 1.

[6] LA 101 - Introduction to environmental assessment - DMRB (standardsforhighways.co.uk) July 2019

[7] See Search Results - DMRB (standardsforhighways.co.uk)

2.9 The EIA process was reported in an ES, which was published in March 2021. The ES consists of:

Volume 1 Environmental Statement (topic chapters) (A4 portrait)

Volume 2 Figures for Volume 1 chapters (A3 landscape)

Volume 3 Appendices to Volume 1 including specialist reports which require three separate binders (A4 portrait binders)

Non-Technical Summary

Table 1: The Application of the New 2019 Design Manual for Roads and Bridges Guidance on EIA

New DMRB Topic	Guidance Published	Applied to Scheme	Explanation
LA101 - Introduction to Environmental Assessment	July 2019	No	This reflects the requirements of the European Directive and the UK EIA Regulations. These requirements were adopted before the LA101 guidance was published. There will be differences in the way the ES is structured, and the assessments prepared because the other LA guidance documents were produced after the content of the EIA Screening and Scoping report was drafted.
LA 102 - Screening Projects for Environmental Impact Assessment	July 2019	No	This task was completed by 23 May 2018 and final report completed by 29 January 2019. The Screening and the Record of Determination was also prepared European Directive and the UK Regulations.
LA103 - Scoping for Projects for Environmental Assessment	January 2020	No	This task was completed in May 2018 and the report completed by 18 February 2019. The Screening was carried out in accordance with the European Directive and the UK Regulations.
LA104 - Environmental Assessment and Monitoring	July 2019	No	This reflects the requirements of the European Directive and the UK EIA Regulations. These requirements were adopted for this Scheme before the LA104 guidance was published. As a consequence, there will be differences in the way the ES is structured. The assessments reported in the ES were completed, based on the Scoping Report, before the new LA guidance documents were published.
LA105 - Air Quality	November 2019	No	The air quality assessment was completed in accordance with the DMRB HA 207/07, but followed the requirements set out for the new Directive and the UK Regulations before the new guidance LA105 was published. The decision was taken to complete the air quality chapter in accordance with the

New DMRB Topic	Guidance Published	Applied to Scheme	Explanation
			completed assessment and air quality modelling. This decision was taken in the light of LA105, which requires a lower level of assessment than that which has been completed for the Junction 15 Scheme.
LA106 - Cultural Heritage Assessment	January 2020	No	All the surveys, the assessment and the draft reporting were completed before the new guidance LA106 was published but applying the new guidance would not have changed the conclusions.
LA107 - Landscape and Visual Effects	February 2020	No	The full assessment and all the surveys were completed in accordance with the DMRB Interim Advice Note (IAN) 135/10W) before the new guidance LA107 was published but applying the new guidance would not have changed the conclusions.
LA108 - Biodiversity	March 2020	No	The surveys, full assessment and reports were completed before the new guidance, LA108, was published but applying the new guidance would not have changed the conclusions.
LA109 - Geology and Soils	October 2019	Yes	The assessment and chapter were prepared after the new guidance had been published and so the chapter was prepared in accordance with the new guidance.
LA110 - Material Assets and Waste	August 2019	Yes	The assessment and chapter were prepared since the new guidance was published and so the chapter was prepared in accordance with the new guidance.
LA111 - Noise and Vibration	May 2020	No	The assessment was completed before the new guidance was published. The changes to the guidance corrected a table that sets out construction time periods, and also amended Appendix A which sets out noise calculations for

New DMRB Topic	Guidance Published	Applied to Scheme	Explanation
			the operation of the road and the use of observable vehicle speeds. Using the new guidance would not have changed the conclusions.
LA112 - Population and Human Health	January 2020	No	The EIA Scoping report, using the old DMRB chapter headings had been agreed and published by May 2019. The assessment and draft chapter were completed, following advice from professional bodies, as a self-contained assessment before the new guidance was published. The new DMRB restructures the environmental statement so that several of the old DMRB chapters are brought together in the population and human health assessment. However, Restructuring the ES to incorporate the old chapters into population and human health chapter would have been a major task affecting 6 assessments and chapters which had already been completed. Assessments in the published ES that would be incorporated into this chapter would include: • Land use • Agriculture • Community effects • Pedestrians, cyclists and equestrians • Vehicle travellers • Using the new guidance would not have changed the conclusions in these topics
LA113 - Road Drainage and Water Environment	March 2020	Yes	The assessment was undertaken over the period since the new guidance was published and so the chapter was prepared in accordance with the new guidance.

New DMRB Topic	Guidance Published	Applied to Scheme	Explanation
LA114 - Climate	October 2019	No	The EIA Scoping report, using the old DMRB chapter headings had been agreed and published by May 2019. The Climate topic was included in the scope in accordance with the new Directive. The assessment and draft chapter were also completed, following advice from professional bodies, before the new guidance was published. This is a new topic introduced to assess and report on the effects of climate on highways (climate change resilience and adaptation and the effects on climate of greenhouse gas from construction, operation and maintenance projects.
LA115 - Habitats Regulations Assessment	January 2020	Yes	The assessment was undertaken over the period when the new guidance was published and so the chapter was prepared in accordance with the new guidance.
LA120 - Environmental Management Plans	March 2020	Yes	Chapter 20 Management of Environmental Effects and the appended Pre-CEMP were prepared before the new guidance was published.

Consultations

2.10 Although first considered in a study carried out between 2003 and 2007, the improvements to Junctions 16 and 16A were not presented to statutory bodies or stakeholders until 2009. In that study, stakeholders, including local councillors, were consulted on the options. The study concluded that grade-separated options should be progressed.

2.11 In 2015 Welsh government decided to procure an Early Contractor Involvement contractor to develop improvement schemes for both junctions 15 and 16. Carillion with Ramboll, RML and YGC were awarded the Early Contractor Involvement (ECI) contract in 2017. Consultations with the statutory bodies and with the public commenced shortly after award of the contract and continued after the liquidation of Carillion.

2.12 A programme of Environment Liaison Group (ELG) meetings was organised. The initial ELG meeting to discuss the Scheme was held on 9 May 2018, attended by representatives of Welsh Government, Corderoy and TACP (representing the client); Arup and RML (designer's team); North and Mid Wales Trunk Road Agency (NMWTRA), Conwy County Borough Council (CCBC) and Cadw (the Statutory Environmental Bodies). Gwynedd Archaeological Trust (GAT) was also present to fulfil a curatorial role regarding cultural heritage sites. Natural Resources Wales (NRW) were unable to attend the initial meeting in May and so a separate meeting was organised with them later in that month.

2.13 Subsequent meetings were postponed following the liquidation of Carillion, before being resumed on 23 May 2019. The last meeting was on 20 November 2019. The ELG was invited to assist in the development of environmental objectives and to comment on the EIA Screening and Scoping Reports, the draft Environmental Masterplans and subsequently on the draft ES.

2.14 In addition to ELG meetings, further contact between the project team and SEBs continued to address specific aspects.

Design Commission for Wales

2.15 A meeting with the Design Commission for Wales (DCfW) was held on 13 June 2019 to allow them to review the early designs for the scheme for both Junctions 14 and 15, and 16 and 16A. A copy of the initial design review report, which was issued by DCfW in June 2019, is included in Appendix 2.4.

Description of the Setting

2.16 The Scheme lies on the A55 Expressway on the coast of North Wales between the town of Conwy and the City of Bangor. The mountains of Snowdonia National Park lie to the south and Liverpool Bay and the Menai Strait to the north. The setting of the existing A55 within administrative areas is shown in ES Figure 2.1. A series of photographs which illustrate the setting are provided in ES Figures 2.3 Sheets 1 to 4. All the figures referenced are in the ES Volume 2 (Document Ref WG 3.01.02).

2.17 ES Figure 2.2 shows the topographical characteristics of the setting of the Scheme and illustrates how the A55 is located close to the northern seaward edge of a narrow coastal plain, facing north-west towards the sea. The prominent and extensively quarried headland of Penmaen Mawr is to the south-west, the craggy Penmaen Bach to the north-east. Both of these headlands push out into the sea, separating the coastal plain from the low land associated with the Conwy estuary to the east and with Llanfairfechan to the south-west. The steep-sided hills of Moelfre and Cefn Coch, among others, lie to the south-east. The area of coastal plain occupied by the village of Dwygyfylchi, to the north-east of Penmaenmawr, is partially separated from Penmaenmawr by Foel Lus, a round-topped, scree-sided, limestone hill that extends a shoulder north-east to within 400 m of the coast.

2.18 Historically the landscape was predominantly agricultural, but quarrying has dramatically altered the landscape around Penmaen Mawr. Both the small town of Penmaenmawr, which grew as a coastal resort in the late 19th century, and the agricultural village of Dwygyfylchi, have grown substantially with residential developments extending outwards from the old centres. Farming, mainly as grazing land, continues the lower hill slopes and areas generally further from the sea. Higher areas tend to be rough grazing.

2.19 A narrow steep road climbs eastward from Dwygyfylchi to Capelulo and then over the Sychnant Pass to Conwy. The A55, and the adjacent North Wales mainline railway route lie mainly within low-lying ground behind the coastal defences, although the headland of Penmaen Bach require these important routes to pass through tunnels. At Penmaen Mawr the railway and the A55 east bound carriageway follow rock cut terraces around the seaward edge while the A55 westbound carriageway uses a tunnel.

2.20 To the north of the A55 and the railway lie the Seaside Promenade and the beach, while to the south lies the main body of the town and the railway station.

Designated Sites

2.21 The Scheme setting contains numerous designations that influence how the environment is managed. The ES chapters list these designated and non-designated sites.

2.22 The nature conservation sites and their proximity to the Scheme, are described in ES Chapter 8, Tables 8.3 and 8.4. Figure 8.1 shows the international statutory nature conservation designations in the study area of the Scheme. These include 3 Special Protection Areas over coastal and maritime areas, and 5 Special Areas of Conservation over coastal and inland areas. Figure 8.2 shows the 6 national statutory nature conservation sites including 5 Sites of Special Scientific Interest (SSSI).

2.23 Figure 9.4 and 10.1 show landscape, townscape and cultural heritage designations within the study area of the Scheme. These include Snowdonia National Park, which extends north from the mountains to the south, to include Foel Lus, Penmaen Bach headland and the eastern portion of the village of Dwygylychi. The Scheme crosses the National Park boundary just to the east of Junction 16A (Dwygyfylchi).

2.24 Much of Penmaenmawr is designated as Conservation Area but the Scheme does not directly affect these areas.

2.25 The North Llechwedd Registered Historic Landscape, which excludes the urban area of Penmaenmawr, occupies the landscape to the south of the Scheme. There are Ancient Monuments on the hills surrounding the Scheme. There are also areas of Designated Ancient Woodland, lying mainly to the west and south of Penmaenmawr and to the east of Dwygyfylchi.

2.26 The habitats along the route support populations of European Protected Species (EPS), including several bat species and otter. There are also populations of badger, hedgehog and reptiles. Marine bird species, which forage on the adjacent coastal SPA and SAC, use terrestrial habitats in summer and winter when the tide is high

Prevailing Conditions

2.27 The area receives a typical maritime climate characterised by weather that is often cloudy, wet and windy, but mild. Air quality is good and there are no Air Quality Management Areas within the setting.

2.28 There is a Noise Action Plan Priority Areas (NAPPA) at Maes y Llan, which lies between Junction 16 and Junction 16A. The NAPPA covers a group of houses that are close to the A55. Noise is considered further in the proof of evidence of my colleague Craig Barson (Document Ref WG 1.09.02).

Planning Policy

2.29 The ES was published in March 2021 and makes reference to national and local policy that was relevant at the time of writing. New policies including the National Development Framework: Future Wales – the National Plan 2040 (NDF)[8] (Document reference WG 4.01.37) and Planning Policy Wales 11 (PPW11)[9] (Document reference WG 4.01.51) have been published since the ES and these have implications for the Scheme. Policies and Plans are addressed in ES Chapter 5, but the new policies and their implications are discussed in the proof of evidence of Shân Wyn Jones (Document Ref WG 1.04.02).

Environmental Surveys

2.30 A programme of environmental surveys to support the environmental assessment has been completed for the Scheme. These commenced in 2017, continued in 2019 and 2020 to ensure that data is current. In all cases, the field work was guided and supported by desk studies (mapping, aerial photography, databases, historical records) and consultations with local stakeholders and statutory consultees. NRW, Conwy County Borough Council (CCBC), Cadw and Gwynedd Archaeological Trust were consulted regarding the scope, extent and method of the surveys and investigations.

2.31 Ecology surveys include:

a) Phase 1 Habitat survey in October 2017 and then repeated in June 2018 and June and July 2019. This survey also included gathering data on Invasive Non-Native Species such as Japanese Knotweed.

b) This extended Phase 1 survey also included several preliminary assessments for specific species. These assessments included summer and winter bat roost assessment on trees (no structures were present) in (June and July 2018 and 2019); otter and water vole habitat appraisal (October 2017 and June 2018); hedgehog, dormouse and reptile habitat and connectivity appraisal (October 2017, June 2018 and June and July 2019); badger survey (October 2017, June 2018 and June and July 2019).

c) Hedgerow Regulations survey and assessment was carried out in July 2019.

d) A survey for great crested newt and other amphibians was carried out on all ponds within 500 m of the Scheme in 2017.

[8] Future Wales: The National Plan 2040 | GOV.WALES

[9] Planning Policy Wales - Edition 11 (gov.wales)

e) Walked bat activity transects in five locations along the Scheme and static bat activity surveys to identify bat flight routes between June to September 2018. A further three transects on land not previously available, were conducted between May and September 2019. The completed surveys included high-risk locations where suitable habitat could be affected.

f) Static bat detectors were deployed for five nights in the high-risk locations on the transects affected by the Scheme, which included hedges and watercourses and where the risk of theft was low.

g) Otter habitat survey on the Afon Gyrach, which crosses the A55 to the east of the Shell service station. This involved two visits over and above the initial appraisal, in June and September 2019 to map the locations of spraints, holts, couches and other field signs. The appraisal of the habitat also checked for water volve and for pests (mink, cats and foxes).

h) Badger surveys were carried out in October 2017, June 2018 and then again in June and July 2019.

i) Reptile presence and absence surveys were carried out in October 2017 and updated in 2018.

j) Aquatic invertebrate surveys in the Afon Gyrach were completed in May and August 2019.

k) Wintering and breeding bird surveys were carried out between October 2017 and March 2018.

2.32 During 2020 a suite of further surveys was carried out to ensure that the survey data was up to date. The survey reports were prepared after the ES was completed and have been made available in the Appendices to the proof of Donna Hall (Document Ref WG 1.08.03).

2.33 Other environmental surveys included:

a) Ground investigation was undertaken during September 2019 and historical ground investigation data was obtained for the original A55 Expressway construction in the early 1980s.

b) Water and catchment drainage walkover survey in October 2018.

c) Landscape and visual surveys were carried out in March 2017 and again in July 2019 and included refinement of the study area.

d) A visual assessment carried out from publicly accessible viewpoints, followed by verification visits. Photographic viewpoint surveys were completed in 2018, 2019 and 2021 to record characteristic views of the

landscape and to show the viewpoints from which the road might be visible in.

e) Baseline lighting assessment was conducted along the Afon Gyrach in May 2019, after Nautical Twilight to collect illuminance readings for consideration of the effect of highway lighting on species using the river corridor and the existing bridge under the A55 and the railway.

f) Preliminary plantation and tree surveys were carried out in 2017.

g) Archaeology walkover surveys were completed in June 2019 to observe the landscape setting, and views from historic assets, designated sites and sites on the Historic Environment Record (HER), with a repeat visit in drier conditions later that summer to observe any parch marks that might be visible.

h) A geophysical survey was completed in May 2019 covering the extent of the Scheme. The archaeologist also implemented a watching brief during the ground investigation.

i) Community assets walkover survey in summer 2019.

j) Agricultural survey included the use of a telephone interviews with affected parties.

k) Baseline Air Quality assessments were based on the results of routine monitoring in automatic monitoring stations operated by Conwy County Borough Council (2018 results). These were supplemented with:

- Baseline local air quality monitoring over six months of 2018 at three locations along Penmaenmawr Road.
- Baseline attended noise level measurements were conducted in July 2019 during daytime at eight representative locations.
- Surveys of the numbers of pedestrians, cyclists and equestrians within the study area were undertaken at five locations on bank holiday Monday, 28 May 2018 between 08:00 and 20:00. A site visit was also made in September 2018.
- Traffic data obtained from the Welsh Government was sufficient for the assessment of water, air, noise and the effects on travellers.

3. Appropriate Assessment

3.1 A Statement to Inform an Appropriate Assessment (SIAA) (Document Ref WG 4.06.01) has been prepared covering Stage 1 (Test of Likely Significant Effect) and Stage 2 (Appropriate Assessment) of the Assessment of the Implications on European Sites (AIES). The process will be addressed in the proof of evidence of Donna Hall (Document Ref WG 1.08.02).

4. Environmental Impact Assessment by Topic

Assessment Methodologies

4.1 The project team have developed the EIA in accordance with the Screening and Scoping Reports, which, alongside the Record of Determination, are contained within ES Volume 3 Appendix 4.2 to 4.4 (Document Ref WG 3.01.03). The general method of assessment is described in Chapter 4 of the ES (Document Ref WG 3.01.01), while each topic chapter (Chapter 6 onwards) includes any specific methods used for that topic.

4.2 In the following sections, in my role as Environmental Coordinator, I summarise the contents of the ES chapters that address the EIA topics. Where a topic is the subject of a separate Proof of Evidence prepared by one of my colleagues, I include only a very limited description and refer to the relevant Proof of Evidence of others as necessary

Geology and Soils

4.3 The assessment of the environmental effects on the geology and soils of the Scheme is presented in ES Chapter 6 (Document Ref WG 3.01.01) and in Appendices 6.1 to 6.3 (Document Ref WG 3.01.04). The assessment has been carried out in accordance with the requirements of DMRB LA101, whilst the detailed assessment on the magnitude of impacts and significance criteria for effects has been undertaken using the methodology outlined in DMRB LA109 Geology and Soils (Document Ref WG 4.01.57). A proof of evidence addressing aspects of geology and soils has been prepared by my colleague Philip Studds ((Document Ref WG 1.12.02).

4.4 The identification of baseline conditions in relation to site geology, geomorphology and land contamination has been undertaken based on a review of available published information and information obtained during the ground investigation. A copy of the Envirocheck Report is included in Appendix 6.1. A ground investigation was conducted in 2019 and the results included in the Ground Investigation Report (ES Appendix 6.2). This report has also provided data for land contamination. A Contaminated Land Risk Assessment was completed and is included in ES Appendix 6.3 (Document Ref WG 3.01.04).

4.5 Geological and historical mapping and results of the ground investigation show that the bedrock is mudstones and siltstones with superficial deposits of sand, gravel, clay and boulders. There are also areas of made ground and potentially there are buried materials associated with past activities that include the stockpiling of quarry material, gas works, railway sidings, landfill and fuel filling station. The assessment has considered the likely effects of the scheme on the underlying geology, ground conditions, groundwater, and any areas of contamination.

4.6 The review of the groundwater monitoring undertaken during the ground investigation showed that groundwater was recorded in all the boreholes. It is anticipated that the presence of ground water is associated with flows through more permeable bands in weathered bedrock and superficial deposits.

4.7 There are no significant effects on the geology or underlying soils during the construction or operational phases of the Scheme. Some areas of ground gas were discovered, but there are no significant risks to the public of being exposed to contamination.

4.8 The Scheme, which lies within the Isle of Anglesey sheet for the Zetica Regional Unexploded bomb map, has been reviewed for the potential presence of Unexploded Ordnance (UXO) and the bomb risk for the Scheme is low.

4.9 The assessment of the risk of pollution releases as a result of operational or construction activities and potential impacts on hydrogeology are covered in ES Chapter 7 Road Drainage and Water (Document reference WG 3.01.01). Mitigation measures to protect the general public and site workers during the works would be detailed in the Construction Environmental Management Plan (CEMP) to be prepared prior to the construction works commencing and developed to ensure full compliance with relevant and current policy, guidelines and best practice.

4.10 The following list presents the assumptions that have been made for the purposes of this ES in terms of incorporated mitigation:

4.11 A CEMP will be prepared, based on the Pre-CEMP, which is included in ES Appendix 2.2. The Contractors' CEMP must be compliant with all relevant construction best practice and codes of practice. This would include impacts associated with compound establishment and activities such as use of fuels/oils which would be minimised by prioritising establishment of designated areas for fuels and materials storage and construction of pollution control measures.

a) Health and safety measures to protect workers during construction works.

b) Measures would be adopted during the construction works to mitigate environmental effects of ground works such as preventing run-off or dust, including if any temporary excavation and stockpiling of soils were to be required. Where material could be contaminated this is likely to involve the construction of temporary bunds and use of sheeting.

c) Relevant pollution control measures would be observed during construction in line with current legislation and best practice.

d) Construction would be compliant with the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites[10], in order to protect soil quality during excavation right through to reinstatement.

4.12 The assessment has shown that the construction of the Scheme is likely to remove or bury mineral resources within the Scheme footprint. The overall effect on the mineral resources is not considered significant. The effect of construction and operation on watercourses, ground water and the human population is also not considered significant. With no Evidence of Significant Contamination, no remedial measures are expected to be needed.

Road Drainage and Water Environment

4.13 The assessment follows the guidance set out in DMRB LA113 Road Drainage and the Water Environment (2019) (Document Ref WG 4.01.78) which provides the methodology and criteria for identifying likely impacts of a proposed road on the water environment and for predicting their magnitude and the significance of the resulting effects. LA113 includes the Water Risk Assessment Tool (HEWRAT). This tool is also used to assess the risk of spillage from road vehicles and the Scheme would be below the risk threshold that would require special pollution control measures.

4.14 The coastal waters of the Menai Strait and Conwy Bay north of Penmaenmawr and Dwygyfylchi are protected due to the importance of the marine life and inter-tidal habitat. This area of sea is also of excellent water quality for bathing. The Water Framework Directive (WFD)[11] (Document Ref WG 4.01.163) and Bathing Water Directive[12] (Document Ref WG 4.01.164) are important pieces of legislation that aim to provide a holistic approach to protection of the water environment and to address the chemical content of the water and marine ecology. As required by the Regulations[13] (Document Ref WG 4.01.165), the assessment has looked at the potential effects of the Scheme on the water quality of the rivers and watercourses that run into the sea, together with any potential risks associated with flooding that would be caused by the construction or operation of the Scheme. Although the Scheme is located beside the sea, and drains into it, it does not fall under the requirements of marine licensing. However, NRW require that a Water

[10] Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (publishing.service.gov.uk)

[11] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy EUR-Lex - 02000L0060-20141120 - EN - EUR-Lex (europa.eu)

[12] Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC EUR-Lex - 02006L0007-20140101 - EN - EUR-Lex (europa.eu)

[13] The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017, SI 2017/407 (legislation.gov.uk)

Framework Directive (WFD) assessment is carried out due to its proximity to the coast. A WFD Assessment has been prepared and forms ES Appendix 7.1.

4.15 The Afon Gyrach descends the steep hill slope to the south of Capelulo and then turns north-west and continues its descent before crossing the more gently-sloping agricultural land of the coastal plain and passing through village of Dwygyfylchi. It flows under the A55 and the railway and then crosses the beach to discharge into Conwy Bay approximately 1 km east of the existing Junction 16 roundabout. The morphology of the river indicates that it is likely to be subject to flash flows. It has 'good' status under the WFD classification.

4.16 A small seasonal watercourse is culverted under the A55 to the west of Junction 16A and this discharges into Conwy Bay.

4.17 To the west and north of the Scheme, shingle and rock beaches line the coast of the Menai Strait and under the WFD classification, the Strait has good status whilst Conwy Bay, to the east has overall moderate status.

4.18 A Flood Consequences Assessment (FCA) for the Scheme is included in Appendix 7.2. The Scheme is mostly within Flood Zone 1. The existing A55 at the Afon Gyrach bridge is within Flood Zone 3 (1% or greater annual probability of flooding from a river). Low-lying land immediately to the south of the A55 and along the banks of the Afon Gyrach through Dwygyfylchi are also at risk of flooding (Flood Zone 3).

4.19 The Scheme will increase the area of impermeable hard surfacing a proposed new drainage system will include attenuation systems to provide temporary storage runoff and a discharge rate no greater than the existing road. Existing discharges will be used into Conwy Bay and into the Afon Gyrach.

4.20 The Scheme includes measures to protect the environment from road drainage, in addition to a surface water attenuation basin located to the east of the fuel filling station. These measures include pollution control and containment measures in case there are spillages on the A55. The Scheme would result in slightly higher flood levels in the Afon Gyrach, but this increase in flooding would affect land wholly in Welsh Government ownership, if the CPO is made.

4.21 During construction there would be measures in place to protect watercourses and the sea from silt and spilled pollutants. These measures would be monitored following completion of the Scheme to ensure they continue to be effective. With these measures in place there would be no adverse effects on the protected coastal waters, inter-tidal areas or bathing water quality. The Scheme would thus be in compliance with the WFD.

4.22 Standard good practice measures to protect water resources would be implemented during construction and would be set out in the contractor's Construction Environmental Management Plan (CEMP) (Document Ref WG 3.01.03). ES Appendix 2.2 contains the Pre-CEMP. The measures would be based on the Guidance for Pollution Prevention

4.23 Overall, it is anticipated that the impacts on the water environment because of the construction and operation of the Scheme would not result in any significant adverse effect. The Scheme would not adversely affect the status of the WFD waterbodies nor prevent these from reaching 'Good' status.

Nature Conservation

4.24 This environmental topic is addressed in the proof of evidence of my colleague Donna Hall (Document Ref WG 1.08.02). A summary of the conclusions of the nature conservation assessment is provided here, but this topic is considered in greater detail in ES Chapter 8 Ecology and Nature Conservation (Document reference WG 3.01.01).

4.25 The coastal waters and inter-tidal areas north of the Scheme are designated sites of national and international importance and include:

a) Menai Strait and Conwy Bay SAC

b) Pen y Gogarth SAC

c) Puffin Island SPA

d) Traeth Lavan (to the west)

e) Liverpool Bay SPA (to the north-east)

4.26 A Statement to Inform an Appropriate (SIAA) Assessment (Document reference WG 4.06.01) has considered the likely effects of the Scheme on these sites of national and international importance. A wide range of birds are recorded in the area, including species normally associated with coastal habitats. A survey of overwintering birds identified that large numbers of oystercatchers foraging in the intertidal zone also take refuge during high tide on local grasslands. There would be no significant effects on these protected areas or overwintering birds as a result of the Scheme. The construction and operational effects would not adversely affect the integrity of SAC or the SPA.

4.27 No bat roosts would be lost because of the Scheme.

4.28 Mitigation to reduce potentially adverse effects includes:

a) Vegetation clearance would be carried out at the appropriate season to avoid harm and disturbance to bats, reptiles and nesting birds.

b) Tree and shrub planting to form coastal scrub and woodland would restore and extend established linear belts to form an enhanced wildlife corridor between Penmaen Mawr and Penmaen Bach. These replanted

areas along the proposed link road, around Junction 16 and 16A, would provide cover, connectivity and flight lines for fauna.

c) Seeding of all new grass areas with wildflowers to encourage pollinators.

d) Measures to avoid an increase in light spread into the Afon Gyrach corridor to reduce the adverse effects of road lighting on nocturnal species.

e) Integral or surface mounted bat roosting boxes would be installed in structures and walls.

f) Otter fencing to exclude the species from the A55 and link road either side of the Gyrach Crossing.

g) Capture and removal of slowworms from areas affected by construction activity.

4.29 Many of the impacts would be short term during the construction period with the removal of some vegetation and disturbance to species such as bats and birds. However overall, the Scheme would be beneficial with an increase in vegetated habitats, including species rich grassland and mixed evergreen and deciduous trees and shrubs.

Landscape and Views

4.30 This environmental topic is addressed in the proof of evidence of my colleague Jon Stoddard (Document Ref WG 1.07.02). A precis of the conclusions of the landscape assessment is provided here, but this topic is considered in greater detail in ES Chapter 9 Landscape (Document Ref WG 3.0101). The impact of the Scheme on residential properties and these other sites are set out in the same chapter of the ES and the associated Figure 9.10 and Appendix 9.5.

4.31 The assessment of landscape and visual effects was carried out in accordance with the methodology described within the DMRB LA107 Landscape and Visual Effects (W)[14] (Document Ref WG 4.01.70), which replaced guidance in the DMRB Volume 11 (Document Ref WG 4.01.68) and IAN 135/10 (W) (Document Ref WG 4.01.69). The guidance refers to Guidelines for Landscape and Visual Impact Assessment Third Edition (GLVIA3)[15] (Document Ref WG 4.01.77).

[14] Interim Advice Note 135/10 (W), Landscape and Visual Effects Assessment (Wales only), Welsh Government, 2014

[15] Guidelines for Landscape and Visual Impact Assessment Third Edition (GLVIA3), published by the Landscape Institute and the Institute of Environmental Management and Assessment, 2013

4.32 A desk study review of the landscape resource and topography principally based on the formally adopted LANDMAP data system which was followed up by a visual and photographic survey from publicly accessible viewpoints without direct access to residential properties or business premises.

4.33 Construction of the Scheme would result in the clearance of sections of plantations growing between the A55 and Conwy Road, and at Maes y Llan, which would have an adverse effect on views for some residents. Early consultations with residents identified a desire to retain seaward views. Construction of the proposed link road from Junction 16 to Junction 16A would be accompanied on the south side by a false cutting, of sufficient height to screen the views of most high-sided vehicles on the link road and the A55, while still allowing sea views from residential properties. The false cutting would also include walls and southern slopes graded out to a gentle profile. Planting on the north side of the false cutting would further screen views of the roads. Mitigation planting would take several years to establish and reduce the visual impact from some locations.

4.34 The most significant impact on the landscape character of the area is confined to landscape character areas immediately adjacent to the existing A55 road corridor between Junctions 16 and 16A. The existing road corridor is already a significant man-made landscape element that crosses the coastal plain between Penmaenmawr and Penmaen-bach headland. As a result of the Scheme, the road corridor would become significantly wider and encroach towards the settlement of Dwygyfylchi. The highly scenic qualities of the surrounding upland areas to the south including the Snowdonia National Park would remain intact. There would be no significant change to the wider landscape character.

4.35 The result of the mitigation measures would mean that the A55 and link road would be screened from the views of nearby residential areas such as those along Ysguborwen Road, Gwel y Mor and Cae Gwynan while keeping open views of the sea beyond. Properties further south, and slightly more elevated would also be partially of fully screened from views of the link road and the A55.

4.36 The proposed link road would pass closer to the residential properties at Maes y Llan and would require the removal of all existing planting that currently screens views north to the A55 and views from ground floor as well as first floor windows would be opened up across the A55 to the open sea. During a site meeting with the residents of Maes y Llan, held in July 2021, to discuss noise mitigation for Maes y Llan, the overriding view expressed to the representatives of Welsh Government was that a view of the sea was preferable to noise barriers or visual screen planting of the kind that is present at the moment.

Archaeology and Cultural Heritage

4.37 The assessment of archaeology and cultural heritage has been carried out in accordance with the guidance set out in LA 106[16] (Document Ref WG 4.01.150) and is set out in ES Chapter 10 Archaeology and Cultural Heritage. LA 106 provides guidance on the assessment and management of environmental effects including magnitude and significance. TAN 24[17] (Document Ref WG 4.01.29) provides guidance on decision making in the planning process. TAN 24 adopts the Cadw Conservation Principles[18] (Document Ref WG 4.01.152).

4.38 The Settings of Historic Assets in Wales[19] (Document Ref 4.01.153) gives guidance on measures to assess the potential visual impact of development. This document indicates that all historic assets, irrespective of their designation, are included. In accordance with the guidance, all historic assets within 1 km are to be considered[20].

4.39 Walk-through surveys were conducted in 2018 and a geophysical survey was undertaken in 2019, covering the footprints of the Scheme. A report on the results of this programme of magnetometer survey is presented in ES Appendix 10.5.

4.40 During the ground investigation the archaeologist made observations of trial pits and boreholes within areas of potential archaeological interest. No other intrusive archaeological investigation within the Scheme boundary has been undertaken to date. Remote sensing has identified several locations that potentially contain buried archaeological evidence. Most appear to be of natural or recent origin.

4.41 Published guidance requires two study areas:

1. **1 km study area** (all known assets): Eight listed buildings, 10 further historic buildings, two conservation areas. 72 sites are listed in the Historic Environment Record. 26 anomalies were identified by the geophysical survey, of which several are buried modern services. The field survey identified a total of nine post-medieval features. All historic assets are shown in ES Figure 10.2 to 10.7 (Document Ref WG 3.01.02).

[16] LA 106 - Cultural heritage assessment - DMRB (standardsforhighways.co.uk)

[17] Technical advice note (TAN) 24: the historic environment | GOV.WALES

[18] Conservation Principles for the Sustainable Management of Historic Environment in Wales (Cadw 2011)

[19] The Settings of Historic Assets in Wales (Cadw 2017).

[20] ES Chapter 10 Archaeology and Cultural Heritage Paragraph 2.2.21.

2. **5 km study area** to identify designated sites. 28 scheduled monuments, five listed buildings, four conservation areas 43 sites were found in total. These are shown in ES Figure 10.1 and listed in ES Appendix 10.1 and 10.2.

4.42 A desk-based assessment was prepared with full coverage of the regional HER for the main study area, together with details of defined Historic Landscape Character Areas (LCA), Scheduled Monuments, Listed buildings and Landscapes of Special Historic Interest and Conservation Areas.

4.43 The North Arllechwedd Historic Landscape, which surrounds Penmaenmawr, is noted for its open landscape and archaeology. These uplands contain numerous Scheduled Ancient Monuments such as hillforts, hut circles, cairns and enclosures.

4.44 Most of the archaeological and cultural heritage assets contained within the area covered by the Scheme are from the last two hundred years, but with a range of features stretching back through to the medieval period. There is potential that intrusive works on the Scheme may uncover previously unrecognised archaeological deposits.

4.45 The Scheme would have no significant effects on designated sites but would affect assets identified by geophysical survey. An Archaeology and Heritage Desk-based Assessment was completed and the report in included in Appendix 10.3.

4.46 An archaeological watching brief would be undertaken during the site clearance and construction stages of the Scheme. This will take place over the full extent of the Scheme and all areas to be used on a temporary basis for construction compounds and access roads.

4.47 A programme of evaluation trenching should be carried out across the assets discovered in the geophysical survey. This includes proposals for the archaeological recording of assets effected by the Scheme. Depending on the results there may be a requirement for mitigation recording of archaeological deposits found at these locations and anywhere else within the footprint of the Scheme.

Community Assets

4.48 The assessment of effects on Community and Private Assets has been carried out in accordance with DMRB Volume 11 Section 3 Part 6 Land Use. The new DMRB guidance for this topic (LA112[21] Document Ref WG 4.01.166) was published after the scope of the ES topics was prepared and agreed (ES Chapter 1, Section 1.5). However, the new ES structure set out in the guidance would have placed this topic within the new chapter entitled

[21] LA 112 - Population and human health - DMRB (standardsforhighways.co.uk)

Population and Human Health. Having agreed the scope this Community Assets chapter was prepared as a self-contained assessment.

4.49 The assessment has examined the effects on community and private assets including development land, agricultural land, open space, use of existing routes and private assets.

4.50 The Scheme would permanently affect approximately 8.8 hectares of agricultural land, all of it on the south side of the existing A55. None of the area lost comprises 'best and most versatile' agricultural land. Two farm businesses would be affected. Pendyffryn Farm, which forms part of an 800-hectare farm enterprise would lose 6.1 hectares permanently and 0.9 hectares on a temporary basis. Ty Newydd Henryd farm would lose 2.3 hectares of grazing. The assessment shows that both enterprises will experience a moderate or limited effect on full time farm business, which equates to a Slight Adverse Effect.

4.51 The impact of land take for the Scheme would be a large adverse effect on the viability of allocated housing land at Maes y Llan and on the contingency employment allocation at Shell Orme Garage in the adopted Conwy Local Development Plan.

4.52 Active Travel routes would be provided to enhance connectivity and access to community facilities, employment and services provided in Penmaenmawr. The Scheme includes combined use routes from Conwy Road in the west to Junction 16A in the east and south into Dwygyfylchi. Links extend across the A55 to connect with the shore and the National Cycle Network Route 5, which follows the North Wales coast. Further detail of these measures is set out in Chapter 14 of the ES and shown on ES Figures 14.1 and 14.2 in the EMP (ES Appendix 2.5). These are assessed as having a beneficial effect.

Air Quality

4.53 The Air Quality Assessment is in ES Chapter 12 and this topic is addressed in the proof of evidence by my colleague Graham Harker (Document Ref WG 1.10.02).

4.54 A baseline assessment of air quality conditions in the vicinity of the Scheme and an assessment of the likely air quality impacts associated with the construction and operation of the Scheme have shown that existing pollutant concentrations in the study area are low and meet air quality objectives. There are no areas where air quality is poor.

4.55 The assessment of potential impacts to air quality during construction phase has identified that construction activities would affect air quality and considered together with the proximity of nearby sensitive receptors, there would be a high risk of impacts on air quality in the absence of suitable

mitigation. With mitigation in place the effects of construction dust have been assessed as not being significant.

4.56 For operation of the Scheme, concentrations of NO_2 and PM_{10} have been predicted for a number of worst-case locations representing existing properties adjacent to the road network. Surveys of existing air quality, which were undertaken in 2018 have been compared with calculations of air quality in 2022/2023, when the Scheme would be open for traffic. An assessment of air quality following completion of the Scheme and during operation has been undertaken that indicates that there would be a reduction in vehicle emissions and airborne pollution. Predicted concentrations of Nitrogen dioxide (NO_2) and Particulate Matter (PM_{10}) would be well below the relevant objectives at all of the existing receptor locations in 2022 with the Junction 16 Scheme in place. The effects of the traffic on local air quality are judged not to be significant with an overall slight improvement in air quality concentrations.

4.57 An increase in Nitrous oxides (NO_x) concentrations and nitrogen deposition on ecological receptors is unlikely to have a significant effect on the integrity of the receptors given the magnitude of the predicted changes and the limited areas of the habitats affected. The operational air quality effects of the Junction 15 Scheme are judged to be not significant for both human health and ecological receptors.

4.58 Overall, it is concluded that there are no air quality constraints to the proposed Scheme. The air quality assessment does not take into consideration the conversion of the UK vehicle fleet to electric power by 2030.

Noise and Vibration

4.59 A summary of the conclusions of the noise and vibration assessment is provided here, but this topic is considered in greater detail in the ES Chapter 13 Noise and Vibration and is addressed in the evidence of Craig Barson (Document Ref WG 1.09.02). ES Figures 13.1 to 13.4 show the changes to noise because of the Scheme based on worst-case assumptions. Further assessments have been undertaken since the ES was published and these are referred to in Craig Barson's evidence (Document Ref 1.09.02). The results of the further work show that traffic noise would be reduced for most or all receptors compared to the existing situation.

4.60 This assessment examined how the Scheme would change noise and vibration associated with construction and operation of the Scheme. The A55 is the primary source of noise in the area. Where traffic noise exceeds acceptable levels at Maes y Llan, there is a Noise Action Plan Priority Area (NAPPA). Surveys of existing noise levels were undertaken in 2018. The assessment showed that during the construction period there would be an increase in noise affecting people living close to the Scheme as a consequence of some construction activities.

All Travellers

4.61 I have summarised the main points of the All Travellers assessment, but details of the footways/cycleways and highways are addressed in the evidence of my colleague Jonathan Bayliss (Document Ref WG 1.05.02).

4.62 This environmental topic addresses the requirement of the Well-being of Future Generations (Wales) Act 2015[22] (Document Ref WG 4.01.04) and the Active Travel (Wales) Act 2013[23] (Document Ref WG 4.01.05). It also addresses the effects that the Scheme would have on pedestrians, cyclists, equestrians, and vehicular travellers. The Active Travel Act refers to walking or cycling as an alternative to motorised transport for the purpose of making regular and daily journeys. Active Travel is a journey made to or from a workplace or educational establishment or to access other services or facilities. This covers short distance commuting such as travel to school, shops or leisure facilities and has to be suitable for everyday use. It does not cover routes or sections of routes that are just used for leisure or recreational purposes. Following consultations with Conwy County Borough Council, Sustrans and Cycling UK, a number of active travel routes have been proposed within the Scheme including improvements to National Cycling Network Route 5 (NCNR5). The Scheme would contribute to both the Well-being of Future Generations (Wales) Act 2015 and the Active Travel (Wales) Act 2013 through the provision of a number of walking and cycling routes. This would include:

a) Links to the National Cycle Network Route 5 (NCNR5)

b) Improved footbridge to cross the A55 at Puffin Services

c) Additional crossing of the A55 at the proposed Junction 16A overbridge

d) Improved cycleway/footway from Junction 16 east along Conwy Road

e) Improved cycleway/footway from Junction 16 west along the proposed link road and into Dwygyfylchi along Glan yr Afon Road

4.63 During construction, a Construction Traffic Management Plan would be put in place by the contractor to manage any diversions or road closures. Junction 16 slip roads would be closed for a period and two lanes of the A55 would be kept open in each direction with a speed limit. There would be a temporary increase in noise levels due to construction works that could also affect travellers on local routes close to the A55 (Traffic and construction noise is addressed in the Proof of my colleague Craig Barson). The assessment has concluded that there would be minor disruption to vehicle traffic. Drivers on

[22] Well-being of Future Generations (Wales) Act 2015 anaw 2 (legislation.gov.uk)

[23] Active Travel (Wales) Act 2013 anaw 7 (legislation.gov.uk)

the A55 might also suffer increased stress as a result of the narrowed lanes but, when fully operational, the improvements in safety would reduce driver stress. During operation of the Scheme, there is predicted to be a minimal change in traffic flows on the A55 and local road network.

Materials

4.64 The assessment of the effects of the Scheme on the use of materials and waste generated during the construction and operational stages of the project is reported in Chapter 15 of the ES. The assessment provides details of bulk earthworks and the results of the geotechnical investigations, and then considers the effects on the construction footprint and on a wider area determined by the extent of travel to waste facilities.

4.65 The assessment has considered bulk material requirements and waste arisings and the potential to reuse arisings within construction, key sources construction materials waste / recycling facilities within the wider area, and the potential for contaminated land. Waste would be minimised by recycling and suitable recycled materials would be used in construction wherever possible and feasible. Road planings, aggregate recovered from the existing road and demolition materials would be suitable for use in construction.

4.66 About 500 tonnes of green waste would be generated and this would be taken for disposal to a recyling centre. Waste that would require disposal to landfill has been calculated as 400 tonnes arising from demolition, treatment of invasive non-native species and off-cuts and office waste. A contaminated land assessment indicates that all materials arising from the site should be capable of reuse within the works.

4.67 During construction the Scheme would require a volume in the order of 145,940 m^3 of fill material, of which around 32,820 m^3 would be won on site. There would be a shortfall in the volume of fill in the order of 113,120 m^3 which would need to be imported from elsewhere. The contractor responsible for construction would be expected to find suitable sources of material from quarries. Opportunities would be sought wherever possible to make use of local projects to source suitable fill materials for construction. Waste would be minimised by recycling and suitable recycled materials would be used in construction wherever possible and feasible.

4.68 On the basis of assessment against the defined criteria, the Scheme will have a large effect and would be significant in terms of re-used/recycled content. This is because the Scheme has a shortfall of materials for construction which would need to be imported. With adequate mitigation to maximise the reuse and recycling of materials the assessment concluded that there will be no residual significant environmental effects as a result of the proposed Scheme.

Climate Change

4.69 The Scheme has the potential to influence the climate and so a climate change assessment has been made. I have summarised the main points of the Climate Change assessment, but a Proof of Evidence addressing this topic has been prepared by my colleague Simon Price (Document Ref WG 1.02.02).

4.70 The assessment, which is reported in ES Chapter 16 addresses the potential effects of the Scheme on Greenhouse gas (GHG) emissions, the resilience of the Scheme to the consequences of climate change (CCR) and the in-combination climate change impact (ICCI), which evaluates the combined effect of the proposed development and potential climate change impacts on the receiving environment during construction and operation.

4.71 Further assessments have been undertaken since the ES was published, using new data and the findings are summarised in Simon Price's evidence (Document Ref WG 1.02.03).

4.72 The full GHG assessment is presented in ES Appendix 16.1. The ES Chapter 16 reports that construction of the Scheme would produce a total emission of 11,603 tonnes of carbon dioxide. A table summarising the results of the assessment, is set out in the ES Chapter 16, Table 16.7.

4.73 The IEMA method of assessment (Document Ref WG 4.01.45) states that all GHG emissions contribute towards climate change and are significant. On that basis the ES reports that the emissions from construction are significant. The current guidance in LA114 introduces a new definition of significance advising in Paragraph 3.2 that 'The assessment of projects on climate shall only report significant effects where increases in GHG emissions will have a material impact on the ability of Government to meet its carbon reduction targets'. Simon Price sets this into the current context in his proof of evidence, which updates the conclusions set out in the ES Climate Change chapter.

4.74 The Climate Change (Carbon Budgets) (Wales) Regulations 2021[24] (Document Ref WG 4.01.154) came into effect on 19 March 2021, after the ES was published, setting the Welsh Carbon Budget for the period 2021 to 2025. The total construction carbon emissions for the proposed project represent a fraction of 1% of the Wales Carbon Budget 2 and is not expected to materially affect the Welsh Government's ability to achieve that budget. The new DMRB standard LA114, states that 'It is very unlikely that the impact

[24] The Climate Change (Carbon Budgets) (Wales) (Amendment) Regulations 2021, SI 2021/87 (legislation.gov.uk)

of a road project will, in isolation, affect the ability of Government to meet its carbon reduction plan targets'.

4.75 During operation of the Scheme, traffic is predicted to be similar to the 'Do Minimum' scenario. In these circumstances, user greenhouse gas emissions, assessed over a 60-year appraisal period would benefit from replacing stop-start driving conditions with free-flowing traffic contribute to improved vehicle emissions. The effect of the proposed junction arrangement is that the release of operational greenhouse gases would increase by 1,005 tonnes compared to the 'Do Minimum'.

4.76 The climate change resilience assessment considered aspects such as increasing frequency and intensity of rainfall, extended periods of drought, increases in severe heat waves, extreme cold weather events, coastal flooding, gales and storms and demonstrates that the Scheme is not vulnerable to the effects of climate change, and so no mitigation measures would be required.

4.77 No additional mitigation measures relating to In-Combination Climate Change Impacts assessments have been identified as being required for the operational stage.

4.78 The assessment concludes that whilst the Scheme will not result in any significant effects with regards to climate change resilience or in-combination climate impacts.

Risk of Accident and Disaster

4.79 The Scheme is designed to resist the normal adverse effects of natural and man-made events that might be expected to affect the area in which it is sited, for example, flooding, high winds, or vehicle collisions. Some very unlikely natural and man-made events, for which the Scheme cannot be designed, could occur such as extreme weather events and severe flooding events following tidal surges from the sea.

4.80 The assessment demonstrates that the Scheme would not worsen the consequences for the environment but could result in closure of the A55 for a short period while damage is repaired. Mitigation for these events would include advanced warning signs and advanced planning for the consequences of collisions and repair of damage to the road.

Population and Human Health

4.81 A Population and Human Health Assessment was undertaken to meet the requirements of the EIA Regulations (2017)[25] (Document Ref WG 4.01.155),

[25] The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, SI 2017/572 (legislation.gov.uk)

the Public Health (Wales) Act 2017[26], the Well-being of Future Generations (Wales) Act (2015) (Document Ref WG 4.01.04) and the Equality Act 2010 (Statutory Duties)(Wales) Regulations[27] (Document Ref WG 4.01.167). The assessment is reported in ES Chapter 18 and it draws on the results of other assessments reported in the ES. A Health Impact Assessment was carried out and is included in ES Appendix 18.1.

4.82 The Scheme has the potential to influence the health and wellbeing of communities because of changes to environmental, social, and economic determinants of health. The assessment of population and health has drawn upon the work carried out in a number of other specialist assessments undertaken as part of the EIA. The assessment has considered the potential effects on people and their health through assets affected by the Scheme, and by considering potential effects arising from natural resources such as geology and soils, the landscape, the atmosphere, the effects of noise and vibration, and the risks of accidents and disasters.

4.83 Consultations with key bodies managing health and care were undertaken including health boards, the local authority, and Public Health Wales.

4.84 The Scheme is located in a rural area with low population density. The nearest population centres are the Town of Penmaenmawr to the west and the village of Dwygyfylchi to the south, both are located close to the sea in Conwy County Borough. The nearest homes to the Scheme are along Ysguborwen Road and Maes-y-Llan in the vicinity of Dwygyfylchi.

4.85 Penmaenmawr has a resident population (30 June 2017) estimated to be 2,422 people and a population density of approximately 2,833 persons per square kilometre (sq km). Dwygyfylchi has a resident population (30 June 2017) of 1,211 people and a population density of approximately 2,329 persons per sq km.

4.86 Approximately 23% people in Penmaenmawr are aged over 65, while the percentage in Dwygyfylchi) is 30%. This figure is higher than Wales where this percentage is 21%. The older age profile in the study area is an important consideration for the health and equalities assessments, as the elderly population can be considered a susceptible population and can have an increased requirement for healthcare services and changes to well-being and mobility. The gender split in Penmaenmawr and Dwygyfylchi is similar to that of Wales as a whole, with approximately 51% female and 49% male. The 2011 census shows that Penmaenmawr and Dwygyfylchi are comprised of homogeneous ethnic populations with over 96% (Penmaenmawr) and over

[26] Public Health (Wales) Act 2017 anaw 2 (legislation.gov.uk)
[27] The Equality Act 2010 (Statutory Duties) (Wales) Regulations 2011, SI 2011/1064 (legislation.gov.uk)

98% (Dwygyfylchi of the population being classified as identifying as being white British as compared to 93% across Wales.

4.87 A Health Impact Assessment noted that the closest receptors to the Scheme are residential properties along Ysguborwen Road and in Maes y Llan.

4.88 The National Clean Air Strategy 2019 (Document Ref WG 4.01.159) sets out the health determinants as No_x, $N0_2$, particulate matter (PM_{10} or smaller) and noise.

4.89 Construction dust is likely to be coarse particle sizes, with only a fraction likely to be in the PM10 size range. The risk of dust soiling impacts is likely to be highest for earthworks and construction activities. With measures in place to control this dust the effect is likely to be negligible with mitigation, and the risk of human health effects from this activity is likewise anticipated to be negligible.

4.90 PM_{10} impacts are also projected to be negligible, with concentrations at all receptors modelled to be decreasing slightly or remaining the same compared with the existing situation.

4.91 NO_2 impacts from the Scheme are projected to be negligible, with concentrations at all receptors modelled decreasing slightly, remaining the same, or increasing by no more than 1%. The modelling is likely to give a different result with lower nitrous oxide emissions if reconsidered based on a conversion of the vehicle fleet to non-fossil fuel energy. Based on these two pollutants, the health implications of air quality changes from the Scheme are judged to be minimal, and no health effects are anticipated from these minimal air quality changes resulting from the Scheme.

4.92 During construction, noise and vibration effects from the Scheme are anticipated to be temporary. The 11 noise-sensitive receptors were evaluated, but no significant noise effects are predicted during the construction phase. No significant vibration levels are predicted with sheet steel piling but there is the potential for significant effects associated with vibratory compaction around Maes y Llan.

4.93 The Scheme is predicted to result in a noise level decrease at majority of the receptors. This is attributed to a diversion of traffic from Glan-Yr-Afon Road in Dwygyfylchi into a new bypass road. Where a noise level increase is predicted, this is attributed to an in increase in traffic speed around the existing junction and realignment of the roads with introduction of additional carriageways closer to the receptors. No receptors are predicted to experience a significant decrease effect.

4.94 During construction of the Scheme access to some local amenities could be adversely affected but would be improved when the Scheme is completed. Further beneficial effects would be as a consequence of increased public

open space, and provision of additional shared use routes (cycle and pedestrian) and access to areas of amenity.

4.95 The Health Impact Assessment concluded that there would be some adverse effects during construction, caused by construction noise and driver stress. When the Scheme is completed and in operation, there would be no adverse effects and there would be beneficial effects brought about by reduced driver stress and a reduction in road accidents as a result of removing the existing roundabout and construction of the new grade separated junction.

4.96 There would be no adverse impact on achieving the goals of the Well Being of Future Generations (Wales) Act 2015 and the Active Travel (Wales) Act 2013. Following completion of the scheme there would be some beneficial effects resulting from improved provision for non-motorised users such as cyclists and pedestrians.

Cumulative Effects

4.97 Cumulative effects are those impacting on receptors but arising from multiple sources and these are reported in ES Chapter 19 Cumulative Effects.

4.98 The assessment has been completed in accordance with current guidance, advice and attempts to present a systematic review and holistic approach. Two types of cumulative effects are considered:

1. Inter-relationships between effects arising from the Scheme. The assessment identifies a ‘modest’ cumulative effect; and
2. The addition or interaction of effects arising from other developments in combination with the Scheme. In particular, the separate A55 Junction 14 and Junction 15 Scheme has the most potential to have cumulative effects on several environmental receptors. Any potential cumulative effects can be either minimised and/or avoided through communication and planning of both schemes.

5. Preliminary Design of the Scheme

5.1 In 2017 Carillion with Ramboll, RML and YGC were awarded the Early Contractor Involvement (ECI) contract for improvements at both Junctions and 15 and 16. Early work on the A55 Junction 16 and 16A Improvements included the application of the Welsh Transport Appraisal Guidance (WelTAG)[28] (Document Ref WG 4.01.36) Stages 1 and 2. A description of the process of appraisal, and the environmental factors that guided the choice of preferred route, are set out in ES Chapter 3.

5.2 The two roundabouts at Junctions 15 and 16 and the dual carriageway and new tunnels were planned and constructed between 1989 and 1993 to serve volumes of traffic on the trunk road that were forecast at that time. From 2005 onwards studies of the A55 route and the two junctions were completed that considered a range of options for improvements. These two roundabouts are the only at-grade roundabouts on this road and are considered to be a cause of increased journey times and poor journey time reliability. The safety hazard posed by incidences of stationary traffic backing-up into Pen-y-Clip and Penmaenbach Tunnels was also an important consideration. Traffic and safety are considered in the proofs of evidence of Jonathan Bayliss (Document Ref WG 1.05.02) and Nigel Robert (Document Ref WG 1.03.02).

Scheme Environmental Objectives

5.3 The project team developed a draft set of environmental objectives to guide the design and the development of mitigation. These objectives, reported in the ES, were further developed, and agreed with the statutory environmental bodies who attended the Environmental Liaison Group (ELG) meetings, including Cadw, Natural Resources Wales (NRW), Conwy County Borough Council, Welsh Government Environmental Coordination and Advice Team (ECAT) and North and Mid Wales Trunk Road Agent (NMWTRA). The agreed objectives are divided into two groups; avoidance or mitigation of impact; and enhancements to support the purposes of the Well-Being of Future Generations Act 2015. Some of these objectives include aspects that are less achievable now that the ECI contractor is not involved.

Avoidance or Mitigation of Impacts to Provide:

a) Connectivity to and from the coast, and either side of the A55 so that communities continue to enjoy public services and open spaces.

[28] https://gov.wales/welsh-transport-appraisal-guidance-weltag#:~:text=Welsh%20transport%20appraisal%20guidance%20%28WelTAG%29%20WelTAG%20should%20be,transport%20proposals%20promoted%20or%20funded%20by%20Welsh%20Government. [accessed 21.08.2021]

b) Protection of community assets and local businesses from adverse impacts during construction.

c) Protection of the quality of urban spaces and listed buildings and that would otherwise be adversely affected through the careful alignment of roads, surfacing of footways, earthworks and tree and shrub planting.

d) Minimise adverse impacts on buried archaeological sites.

e) Landscape integration the junctions into their coastal settings by avoidance of further 'industrialisation' of the road corridor.

f) Consider the design of the Scheme to achieve an overall reduction in traffic noise nuisance, problems associated with airborne pollution and visual impact of traffic.

g) Protect valued seaward views in the long term through careful design and aftercare.

h) Minimise light spill from highway lighting to avoid or reduce the impact on 'Dark Skies' within the Snowdonia National Park.

i) Protection of the marine SPA and associated species and habitats.

j) Improved road drainage to reduce the adverse impacts of A55 traffic pollutant spills on water quality in watercourses and on the sea.

k) Protect habitats and biodiversity and provide habitats designed to suit the coastal context.

l) Consider whole-life cost, health and safety risks and onerous management commitments when designing the soft estate.

Enhancements to support the purposes of the Well-Being of Future Generations Act:

m) Support community life and economic viability through enhanced cohesion and connectivity, support for education, learning and community involvement.

n) Enhanced quality and quantity of public spaces associated with the road corridor.

o) Improve access and enjoyment of the coastal setting, the townscape and the seafront, while enhancing opportunities for walking cycling and healthy lifestyles.

p) Enhance biodiversity through habitat creation, habitat connectivity and improvements within the road corridor in a manner that reflects and supports the coastal setting.

Appraisal of Options

5.4 Options for the improvements were identified through stakeholder engagement exercises, consultations with statutory environmental bodies, technical assessments, previous studies and published data. Welsh Government determined that keeping the existing situation would not be acceptable as it would lead to the existing problems continuing. An appraisal of the options considered how the problems and constraints could be understood, objectives met, and the key risks and adverse effects identified. The impact of the options on residents living in the setting of the Scheme was a particular concern, particularly within the tightly constrained corridor.

5.5 During the WelTAG Stage 2 Appraisal it became clear that there was a need for some environmental surveys to support decision-making. There were also concerns about the impact of the options on residents living in the setting of the Scheme.

5.6 Desk studies to obtain data, and environmental surveys that could be conducted from publicly accessible areas, commenced in 2017 and 2018. Those early surveys are listed in Section 2 of my proof.

5.7 The survey and desk study results identified constraints on the Scheme, and alongside the views expressed at public information events, and consultations with statutory environmental bodies, these influenced the choice of route and took into consideration the Scheme Environmental Objectives.

5.8 The five main options ('A' to 'E') that were considered in the WelTAG Stage 2 assessment are briefly described in ES Chapter 3 Alternatives Considered, Paragraphs 3.3.12 to 3.3.23. The statutory consultation on these options is summarised in that same chapter Section 3.4.

5.9 The Preferred Option 'A' performed best against the Project Objectives (Chapter 2, Section 4) and against performance requirements set out in the WelTAG guidance. The reasons for the selection are set out in ES Chapter 3 Paragraphs 3.4.10, and the Minister's Decision to adopt the preferred route is set out in Section 3.5.

5.10 The key environmental considerations that influenced the selection of the preferred route were:

5.11 The key environmental considerations that influenced the selection of the preferred route were:

a) Avoidance of large scale changes at the existing Junction 16, which would affect more residential properties, by making Junction 16A the grade separated junction.

b) The potential to reduce the visual impact of the existing A55 and the proposed link road and junction, while retaining valued views to the sea.

c) The potential to reduce traffic noise affecting most nearby properties.

d) Other options would cause adverse effects, particularly noise and visual impact on more residents compared with the other options.

e) Minimising areas of gardens taken.

f) Maintaining local routes for vehicles and improved or additional recreational and Active Travel routes for cyclists and pedestrians.

g) Potential to improve public open spaces and to enhance biodiversity and habitat connectivity.

h) Avoiding intrusion across the boundary of the coastal Special Area of Conservation (SAC) and the Special Protection Area (SPA).

i) Minimising the adverse visual impact on existing views from elevated viewpoints lying within Snowdonia National Park.

6. Description of the Preferred Option (WelTAG Stage 2 Appraisal)

6.1 I shall describe the layout of the preferred route shown on the TR111 Plan (included in ES Appendix 3.1) and then I shall summarise how we developed the layout and the mitigation strategy for the Scheme that is described in the ES. The Scheme is located at Junctions 16 and 16A of the A55, which are the primary junctions serving Penmaenmawr and Dwygyfylchi.

6.2 Place names given are those used in the General Arrangement drawings and the EMPs in the ES Appendix 2.5 (Document Ref WG 3.01.03).

6.3 The preferred option, was shown on plan in the public consultation events, comprised measures intended to improve the corridor associated with the A55. These beneficial measures were a consideration in the advice received from the Design Commission for Wales, which are included in ES Appendix 2.4.

6.4 The Scheme includes removal of the roundabout at Junction 16 so that the dual carriageway would continue through the junction without interruption. Westbound on and off slip roads at the site of the roundabout would give access to the A55 from the local network. The westbound on and off slip roads, at Junction 16A, at the north-end of Glan-yr-Afon Road, would be replaced with a grade-separated junction with east and west bound slip roads. Much of the existing dual carriageway of the A55, between the headlands of Penmaen Mawr in the west and Pen y Clip to the east, would remain substantially unchanged.

6.5 The existing landform is generally a north-facing slope dropping to the edge of the sea. To the west of Puffin Services, the A55 is in a cutting, but further east the land drops slightly to form a shallow valley containing the Afon Gyrach and here the dual carriageway is roughly at grade but rising onto a shallow embankment. The proposed Junction 16A grade-separated junction would include slip roads rising onto embankments to meet a bridge raised above the dual-carriageway.

6.6 A new single carriageway link road would be constructed running roughly parallel with the A55 starting at the from the new grade-separated Junction 16A and extending westwards towards Junction 16, passing to the south of the Puffin Café and extending to meet Ysguborwen Road near the Gladstone Hotel. From here is would continue westwards to meet the Junction 16 westbound slip roads and Conwy Road. The link road would occupy the narrow strip of land that currently separates these properties from the A55. While most residential properties in Dwygyfylchi would be separated from the Scheme by intervening land, some properties in Maes y Llan would be very

close, with 17, 19, 37 and 39 Maes y Llan lying within 10 m of the proposed link road.

6.7 The northern-end of Glan-yr-Afon Road, which currently extends north from Dwygyfylchi to the existing Junction 16A, would be widened and would rise onto an embankment as it reaches the new grade-separated Junction 16A. The western end of Ysguborwen Road would be truncated to join the proposed link road. Visibility splays would be provided for entrances to the Pendyffryn caravan park and nearby agricultural accesses. Traffic calming measures are proposed to discourage through traffic from using Glan-yr-Afon Road and Ysguborwen Road. These are addressed in the proof of evidence of Jonathan Bayliss and Nigel Roberts (Document Ref WG 1.05.02 and Document Ref WG 1.03.02).

7. Mitigation and Environmental Management

7.1 Mitigation measures that are integral to the design of the published Scheme are essential and Welsh Government are fully committed to completion of them. I define essential mitigation as measures affecting and reducing the significance of adverse effects, i.e., those measures taken into account when assigning significance in EIA terms, which can be provided under the requirements and powers of the Highways Act 1980 (as amended) (Document Ref WG 4.01.10). Mitigation measures and other commitments, in addition to being identified in the ES chapters, are set out in the Register of Environmental Actions and Commitments (REAC) located in ES Appendix 2.3 (Document Ref WG 3.01.03) and where possible shown in plan on the Environmental Masterplan ES Appendix 2.6.

7.2 Section 105A of the Highways Act 1980 sets out the minimum information that an ES must include as defined by Annex IV of Directive 2011/92/EU. Annex IV includes, at (5) (b), a '*description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements'* (i.e. mitigation measures).[29] (Document Ref WG 4.01.149)

7.3 Section 246 of the Highways Act 1980 (as amended) provides the power for a highway authority to '*acquire land for the purpose of mitigating any adverse effect which the existence or use of a highway constructed or of land for improved by* them*, or proposed to be constructed or improved by them, has or will have on the surroundings of the highway*'.

7.4 HA205/08[30] describes the hierarchical approach to mitigation at Paragraph 1.42. It states that '*the iterative assessment and design processes should seek to incorporate measures to avoid or reduce the significant* environmental *effect following a hierarchical system, where avoidance is always the first mitigation measure to be considered*'.

7.5 A variety of words are used to mean mitigation of a likely adverse effect. These include measures to avoid or prevent, to reduce, or to remedy or offset. Whilst proposed as mitigation, some measures can result in an enhancement of the existing situation.

[29] Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment EUR-Lex - 02011L0092-20140515 - EN - EUR-Lex (europa.eu)

[30] DMRB Volume 11 Part 2 Section 5: HA205/08 – Assessment and Management of Environmental Effects

Land Taken for the Purposes of Mitigation

7.6 Land identified in the draft Orders is required for various engineering purposes. Where possible, environmental mitigation has been provided within the permanent land take and is therefore within the Compulsory Purchase Order (CPO) as 'Title'. Some further land, required for environmental mitigation only, would be taken as 'Title Mitigation' for landscape integration, visual screening, or ecological purposes. In some areas parts of the proposed mitigation land would be available to be returned to the original use.

7.7 Section 10 of this proof sets out the plots of land included in the CPO for mitigation and explains the purpose for which it is required.

Environmental Management

7.8 Commitments to mitigate made in the ES and in consultation with landowners, residents and consultees must be carried through to detailed design, construction and routine maintenance. Furthermore, construction and operation of the Scheme must be carried out in a manner that is compliant with environmental legislation and the conditions of any formal approvals, consents, permits and licences. Chapter 20 of the ES reports on aspects of Environmental Management (Document Ref WG 3.01.01).

7.9 Potential construction effects, including surface water or sediment runoff, construction noise and dust, and accidental spillages and traffic congestion, would be mitigated by the implementation of industry best practices, which are described in the Pre-Construction Environmental Management Plan (Pre-CEMP). A draft version of this document is provided in the ES Appendix 2.2 (Document Ref WG 3.01.03) and this would be developed by the contractor to provide best practice environmental protection and to manage the environmental performance of the contractor during construction. The CEMP is prepared to operate within the framework of the future appointed contractor's Environmental Management System and it will include a number of key components including:

a) A Register of Environmental Actions and Commitments (REAC) including all commitments made in the ES, in meetings and correspondence is included in ES Volume 3 Appendix 2.3. A new draft has been made to include any additional commitments that have been made in the preparation for this Public Local Inquiry (PLI). It is possibly that further commitments or actions could be added during the PLI. The REAC takes the form of a spreadsheet with columns that describe the actions that must be taken and commitments that must be fulfilled before and during construction, during aftercare and in the long term, following handover, by the Employer through the Maintaining Agent.

There are also columns to record the process of implementation and monitoring as required in the future.

b) Method Statements that demonstrate a commitment to minimising environmental impacts during construction and to completing proposed environmental mitigation.

c) Environmental Masterplan (plans provided in the ES Appendix 2.6 which define the form, extent, and environmental function of all environmental components of the proposed Scheme.

d) Any additional documents defining mitigation that is identified during the PLI.

e) A basis for monitoring and recording the Contractors environmental performance during construction.

7.10 The CEMP is a document that must be periodically updated to include any new commitments, design changes, staff changes, new environmental legislation, or standards. So far, the CEMP has been issued in an outline draft in ES Appendix 2.2.

7.11 Following a decision by Welsh Ministers to proceed to construction, the components of the CEMP will be developed during detailed design and will be integrated within tender documents and the Design and Build Contract with the requirement for the CEMP and the ES to form a key component of the successful contractor's environmental management system.

7.12 When construction is complete, the updated CEMP will form the basis for the aftercare documents and handover documents.

8. Development of the Preferred Design and Environmental Mitigation

8.1 Mitigation or avoidance measures have been incorporated into the design of the Scheme to avoid or reduce potential adverse environmental effects. In some cases, these measures may result in some enhancement of environmental conditions. Surveys and early consultations identified that existing traffic noise was a concern. We also recognised that protecting views towards the sea from properties was an important consideration.

8.2 Throughout the planning of this Scheme the physical constraints on the existing road corridor have been influential. The requirement to provide a grade separated junction has been the most influential component of our design of the vertical and horizontal alignment. To the west of the Junction 16 roundabout the A55 crosses to the north side of the Chester to Holyhead railway to avoid passing through the core of Penmaenmawr and to avoid higher ground around the headland. It is then constrained by the railway to the south and the Promenade and sea to the north. To the east of the roundabout the corridor is narrowed between the railway to the north, and the existing houses at Maes Y Llan but also by those along the south side of Ysguborwen Road.

9. Environmental Mitigation Strategy

9.1 Within the constrained corridor of the A55 Junction 16, we have developed a design that moves the grade separated junction away from residential areas, avoids the demolition of any houses and physical impact on private gardens. We have also tried to avoid felling existing, well-established roadside plantations and trees, although there are locations where felling cannot be avoided.

9.2 The various route options that were presented to the community at Public Information Exhibitions raised concerns about noise, visual impact and loss of sea views. The selected option was one that kept the proposed junction improvements away from most residential properties to avoid these adverse effects. Having space to create opportunities for environmental mitigation and providing measures that could deliver some benefits to the community have also been considered within the available corridor.

9.3 The environmental objectives have guided the development of the proposed environmental mitigation. Some of our key environmental considerations during refinement of the route alignment are described in the following paragraphs. These are based on the details set out in the ES (Document Ref WG 3.01.01) Chapter 2 The Scheme, Chapter 7 Road Drainage and Water, Chapter 8 Nature Conservation, Chapter 9 Landscape, Chapter 14 Noise and Vibration. Mitigation measures are shown in the Environmental Masterplan (EMP) which is included in the ES Appendix 2.5 (Document Ref WG 3.01.03).

9.4 Details of proposed mitigation measures are shown in the Environmental Masterplan Sheets 1, 2 and 3 and described later in this section. The effect of proposed mitigation is considered in assessing the effects of the Scheme.

9.5 Place names given are those used in the General Arrangement drawings in ES Appendix 2.5 and the EMPs in the ES Appendix 2.6 (Document Ref WG 3.01.03).

Alignment of the Link Road

9.6 Design refinements were incorporated into the preferred route in order to address concerns raised in the consultation and public engagement events. These changes have often contributed to reducing or avoiding adverse effects of the Scheme.

9.7 The environmental objectives have guided the development of the design of the road and the proposed environmental mitigation. Some of our key environmental considerations during refinement of the route alignment are described here. These are based on the details set out in the ES Chapter 2 The Scheme, Chapter 7 Road Drainage and Water, Chapter 8 Nature Conservation, Chapter 9 Landscape, Chapter 14 Noise and Vibration.

Mitigation measures are shown in the Environmental Masterplan (EMP) which is included in the ES Appendix 2.5.

9.8 Recognising that the proximity of the link road could result in increased traffic noise and greater visual impact from traffic, in particular for the residents of Maes y Llan, an early design decision was to lower the vertical alignment so that it would lie at the same level as the A55 and so be below the northern garden boundaries and street level of Maes y Llan. The vertical separation would mean that many vehicles would be below the view from the houses and the retaining wall would deflect some traffic noise. Similarly, the reduced impacts would be felt at other properties to the south on Ysguborwen Road and elsewhere is Dwygyfylchi.

Arrangement of the Side Roads at Junction 16

9.9 The original design for the Scheme in the vicinity of Junction 16 included a 'T' Junction with Ysguborwen Road joining Conwy Road, which then continued towards Junction 16 to form westbound slip roads for the A55. The result of this arrangement was a deep cutting into the hillside to the south and the extensive clearance of the established plantations on the south of Conwy Road. In December 2020 a consultation with Conwy County Council led to consideration of a new layout with a roundabout proposed instead of a 'T' junction. The change meant that the junction would occupy a narrower strip of land on the south side of the dual carriageway without requiring further cutting into the hill slope, and without clearance of the established plantations to the south. This change to the alignment avoided physical disturbance of the gardens to The Oasis Centre and Llysfaen.

Slip Road for the Puffin Services

9.10 Consideration of the design of the A55 dual carriageway west of Junction 16A identified that the existing slip road arrangement for the Shell service station and café at Puffin Services might not be adequate to meet design standards. The Scheme was altered to include slip roads extending eastwards towards Junction 16A. This change required the link road to be moved several metres south and a wider bridge over the Afon Gyrach to accommodate the increased width of the westbound carriageway.

Connectivity and Active Travel Measures

9.11 The need for connectivity to address community severance and connectivity is addressed in ES Chapter 14 All Travellers. More detail is provided in the proof of evidence of Nigel Roberts (Document Ref WG 1.03.02).

9.12 In accordance with Welsh Government legislation, the design was developed to incorporate Active Travel Mini Schemes. These were a late addition to the layout and are shown in the General Arrangement plans in ES Appendix 2.5.

The following Active Travel and recreational measures are proposed to improve connectivity and safer routes for pedestrians and cyclists.

a) The link across the A55 via the footbridge near Puffin Services would be improved replace the existing bridge to maintain the route to the seashore, and to the National Cycle Network Route 5 (NCNR5). The bridge would have better pedestrian and cyclist safety with longer access ramps and a signal-controlled crossing over the link road.

b) A new non-motorised way would cross the A55 using the Junction 16A overbridge. This would not only provide a route to the seashore, but also to the NCNR5.

c) A new Active travel route would extend from Junction 16A in the east along the link road and along Conwy Road in the west to link Penmaenmawr and Dwygyfylchi, as well as connecting local facilities and established long-distance routes such as National Cycle Network Route 5 (NCNR5).

d) Paths provided in the area of Public Open Space which will link to existing footways and Active Travel Routes.

False Cutting

9.13 With the proposed link road lying at a relatively low level in the landscape, and at a similar level to the adjacent dual-carriageway, a proposal for a false cutting, which would extend eastwards from the Junction 16 roundabout to Maes y Llan and then from east of Maes y Llan to Puffin Services was seen as an effective form of mitigation for the residential areas to the south. This proposed landform would rise above the proposed road and so raise the threshold of seaward views above the top of vehicles driving on the link road and on the A55. Designed to be an effective visual barrier, the false cutting would reduce the impact of traffic noise for properties to the south as well.

9.14 The north side of the bank, facing the link road and A55, would be formed at a gradient of 1:2, but the south side, facing the village of Dwygyfylchi, would have a more naturalistic slope formed at shallower gradient with the bottom of the slope graded to blend with natural ground. In some places the overall slope would be as shallow as 1:6.

9.15 On top of the false cutting there would be a boundary marked by a wall or clawdd which would be constructed to provide any additional height required to provide the visual screen. On the northern slope of the false cutting would be plantations of suitable coastal scrub woodland species. The southern slopes would be added to any adjacent use, such as grazing or Public open space.

9.16 Due to the close proximity of the link road to the garden boundaries and residential road of Maes y Llan, there was insufficient space to extend the false cutting across the frontage. Instead, there will be a gap in the earthwork, with noise barriers proposed as mitigation across the frontage to screen views of vehicles and to mitigate for traffic noise. Low noise surfacing will also be applied to the link road. The effectiveness of noise mitigation is described in the proof of evidence of my colleague Craig Barson (Document Ref WG 1.09.02).

9.17 In recognition of the concerns of the residents of Maes y Llan Welsh Government representatives attended a meeting with residents to discuss with them their preferences for screening and noise barriers. The meeting was held on Monday 5 July and was well attended. The consensus view was that sea views were desirable and that planting and noise barriers should not intrude into the view.

Green Infrastructure and Replacement Public Open Space

9.18 To provide a range of environmental benefits a corridor of Green Infrastructure would be created on the south side of the proposed link road and false cutting, separating the strategic transport routes to the north from the residential and agricultural areas to the south. Part of the corridor would include Public Open Space (POS) exchange land provided in place of the area lost to the east of Maes y Llan.

9.19 The green corridor would be an area of grassland with tree and shrub planting and incorporating a simple network of paths linking nearby residential streets, play areas, and local facilities such as the football field by Maes y Llan, and the Puffin Café, to provide a landscape separation of woodland and meadows as a setting for circular cycle and walking routes and safe access to the shore. The existing football pitch would be relocated to a slightly different position. Ideas expressed by stakeholders that could be included in the area included a community orchard, and a new play area providing for older children to supplement the facility provided recently by a developer for younger children.

Existing Plantations, Hedges and Trees

9.20 The A55 at Junction 16 and 16A occupies a corridor to the south of the railway, with some tree and shrub planting established on the available embankment and cutting slopes. Much of these areas of planting would be cleared for the scheme.

9.21 When the original A55 dual carriageway was constructed, areas of roadside woodland were planted from the Penmaen Mawr headland eastwards to Junction 16. East of the Junction 16 roundabout the roadside planting was more restricted to a block across the frontage of Maes y Llan and some pine

trees planted around the tunnel portal. These have matured to serve their purpose.

9.22 Minimising changes to the existing dual carriageway was a consideration in the development of the design because some areas of trees and shrubs could be retained on the south side of the A55 and on Conwy Road. However, there are two critical locations where the existing plantations would have to be cleared. These are around Junction 16 and along the north side of Maes y Llan.

9.23 The plantations at Maes y Llan have grown to provide a robust visual screen of the A55. Residents of Maes y Llan have for some years been expressing concerns about the height of these plantations because they screen seaward views. Much of this vegetation is predicted to be lost if the proposed link road is constructed.

9.24 Close to Junction 16, Conwy Road, Ysguborwen Road, and the two westbound slip roads were designed to meet at a junction. The proposal required clearance of virtually all the existing plantations, including those on the cutting slope to the south. A modification of the design, previously described in Paragraph 7.10, includes a roundabout where the two westbound slip roads and the two side roads would meet. The modification has allowed the plantations on the southern cutting slope to be retained.

Planting Proposals

9.25 Our plans to retain existing vegetation and the proposed mitigation design are shown in the EMP in ES Appendix 2.6 (Sheets 1 to 3) We aim to provide replacement planting for any areas cleared and some new planting as well. Once the proposed planting has grown sufficiently it should provide a degree of screening for most views from residential properties. The visual impact assessment reported in ES Chapter 9 Landscape sets out the degree of screening provided. The Visual Impact Schedules in the ES Appendix 9.5 describe the visual impacts on locations with and without mitigation in place.

9.26 The planting design and the proposed false cutting are integral to the mitigation strategy for landscape integration, biodiversity and visual impact. The false cutting is also integral to mitigating noise impacts. New tree and shrub planting would be carried out along the north side of the false cutting and in areas where existing plantations would be cut down. More detail about the landscape and noise mitigation is provided in the Proofs of Evidence of my colleagues Jon Stoddard (Document Ref WG 1.07.02) and Craig Barson (Document Ref WG 1.09.02). The ecological mitigation provided by new planting is set out in ES Chapter 8 Ecology and will be discussed in the proof of evidence of my colleague Donna Hall (Document Ref WG 1.08.02).

9.27 The planting proposals would be carried out using mainly locally indigenous species of trees and shrubs at sizes suited to their purpose and to establishment in the coastal conditions. There would also be some non-native species included in mixes to support native species with special purposes such as species tolerant of coastal conditions and dense fast growing evergreen shrubs of the kind previously used in the 1980s planting scheme associated with the A55 dualling.

9.28 All areas of grassland within the future A55 highway estate will be seeded with grass and wildflowers in accordance with the Welsh Ministers Green Corridors Initiative.

9.29 Proposals for monitoring the development of planting mitigation are contained in the ES: these would be implemented by the future construction contractor during the construction and aftercare period of the contract. After handover maintenance of these measures will be the responsibility of the Welsh Government's Maintaining Agent. Monitoring during the construction and aftercare period would be carried out to identify and undertake any management interventions that are required to ensure mitigation satisfies the objectives.

Traffic Noise

9.30 The false cutting, described in Paragraphs 7.14 to 7.20, is a measure that was incorporated into the design at an early stage to provide noise and visual screening. The noise modelling takes the false cutting into account and considers what additional mitigation is required.

9.31 Because the link road will bring traffic further south that the existing dual carriageway low noise surfacing is proposed for that new road. The full noise assessment is reported in ES Chapter 13 (Document Ref WG 3.01.01). Traffic noise is addressed in detail in the proof of evidence of Craig Barson (Document Ref WG 1.09.02).

9.32 Proposed mitigation for traffic noise would include a low-noise surfacing system for the link road carriageway, existing noise barriers would be retained or replaced and additional noise barriers, including the false cutting to the south of the link road from Junction 16 to west of Puffin Services, would be provided.

9.33 In Paragraph 7.24 of my proof, I have recorded that we understand that the residents at Maes y Llan want to keep open sea views. At a meeting with residents on Monday 5 July, the project team raised the question of noise mitigation. Those residents present indicated a preference for no noise barriers or planting if these would interrupt valued views to the sea. Following the meeting with residents, the design team are examining different mitigation proposals which look to maintain sea views whilst still providing noise

reduction, and that the WG will discuss these further with residents prior to Inquiry. Because houses in Maes y Llan that face the A55 are in a Noise Action Plan Priority Area (NAPPA), there is a requirement to reduce traffic noise and so further design work is being undertaken to consider the options available to mitigate traffic noise while retaining views. While low noise surfacing is proposed along the new link road further mitigation in the form of walls or fences is possible without obscuring views to the sea from ground floor windows.

Drainage and Water

9.34 The existing road drainage for the A55 dual carriageway and the existing outfalls have been retained in the proposed design. The road pavement within the Scheme boundary is currently drained using a kerb and gully drainage system, which discharges directly into Conwy Bay via seven drainage outfalls into Conwy Bay via the beach to the north of the Scheme. There are outfalls also to the Afon Gyrach and to a minor watercourse to the east of Gyrach. There is no attenuation of flow rates.

9.35 The proposed link road would increase the area of impermeable carriageway and therefore the amount of precipitation that requires drainage collecting in drainage ditches, filter drains and pipes. The existing outfalls into Conwy Bay would be maintained and one extra outfall into the Afon Gyrach would be added. A range of mitigation measures, intended to meet the requirements of the statutory standards for sustainable drainage systems (SuDS), would include attenuation of water from the Scheme and from areas where there are risks of surface water flooding. These would act to attenuate flows to existing rates (allowing for climate change) during the operation of the Scheme prior to discharge to existing outfalls. Part of the SUDs design includes a surface water attenuation basin located to the north of the link road, between the Afon Gyrach and the Puffin Services.

9.36 The proposed link road would cross the Afon Gyrach immediately upstream of the existing A55 crossing. To ensure the new structure for the crossing would not increase the risk of flooding to residential receptors upstream, the bridge carrying the link road over the Afon Gyrach should have an opening shape, width and height that would be the same or larger than the existing A55 bridge.

9.37 Proposed mitigation associated with drainage and water and are described in more detail in the ES Chapter 7 (Document Ref WG 3.01.01), and in the Proof of Evidence of Steve Cox (Document Ref WG 1.11.02). Some of the mitigation is also shown in the EMP in ES Appendix 2.5 (Document Ref WG 3.01.03).

9.38 Construction activity will be managed under the CEMP which will include measures to protect the water environment and monitoring of discharges from the drainage network, surface water runoff and spillage protection measures.

Habitat and Species Mitigation

9.39 Proposed mitigation associated with habitats and species are described in more detail in the ES Chapter 8 Nature Conservation, and in the Proof of Donna Hall (Document Ref WG 1.08.02). Mitigation is also shown in the EMP in ES Appendix 2.5 (Document Ref WG 3.01.03).

9.40 We have developed measures to mitigate for adverse effects on species and habitats and to provide enhancements in accordance with the requirements of the Environment (Wales) Act 2016[31] (Document Ref WG 4.01.01):

a) Site clearance of vegetation taking into account the seasonal constraints to protect nesting birds and avoid harm to roosting bats.

b) Measures to control dust, noise and pollution of waterbodies during construction and operation to reduce or avoid adverse effects on the Special Protection Areas, Special Areas of Conservation, Sites of Special Scientific Interest, National Nature Reserve and Local Nature Reserve. These sites and areas are listed in Table 8.17 of ES Chapter 8 Ecology.

c) Protection of all areas of retained habitat from damage, such as plantations, during construction.

d) Replacement woodland and scrub habitat created on land taken within the CPO. Coastal scrub would be planted on the north side of the false cutting

e) Creation of a green/wildlife corridor along the A55 corridor from the Penmaen Bach in the east to Junction 16 in the west. From Junction 16 westwards to woodland on Penmaen Mawr headland the green/wildlife corridor already exists in the form of roadside plantations and railwayside scrub, public green spaces and gardens.

f) All new grassland on verges, cutting and embankment slopes, in ditches and enclosures around attenuation basins/ponds, as well as the replacement public open space would be seeded with grasses and wildflowers. Low fertility soil would not be spread on areas cleared for construction to ensure a relatively low-fertility conditions that would supporting species diversity, including pollinator species. More fertile soil would be retained for use in proposed areas of tree and shrub planting and in areas where a more intensive maintenance regime is required. This reflects the objectives of the Welsh Government Green

[31] Environment (Wales) Act 2016 anaw 3 (legislation.gov.uk)

Corridors Initiative (Document Ref WG 4.01.16), and 'The State of Roads in Wales' Welsh Government, October 2018[32] (Document Ref WG 4.01.157) and would also be an enhancement as defined in the Environment (Wales) Act 2016.

g) To protect the wildlife corridor provided by the Afon Gyrach the new road crossing would be a bridge of sufficient size to allow the streambed to remain beneath the arch. The design of highway lighting and planting would provide a night time dark zone on the south side of the new bridge to avoid disturbance of established wildlife activity, including fish, otter and foraging bats.

h) Otter fencing will be installed along the south side of the proposed link road either side of the Afon Gyrach to tie in with other fences or barriers.

i) Replacement habitat for reptiles (slowworms), which are protected species, will be created.

j) Bat roosts within the masonry wall along the false cutting, and associated with the proposed Afon Gyrach bridge, will be provided for bat species which forage along the Afon Gyrach and in roadside plantations and the coastal strip.

Archaeological Mitigation

9.41 Proposed mitigation for sites that would be directly or indirectly affected by the Scheme are set out in the ES Chapter 10. These sites affected indirectly are those that have line of sight or within hearing of the Scheme. Low noise surfacing, proposed as mitigation for traffic noise arising from the link road would address impacts on Scheduled Monuments, Listed Buildings, Conservation Areas and Historic Landscapes that are indirectly affected.

9.42 A programme of recording and investigation is proposed to address direct impacts on buried archaeological remains. This mitigation would include:

a) Archaeological recording of parts of the field system that would be demolished.

b) Trial trenching and evaluation in areas identified by the geophysical survey, with recording of discovered archaeological deposits if required. The scale and nature of archaeological evaluation trenching in these areas needs to be fully agreed with the regional curator.

[32] The State of Roads in Wales, National Assembly for Wales, October 2018 https://senedd.wales/laid%20documents/cr-ld11791/cr-ld11791-e.pdf [Accessed 17.08.2021]

c) Following consideration of the results of the trial trenching evaluation, further detailed archaeological mitigation investigation may then be required at some of these locations.

d) Ridge and furrow has been identified, concentrated to the east of Junction 16 and there is further evidence of Ridge and Furrow in the Dwygyfylchi area on the HER (89, 90). A programme of intrusive evaluation trenching is recommended to provide additional information on this group (94-122) in order to better understand the nature of anomalies identified and their significance. Further detailed mitigation excavation may be required on some or all, of these depending on results.

e) An archaeological watching brief should be undertaken on all construction activity within the Scheme boundary. This may lead to a requirement for further archaeological investigation of any previously unknown buried archaeological remains that are identified during the watching brief.

f) The watching brief would record surviving sections of the gasworks (124), Ship Inn (125) and Brickfield Cottage (126), if revealed by construction. Basic recording of hedgerows, part of the field system, will be undertaken as part of the watching brief.

g) As additional construction areas such as site compounds, are identified, archaeological assessment, evaluation or monitoring may be identified as the appropriate action to be undertaken. This will be agreed with the regional curator and implemented by the appointed construction contractor.

10. Land taken for Essential Mitigation

General Points

10.1 The environmental mitigation proposals were designed to minimise additional land take over and above the land required for engineering purposes. Some of the proposed environmental mitigation is contained within Title land, or land contained within land already owned by Welsh Government.

10.2 The Essential mitigation plots are described in numerical order which starts in the west and progresses eastwards, which is the reverse of chainage.

Essential Mitigation Plots

10.3 A major component of the mitigation scheme is a false cutting on the south side of the proposed link road, commencing in the west at the junction of Ysguborwen Road with the link road and extending as far eastwards as the Puffin Services, but with a short break in continuity at Maes y Llan. This substantial earthwork extends through several individually numbered plots and as a result is described repeatedly. The extent of the false cutting will include several different categories of land and the specific function in relation to the false cutting is described in Table 8.1.

Table 8.1: The Function of Land Categories Included in the Land Area Occupied by the False Cutting

Title Land	The northern slope of the false cutting would normally occupy the extent of any land required for engineering purposes to form a stable cutting or embankment slope.
Title Mitigation	Land required in addition to Title to ensure there is space to provide the false cutting to the required height.
Essential Licence	Land required to form part of the false cutting, which can be returned to the landowner for the original use, such as grazing, once the landform has been altered
Easement	A right of access for maintenance across land that forms part of the false cutting but which would not be retained in Welsh Government ownership.

Plot 2/2b

10.4 This plot is required to serve two separate mitigation measures:

1. The northern portion would contain the upper part of the north-facing slope of the westernmost length of the proposed false cutting and the mortared stone wall that follows the top of the slope. The lower part of the north facing slope is within Title to the north.
2. The southern portion, against Ysguborwen Road, would be seeded to grassland as replacement habitat and managed for reptile (slow worm) .

A selection of native trees will be planted in small, scattered groups for landscape integration and to contribute to visual screening of views of the road from residential properties to the south.

Plot 2/5b

10.5 Along with the adjacent Title Plot 2.5a, this Title Mitigation plot would contain the upper part of the north slope of the false cutting. The south edge of the plot would be the proposed mortared masonry wall. Plot 2/5c would be Easement to allow maintenance of the wall. Plot 2/5d Essential Licence would be returned to the owner to continue grazing.

Plots 2/5e and 2/5f

10.6 These plots are required for the south slopes of the false cutting where the slope would form part of the permanent mitigation to provide habitat for reptiles (slow worms).

Plots 2/3d, 2/3e and 2/3f

10.7 These plots are required to complete the north and south slopes of the false cutting where the south slope would form part of the permanent mitigation for reptiles (slow worms). The mortared stone wall would be built along the boundary between the two plots.

Plots 2/8 and 2/8b

10.8 These two plots would form the permanent landtake required for the north and south slopes of the false cutting, where it recommences to the east of Maes y Llan as far as the line of the public footpath Penmaenmawr 08. The adjacent **Plot 2/8a** to the south is Easement, taken to allow the position of the existing football pitch to be realigned and for works to make a new pitch to be completed.

Plots 2/13, 2/20b, 3/3d, 3/3e and 3/4b

10.9 These plots form the eastern end of the false cutting from the public footpath (Penmaenmawr 08) east to the point where the new landform terminates. Title Plot 3/3f and a portion of Title Plot 3/3c are part of the land required for engineering purposes, in this case as the location for a balancing pond. The land around the pond will be landscaped and managed as if part of the adjacent public open space with the possibility of informal public access continuing as far as the river bridge and beyond.

Plots 2/20 2/20a and 3/4c

10.10 Plot 2/20 is Exchange land taken in exchange for affecting nearby Public Open Space in nearby plots. The land will be landscaped. Plot 2/20a and Plot 3/4c is a Private Means of Access to land to the south. This land would also

be an Easement for Welsh Government to maintain the false cutting and the associated Masonry wall.

10.11 Proposed otter fencing (mitigation) would be installed through various plots extending from the eastern end of the false cutting to follow the southern edge of the link road for approximately 400 m. The fence would tie-in to the southern abutments of the proposed Afon Gyrach bridge to exclude otters using the watercourse from the carriageway.

Plot 3/4j

10.12 A plot of low-lying land adjacent to the Afon Gyrach, and lying mostly within the flood zone, which is required for tree and shrub planting to continue the visual screen from the eastern end of the false cutting to the edge of the Afon Gyrach. The planting here would serve to screen the river corridor and contribute to shading it at night from artificial lighting. This measure forms part of the plan to reduce light spill in the river corridor which is used at night by bat species, otter and freshwater fish. A similar function is served by the western end of Plot 3/4k (following).

Plots 3/4k and 3/4n

10.13 To continue the linear belt of trees and shrubs eastwards, this plot provides space for a depth of native species planting to screen views of the link road and its traffic. On the north side a strip of grassland would be maintained for the benefit of biodiversity.

Plots 4/2d, 4/2g, 4/2k and 4/3a

10.14 To continue the linear belt of trees and shrubs eastwards, this plot provides space for a depth of native species planting to screen views of the Junction 16A slip road and its traffic. On the north side a strip of grassland would be maintained for the benefit of biodiversity. Planting here would include more evergreen native trees to support a gradual transition from deciduous native species to the west to the established pine trees around the tunnel portal to the east.

Plot 4/2j

10.15 Minor unnamed watercourse flows north and would pass under the proposed link road in this plot. The land is currently low-lying and wet and is taken as Title Mitigation so that the land can be managed to mitigate for lost wetland habitat lost under the adjacent length of the link road.

Plots 3/3a, 3/4g

10.16 This single large plot is taken as Essential Licence, not taken to provide mitigation, but for the temporary use by a contractor for a construction compound and construction materials storage. These plots are included here because the site of the compound has been defined in the ES in accordance

with the requirements of the EU Directive 2014/52/EU, Annex IV, Information for the Environmental Impact Assessment Report. This requires *'a description of the physical characteristics of the whole project, including, where relevant, requisite demolition works, and the land use requirements during the construction and operational phases'*.

10.17 These plots would be returned to the owners on completion of the construction contract in a manner so that they can be returned to the former use.

Plots 4/2f, 4/2m and 4/3b

10.18 These plots, similar to Plots 3/3a and 3/4g, are Essential Licence to provide the contractor space for construction work requirements during the construction phase.

11. Objections to the Scheme

11.1 Objections have been made that raise matters that fall within the scope of my proof of evidence or that of one of my colleagues. I reference an objection from Natural Resources Wales which raises a number of topics and then I will address each of the key topics that are raised in other objections.

Natural Resources Wales

11.2 We have prepared a comprehensive response that addresses each point in the NRW letter of objection. This is provided in an Appendix A of my proof (Document Ref WG 1.06.03).

Construction Effects

11.3 *A number of objections refer to the effects of construction works on the lives, of members of the community. These also mention environmental impact and in particular, the noise, dust, physical disruption during construction, increased emissions and effects on climate.*

11.4 *We are aware of the potential consequences of construction noise, vibration emissions and badly directed artificial light at night on the natural environment and on local residents. If the Scheme goes ahead all construction work would be completed in accordance with best practice to minimise the impacts. The contractor will be required to comply with the Construction Environmental Management Plan (CEMP). A preliminary version of this is an appendix to the Environmental Statement. To avoid adverse night time effects the contractor would only work within strictly defined hours which would be agreed with the local authority.*

Response

11.5 The contractor would be expected to liaise and communicate with the community, giving out information to local people to ensure they know the work that is being carried out, the duration, the working hours, measures to avoid or mitigate for adverse effects, and contact details in the event of problems such as a noise disturbance.

General Environmental Concerns

11.6 *More than one objection asked what benefits the Scheme would bring for local people, visitors to the town and for long-distance travellers on the A55. The concern was that there would be disruption, expense and adverse effects on the environment and climate arising from construction and that the use of a lot of concrete would be damaging to the environment.*

11.7 *There was concern about how the Scheme would provide a better environment for future generations.*

Response

11.8 The published ES contains a summary of the benefits in relation to Policy. However, some more specific environmental benefits are listed below:

a) A new green corridor for wildlife that would extend the established strips of vegetation to the west of Junction 16 as far as Penmaen Bach in the east. The corridor would include coastal scrub and woodland as well as wildflower grassland. Once established the green corridor would extend from Penmaen Bach to Penmaen Mawr, providing nesting opportunities for birds, flightlines for bats and nesting and roosting opportunities for other native mammals, reptiles and amphibians. The wildflower grassland and planting would also provide habitat for insects, including pollinators. The masonry wall would include roosting sites and refuges for bats and reptiles.

b) The green corridor would include the existing and replacement public open space, incorporating the playing field and play area as well as paths and shared use Active Travel routes from Junction 16 to 16A and linking with the crossings over the A55 and railway. These measures would form circular walking routes to the coast and into Dwygyfylchi and Penmaenmawr.

c) The pedestrian footbridge and ramps linking the community to the National Cycle Network Route 5 and the beach will be replaced and will be fully compliant with the Equality Act. An additional safe crossing of the A55 at Junction 16A which also provides access to the beach.

d) The false cutting and masonry wall, which extends from Junction 16 to west of Puffin Services, would provide effective visual and noise screening of the proposed link road, the existing A55 and all the traffic, which would benefit the green corridor and residential areas to the south. Belts of tree and shrub planting would grow to extend the visual screening from Puffin Services eastwards to Penmaen Bach tunnel portal. The false cutting has been designed to provide the proposed degree of screening of the roads and traffic, while also retaining views to the sea.

e) A reduction from emissions for a small number of properties in the area around the A55 junction.

Water Environment

11.9 *Correspondence reported that there is a history of flooding close to where the Scheme would affect Ysguborwen Road and asked whether the design should take account of this problem and provide a solution within the proposed surface water drainage plans. The letter suggested that in the interests of joined up thinking, Welsh Government could resolve a problem*

that would otherwise be the subject of a grant application from Conwy County Borough Council.

Response

11.10 It is understood that the flooding problem is outside the Scheme boundary. Nevertheless, we would work with Conwy County Borough Council at detailed design to investigate this issue further.

Landscape and Visual Impact

11.11 *The status of the A55 as a tourist route was raised, because there is concern that the impact of the Scheme on views across to the Carneddau Mountains and Snowdonia National Park from along this section of the A55. An objection stated the desire to protect the natural and open aspect of views from this stretch of A55 and from Dwygyfylchi, and to offer a positive and 'green' outlook for visitors and residents alike. Two examples along the A55 corridor have been presented to demonstrate the concern to protect local views. One is the recent alterations made to provide mitigation of traffic noise affecting the 'Gypsy Traveller Site' adjacent to the A55 between Conwy tunnel and Penmaenbach Tunnel. The second is the 'concreteness of the Colwyn Bay stretch' of the A55 50mph stretch'.*

11.12 *Concern about the effect of artificial lighting on the Scheme on nearby properties was expressed.*

Response

11.13 There are established plantations and grass areas that were implemented as part of the A55 dualling. These are maintained by North Wales Trunk Road Agency on behalf of Welsh Government. There are other areas of public open space and plantations of trees and shrubs that are maintained by others.

11.14 *One objection expressed uncertainty about who is currently responsible for maintenance of hedging and trees around the area and complained about how the area often 'looks overgrown & unsightly, rather than welcoming and inviting'.*

Response

11.15 The draft Side Road Orders show a demarcation boundary for the Trunk Road and the County Road improvements. Unless agreed otherwise, between the Welsh Government and Conwy CBC, once the contract maintenance period has finished for the Scheme the respective parties would be responsible for the maintenance of the land within these boundaries.

11.16 *Clarification of the mitigation design shown in the Environmental Masterplans was requested in correspondence regarding an area of land along the 'length*

of the embankment opposite the Gladstone area'. The letter stated that the objector had been told there would be a 5ft tall wall but required clarification.

Response

11.17 There will be a mortared stone wall at the top of the false cutting at a similar height to a stock proof fence.

11.18 *A request for wildflower planting was made in two separate objections. One expressed surprise that 'there is no thought of wildflowers along the bank bordering the A55. Wildflowers form a wonderful nature corridor and alleviate the need for constant strimming.' The planting of daffodils was also suggested. Overall these measures should enhance entrances to the town from the A55 and form a 'River of Flowers' leading people into the town.*

Response

11.19 All grassed areas within the Scheme would be seeded with wildflowers. This is a commitment made by Welsh Government in line with the Wales-wide Green Corridors Initiative which applies to all trunk roads. Native wildflower seed, suited to local conditions, would be spread with grass seed to create a species rich mix that would provide seasonal interest.

11.20 *It was also suggested that improvements to the town entrances should include sculptures depicting local heritage. At the town entrance from the A55 a new 'facility sign' harmonising with the existing signage into both Dwygyfylchi and Penmaenmawr should be installed.*

Response

11.21 At Junctions 16 and 16A areas of verge would be planted with spring bulbs in addition to being seeded with wildflowers. Some feature trees and shrubs could also be planted. At Junction 16 a widened verge would be provided at the proposed roundabout and at the junction between the link road and Ysguborwen Road as a site for a gateway feature. These have been included following requests from local stakeholders.

11.22 *A community orchard would benefit the town, the Town Council have a site in mind and would welcome the opportunity to discuss this.*

Response

11.23 Space for a community orchard would be available within the proposed green corridor.

11.24 *Concerns have been expressed about views from properties in Maes y Llan. This group of houses are separated from the A55 by dense shrub and tree planting along the road cutting. These plantations would be cleared for the Scheme and replacement planting forms part of the mitigation proposals. At a*

site meeting the residents indicated a preference for open views towards the sea rather than planting.

Response

11.25 The properties on the A55 road frontage at Maes y Llan are within a NAPPA and will be close to the proposed link road. Low noise surfacing in proposed along the link road. A noise barrier is proposed along the boundary separating the houses from the road. This is shown on the Environmental Masterplan and is described as 'Barrier to screen views of roads and attenuate traffic noise'. This barrier could be as tall as 3 m as indicated in the noise assessments. The barrier would have the same effect as the existing planting by screening views to the sea. One objection stated that the barrier, as shown in the drawings, would look *'really out of place, solid and high'*. A preference for a more discreet (transparent) noise barrier was indicated to minimise the disruption of the views and to reduce the impact on residents of the street.

Response

11.26 Representatives of Welsh Government have met with those residents of Maes y Llan who would overlook the Scheme. The views expressed about the form of noise and visual screening mitigation are summarised in paragraphs 4.26 and 9.17 of this proof. Designs that would meet the requirements of the residents are under consideration in the period before the Public Inquiry.

The Community and Public Open Space

11.27 *Several objections state that the loss of the 'safe multigenerational recreational space which contains the village football field' formed the basis for an objection. Public Open Space is deficient in the village according to Conwy County Borough Council. The Scheme takes a proportion of the area and so the CPO includes exchange land to make good the loss. The objectors consider that the exchange land is 'neither fair nor proportionate to the proposed loss' and state that the triangular area of exchange land is an awkward space of limited value and would not compensate for the loss of amenity. The objection asks how children are to play football across two different fields.*

Response

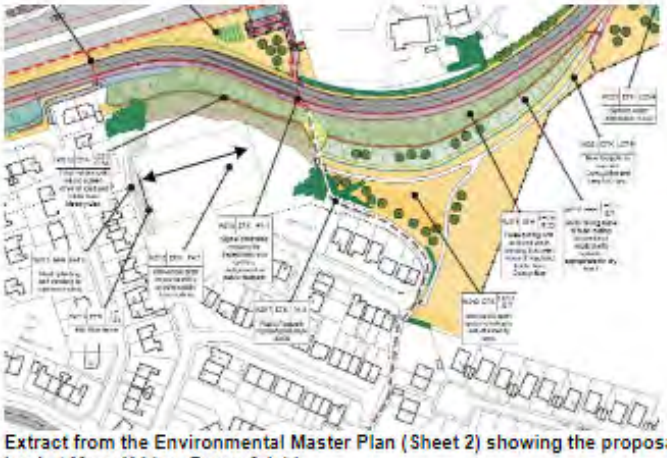
11.28 Welsh Government recognise that the playing field is an important amenity and have proposed two aspects to the replacement:

1. Provision of an area of exchange land immediately adjacent to the existing Public Open Space so that a single larger area is formed. The area would be designed as a multi-generational recreation area with facilities to complement the existing play areas within Maes y Llan and

Gwel y Mor housing estates. The locations of the existing play areas are shown with yellow stars on the plan below – see Figure 1.

2. Relocation of the football field towards the south-west so that it remains the same usable area on a similar slope within the existing Public Open Space. The relocated football pitch is shown in the lower plan below. A simple indicative layout for the exchange land is also shown in the lower plan.

Extract from Google Maps, showing satellite imagery of the open space at Maes Y Llan, Dwygyfylchi (@Google 2021)



Extract from the Environmental Master Plan (Sheet 2) showing the proposals for the open space and exchange land at Maes Y Llan, Dwygyfylchi

Figure 1: Locations of Existing Playing Areas

11.29 *The proposed replacement footbridge (Iron Bridge) across the A55 would include Disability Discrimination Act 1995 (DDA) compliant access ramps. Objections to the proposals state that the replacement is not a like for like replacement in terms of safe access & connectivity from the village. In particular the existing arrangement of footpaths leading to the bridge should be retained and the need to cross the 'busy new 40mph link road' for safe access to the beach and the cycle path avoided. However, there was support for the cyclepath being widened.*

11.30 *In addition, improvements to the Dwygyfylch I beach area is requested with the existing grass area and benches/picnic tables extended and improved.*

Response

11.31 Welsh Government have responded to advise the objector that the existing footbridge would be maintained for public use until the replacement bridge is completed and in use.

11.32 The new footbridge is designed to meet the requirements of the Equality Act 2010 to provide improved access to the National Cycle Route and to the beach and village. The crossing of the proposed link road would include an at grade crossing which it is currently anticipated that this would be a toucan crossing to cater for pedestrians and cyclists.

Traffic Noise and Noise Mitigation

11.33 *The concern about traffic noise resulted in correspondence requesting that the new road should be constructed with low noise surfacing 'to help reduce noise pollution'.*

11.34 *Another objection raised the problems of traffic noise along the North Wales coast, which 'is blighted by road noise from the A55 motorway along its length and nothing has ever been done to address this'. The objector expressed concern that the Scheme would increase traffic speed and thus create even more noise. A speed limit was proposed 'to reduce traffic to 50mph through all towns and villages'. Noise barriers should be erected along as much of the A55 as possible.*

Response

11.35 The scope of this scheme is limited to the improvements at Junctions 16 and 16A of the A55 and cannot therefore address traffic noise for the whole of A55.

11.36 The assessment of traffic noise for the scheme indicates that the proposed mitigation, which does include low noise surfacing and noise barriers where required, is appropriate to reduce impacts to a level which is not significant within the study area. The assessment is reported in the ES Chapter 13.

11.37 The Welsh Government's approach to dealing with road noise issues across Wales can be found in the 2018 to 2023 noise and soundscape action plan at the following link: noise-and-soundscape-action-plan.pdf (gov.wales)

Climate Change and Carbon

11.38 *Correspondence from several objectors raised concerns about the impact on climate change and carbon from use of concrete.*

Response

11.39 In the ES the Scheme's total emissions are compared to the whole of the UK Carbon Budget. The Climate Change (Carbon Budgets) (Wales) Regulations 2021 (Document Ref WG 4.01.154) were not published until March 2021, which was after December 2020 when the Environmental Impact Assessment and the ES were completed. The information provided within the original report, which compared the UK carbon budget was correct at time of writing. Now that the relevant information has been published, comparisons can be made with the Welsh carbon budget.

11.40 The annual Welsh carbon baseline is 56 million tonnes. Annual carbon emissions for Wales averaged 41.2 million tonnes (2016 to 2020) and Carbon Budget 2 for 2021 to 2025 is reduced to 35.5 million tonnes per year. The total construction carbon emissions for the proposed project are estimated to be about 11,600 tonnes. This therefore represents about 0.03% or about 1/3000th of the carbon budget and is not expected to materially affect the Welsh Government's ability to achieve its target. As a result, the estimated emissions for the proposed Scheme are not considered significant. But, throughout construction, continuing efforts will be made to minimise carbon emissions wherever possible and such measures will be outlined within the Construction Environmental Management Plan.

12. Conclusion and Declaration

12.1 My proof of evidence includes facts which I regard as being relevant to the opinions which I have expressed, and the Inquiry's attention has been drawn to any matter which would affect the validity of that opinion.

12.2 As Environmental Coordinator I have overseen the environmental design process and sought, with the engineering and environmental specialists in the team, to minimise overall environmental impacts of the Scheme and to optimise the effectiveness of proposed mitigation.

12.3 In my opinion the Environmental Impact Assessment, the Appropriate Assessment have been carried out and published in accordance with legislation and professional guidance.

12.4 In my opinion the development of measures to mitigate the effects of the Scheme are effective, justifiable and achievable within the proposed CPO.

12.5 I believe the facts I have stated in this proof of evidence are true and that the opinions expressed are correct.

12.6 I understand my duty to the Inquiry to assist it with matters within my expertise and believe that I have complied with that duty.

12.7