



**SP MANWEB**

# **The North Wales Wind Farms Connection Project**

## **Environmental Statement Chapter 12 - Traffic and Transport**

Application reference: EN020014

March 2015



Regulation reference: The Infrastructure Planning  
(Applications: Prescribed Forms and Procedure)  
Regulations 2009 Regulation 5(2)(a)

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The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 – Regulation 5(2)(a)



**The Planning Act 2008**

**The Infrastructure Planning (Applications: Prescribed Forms and Procedure)  
Regulations 2009**

**Regulation 5(2)(a)**

**The North Wales Wind Farms Connection Project**

**Environmental Statement**

**Chapter 12 Traffic and Transport**

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## Environmental Statement Documents

<b>Volume 6: Environmental Statement</b>		
Document Reference	Chapter	Document
6.1	1	Introduction
6.2	2	Description of the Proposed Development
6.3	3	Alternatives and Design Evolution
6.4	4	EIA Methodology
6.5	5	Planning Policy Considerations
6.6	6	Ecology and Biodiversity
6.7	7	Landscape and Visual
6.8	8	Historic Environment
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6.15	15	Summary of Environmental Effects
6.16		Environmental Statement Figures
6.17 – 6.26		Appendices
6.27		Glossary
6.28		Non-Technical Summary

This Chapter includes the following Appendices:

<b>DCO Document Reference</b>	<b>Appendix</b>	<b>Document</b>
6.25	12.1	Traffic Count Data

Reference is also made to the following documents:

<b>DCO Document Reference</b>	<b>Document</b>
2.4	Access and Rights of Way Plans
6.17	Proposed Works at St Asaph Substation
	Proposed Underground Cable; St Asaph Substation to the Terminal Point (Appendix 1.2 to this ES)
	Proposed Collector Substation; Clocaenog Forest; Environmental Report (Appendix 1.3 to this ES)
	Lower Voltage Diversions (Appendix 1.4 to this ES)
	Potential Connection Routes for the Derwydd Bach, Nant Bach and Brenig Wind Farms (Appendix 1.5 to this ES)
6.18	Construction Environmental Management Plan (Appendix 2.1 to this ES)
6.29	North Wales Wind Farm Connections Project; Scoping Report, (January 2014)
6.30	Planning Inspectorate: North Wales Wind Farm Connections Project; Scoping Opinion: (February 2014)
7.1	Design and Construction Report

## 12 TRAFFIC AND TRANSPORT

### 12.1 Introduction

- 12.1.1 This chapter assesses the likely significant environmental effects of the Proposed Development on traffic and transport and considers the potential impacts arising from the construction, operational and decommissioning phases.
- 12.1.2 The North Wales Wind Farms Connection Project would provide connections into the Scottish Power network for four consented wind farms at Nant Bach, Clocaenog, Brenig and Derwydd Bach. All four wind farms would connect to the Collector Substation at Clocaenog Forest in Denbighshire.
- 12.1.3 The Proposed Development is scheduled to commence in June 216 and take 16 months to complete. It would remain in operation for up to 40 years at which point it is likely to be decommissioned.
- 12.1.4 The assessment of traffic and transport effects is based on information included within the Design and Construction Report (DCO Document Ref 7.1).

### 12.2 Legislation and Policy Background

- 12.2.1 The assessment has been undertaken in accordance with key legislative and policy documents. General planning documents are discussed in Chapter 5: 'Planning Policy Considerations', however legislation and policy specifically relevant to traffic and transport are summarised below.

#### **The Overarching National Policy Statement for Energy (EN-1)**

- 12.2.2 Part 5 of the Overarching National Policy Statement for Energy (EN-1) identifies the generic impacts of an NSIP which should be considered. The table below identifies the guidance for 'traffic and transport, and identifies where in this ES the information can be found:
- 12.2.3 Compliance with the requirements of EN1 is indicated in Table 12.1 below.

**Table 12.1: Compliance with NPS (EN1) Requirements**

<b>Compliance with NPS (EN-1) Requirements</b>	
<b>NPS EN-1 Section</b>	<b>Covered in ES Section</b>
5.13.13 If a project is likely to have significant transport implications the applicants ES should include a transport assessment using the NATA/webTag (or WelTag in Wales) methodology stipulated in Department of Transport guidance or any successor to such methodology	A full transport assessment has not been completed because the development would not give rise to traffic volumes that exceed the thresholds for an assessment to take place (by assessment this refers to junction assessments in terms of capacity) as such no significant effects arise. An assessment of existing status of the highway network and potential

<b>Compliance with NPS (EN-1) Requirements</b>	
<b>NPS EN-1 Section</b>	<b>Covered in ES Section</b>
	<p>impacts of the Proposed Development on the highway network are included in this Chapter 12.</p> <p>As the flows are considered low in nature the use of WelTag has not been taken forward as the proposal does not change long term the layout of the road network or flows in the area. The alternative for planning developments has been used as set out below.</p> <p>Section 12.4 of this chapter sets out the assessment methodology with reference to the guidance in TAN 18 which sets out guidance for Local Highway Authorities (LHA) to use. Appendices D and E have been referred to in combination with the Department for Transport’s publication entitled “Guidance on Transport Assessment” (GTA) dated March 2007 which sets out the criteria for assessing new development. The GTA supersedes the IHT guidance as set out in TAN 18 Appendix D and thus is the most current guidance to be used. WelTag sets out % impacts, the actual impacts are for HGV's 34 across a 12 hour day as such 3 per hour a very low % hence the alternative criteria is used.</p> <p>GTA considers in Item 3 that for 100 two way trips across the day a Transport Assessment will be required.</p> <p>In the absence of any other local guidance, the '100 two-way trip daily threshold' has been adopted as the basis of a materiality test of traffic impact for the area. For the trunk road network which is managed by the Welsh office and not the LHA this has been combined with the 5% impact figure that is the threshold set out for trunk roads.</p>

<b>Compliance with NPS (EN-1) Requirements</b>	
<b>NPS EN-1 Section</b>	<b>Covered in ES Section</b>
5.13.6 A new energy NSIP may give rise to substantial impacts on the surrounding infrastructure and the IPC should therefore ensure that the applicant has sought to mitigate these impacts, including during the construction phase of the development.	The chapter demonstrates that the Proposed Development does not lead to significant effects other than in combination with the construction of the Collector Substation. The impacts are mitigated by the short term programme and restricted working hours ensuring no residual effect.

### **National Policy Statement for Electricity Networks Infrastructure (EN-5)**

- 12.2.4 The National Policy Statement for Electricity Networks Infrastructure (EN-5) does not provide any specific guidance with respect to traffic and transport, referring back to Part 5 of EN-1 (generic impacts).

### **The Wales Transport Strategy**

- 12.2.5 The Welsh Government (WG) set out its policy for the future of transport in Wales in “One Wales: Connecting the Nation – The Wales Transport Strategy” published in April 2008. This policy includes objectives such as reducing greenhouse gas emissions, reducing environmental impact from transport, integrating local transport, improving access between key settlements and sites, enhancing international connectivity and increasing safety and security. The delivery of the One Wales Strategy was to be achieved in partnership with the Regional Transport Consortium which each produces its own Regional Transport Plan (RTP). There are no specific transport-related policies that affect the Proposed Development or the Wider Scheme.

### **National Transport Plan**

- 12.2.6 The National Transport Plan (NTP) was first published by WAG in July 2009 and was updated in March 2010. It sits alongside the Regional Transport Plans in delivering the Wales Transport Strategy and sets out a series of proposed transport interventions across Wales, as well as targeted proposals along the main movement corridors.

### **Technical Advice Note 18 (TAN 18) 2007**

- 12.2.7 TAN 18 describes how to integrate land use and transport planning and explains how transport impacts should be assessed and mitigated although it makes no direct reference to the construction impact of development or to wind farm developments. The principles of TAN18 have however been adopted in the development of the construction methodology for the Proposed Development and the Wider Scheme.

### **Denbighshire County Council Local Development Plan (2013)**

12.2.8 The LDP states that:

*“Denbighshire is well placed to contribute to renewable energy generation by virtue of its natural resource. The Clocaenog Forest Strategic Search Area (SSA) identified by Technical Advice Note 8: Planning for Renewable Energy as a location for large scale wind turbine developments falls within Denbighshire and Conwy Council boundaries. Natural Resources Wales also identified a number of opportunities within the County with respect to hydropower. The Council recognises its responsibility to promote renewable energy through the planning system and has sought to balance this need with other objectives, including protection of important landscapes and conservation of the natural environment and built heritage”.*

12.2.9 Chapter 4 of the LDP sets out a number of objectives which ...”*have been developed to address identified issues and needs within Denbighshire. These will need to be met in order to achieve the Vision for the County up to the year 2021. The Local Development Plan policies aim to address these objectives and relevant objectives are listed after the justification to each policy”.*

12.2.10 Objectives 5 and 6 relate to transport:

*5. The Local Development Plan will place emphasis on integrating land uses, such as, employment, housing, transport, with a view to reduce the need to travel and will promote sustainable transport.*

*6. The Local Development Plan will make the best use of the County’s two existing key transport corridors - the A55 trunk road and the North Wales Coast main railway line.*

12.2.11 There are no specific LDP policies that deal with construction traffic or set out the need for Transport Assessment but does the LDP does cross refer to TAN 18. Transport Assessments are to be dealt with via development control conditions and Construction Management Plans

### **Conwy Council Local Development Plan (2013)**

12.2.12 Policy NTE/7 – Onshore Wind Turbine Development states that:

*The development of large or very large-scale (over 25MW) wind farms will be concentrated within the Clocaenog SSA in accordance with Policy DP/6 and be subject to a satisfactory Environmental Impact Assessment. Proposals will be expected to:*

*b) Ensure all details of associated ancillary development are submitted with the planning application as an integral part of the scheme;*

*c) Ensure that the potential cumulative impacts on surrounding communities, landscape and environment are considered acceptable. Where the development of a wind farm is considered to have an unacceptable cumulative impact it will be refused;*

### 12.2.13 It goes on

*Outside the Clocaenog SSA the development of medium-scale wind farms over 5MW and below 25MW will only be approved in exceptional circumstances in the context of the following:*

- a) Acceptability in terms of other Local Development Plan policies;*
- b) The potential cumulative impacts on surrounding communities, landscape and environment are considered acceptable. Where the development of a wind farm is considered to have an unacceptable cumulative impact it will be refused;*

### 12.2.14 Para 4.8.4.1 states that....."It is important that all development mitigates its transport impact"

*'Major development' proposals or development proposals with 'significant transport implications', as set out in TAN18, will be required to produce a Transport Assessment and a Travel Plan (as set out in Policy STR/3). A Transport Statement should be submitted alongside all other development proposals to enable the applicant to demonstrate to the Council that they have properly considered the transport impact of the proposal and taken into account how to mitigate them. The level of detail of the Transport Statement will vary according to the scale and complexity of the application in line with national guidance and Policy DP/6 – 'National Planning Policy and Guidance'.*

### 12.2.15 Para 4.8.4.2 states –

*A primary planning consideration is to ensure that development proposals achieve a suitable connection to the highway that is safe for pedestrians, cyclists, occupants of vehicles and other road users. Equally important is the need to ensure that road safety is not jeopardised by allowing proposals which would generate levels of traffic beyond the capacity of the surrounding road network.*

### 12.2.16 Policy STR/3 – Mitigating Travel Impact states that:

- 1. New developments will be required to mitigate the undesirable effects of travel such as; noise, pollution, impact on amenity and health and other environmental impacts.*
- 2. Where a proposed development is likely to have significant transport, social or environmental implications, the Council will require developers to submit a Transport Assessment and a Travel Plan with the planning application. A Road Safety Audit may also be required.*
- 3. Where the proposed development is considered to have significant transport implications on a wider area, financial contributions will be required towards improvements in transport infrastructure, in particular to support public transport, cycling and walking, in accordance with the development principles in Section 4 – Spatial Policies and Supporting Development Management Policies.*

*4. The Council may also require developers to submit a Transport Statement for other development proposals where there is need to understand the traffic impact of the proposal.*

12.2.17 Conwy County Borough Council are currently developing planning supplementary policy for onshore wind developments which will include transport, however currently there is no specific local guidance.

## 12.3 Consultation

12.3.1 In January 2014 SP Manweb issued the 'North Wales Wind Farm Connections EIA Scoping Report to the Secretary of State (SoS), who duly prepared a Scoping Opinion based on consultation with interested parties.

12.3.2 Table 12.2 below provides a summary of the SoS's Scoping Opinion and the elements within this Chapter that respond to the issues raised in the Opinion.

**Table 12.2: Summary of Responses to SoS's Scoping Opinion**

Issue Raised by SoS	Response
<p>2.58 The SoS considers that site access routes for construction traffic and any vehicles carrying abnormal indivisible loads (AIL) should be clearly identified and assessed within the ES, including any alterations required to the existing road network to accommodate any AIL. The ES should also identify whether any alterations to the existing road network would be retained or reinstated, and assess the potential effects arising.</p>	<p>There is no requirement for AILs to be needed for the Proposed Development</p> <p>As part of the Wider Scheme (specifically the development of the Cloganeog Collector substation) two abnormal indivisible loads (AIL) would be required. The route for these has been assessed and details provided as part of the planning documents. This chapter provides an assessment of the traffic effects of the Wider Scheme (Section 12.9). No changes to the road network are envisaged and normal escort management would be sufficient mitigation, the impacts are short term in nature.</p> <p>Other than the minor changes at the local access points to fields no changes of the highway network are proposed.</p>
<p>2.63 Information on the operation and maintenance of the proposed development should be included in the ES and should cover but not be limited to such matters as: the number of full/part-time jobs; the</p>	<p>The assessment sets out the type of vehicles, hours of operation and programme to allow the assessment of the impacts to be carried out.</p>

Issue Raised by SoS	Response
operational hours and if appropriate, shift patterns; and the number and types of vehicle movements generated during the operational stage.	
<p>3.68 It is stated that OHPL projects do not normally consider traffic and transport issues because the anticipated 'levels of vehicles' are relatively low and there is minimal likelihood of impacts on traffic flow and the road network, and subsequently concluded that no significant effects are likely. insufficient information has been provided in this section to justify that conclusion at this stage, particularly in relation to the construction phase of the proposed development. Little information is provided on matters such as for instance the likely vehicle types, number of traffic movements, requirement for HGVs or vehicles to transport abnormal loads, and the period over which construction vehicles will be accessing the site. The SoS would expect such information to be provided in the ES and full justification provided for the conclusions on impacts.</p>	<p>The assessment sets out the type of vehicles, number of traffic movements required for HGVs, vehicles to transport abnormal loads, hours of operation and programme to allow the assessment of the impacts to be carried out.</p> <p>Further information is included in Appendices 1.1 – 1.5 to this ES (DCO Document Ref 6.17), the Construction Environmental Management Plan (Appendix 2.1 to this ES (DCO Document Ref 6.18)) and the Design and Construction Report (DCO Document Ref 7.1)</p>
<p>3.71 Information on vehicular movements required and routes used to remove any waste generated during the construction phase of the proposed development should be included in the ES.</p>	<p>The deliveries and removal of materials where needed has been assessed and the impacts are not considered significant.</p>

12.3.3 Responses received from consultees regarding the S42 submission are summarised in Table 12.3 below.

**Table 12.3: Responses to Consultation**

Organisation	Issue raised	Response
Denbighshire County Council	From the information provided, the proposed traffic and transport assessment would be adequate to assess the impacts in the ES, which includes assessing the impact of temporary construction and maintenance accesses onto the public highway at various locations and the consideration of effects on the existing highway network leading to these access points.	Local access points and works required are identified in Chapter 2 'Description of the Proposed Development' (DCO Document Ref 6.2) and in the Design and Construction Report (DCO Document Ref 7.1).
	The Council would agree that the traffic associated with the operational phase will be very low, although it could be significantly higher during the construction and decommissioning stages.	This view has been confirmed by the assessment. Higher flows would occur during the construction and decommissioning stages.
	However, the local highways authority would need to agree the site compound locations, vehicular access points and construction traffic routes to ensure any effects on the highway network are minimised	The Construction Compound at Broadleys Farm and the two temporary storage areas (Collector Substation and the existing St Asaph Substation) have been included in the cumulative assessment of the Proposed Development and the Wider Scheme.  In order to reduce movements and control material deliveries, the Broadleys Farm site is to be used as the main compound for the staff and management of the construction activity.

Organisation	Issue raised	Response
	<p>...the Council would request that the cumulative impact of construction traffic in combination with other infrastructure and wind farm development which may be constructed at the same time as this project is fully assessed. In particular, as a worst case scenario, the traffic and transport assessment should take into account the cumulative effects from construction works in combination with construction works for the 4 no. wind farms in the SSA and the Bodelwyddan key strategic site.</p>	<p>Section 12.9 provides an assessment of the potential combined effects of the Wider Scheme together with an assessment of the potential cumulative effects of the Wider Scheme with other planned or proposed development in the area.</p>
NFU Cymru	<ul style="list-style-type: none"> <li>• Transport Infrastructure</li> </ul> <p>There is concern that some roads and villages in the identified route corridors are incapable of carrying the amount of traffic and the size of loads required for the construction of a substation and connection line. Many of the areas in the route corridors are served by minor roads, mainly single track and some with steep sections</p>	<p>Potential routes to / from the Construction Compound and the temporary storage areas have been assessed together with the programme of works. Potential effects would be short term and temporary and would be managed with additional escorts as necessary. Further information is provided in the Design and Construction Report (DCO Document Ref 7.1).</p>
Welsh Government	<p>Please note there may be potential transportation impacts where the Welsh Government is not the highway authority. It is assumed SP Manweb will liaise directly with all relevant highway authorities, regarding the potential transportation impacts.</p>	<p>Consultation with the local authorities has taken place and would continue both during the application process and post consent.</p>

Organisation	Issue raised	Response
	<p>The sizes of components for the proposed development may qualify as Abnormal Indivisible Loads (AILs). If AILs are necessary then we will require a Traffic Management Plan (TMP) detailing how the loads will be moved from the port of entry to the site whilst minimising delay to other traffic. I attach a letter from the Welsh Government to Flintshire setting out the requirements of such a TMP in detail. Welsh Government Transport Division will require details of how other traffic will be safely managed during the deliveries and construction phase, in accordance with the scope set out in the attached letter.</p> <p>In addition to the TMP, the Transport Division will also require full details, drawings and specifications of any new accesses or modifications to existing accesses off the trunk road network, which must be constructed to the Design Manual for Roads and Bridges (DMRB).</p>	<p>AILs are only required for the development of the Collector Substation and not as part of the Proposed Development. A planning application has been submitted to Denbighshire County Council (ref 23/2014/140) and it is therefore expected that a traffic management plan would be secured by planning condition should consent be granted.</p> <p>An initial review of the AIL routes has been undertaken and formed part of the assessment of the proposed Collector Substation (see Appendix 1.3 (DCO Document Ref 6.17)) which set out the proposed route and numbers of vehicles) and the assessment of the Wider Scheme.</p> <p>The Proposed Development and the Wider Scheme do not require any new accesses or modifications to accesses off the trunk road network.</p>

## 12.4 Methodology

- 12.4.1 It is expected that any potential traffic impacts would be related to the construction phase and temporary in nature based on the indicative construction programme (see Chapter 2 'Description of Proposed Development'). As stated in Table 12.1 above, the guidance in TAN 18 'Transport' Appendices D and E<sup>1</sup>, has been used along with The Department for Transport's publication entitled "Guidance on Transport Assessment" (GTA) dated March 2007, which sets out the criteria for assessing new development. This supersedes the IHT guidance as set out in TAN 18 Appendix D.
- 12.4.2 Reference is also made to Appendix E4 of TAN 18 which refers to trunk roads, where a 5% increase on a link would be the threshold for impacts to be assessed.
- 12.4.3 The Proposed Development does not form part of the typical development thresholds set out in Appendix D of TAN 18 therefore reference has been made to the GTA. This states, in the GTA considerations Item 2, that for a development generating more than 30 two way trips in the peak, or in Item 3, generating 100 two way trips across the day that a Transport Assessment will be required.
- 12.4.4 In the absence of any other local guidance, the '100 two-way trip daily threshold' has been adopted as the basis of a materiality test of traffic impact for the area. For the trunk road network this will initially be combined with the 5% impact figure.
- 12.4.5 WelTag is used to consider wider area network impacts for changes in major infrastructure, normally for roads that will alter the flows on links across an area. It requires network modeling, and sets out % impacts that relate to traffic flow increases of 60% of base line flows. The traffic impacts from the Proposed Development (see Section 12.5) are for baseline flow of 259, as the lowest link flow, with 34 construction flows across a 12 hour day, and as such, at 13% are well below the 60% guideline. In simple terms it could be argued that no further assessment is needed. However the guidance indicates a 100 two way flow threshold for lower impacts to be considered against hence the alternative criteria has been used.
- 12.4.6 The traffic flows are transient in nature and are based on typical vehicles seen on a highway as such the criteria below is considered acceptable to assess the effects of the scheme.
- 12.4.7 A standardised significance criteria will be used, the guidance indicates that any flows below 100 two way per 12 hours would not require detailed assessment as such minor in nature. The table below could therefore be set aside as no flows exceed 100, however to be able to compare to EIA good practice for a range of impacts to be considered against a 50% increase and 50% decrease has been used to provide a more refined description of the flow levels:

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<sup>1</sup> Planning Policy Wales, Technical Advice Note 18, Transport (March 2007) (Appendix D: 'Transport Assessment'; and Appendix E 'Planning Application Procedures')

<b>Significance Rating</b>	<b>Description of Significance</b>
Major	Exceeds threshold by 50%
Moderate	Exceeds 100 trips but less than 150 per 12 hours
Minor	Between 50 and 100 trips per 12 hours
Negligible	Below 50 trips per 12 hours.

12.4.8 All criteria are assumed to be adverse unless otherwise stated. Any effect over "moderate" is considered significant for the purposes of the EIA regulations.

## **12.5 Baseline Context**

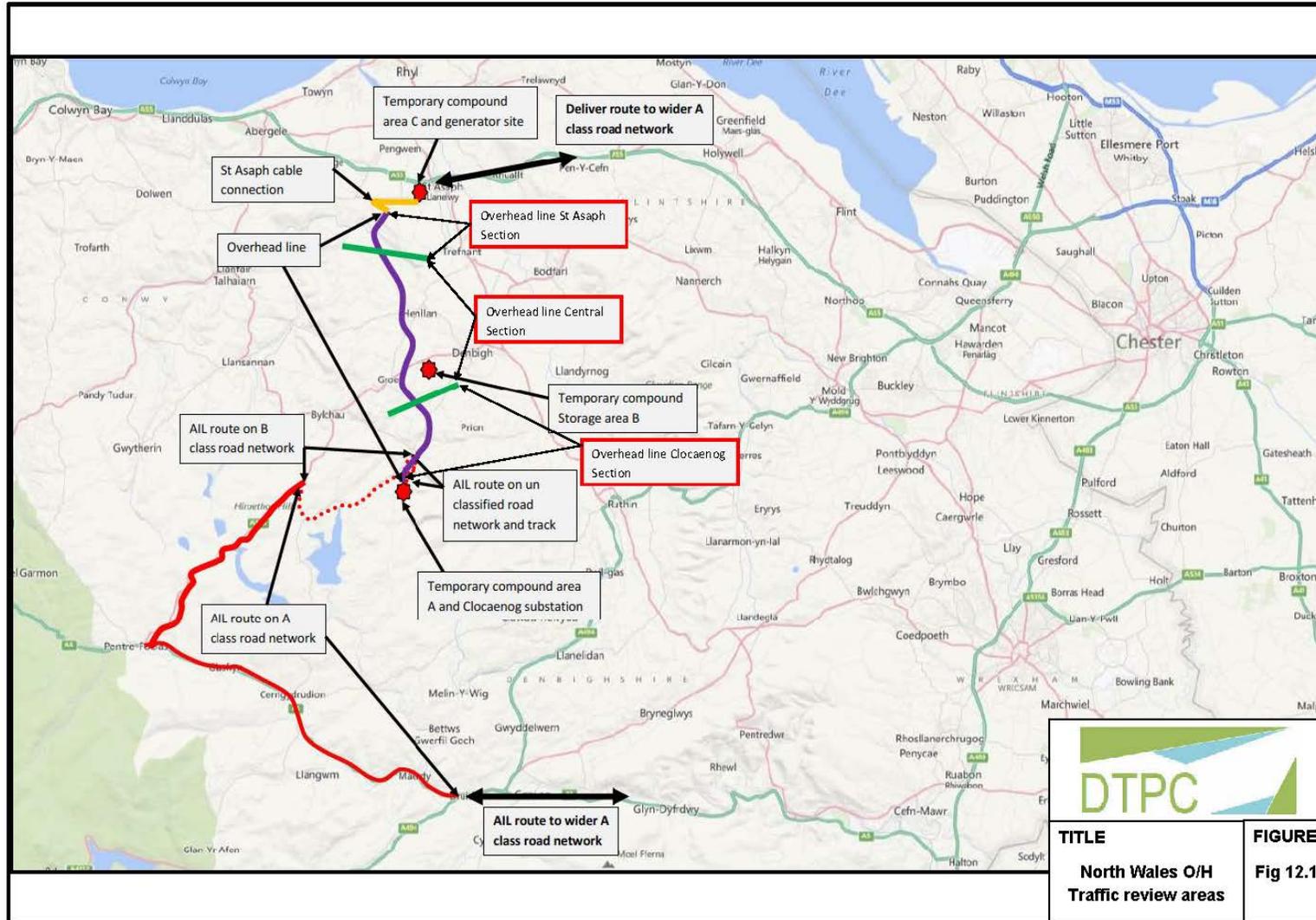
12.5.1 Access points from the highway network are indicated on the Access and Rights of Way Plans (DCO Document Ref 2.4)

### **Local Highway Assessment**

12.5.2 The Proposed Development can be divided into three distinct sections:

- Clocaenog - from the proposed Collector substation to south of the Afon Ystrad river corridor;
- Central section – from north of the Afon Ystrad river corridor to south of River Elwy corridor; and
- St Asaph - north of the River Elwy corridor to the existing substation.

12.5.3 These sections are illustrated in Figure 12.1 (red boxes and green cut lines)below.



*Clocaenog*

- 12.5.4 Existing access is currently via a track off an unclassified road. This track is a rural single track road accessing part of the Clocaenog Wind Farm, and the forest areas and agricultural land surrounding the Proposed Development It is approximately 1.5km in length. The track varies in width averaging about 3.5m with places to allow vehicles to pass. The track is very lightly trafficked. The track also provides operational access to the existing forest plantation.
- 12.5.5 The track leads to a short section of unclassified road approximately 2.8km in length serving the local area. The road varies in width averaging about 4.5m with wider sections to allow vehicles to pass. The road links to the B4501 near to Bryn Glas.
- 12.5.6 From the junction with the B4501 the network runs roughly south west to Cerrigydrudion and the A5 and north east to Denbigh which then links to a number of A and B roads connecting to the wider area. The B4501 has long sections where two lanes are marked and short sections where cars and smaller HGV's can pass but two full size HGV's would need to pass with care.
- 12.5.7 As the B4501 nears Denbigh it crosses the Afon Ystrad with steep slopes into and out of the valley combined with a Z bend, this section cannot accommodate long or wide vehicles.
- 12.5.8 The B4501 also has a short section to the south west which runs north to the A543, this again also runs south west to Pentrefoelas where it connects to the A5 a high standard classified road.
- 12.5.9 The A5 runs easterly to the A483 junction at Ruabon forming a north south route. To the west it turns north west linking to the A55 near Bangor.

*Central Section*

- 12.5.10 North of Denbigh running to the west is the B5382 through Henllan linking to Llansannan and Llangernyw, and the A548. This road has long sections where two lanes are marked and short sections where cars and smaller HGV's can pass but two full size HGV's would pass with care.
- 12.5.11 Also linking to and through to the east of Denbigh is the A543 route from the south west at Pentrefoelas where it connects to the A5 a high standard classified road. This road has long sections where two lanes are marked and short sections where cars and smaller HGV's can pass but two full size HGV's would do so with care.
- 12.5.12 A connecting route, the B5428, runs southerly from the B5382 at Henllan to the A543 at Groes. This route is largely unmarked but accommodates two cars and smaller vehicles but larger HGV's would pass with care.
- 12.5.13 Between the A543 and the B4501, the B5382 and A543 and north of the B5382 corridors, are a number of unclassified roads connecting to farms and dwellings. These roads vary in width averaging about 3.0m with irregularly located places to allow vehicles to pass. The roads are very lightly trafficked.

*St Asaph*

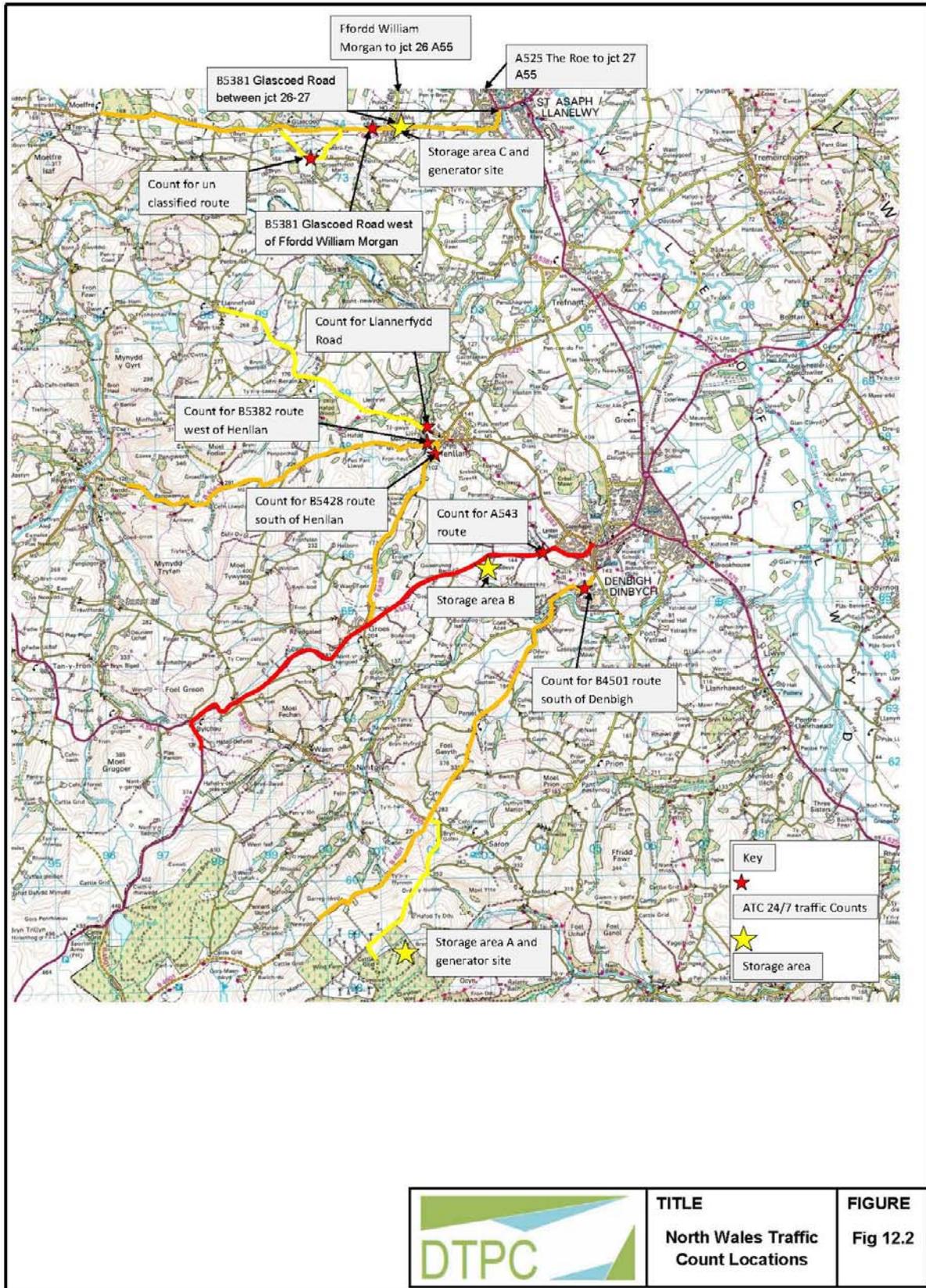
- 12.5.14 North of St Asaph is the A55 North Wales Expressway a dual carriageway running west to Bangor linking to the A5 and Holyhead. To the east it links to the

A494 at Ewloe. These routes wrap around the City of Chester and both connect to the M56.

- 12.5.15 The A55 at St Asaph has two junctions, 26 and 27. Junction 27 directly links to St Asaph via The Roe. It connects to the B5381 Glascoed Road which has two marked lanes running to the west and Penrefail crossroads. Some 2.2km to the west of St Asaph the route serves the St Asaph Business Park and the existing St Asaph substation.
- 12.5.16 The Business Park area connects back to the A55 at Junction 26 via Ffordd William Morgan.
- 12.5.17 To the south of the B5381 are a number of unclassified roads connecting to the residential area of Groesfordd Marli, farms and individual dwellings. These roads vary in width averaging about 3.0m with irregularly located places to allow vehicles to pass.
- 12.5.18 There is a primary school at Cefn Meiriadog which has associated traffic movement, other than this the roads are very lightly trafficked.

### **Baseline flows**

- 12.5.19 To understand the existing traffic movements on the classified road network a series of automatic traffic counts (ATC) using rubber tubes (enabling surveying of flows over a 24 hour 7 day period) have been carried out. The traffic count data are included in Appendix 12.1 and locations shown on Figure 12.2 below
- 12.5.20 The locations include:
- B4501 south west of Denbigh linking to the Collector Substation and the proposed temporary storage area (referenced as compound A on Figure 12.1);
  - A543 west of Denbigh, associated with the Construction Compound at Broadleys Farm (Reference B on Figure 12.1);
  - B5428 south west of Henllan linking to the A543;
  - B5382 west of Henllan;
  - Unclassified road east primary school at Cefn Meiriadog; and
  - B5381 west of the roundabout with Ffordd William Morgan associated with the existing St Asaph substation and the proposed temporary storage area (Reference C on Figure 12.1).



12.5.21 A summary of the traffic counts is provided in Table 12.4 below. Where possible, counts have been taken near the largest urban area on the route to ensure the count is the maximum flow along the route.

**Table 12.4: ATC Flows**

Location	2014 surveyed 12-Hour Traffic Flows (Two way traffic flows)	
	Total Vehicles	HGVs
Site 1 B5381 west of jct 26	1245	44
Site 1A Unclassified road	320	5
Site 2 B5382	315	16
Site 2C B5428	259	6
Site 3 A543	1925	72
Site 4 B4501	605	19

12.5.22 In addition, with regard to the St Asaph section, the EIA reports for the Western Link (offshore wind farm) have been reviewed for activity at the two A55 junctions (see Table 12.5 below).

**Table 12.5: A55 flows**

Location Junction 26	2011 Observed 12-Hour Traffic Flows (Two way traffic flows)	
	Total Vehicles	HGVs
A55	10,495	504
Ffordd William Morgan	4,448	135
B5381 Glascoed Road between jct 26-27	3,868	244
Location Junction 27	2011 Observed 12-Hour Traffic Flows (Two way traffic flows)	
	Total Vehicles	HGVs
A55	10,495	504
A525 The Roe	14,867	720
B5381 Glascoed Road between jct 26-27	3,868	244

## 12.6 Embedded Mitigation

- 12.6.1 Potential effects would be mitigated by the use of good construction management practice:
- the indicative construction programme (see Chapter 2 'Description of the Proposed Development') has minimised the overlap between activities that generate higher flows on the network;
  - the areas where work is to commence would be signed to show the programme for construction traffic and any routes that may be affected;
  - narrow roads would be accessed using escort vehicles to highlight the approach of the larger pole carrying or material vehicles to ensure conflicts are removed or reduced;
  - safe access points for the construction of the overhead line have been identified; and
  - the Construction Environmental Management Plan (Appendix 2.1 to this ES (DCO Document Ref 6.18), secured as a draft requirement within the DCO, and which includes a draft Traffic Management Plan.

## 12.7 Assessment of Effects

- 12.7.1 The poles, conductors and cables would be delivered from suppliers outside the wider study area on an 'as needed' basis. The HGV's used would be standard rigid and articulated vehicles that meet the construction requirements and comply with the relevant use regulations. There would no requirement for any to be designated as AILs and as such the HGVs would be part of the daily variation and mix of traffic on the primary and motorway network. Locally they would use the A55 if approaching from the north west / north east or the A5 from the south east / south west. Deliveries would be intermittent / 'as needed', thereby ensuring large storage areas would not be needed.
- 12.7.2 In order to carry out an assessment of the likely effects of the traffic generated by the Proposed Development an understanding of the construction requirements and the movements associated with each task is needed. More detailed information is included within the Design and Construction Report (DCO Document Ref 7.1) and summarised below.
- 12.7.3 As set out in Chapter 2 'Description of Proposed Development' during operation the 132kV Overhead Line would be maintained from SP Manweb depots in Wrexham and Llandudno Junction. No permanent presence would be required on site. Most components of overhead lines are maintenance free and once installed the 132kV Overhead Line would require only monthly and annual site inspections and periodic maintenance. Traffic movements would therefore be negligible and have not been assessed further.

## Construction

- 12.7.4 During the construction phase it would be necessary to establish a temporary construction compound. This compound would include welfare facilities for the workforce throughout the construction phase of the works and would have a number of portable cabins together with a material store. A site has been identified at Broadleys Farm (Ref B on Figure 12.1) which fronts the A543 and would hence facilitate the convenient delivery of materials.
- 12.7.5 At convenient places along the route, temporary lay down areas would be required for the dispersal of plant and equipment. In identifying temporary lay down areas care is undertaken to minimise disruption to local traffic and to ensure potential environmental effects are fully mitigated. This would involve preparing the area in advance of deliveries and would include ground protection if the temporary bulk storage of poles is planned. Typically these lay down areas would measure a minimum of 50m x 50m and would be level such that articulated lorries can be safely unloaded. In some areas poles would be delivered directly from the highway without use of the storage areas.
- 12.7.6 The average distance between the wood pole structures (referred to as 'span length') is 79m. The maximum span length is 120m and the shortest 50m. The current design includes a total of 218 structures, including 2 terminal structures. The design of the terminal structure incorporates four poles in order to support the cable terminations. The 218 structures would therefore require a total of 438 wood poles (see Design and Construction Report DCO Document Ref 7.1).
- 12.7.7 The heights of the poles vary due to changes in topography and other factors such as span length, wind span and weight span, and angles of deviation. The wood poles are generally no larger than 470mm in diameter, and would range between 11.5m and 16m in length. The initial movements would involve the delivery of the poles from the pole supplier to the construction compound and the two temporary storage areas at the Collector Substation and the existing St Asaph substation (Ref A and C on Figure 12.1).
- 12.7.8 Typical articulated vehicle dimensions for the delivery of a 16m pole would be width 3.1m, height 4.9m and length 18m, including trailer. The maximum pole length is 16m and only 7 - 8 would be required; other poles are generally 14m in length (see Design and Construction Report DCO Document Ref 7.1).
- 12.7.9 Poles greater than 18m would require delivery on an abnormal indivisible load (AIL) and would therefore require special permission from the highways authorities (the total vehicle length would potentially exceed 18.75m). No such poles of this length are proposed for the scheme.
- 12.7.10 The maximum allowable gross weight of a Vehicle/Trailer/Load Combination is 44 tonnes on UK roads and the Proposed Development would not exceed this for any loads.

- 12.7.11 From the temporary storage areas at the Collector Substation and the existing St Asaph substation the poles would be taken to their individual locations, as close to their final position as possible. This would be by general purpose vehicles with incorporated lifting devices. An advance warning vehicle with flashing beacons may have to accompany the lorry along some routes as some of the poles would overhang the bed of the lorry. Tractors and trailers or excavators would be used, if necessary, to transport the poles to their individual peg positions. Where practical large vehicle movements would be minimised to avoid areas of high congestion during busy periods.
- 12.7.12 The conductor would be delivered on cable drums by general purpose vehicles, to locations as close as possible to the angle or tension pole sites from which the conductors would be pulled. If necessary tractors adapted to carry such loads would be used to transport the cable drums to the pole sites.
- 12.7.13 As set out in the Design and Construction Report (DCO Document Ref 7.1) the conductors, steelwork, insulators and fittings would be centrally stored and managed within a secure storage area (within the Construction Compound) and delivered to site by general purpose 4 x 4 lorry.
- 12.7.14 To assess the likely traffic impacts an indicative list of vehicle movements for the construction of a typical 1.5km section of overhead line with 18 structures, assumed two of them requiring non-standard foundations due to ground issues, has been set out. For each section it is assumed that there are three accesses off the highway with underline access available.

### **Access Routes**

- 12.7.15 Access would be required to each pole position on an on-going basis throughout the duration of the works. Generally a 5m access is required to accommodate the construction vehicles. All vehicle movement would be kept to the minimum practicable. Wherever possible, mitigation would be implemented to minimise disruption during the construction phase, for example by only using suitably sized vehicles and equipment as is necessary to complete the works.
- 12.7.16 Access routes from the highway have been identified and are indicated on the Access and Rights of Way Plans (DCO Document Ref 2.4). At this stage the exact routes to each location / area are not known other than via the A/B roads and then the unclassified network. These have been assessed to ensure they can accommodate the vehicle types to be used and where necessary agreement reached on routes that cannot be used.
- 12.7.17 Typically access is required for excavators (wheeled JCB and/or tracked 360 degree excavator), 4x4 Lorries (often with a crane) and 4x4 pick-ups. Subject to access constraints the poles would tend to be erected in sequence from one end of the route to the other albeit there may be construction operations at multiple work locations. Additionally some of the foundation works would require the import of suitable backfill material which would normally be delivered in 20 tonne capacity tipper lorries (15m<sup>3</sup> capacity). The backfill material can be unloaded in a convenient location and transported to the pole locations by dumper truck.

- 12.7.18 During the conductor erection phase of the works, specialised line winches are towed to specified pulling and tensioning positions along the route using agricultural sized tractors. Cable drums would also be delivered to the tensioning positions. These works are critically sequenced and the plant would move in “wiring sections” from one end of the line to the other until conductoring is completed. All equipment would be delivered to site only when required to minimise the chances of theft or vandalism.
- 12.7.19 In certain locations, where ground conditions are poor, it may be necessary to install temporary access roads and working areas in order to minimise potential damage. These measures could include dry stone roads or proprietary temporary access ways using aluminum panels.

### **Programme**

- 12.7.20 Based on the indicative programme (see Chapter 2 ‘Description of Proposed Development (DCO Document Ref 6.2)'), the construction works are expected to take place within a 16 month period commencing in June 2016.
- 12.7.21 For the line construction works it is likely that the contractor would use three teams each consisting of five staff to carry out the pole assembly and erection work. It is reasonable to assume that each team would progress at an installation rate of two complete structures per day. It could therefore be expected that the 218 structures would take an elapsed time of approximately three to four months to erect, allowing for availability of resources, movement of plant, additional foundations at some locations, and reinstatement.
- 12.7.22 As set out in the Design and Construction Report (DCO Document Ref 7.1), experienced wiring teams would erect the new conductors, once the majority of the poles have been erected. This would typically comprised three separate five man teams working in individual pulling sections along the route. There would be approximately 12 pulling sections along the 132 kV Overhead Line averaging 1.5km per section.
- 12.7.23 A pulling section is a length of line between two angle structures and these would be sequenced in order to minimise the need for supporting temporary stays. Although it should be possible to erect conductors over a route length of 17km in about four months, the indicative programme indicates an elapsed time of five months to make due allowance for the nature of the terrain which may increase the preparation time between individual sections.

## Movements

12.7.24 As identified above the Proposed Development can be divided into three distinct sections, and the following assumptions have been made:

- Clocaenog - from the proposed Collector substation to south of the Afon Ystrad river corridor (approx. 80 poles sourced from the temporary storage area at the Collector Substation - at 2 poles per day on average this would be 16 days' work for one gang).;
- Central section – from north of the Afon Ystrad to south of River Elwy (approx. 118 poles sourced from Broadleys Farm Construction Compound- 59 days for one gang); and
- St Asaph - north of the River Elwy to the terminal pole (approx. 20 poles sourced from the temporary storage area at St Asaph Substation – 10 days for one gang).

12.7.25 Based on the information provided in the Design and Construction Report (DCO Document Ref 7.1) a typical set of vehicle movements for the construction of a 1.5km section of line with 18 structures, two requiring non-standard foundations, is shown in Table 12.6 below. Each 1.5km section would take 10 working days to complete based on the indicative programme. This is considered a reasonable assumption for setting out a daily set of movements as would be needed to undertake the works along the full length of the 132 kV Overhead Line.

**Table 12.6: Overhead Line - Movements for a 1.5km Section**

Activity / Vehicle	Visits off Highway based on 10 working days (approx.)	Purpose
<b>Setting Out</b>		
4 x 4 Pickup	3	Surveyor's vehicle
<b>Tree Trimming</b>		
4 x 4 Pickup	5	Tree trimming/removal of logs and waste
Trailer/Wood chipper	5	
Agricultural tractor	5	
<b>Total</b>	<b>18</b>	
<b>Work Area Preparation</b>		
JCB excavator	3	Removal of hedges/persons to site/import of hard stand material/security fencing

<b>Activity / Vehicle</b>	<b>Visits off Highway based on 10 working days (approx.)</b>	<b>Purpose</b>
4 x 4 pickup	10	
<b>Hiab lorry</b>	2	
6t dumper	3	
<b>Tipper lorry</b>	10	
<b>Total</b>	<b>28</b>	
<b>Foundations/Pole Erection</b>		
JCB excavator	3	Material deliveries/persons to site/excavation of foundations/erection of poles/import of backfill material
<b>Tracked excavator</b>	3	
<b>Low loader</b>		
4 x 4 tractor / trailer	3	
4 x 4 Pickup	20	
<b>Hiab lorry</b>	15	
6t dumper	10	
<b>Tipper lorry</b>	10	
<b>All terrain crane</b>	3	
<b>Total</b>	<b>67</b>	
<b>Conductor Stringing</b>		
Winches/tensioner (towed)	2	Persons to site/material deliveries/delivery of winches
Agricultural tractor	2	
<b>Hiab lorry</b>	4	
4 x 4 Pickup	12	
<b>Total</b>	<b>20</b>	
<b>Reinstatement</b>		

<b>Activity / Vehicle</b>	<b>Visits off Highway based on 10 working days (approx.)</b>	<b>Purpose</b>
JCB excavator	3	Reinstatement of excavations/fields/verges etc/removal of all plant and equipment
<i>Tracked excavator</i> Low loader	3	
4 x 4 Pickup	10	
<i>Hiab lorry</i>	4	
6t dumper	3	
<i>Tipper lorry</i>	10	
Road sweeper	As required	
<b>Total</b>	<b>33</b>	
<b>Total movements</b>	<b>166 or av 17 per day (two way flows 34 per day)</b>	
<b>Total HGV</b>	<b>64 or av 7 per day (two way flows 14 per day)</b>	

Note: HGV have been highlighted in italics for clarity

### **Assessment of Construction Movements**

- 12.7.26 From the predicted movement data set out above anticipated traffic flows have been identified for each section of the Proposed Development, excluding pole deliveries as, as outlined below, they are of a low number and would be intermittent throughout the construction programme).
- 12.7.27 The 438 poles would require approximately 10 delivery loads based on 40-45 per load. These are spread across the programme and equate to 1 or 2 loads per 2 week period. Other materials would be of a similar scale/nature of traffic movements. A worst case is therefore a weekly delivery profile of 1-2 HGV's, which would not be noticed on the wider and local network. The pole deliveries are therefore of such a low/intermittent level in terms of numbers and thus no detailed assessments are considered necessary.

- 12.7.28 In addition to the materials the construction process on a day to day basis would require workers (approximately 20-25 staff) to travel to the three storage areas and to site as required. The origin of these movements would be spread across the urban area with workers travelling either from home or bed and breakfast facilities. These movements be spread across the local networks and, as they are commuter type trips, would form part of the daily background flows.
- 12.7.29 As described earlier, the route of the 132 kV Overhead Line has been divided into three sections to enable the local network to be assessed for potential impacts. The road network within these sections is identified below. The A55 trunk road, around Jcts 26 and 27, together with the local routes connecting the two junctions, has also been assessed for the deliveries and daily flows derived as a worst case i.e. the A5 would also be utilised thus spreading the delivery routes across the wider network.
- *Section 1 Clocaenog - from the proposed Collector substation to south of the Afon Ystrad;*  
B4501 south west of Denbigh (linking to the Collector substation and the proposed temporary storage area (Compound A on Figure 12.1);
  - *Section 2 Central section – from north of the Afon Ystrad to south of River Elwy.*  
A543 west of Denbigh (adjacent to the Construction Compound at Broadleys Farm (Compound B on Figure 12.1);  
B5428 south west of Henllan linking to the A543;  
B5382 west of Henllan;  
Llannerfydd Road west of Henllan;
  - *Section 3 St Asaph - north of the River Elwy to the existing substation.*  
Unclassified road east primary school at Cefn Meiriadog; and B5381 west of the roundabout with Ffordd William Morgan (linking to the existing St Asaph substation (and Compound C on Figure 12.1).
- 12.7.30 From the tables above, there would be an average total 34 two way flows over a 12 hour period with 14 two way hgv movements (for the full length of the 132 kV Overhead Line originating from a storage areas). As a worst case assessment the flows for each day have been applied to each road section, from each of the three storage areas, however this would not be the case on a day to day basis.
- 12.7.31 Reference has been made to the EIA reports for the Western Link (offshore wind farm) to identify activities along the A55. The following flows have been abstracted to allow direct comparisons to be made as part of the cumulative assessment.

*A 55 Trunk Road*

12.7.32 For clarity, as set out in Table 12.1, the % change is set out for the trunk road network only as set out in the standardised assessment.

12.7.33 As a worse case the construction flows have been assessed using the Junctions 26 and 27 individually (which is unlikely) and across both junctions for completeness.

**Table 12.8: Assessment of all Construction Traffic Using Junction 26 of the A55**

Location	2011 Observed 12-Hour Traffic Flows (Two way traffic flows)		Development 12-Hour Traffic Flows (Two way traffic flows)		Percentage Increase for A55 only	
	Total Vehicles	HGVs	Total Vehicles	HGVs	Total Vehicles	HGVs
A55	10,495	504	34	14	0.28%	2.8%
Ffordd William Morgan	4,448	135	34	14		
B5381 Glascoed Road	3,868	244	34	14		

**Table 12.9: Assessment of all Construction Traffic using Junction 27 of the A55**

Location	2011 Observed 12-Hour Traffic Flows (Two way traffic flows)		Development 12-Hour Traffic Flows (Two way traffic flows)		Percentage Increase	
	Total Vehicles	HGVs	Total Vehicles	HGVs	Total Vehicles	HGVs
A55	10,495	504	34	14	0.28%	2.8%
A525 The Roe	14,867	720	34	14		
B5381 Glascoed Road	3,868	244	34	14		%

12.7.34 Assuming a 50% split of construction traffic using junction 26 and 27 of the A55, the effect upon the highway is detailed in Table 12.10 below:

**Table 12.10: Assessment of Construction Traffic using both routes**

Location	2011 Observed 12-Hour Traffic Flows (Two way traffic flows)		Development 12-Hour Traffic Flows (Two way traffic flows)		Percentage Increase	
	Total Vehicles	HVs	Total Vehicles	HVs	Total Vehicles	HVs
A55	10,495	504	34	14	0.28%	2.8%
A525 The Roe	14,867	720	17	7		
Ffordd William Morgan	4,448	135	17	7		
B5381 Glascoed Road	3,868	244	34	14		

- 12.7.35 The predicted effect on the traffic flow on the A55 indicates that there would be less than a 5% increase in traffic flow on the trunk road. This is the relevant significance criteria for trunk road impacts as set out in the methodology in TAN 18.
- 12.7.36 HGV movements have also been assessed in isolation in order to judge the % change in HGV flows on the trunk road. The result for this scenario are also less than the threshold % figure required for detailed assessments.
- 12.7.37 The 5% threshold normally used for assessment purposes is against the peak hours where operational issues are anticipated. It should also be noted that the flows above have been assessed across the 12 hour working day and therefore the % change against peak hour flows would be even less.
- 12.7.38 In relation to the potential effects of the Proposed Development on the local highway network (i.e. other than the trunk road) the assessment has applied '100 two-way trip daily threshold' as set out in TAN18, to identify whether the Proposed Development would have a significant effect.

12.7.39 From the tables above no locations are close to the threshold, therefore.

- Standardised significance criteria<sup>2</sup> would be **negligible**; and
- Not considered significant for the purposes of the EIA

*Wider Area Network*

12.7.40 As outlined above (12.7.29) the Proposed Development has been divided into sections to be assessed.

12.7.41 From the tables above, there would be an average total 34 two way flows with 14 two way hgv movements for each section. As the sections would be served by the three storage areas the potential for one storage area to serve two sections is low.

**Table 12.11: Assessment of Construction Traffic for each Section**

Location	2014 surveyed 12-Hour Traffic Flows (Two way traffic flows)		Development 12-Hour Traffic Flows (Two way traffic flows)	
	Total Vehicles	HGVs	Total Vehicles	HGVs
Site 1 B5381 west of jct 26	1245	44	34	14
Site 1A Unclassified road	320	5	34	14
Site 2 B5382	315	16	34	14
Site 2C B5428	259	6	34	14
Site 3 A543	1925	72	34	14
Site 4 B4501	605	19	34	14

12.7.42 As above, the assessment criteria of '100 two-way trip daily threshold' has been adopted as the basis of a materiality test of traffic impact for the area.

<sup>2</sup> See para 12.4.7 above

- 12.7.43 For all of the routes assessed none are close to the threshold therefore;
- Standardised significance criteria would be **negligible**
  - Not considered significant for the purposes of the EIA
- 12.7.44 Although discounted as a low potential to take place if one storage area served two sections the potential flows along the routes adjacent to the storage area would be doubled i.e. 68 and 28 HGV.
- 12.7.45 This worst case is below the threshold therefore;
- Standardised significance criteria would be at worse **minor/negligible**
  - Not considered significant for the purposes of the EIA.

### **Decommissioning**

- 12.7.46 Decommissioning would involve the removal of poles, conductors and other equipment. It is likely that some poles would be given to land owners thus reducing the need to remove materials from site. Foundations below topsoil level would not be removed. The overall level of movements would thus be less than for construction, such that decommissioning would result in fewer impacts.

## **12.8 Specific Mitigation Measures**

- 12.8.1 Given the low flows and minor/negligible impacts it is not considered that any additional mitigation measures are required over and above the embedded mitigation set out.

## **12.9 Assessment of Cumulative Effects**

### **Approach to Cumulative Impact Assessment**

- 12.9.1 The purpose of the cumulative impact assessment is to consider the potential effects of the Proposed Development in conjunction with other major developments in the area. This is in recognition that the combined effects of a number of similar developments concentrated in one area may be greater than the sum of the effects from the same developments if considered individually.
- 12.9.2 The assessment is split into two stages:
- Stage 1 – The Proposed Development in combination with the Wider Scheme and the Wind Farms. This assessment considers Cloganeog Forest and Brenig Wind farms only as Nant Bach, and Derwydd Bach are located to the south of the Proposed Development and would not use the same highway network as would be used for the Proposed Development and Wider Scheme, as such they have not been included in the cumulative assessment.
  - Stage 2 then includes other proposed and planned developments in the area.

**Stage 1 -Cumulative Assessment.**

12.9.3 In order to undertake an assessment of the likely significant effects an understanding of the construction for each of the Proposed Development, Wider Scheme and the Wind Farms, and the traffic movements associated with each is needed, this is set out below.

*Programme*

12.9.4 Based on the current outline project programme, the construction works are expected to take a total of 16 months commencing in June 2016, with all elements of the Proposed Development and the Wider Scheme being completed within this timescale.

*Movements*

12.9.5 It is likely that the construction of the Collector Substation would overlap with the construction works for the Proposed Development in the local area and similarly, the construction works at St Asaph substation (including the underground cable from St Asaph substation to the terminal pole) would overlap with the Proposed Development in that local area.

12.9.6 For the purposes of the assessment consideration has been given to only two of the three sections identified in Section 12.5.2 above as the central middle section/storage area is only potentially affected by the construction of the 132 kV Overhead Line with no overlaps is not affected by works at the two ends of the scheme:

- The Collector substation to south of Afon Ystrad; and
- north of the River Elwy to St Asaph substation (including the underground cable).

*Collector Substation*

12.9.7 Further information relating to the Collector Substation is provided in Appendix 1.3 to this ES (DCO Document Ref 6.17). Table 12.11 below provides a summary of typical plant/machinery required with outline durations:

12.9.8 Based on the construction report for the proposed works for the Collector Substation the maximum anticipated average hourly one – way traffic flow to the Collector Substation site would be 5 HGV's per hour or 60 two way for a 12 hour period. It is expected this peak figure would be required for short periods only, specifically during the initial platform forming phase and concreting of the bases where high demand is needed for offsite material deliveries. After which it is likely that this figure would reduce dramatically.

12.9.9 It is also anticipated that a maximum of between 20 and 25 construction workers would access/egress the Collector Substation site during the morning and evening peak hours in cars or light goods vehicles. Again this maximum would be for a short period only when civils infrastructure works and electrical installation activities are ongoing concurrently.

**Table 12.11: Collector Substation - Movements**

<b>Activity</b>	<b>Vehicle</b>	<b>Duration on site</b>	<b>Anticipated Movements</b>	<b>Purpose</b>
<b>Setting Out</b>				
	4 x 4	0.5 months	2 per day two way	Surveyors vehicle
<b>Site/Tree Clearance</b>				
	<i>Forest Harvester</i>	1 month	Worst case 1 trip in or out	Felling of trees, removal of branches and cutting to transportable length.
	<i>360 Excavator</i>	1 month	Worst case 1 trip in or out	Loading of logs onto lorries
	<i>Articulated lorries</i>	1 month	17 per day two way	Transport of logs from cleared site Tree Felling activities would be 84 vehicle movements in total based on 5 hectares of felling. During a 1 month period (20 working days) this would equate to an average of just under 17 movements per day.
	<i>Trailer/Wood chipper</i>	1 month	Worst case 1 trip in or out	Chipping branches
			<b>Total - 20 hgv trips</b>	

Activity	Vehicle	Duration on site	Anticipated Movements	Purpose
<b>Site Establishment</b>				
	<b>Telehandler</b>	1 month	Worst case 1 trip in or out	Offloading and placing of welfare cabins, canteens, mess rooms etc.
			<b>Total - 1 hgv trip</b>	
<b>Civil Works</b>				
(inc platform works, access tracks, structural foundations, cable ducting etc.)	<b>360 Excavator</b>	8 months	Worst case 1 trip in or out	General excavation for structural foundations, drainage, ducting and levelling of access roads etc.
	Dumper	8 months	Worst case 1 trip in or out	General movement of excavated material or placement of aggregate for access roads etc.
	Ride on roller	4 months	Worst case 1 trip in or out	Compaction of access tracks, platforms etc.
	<b>Tipper Lorries</b>	2 months	10 per day two way	Removal of spoil and delivery of aggregate during initial stages of civils works assuming that earthworks would have a cut/fill balance and no material is removed from site, we estimate that approximately 5 deliveries

Activity	Vehicle	Duration on site	Anticipated Movements	Purpose
				per day (10 vehicle movements) would be required for the delivery of aggregate to create the platform etc. throughout the programmed 2 month period
	Generator	8 months		Supply of electricity to welfare facilities
	Compressor	8 months	Worst case 1 trip in or out	For occasional use of compressed air tools to break out concrete etc.
	Concrete compaction tools	4 months	Worst case 1 trip in or out	Compaction of structural concrete.
			<b>Total - 15 hgv trips</b>	
<b>Substation Building Works</b>				
	360 Excavator	2 months	Worst case 1 trip in or out	Excavation of foundations, trenches for building services and drainage, trenches for circuits.
	Mini Excavator	2 months	Worst case 1 trip in or out	As above where space is restricted
	Dumper	2 months	Worst case 1 trip in or out	General movement of excavated material or placement of

Activity	Vehicle	Duration on site	Anticipated Movements	Purpose
				aggregate for access roads etc.
	Mixer	2 months	Worst case 1 trip in or out	Preparation of mortar for brickwork.
	Telehandler	4 months	Worst case 1 trip in or out	General lifting operations associated with building construction including placement of roof slabs etc.
			<b>Total - 4 hgv trips</b>	
<b>Electrical Installation/Commissioning</b>				
	Crane	0.5 month	Worst case 1 trip in or out	Off-loading of heavy electrical plant including transformers
	MEWP <sup>3</sup>	6 months	Worst case 1 trip in or out	To gain access to install electrical infrastructure.
	Telehandler	6 months	Worst case 1 trip in or out	General lifting operations associated with receiving equipment deliveries and electrical installation works.
			<b>3 hgv trips</b>	
	<b>Total</b>		<b>Two way flows 20 per day</b>	

<sup>3</sup> Mobile Elevated Work Platform

<b>Activity</b>	<b>Vehicle</b>	<b>Duration on site</b>	<b>Anticipated Movements</b>	<b>Purpose</b>
	<b>movements</b>		<b>worst case for felling works section</b>	
	<b>Total HGV</b>		<b>Two way flows 20 per day worst case for felling works section</b>	

- 12.9.10 In addition to the above it is anticipated that delivery vehicles would visit the Collector Substation site on an ongoing basis throughout the duration of the construction. These would include, flat bed lorries for delivery of smaller electrical equipment, tipper lorries, concrete lorries, vans etc. Two abnormal indivisible loads would also be required for the substation transformers, these would be delivered in the third quarter of the programme.
- 12.9.11 The optimum route for construction vehicles, including delivery of the proposed transformers, is as detailed below.
- From Chester M55 turn into A55
  - From A55 turn into A483 to Wrexham
  - Continue on A483 to A5 Ruabon
  - From the A5 at Pentre-Foelas turn onto the A543
  - Continue on the A543 to junction with B4501
  - Turn right onto B4501
  - Turn left continuing on B4501
  - Continue on B4501 to junction with B5435
  - Turn right onto B5435
  - Turn right on to unclassified road Continue on unclassified road to existing access track into Clocaenog Forest
  - Follow access track to proposed substation location
- 12.9.12 As only two AILS are required they would not make a material impact on the local network other than a short period of time whilst the traffic management escort plan is actioned.
- Assessment of Effects
- 12.9.13 For the Proposed Development in the section to the south of Afon Ystrad, from Table 12.6 above, there would be an average total 34 two way flows with 14 two way hgv movements for the full length of the Proposed Development.
- 12.9.14 For the Collector substation there would be an average total 26 two way flows with 20 two way hgv movements (see Table 12.11).
- 12.9.15 As a worst case these have been combined with movements associated with the Proposed Development south of Afon Ystrad, to give an average of total 60 two way flows, with 34 two way hgv movements.
- 12.9.16 The assessment criteria of '100 two-way trip daily threshold' has been adopted as the basis of a materiality test of traffic impact for the area.
- 12.9.17 The average movements for the Collector Substation and Proposed Development is shown in Table 12.12 below.

**Table 12.12: Average movements for the Collector substation and Proposed Development**

<i>Location</i>	<i>2014 surveyed 12-Hour Traffic Flows (Two way traffic flows)</i>		<i>Development 12-Hour Traffic Flows (Two way traffic flows)</i>	
	<i>Total Vehicles</i>	<i>HVs</i>	<i>Total Vehicles</i>	<i>HVs</i>
B4501	605	19	54	34

12.9.18 Thus for the B4501 substation section they are below the 100 two way threshold i.e. 54.

12.9.19 It should be noted that this would be for a very concentrated period of 1 month out of the 16 month construction period and is thus not reflective of the full build period.

- Standardised significance criteria would be at **minor**:
- Not considered significant for the purposes of the EIA.

#### *Wind Farms*

12.9.20 The Collector Substation and the Proposed Development construction works would be undertaken at the same time as the construction of the Clocaenog and Brenig Wind Farms thus the cumulative impact needs to take this into account.

12.9.21 The Transport Report for Clocaenog Wind Farm<sup>4</sup> sets out

- Construction materials (excluding turbine components) would be sourced as locally as possible and would utilise the agreed delivery routes to and from the Clocaenog Wind Farm Site.
- The construction period is expected to last 24 months including commissioning of the turbines and restoration of any temporary off-site works. (For the purposes of this assessment it has been assumed that the worst case trips would occur at the same time as the worst case trips for the 132 kV Overhead Line).
- The construction site would operate on a single day-shift system, Monday to Friday, between 0700 to 1900 hours and on Saturday, between 0700 to 1300 hours. HGV deliveries are expected to be on a Monday to Friday only, with no significant deliveries anticipated on Saturdays. It has been assumed that HGVs would operate 20 days per month (5 days per week) for the duration of the construction period and that daily HGV movements would be distributed evenly across the 12 hour working day.

<sup>4</sup> Produced by SKM

- Peak construction traffic will be in month 16 with a total of 1,671 two-way HGV movements.
- The movements within the peak month include the transportation of imported stone aggregate (1,239 two-way HGVs), other construction materials (374 two-way HGVs) and the movement of AILs (58 deliveries).
- There will also be a requirement for concrete deliveries for the construction of the turbine foundations. Each foundation will be poured over a single day and will require an anticipated 64 deliveries of concrete (128 two-way HGVs). On days when concrete is being delivered, other deliveries to the site will be significantly reduced.
- The agreed route to the Application Site for the significant portion of construction HGVs is from the north, from the A55 at junction 26 near St. Asaph and along the B5381, A548, A544, A543 and the B4501.
- This will ensure that no construction HGVs pass through the larger towns of Denbigh and Abergele.

12.9.22 Thus month 16 of the construction programme for Clocaenog Wind Farm has a total of 1,671 two-way HGV movements across the day. These flows have been used in this assessment to assess the impact along the A55 expressway for the St Asaph section.

12.9.23 The Environmental Statement for the Brenig Wind Farm sets out that the flows along the network as combined with other flows along the B4501. The mean worse case flow (see Table 9.6 of that ES<sup>5</sup>) in August is 1564 two way with 86 HGV movements.

12.9.24 As the flows are approved and committed they have been added to the base line flows to assess the combined effects with the Proposed Development and the Wider Scheme. As such the wind farm movements (Clocaenog Wind Farm and Brenig Wind Farm) have the effect of increasing the background flows (base plus committed/approved) and thus % impact on the network of the Proposed Development and the Wider Scheme would be a lower number as part of a larger flow on the network.

**Table 12.13: Average Movements for the Proposed Development and the Wider Scheme with the Wind Farm Movements**

<b>Location</b>	<b>2014 surveyed 12-Hour Traffic Flows plus approved (Two way traffic flows)</b>		<b>Development 12-Hour Traffic Flows (Two way traffic flows)</b>	
	<b>Total Vehicles</b>	<b>HVs</b>	<b>Total Vehicles</b>	<b>HVs</b>
B4501	3837	1773	54	34

<sup>5</sup> Insert ref

12.9.25 For the B4501 the flows remain below the 100 threshold i.e. 54.

12.9.26 It should be noted that this is for a very concentrated period of 1 month out of the 16 month construction period and is thus not reflective of the full build period.

- Standardised significance criteria would be at worse **minor**
- Not considered significant for the purposes of the EIA

*St Asaph Substation and Underground Cabling*

12.9.27 Construction of this element of the Wider Scheme is currently programmed from August 2016 for 14 months. This equates to 420 days or 60 weeks, which over 5 working days equates to 300 days.

**Table 12.14: Construction Movements - St Asaph Substation**

Activity / Vehicle		Visits off Highway (approx.)	Purpose
<b>General</b>			
Cars/Light vehicles	Goods	2500	General access and egress of construction resource during AM and PM peak periods during 13 month construction and commissioning period (allowance made for some car sharing).
		<b>10 per day across all tasks</b>	13*20 = 260 days
<b>Site Establishment</b>			
Low Loader to deliver/remove excavator		4 (2 start 2 end)	Preparation of platform for temporary welfare facilities. Delivery and placing of welfare cabins, mess room etc. 1.5 months or 30 days
Hiab lorry		8	
Low Loader to deliver/remove dumper	6T	4 (2 start 2 end)	
Tipper lorry		6	
Low Loader to deliver/remove Telehandler		4 (2 start 2 end)	
Low Loader to deliver/remove Ride on roller		4 (2 start 2 end)	

Activity / Vehicle	Visits off Highway (approx.)	Purpose
	<b>Total 22 or 1 per day average</b>	
<b>Civils Works</b>		
Low Loader to deliver/remove excavator	Included above	Plant and Material deliveries/excavation of foundations/erection of formwork/concrete pour/import of backfill material over 3.5 months or 70 days
Tipper Lorry	20	
Concrete Lorry	20	
Hiab/Flatbed lorry	15	
Low Loader to deliver/remove 6t dumper	Included above	
Low Loader to deliver/remove Telehandler	2	
Low Loader to deliver/remove Ride on roller	Included above	
	<b>Total 57 or 1 per day average</b>	
<b>Building Works (Works within existing buildings)</b>		
Hiab/Flatbed lorry	12	Protection and Control Modifications to existing infrastructure housed within switchrooms over 6 months or 120 days
Delivery Vans	10	
	<b>Total 22 or less than 1 per day average</b>	
<b>Electrical Installation and Commissioning Works</b>		
Low Loader to deliver/remove Telehandler	4	Plant/Material deliveries for electrical infrastructure works. over 2 months or 40 days

Activity / Vehicle	Visits off Highway (approx.)	Purpose
Low Loader to deliver Reactor	2	
Mobile Crane	4	
Hiab lorry	16	
	<b>Total 26 or 1 per day average</b>	

12.9.28 The above would indicate 10 per day two way flows and 1 hgv movements along the A55 and the local network.

**Table 12.15: Underground Cabling Movements**

St Asaph Activity / Vehicle	Visits off Highway (approx.)	Purpose
<b>Cable Civils and Cable installation works</b>		
Cars/Light Goods vehicles	1650	General access and egress of construction resource during AM and PM peak periods during 6 month construction period (allowance made for some car sharing).
Low Loader to deliver/remove excavator	4	Excavator required for trench excavation.
Hiab lorry	45	Transport of small plant items, Road Saws, Disc Cutters, Hydraulic Breakers, Compressors, Generators, Pumps, Trench Rollers, Pumps, Rammers, Winching equipment etc. Also for delivery of ducts
Low Loader to deliver/remove 6T dumper	4	Dumper required for trench excavation activities.

St Asaph Activity / Vehicle	Visits Highway (approx.)	off Purpose
Tipper lorry with Grab	200	Load and transport of spoil/aggregate.
Tipper lorry	200	Delivery of backfill material
Low Loader to deliver/remove roller	4	Roller required for compaction of road surfacing material.
Flat-bed lorry for establishment / maintenance of TM including reestablishment of permanent line markings.	250	TM Crew likely to be on site for duration of works to establish/amend and maintain TM.
Insulated Tipper Lorry 'Hot-box'	20	Delivery of surface course materials
Low Loader to deliver cable drums	20	Delivery of cable drums
Tractor to move cable drum to works area	20	Movement of cable drums to works area
<b>Total movements</b>	<b>2417 or av 8 per day (two way flows 16 per day)</b>	
<b>Total HGV</b>	<b>747 or av 3 per day (two way flows 6 per day)</b>	

12.9.29 From the tables above (12.6 and 12.13 respectively) the underground cabling had an average total 16 two way flows with 6 two way hgv movements. As a worst case this has been combined with movements for the Proposed Development to give an average of total 50 two way flows with 20 two way hgv movements.

#### Assessment of Effects

12.9.30 For the works comprising the St Asaph substation, underground cable and the section of the Proposed Development north of the River Elwy, from the tables above, the underground cabling had an average total 16 two way flows with 6 two way hgv movements. As a worst case this has been combined with movements for the Proposed Development of 34 and 14 respectively, these are then combined with the substation flows of 10 and 1 respectively to give an average of total 60 two way flows with 21 two way HGV movements.

**Table 12.16: Assessment of all Construction Traffic using Junction 26 of the A55 for Construction of the Proposed Development, St Asaph Substation Works and the Underground Cabling**

Location	2011 Observed 12-Hour Traffic Flows (Two way traffic flows)		Development 12-Hour Traffic Flows (Two way traffic flows)		Percentage Increase	
	Total Vehs	HVs	Total Vehs	HVs	Total Vehs	HVs
A55	10,495	504	60	21	0.57%	4.2%
Ffordd William Morgan	4,448	135	60	21		
B5381 Glascoed Road	3,868	244	60	21		

**Table 12.17: Assessment of all Construction Traffic using Junction 27 of the A55 for Construction of the Proposed Development, St Asaph Substation Works and the Underground Cabling**

Location	2011 Observed 12-Hour Traffic Flows (Two way traffic flows)		Development 12-Hour Traffic Flows (Two way traffic flows)		Percentage Increase	
	Total Vehs	HVs	Total Vehs	HVs	Total Vehs	HVs
A55	10,495	504	60	21	0.57%	4.2%
A525 The Roe	14,867	720	60	21		
B5381 Glascoed Road	3,868	244	60	21		

12.9.31 Assuming a 50% split of construction traffic on each of the two routes, the effect upon the highway is detailed in the table below:

**Table 12.18: Assessment of Construction Traffic using both routes**

Location	2011 Observed 12-Hour Traffic Flows (Two way traffic flows)		Development 12-Hour Traffic Flows (Two way traffic flows)		Percentage Increase	
	Total Vehs	HVs	Total Vehs	HVs	Total Vehs	HVs
A55	10,495	504	60	21	0.57%	4.2%
A525 The Roe	14,867	720	30	10		
Ffordd William Morgan	4,448	135	30	10		
B5381 Glascoed Road	3,868	244	60	21		

12.9.32 The flows set out have been compared to the existing traffic flows set out in 'Baseline Flow' above (see Section 12.5) and the impact assessment (see Tables 12.16, 12.17 and 12.18).

12.9.33 As the construction traffic for the works at St Asaph Substation and the underground cabling would affect the trunk road network the relevant significance criteria is that there should be a less than 5% increase in traffic flows, as set out in the methodology/TAN 18. The above table demonstrates that the traffic flows would be below this significance threshold. .

12.9.34 In addition, using the assessment criteria of '100 two-way trip daily threshold' as the basis of a materiality test of traffic impact for the area, none of the above are close to the 100 threshold i.e. 60

- Standardised significance criteria would be minor/**negligible**
- Not considered significant for the purposes of the EIA.

### **Stage 2 Cumulative Assessment**

12.9.35 Table 12.22 below summarises the Stage 2 developments that have been identified for consideration. It also provides further details on each of the developments and comments relating to the potential for cumulative traffic impacts. A number of the schemes to be assessed have either no detailed traffic flow data as part of the application documents, or only an assessment of the operational phase and not the construction phases with flows or the routes that would be used. In addition the construction programmes associated with a number these schemes is unknown and may not take place concurrently with the construction of the Proposed Development. As such some of these developments have not been taken forward for consideration, where this is the case comments have been noted in the table below.

12.9.36 In summary the adopted approach is as follows:-

- Stage 2** – assessed the proposals in Stage 1 together with Burbo Bank Extension + other onshore proposed wind farms + proposed single turbines.

12.9.37 The assessment methodology sets out the development trips against a threshold, this does not change for any of the approved or Stage 2 developments as they would form part of the base lines flows and the only effect would be to show the impacts from the Proposed Development would be an overall reduced % of the larger baseline flows i.e. survey plus approved flows.

**Table 12.19: Stage 2 Developments**

Developments Considered in Stage 2		
Development	Description	Comments
Hafod Ty Ddu Wind Turbine	Single wind turbine located in relatively close proximity to the proposed overhead line.	No cumulative effects are anticipated due to the scale of the development. 1 or 2 deliveries may be used but no details are available as to when or where from.
Tyn y ffynnon Wind Turbine	Single wind turbine (up to 48m height to blade tip).	No cumulative effects are anticipated due to the scale of the development. 1 or 2 deliveries may be used for the turbine but no details are available as to when or where from.
Meifod Farm, Saron, Wind Turbine	Single wind turbine (up to 34.5m to blade tip).	No cumulative effects are anticipated due to the scale of the development. 1 or 2 deliveries may be used for the turbine but no details are available as to when or where from.
Pant y Maen Wind Farm	8no. wind turbines in SSA A.	No cumulative effects are anticipated due to the differing nature of development and distance from the Proposed Development. 1 or 2 deliveries may be used for each turbine but no details are available as to when or where from.

<b>Developments Considered in Stage 2</b>		
<b>Development</b>	<b>Description</b>	<b>Comments</b>
Bryn Cocyn Wind Turbine	Single wind turbine	No cumulative effects are anticipated due to the scale of the development. 1 or 2 deliveries may be used for the turbine but no details are available as to when or where from.
Burbo Bank Extension (including onshore substation)	Extension to existing offshore wind farm and proposed substation near the northern end of the Proposed Development.	This would only effect the A55 corridor. As per normal practice the committed flows are added to the base line so increasing background flows. This has the effect of reducing the overall impact of the Proposed Development in % terms due to it being a smaller proportion of the larger base line flows. No cumulative effects are anticipated.
<b>Developments Considered But Not Included in the Stage 2</b>		
Llys Dymper Wind Farm	10no. wind turbines to be connected to the National Grid locally at Llansannan.	Conwy Council requested the inclusion of the Llys Dymper wind farm in the cumulative assessment. Given the distance from the Proposed Development no cumulative effects are anticipated.
Crematorium proposal on land to south of Glascoed Road		No cumulative effects are anticipated due to the differing nature and size of development and distance from the Proposed Development.
Pilkington Playing fields site on the St Asaph business park	Development of 3.9ha of land for office/light industrial use (Class B1) and construction of new vehicular/pedestrian	This would only effect the A55 corridor. As per normal practice the committed flows are added to the base line so increasing background flows. This has the effect of reducing

<b>Developments Considered in Stage 2</b>		
<b>Development</b>	<b>Description</b>	<b>Comments</b>
	access.	the overall impact of the Proposed Development in % terms due to it being a smaller proportion of the larger base line flows. No cumulative effects are anticipated.
Bodelwyddan Key Strategic Site A	Approved for a mixed use development.	The assessment for this Site did not include any construction traffic flows as they are well below the operational flows, for which mitigation has been agreed, The construction phase was therefore not considered a significant factor. No cumulative effects are anticipated.
Application for residential development at former H M Stanley Hospital site, Upper Denbigh Rd, St Asaph	Conversion of former St Asaph hospital into a housing development (85 homes)	This would only effect the A55 corridor. As per normal practice the committed flows are added to the base line so increasing background flows. This has the effect of reducing the overall impact of the Proposed Development in % terms due to it being a smaller proportion of the larger base line flows. No cumulative effects are anticipated.

## 12.10 Residual Effects

### *Construction*

- 12.10.1 As the potential effects relate to the construction phase for the Proposed Development no residual effects are anticipated following completion of the works.

*Operation*

- 12.10.2 Post construction, operational inspections needs would be for routine maintenance on an ad hoc basis and to resolve any unforeseen issues.
- 12.10.3 Maintenance would be highly unlikely to require pole replacement.
- 12.10.4 The vehicles used would of a standard size and scale that could be expected on the local network and be so irregular that they would be considered negligible in terms of impacts on the network. The flows are much lower than the construction flows.

*Decommissioning*

- 12.10.5 Beyond the 40 year planned life of the 132 kV Overhead Line the poles/cables may be removed.
- 12.10.6 The materials used would be removed in a reverse of the construction process.
- 12.10.7 The decommissioning process would remove the lines and the poles, it is likely the poles would be given to some land owners thus reducing the need to take of site. In addition the foundations would be below topsoil level and thus not require removal. The overall level of movements would thus be less than the construction movement levels and thus provide a worse case for impacts. Decommissioning would be lower in terms of impacts than construction.