22 ONSHORE TRANSPORTATION AND ACCESS

22.1 There were no supporting studies which directly relate to the Onshore Transportation and Access impact assessment.

22.1 Introduction

22.2 This section assesses the potential environmental impacts of the Project on the existing road infrastructure and receptors which may be sensitive to traffic associated with the proposals. This assessment has been undertaken by Xodus.

22.3 Noise, vibration and dust elements relating to transportation and access are assessed in Section 23.

22.4 Several definitions have been used in this section and are described below:

- Construction Phase / Traffic: The construction phase refers to all aspects of the development prior to it becoming operational and includes the transportation of construction staff, construction materials and plant items to the development site. As with operational traffic a worst case scenario has been assumed and assessed (defined below);
- Operational Phase / Traffic: The operational phase refers only to the day to day operation of the Project and any maintenance requirements therefore limited to control and maintenance staff visits to the Power Conversion Centre (PCC). A worst case scenario has been assumed and assessed (defined below);
- Goods Vehicles: Light Goods Vehicles (LGV) under 7.5 tonne Gross Vehicle Weight; Heavy Goods Vehicles (HGV) over 7.5 tonnes but under 44 tonnes Gross Vehicle Weight, abnormal loads (where an abnormal load is one which is over 2.9m wide, over 18.65m in length or over 80 tonnes Gross Vehicle Weight);
- Automatic Traffic Counter (ATC) data: Transport Scotland has provided historic ATC data for traffic volumes at various locations in the vicinity of the study area; and
- National Road Traffic Forecast (NRTF): NRTF growth factor (1.53%) is adopted for the purposes of this assessment to predict future traffic predictions.

22.2 Assessment Parameters

22.2.1 Rochdale Envelope

22.5 In line with the Rochdale Envelope approach, this assessment considers the maximum ('worst case') Project parameters. Identification of the worst case scenario for each receptor (i.e. Environmental Impact Assessment (EIA) topic) ensures that impacts of greater adverse significance would not arise should any other development scenario be taken forward in the final scheme design. Table 22.1 describes the detail of the Project parameters that have been used in this assessment and explains why these are considered to be worst case. The potential impacts from alternative Project parameters have been considered in Section 22.9.

22.6 Based on the information presented in Table 22.1 year 3 construction represents the worst case from an onshore transportation and access perspective.

Project parameter relevant to the assessment		'Maximum' Project parameter for impact assessment	Explanation of maximum Project parameter
Onshore Power Conversion Centre	Construction - Year 1	25 HGV trips plus 20 workers travelling to site.	Construction of 1 Power Conversion Unit Building (PCUB) and control building during year 1 of onshore construction schedule at either Ness of Quoys or Ness of Huna.
(PCC)	Construction - Year 3	50 HGV trips plus 30 workers travelling to site.	Construction of 2 PCUB buildings during year 3 of onshore construction schedule at either Ness of Quoys or Ness of Huna.
	Operation and Maintenance (O&M)	No HGV trips. Eight workers and their vehicles travelling to site per day.	Assessment based on assumption that six permanent control staff are present at the same time as two maintenance vans.
Onshore cable routes between PCC and SHETL substation	Construction – Year 2	Disruption to road network with installation of cables.	Installation of 1 x 33kV underground cable. Assessment of potential impacts associated with cable installation along all potential cable corridors identified between PCC locations and SHETL substation proposed at Phillips Mains. No permanent road access (other than existing road network) required along cable routes.
	Construction – Year 3	Disruption to road network with installation of cables.	Installation of 2-3 x 33kV underground cables. Assessment of potential impacts associated with cable installation along all potential cable corridors identified between PCC locations and SHETL substation proposed at Phillips Mains. No road access (other than existing road network) required along cable routes.
Cable landfall	Horizontal Directional Drill (HDD) site construction	Up to 75 HGV trips plus 10 workers travelling to site.	Assessment of potential impacts associated with the HDD of the cable bores, during the Project construction phase. This includes: ▪ Establishment and reinstatement of the HDD site; ▪ Transport of equipment to and from site during mobilisation and demobilisation of HDD activities each year of the 3 year HDD drilling campaign; and ▪ Workers travelling to and from the HDD site. Up to 1 abnormal load associated with the HDD site construction activities.
	HDD spoil removal – Year 1	Up to 211 HGV trips plus 10 workers travelling to site.	Assessment of potential impacts associated with the HDD of the cable bores, during the Project construction phase. This includes: ▪ The transport of drill cuttings from the site to the recycling/reuse/disposal site and transport of water for mixing bentonite to the site; and ▪ Workers travelling to and from the HDD site. No abnormal loads associated with the HDD activities.
	HDD spoil removal – Year 2	Up to 422 HGV trips plus 10 workers travelling to site.	Assessment of potential impacts associated with the HDD of the cable bores, during the Project construction phase. This includes: ▪ The transport of drill cuttings from the site to the recycling/reuse/disposal site and transport of water for mixing bentonite to the site; and ▪ Workers travelling to and from the HDD site. No abnormal loads associated with the HDD activities.
	HDD spoil removal – Year 3	Up to 1,497 HGV trips plus 10 workers travelling	Assessment of potential impacts associated with the HDD of the cable bores, during the Project

Project parameter relevant to the assessment		'Maximum' Project parameter for impact assessment	Explanation of maximum Project parameter
		to site.	construction phase. This includes: ▪ The transport of drill cuttings from the site to the recycling/reuse/disposal site and transport of water for mixing bentonite to the site; and ▪ Workers travelling to and from the HDD site. No abnormal loads associated with the HDD activities.
Offshore Project components	Transport of offshore turbine and Turbine Support Structure (TSS) components to onshore assembly area	Based on 3 abnormal loads per turbine: Year 1 – 30 abnormal loads. Year 2 – 54 abnormal loads. Year 3 – 222 abnormal loads. Up to 10 workers assumed to travel to the assembly site in their vehicles on any given day.	Assessment of potential impacts associated with the assembly and installation and long term operation and maintenance of the offshore infrastructure; TSS, turbines and cables. During offshore installation the following is assumed: ▪ Transport of all TSS/turbine components to assembly site by road; ▪ The transport of TSS/turbine components to assembly site (assumed to be Scrabster) will involve up to 3 abnormal sized loads; and ▪ Workers associated with offshore installation will live on board the installation vessels and arrive at site on board the vessel(s).
	Operation and Maintenance	Delivery of components and numbers of workers travelling to site Up to 50 workers assumed to travel to Scrabster on a daily basis.	During the operational phase of the Project the impact assessment has considered workers travelling to and from maintenance vessel base (assumed to be Scrabster). There will be 50 people working on the Operations and Maintenance (O&M) phase, including offshore works and maintenance of offshore equipment and onshore, (i.e. maintaining turbines) which will all be heading to facilities around Scrabster.

Table 22.1: Rochdale Envelope parameters for the onshore transportation and access assessment

22.2.2 Area of assessment

22.7 It is also important to define the geographical extent of the assessment area. The focus of the onshore transportation and access assessment is potential impacts on the road network and receptors in the areas of the road network to be used during the onshore transport aspects of the Project.

22.8 It should be noted that this assessment was completed on a larger Project area this has since been refined to a smaller footprint at both the Ness of Quoys and Ness of Huna PCC sites and a single cable corridor to the SHETL substation option areas. The final Project is described in Section 5 and shown in Figure 5.2; the selection process for these is discussed in Section 4.

22.3 Legislative Framework and Regulatory Context

22.3.1 Legislation

22.9 The EIA Regulations are the only legislation relevant to this assessment. There is currently no statutory legislation which applies to environmental impacts of traffic generated by new developments.

22.3.2 National planning policies

22.10 In 2004 the Scottish Government published the Scottish transport white paper which set out the Government's vision for transport in Scotland. The paper documented plans for a radical reform of transport at National and Regional levels. The key objectives detailed in the paper were:

- To promote economic growth by building, enhancing, managing and maintaining transport services, infrastructure and networks to maximise their efficiency;
- To promote social inclusion by connecting remote and disadvantaged communities and increasing the accessibility of the transport network;
- Protect our environment and improve health by building and investing in public transport and other types of efficient and sustainable transport which minimise emissions and consumption of resources and energy;
- Improve safety of journeys by reducing accidents and enhancing the personal safety of pedestrians and staff; and
- Improve integration by making journey planning and ticketing easier and working to ensure smooth connection between different forms of transport.

22.11 Following from this Scotland's National Transport Strategy (2006) was released which sets out the Scottish Government's long term vision for transport including objectives, priorities and plans. The high level objectives identified in the white paper remain applicable to the Transport Strategy and in addition three key strategic outcomes were identified:

- Improve journey times and connections;
- Reduce emissions; and
- Improve quality, accessibility and affordability.

22.12 Scottish Planning Policy (Paragraphs 165 – 181) sets out the broad policies relating to transport and new or existing developments including emissions, land use, existing transport network, locations for development, development plans, parking policies, strategic transport network, airports and seaports, freight, and roadside facilities.

22.13 Planning Advice Note 75 (PAN 75) Planning for Transport (Point 41) states that "All planning applications that involve the generation of person trips should provide information covering the transport implications of the development, the level of detail will be proportionate to the complexity and scale of the impact of the proposal. This will provide an indication of whether a transport assessment should be carried out".

22.14 The same advice note (Point 37) states "Schemes in committed programmes and/or those at an advanced stage of preparation where work is expected to begin in the plan period should be included in the local plan proposals map".

22.3.3 Development plan policies

22.15 The Caithness Local Plan is a statutory document which was prepared by The Highland Council (THC) to guide decisions on planning applications[1]. The plan was adopted in September 2002 but will be replaced by the Highland-wide Local Development Plan (HWLDP)[2] (expected to be adopted in 2012).

22.16 The vision of the current is for a robust and expanding economy growing population, improved communications and services and safeguards for the environment. An overall development strategy for the county based on strategic objectives is the mechanism for achieving this vision.

22.17 Elements of the strategic objective for infrastructure relate to transport in the county. The Council will seek to:

[1] Still in force at time of EIA and ES compilation
[2] Not adopted at time of EIA and ES compilation

- Ensure key roads are brought up to an acceptable standard and fit into the natural environment as far as is practicable;
- Support measures that will maintain the Far North Rail Line, Scrabster and Wick harbours and Wick airport to encourage greater use by passengers and freight; and
- Reduce the environmental impact of traffic in settlements and larger developments through traffic calming measures and by giving priority to pedestrians and cyclists.

22.18 The plan recognises that the A3836 is a major tourist route linking John o' Groats and North Sutherland and realises that there may be opportunities to take advantage of this and derive more local benefit in association with Castlehill / Dunnet Bay area.

22.19 The draft Highland-wide Local Development Plan (already been out to consultation and expected to be adopted in 2012)[3] sets out an overarching spatial planning policy for the whole of THC's area. It will update the General Policies of the Caithness Local Plan. The vision for Caithness and Sutherland is for the area to be a connected and place.

22.20 Policy 57 – Travel states that "Development proposals that involve travel generation must include sufficient information with the application to enable the Council to consider any likely on and off site transport implications of the development" and should:

- Be well served by the most sustainable modes of travel available in the locality from the outset, providing opportunity for modal shift from private car to more sustainable transport modes wherever possible, having regard to key travel desire lines;
- Be designed for the safety and convenience of all potential users;
- Incorporate appropriate mitigation on site and/or off site, provided through developer contributions where necessary, which might include improvements and enhancements to the walking/cycling network and public transport services, road improvements and new roads;
- Incorporate an appropriate level of parking provision, having regard to the travel modes and services which will be available and key travel desire lines and to the maximum parking standards laid out in Scottish Planning Policy or those set by the Council; and
- Fit with the policies and recommendations of the Local Transport Strategy.

22.21 Policy 57- Travel also states "Where site masterplans are prepared, they should include consideration of the impact of proposals on the local and strategic transport network. In addition the Council will seek the implementation and monitoring of Green Travel Plans in support of significant travel generating developments".

22.22 The Local Transport Strategy highlights the importance of the A9 trunk road. It states that flows on the A9 were consistent with general growth patterns, with growth on all sections south of Aviemore, and at Aviemore itself, of 44% from 2000 to 2006. The stretch of the A9 at Inverness also experienced growth of 50% over the same period. The section of the A9 north of Inverness has flows of up to 33,000 vehicles per day, but further north there has been less traffic growth particularly north of Dornoch Bridge, where low daily flows are consistent with the level of population. However, with the potential for development of marine energy in the Pentland Firth and other renewable developments this route is likely to become increasingly important for commercial and business connections to the south.

[3] Not adopted at time of EIA and ES compilation

22.4 Assessment Methodology

22.23 Guidance for the assessment of the impact of the Project on transportation and access has been taken from the Institute of Environmental Assessment (IEA) Guidance Notes No.1: Guidelines for the Environmental Assessment of Road Traffic (IEA, 2003).

22.24 The increase in any traffic levels and their receptor effects have been assessed against the guidelines (IEA, 2003) which state that assessment is required where traffic movements or HGV movements increase by >30%, or more than 10% where there are sensitive receptors likely to be affected.

22.25 In addition, specific feedback on the Project from relevant stakeholders has been taken into consideration in the assessment.

22.26 This section outlines the relevant feedback on the Project, the approach to baseline characterisation and the significance criteria used in the impact assessment.

22.4.1 Scoping and consultation

22.27 Since the commencement of the Project, consultation on onshore transportation and access issues has been ongoing. Table 22.2 summarises all consultation relevant to onshore transportation and access. In addition, relevant comments from the EIA Scoping Opinion are summarised in Table 22.3, together with responses to the comments and reference to the Environmental Statement (ES) sections relevant to the specific comment.

Date	Stakeholder	Consultation	Topic/specific issue
7th April 2011	Marine Scotland and Scottish Natural Heritage (SNH)	Pre-Scoping meeting	EIA surveys and studies required and the data needs for each EIA study.
27th May 2011	Marine Scotland, statutory consultees and non statutory consultees	Submission of EIA Scoping Report	Request for EIA Scoping Opinion from Marine Scotland and statutory consultees and request for comment from non statutory consultees.
30th June – 2nd July 2011	Local stakeholders	Public Event - EIA Scoping	Public event to collate information/opinions on proposed EIA scope.
19th August 2011	THC	Telephone call	Scope of transport study.
19th August 2011	Transerv	Telephone call	Scope of transport study.
14th September 2011	THC	Meeting	Planning pre application meeting. Presentation on overall Project and results of EIA studies to date.
31st September 2011	Marine Scotland, The Highland Council, statutory consultees and non statutory consultees	Receipt of EIA Scoping Opinion	Receipt of response to EIA Scoping Report and other comments from non statutory consultees.
10th October 2011	THC	Receipt of pre application advice	Receipt of pre application advice from The Highland Council.
8th November 2011	Caithness Transport Forum	Email	Scope of transport study.
6th – 7th December 2011	Local stakeholders	Public Event – pre application consultation	Public event to communicate the findings of the EIA to local stakeholders.

Table 22.2: Consultation relevant to onshore transport and access

Name of organisation	Key concerns	Response	ES section within which the specific issue is addressed
THC	Construction traffic for the size of scheme considered to be reasonable and appropriate to the road network but would like to see further information on traffic levels presented (no responsibility for the trunk road network).	Construction traffic levels have been predicted as part of the impact assessment and are presented in this section in comparison with the existing traffic levels.	Section 22.5 Baseline Description
Transport Scotland (JMP Consultants Limited)	Impact of construction traffic on the trunk road network including preferred routes, impact on traffic levels, noise and air quality. Impact of operational traffic on the trunk road network.	Construction traffic levels are predicted in this section alongside indications of likely preferred routes of construction vehicles. Air quality issues due to traffic have been scoped out (described in this section) due to the predicted traffic levels and the criteria set out in the JMP response. Noise and vibration are considered in a separate section (Section 23). Operational traffic is likely to be minimal but is described in this section.	Section 22.5 Baseline Description, Section 23 Onshore noise and Dust, and, Section 22.6 Construction Impact Assessment
Caithness Transport Forum	The CTF recommended that the A99 needs widening both sides of Keiss village to make the carriageway suitable for two-way commercial traffic. Additionally, the CTF advised that if Gills Harbour were used for large loads the corner going down to the harbour could also be widened for ease of access.	At the present stage the EIA focuses on Project components and their interactions with the road network in its present state. The EIA is not at this stage looking at engineering aspects of the road network and issues such as road capacity and the quality of existing infrastructure will be the subject of consideration at a later date during detailed engineering design.	N/A

Table 22.3: Scoping comments relevant to onshore transportation and access

22.4.2 Desk based study

22.28 A desk study has been undertaken to characterise the road infrastructure in the area of the proposed Project and collate road traffic numbers for the main routes serving the area. This allows a comparison to be made between likely existing traffic levels and the traffic levels associated with the Project, provided by MeyGen.

22.29 In undertaking the desk based study, various data sources and documents have been reviewed including:

- Responses to consultation and the EIA Scoping Report;
- Consideration of 2010 and 2011 traffic count data provided by Transport Scotland for the A836, including classification by vehicle type; and
- Consideration of other traffic sensitive receptors in the area such as communities, busy routes and sites of particular interest e.g. important tourist destinations.

22.4.3 Field survey

22.30 Detailed recent traffic count data (up to July 2011) provided by Transport Scotland for the A836 has negated the requirement for a further manual traffic count survey, following discussion with THC in August 2011.

22.31 A site visit was undertaken in order to make a photographic record of condition of all the roads and junctions in the immediate area which may be affected by the Project. This site visit did not include the A9 trunk road which regularly supports large volumes of traffic, including haulage to and from Scrabster.

22.32 No further field survey was deemed necessary for the environmental assessment of the transportation and access requirements or implications of the Project.

22.4.4 Significance criteria

22.33 The EIA process and methodology are described in detail in Section 8. Each assessment section is, however, required to develop its own criteria for the 'sensitivity of receptor' and 'magnitude of impact' aspects since the definition of these will vary between different topics. For onshore transportation and access, the significance criteria used in this section is based on the methodology described in Section 8 but the sensitivity of the receptor and magnitude of impact are defined in Table 22.4 and Table 22.5 respectively.

22.34 The consequences of impacts are then considered by reference to the relevant criteria in the EIA Regulations. The significance of impacts in relation to the EIA Regulations is defined in Section 8, Table 8.2.

Sensitivity of receptor	Definition
Very High	▪ Receptors of greatest sensitivity to traffic flow: schools, playgrounds, accident blackspots, retirement homes, roads without footpaths that are routinely used by pedestrians.
High	▪ Receptors with a high sensitivity to traffic flow: colleges, hospitals and doctors' surgeries, shopping streets with multiple roadside frontages, roads without footpaths that are infrequently used by pedestrians.
Medium	▪ Receptors with medium sensitivity to traffic flow: recreation facilities, streets with few shops with roadside frontages, roads with narrow footpaths used by pedestrians.
Low	▪ Receptors with some sensitivity to traffic flow: places of worship, public open space, listed buildings, tourist attractions and residential areas with adequate footpath provision.
Negligible	▪ Receptors with little or no sensitivity to traffic flow and those sufficiently distant from affected roads and junctions.

Table 22.4: Definitions for sensitivity of receptor

Magnitude of impact	Definition
Severe	▪ Severe alteration to key elements / features of the baseline conditions such that the character / composition / attributes will be fundamentally changed. ▪ Guide: >100% increase in baseline conditions. ▪ Impact highly likely to occur or will have the effect of being a permanent (> 3 years) change in baseline conditions.
Major	▪ Major alteration to key elements / features of the baseline conditions such that character / composition / attributes will be fundamentally changed. ▪ Guide: 71% to 100% increase in baseline conditions. ▪ Impact likely to occur or will have the effect of being a semi-permanent (< 3 years) change in baseline conditions.

Magnitude of impact	Definition
Moderate	▪ Alteration to one or more key elements / features of the baseline conditions such that post deployment character / composition / attributes of baseline will be partially changed. ▪ Guide: 31% to 70% increase in baseline conditions. ▪ Impact will possibly occur or will have the effect of being a temporary lasting change to baseline conditions (i.e. more than a series of independent occurrences).
Minor	▪ Minor shift away from baseline conditions. Change arising from the loss / alteration will be discernible but underlying character / composition / attributes of baseline condition will be similar to pre-development circumstances / patterns. ▪ Guide: 11% to 30% increase in baseline conditions. ▪ Impact unlikely to occur or will have the effect of being a series of independent occurrences or daily short-term change to the baseline conditions over a period < 6 months.
Negligible	▪ Very slight change from baseline conditions. Change barely distinguishable, approximating to the "no change" situation. ▪ Guide: 1% to 10% increase in baseline conditions. ▪ Impact extremely unlikely to occur.
Positive	▪ An enhancement in the availability or quality of a resource.

Table 22.5: Definitions for magnitude of impact

22.4.5 Data gaps and uncertainties

22.35 This is a semi quantitative assessment that includes some professional judgement of conditions and worst case estimates regarding traffic levels associated with the Project. Much of the assessment concerns traffic levels in rural areas and on minor roads for which there is limited continuously recorded traffic flow data. However, assumptions have been made for these roads using the available continuous data for the A836.

22.36 The A836 is a single two-way carriageway whereas all the minor link roads are single-track roads with passing places.

22.5 Baseline Description

22.5.1 Introduction

22.37 This section describes the road network in its current form. It also describes the local transport network available for travel by bicycle, bus and car in the vicinity of the site.

22.5.2 Geographical area of assessment

22.38 The Project is located around a section of the A836. It is likely, however, that routes for delivery of materials of plant will utilise the trunk road network. The A9 to Thurso is an important link between Inverness and Caithness as well as Orkney and is recognised in The Highland Council Local Transport Strategy as a key route for freight. For construction traffic and transport of turbine component parts, assessment has included utilisation of the A9 trunk road. For operational traffic assessment has been made on the local road network only. Figure 22.1 shows the local road network.

22.5.3 Road network

22.39 The existing road network in the vicinity of the proposed Project comprises a local 'A' road, A836, which links the A9 at Thurso to the A99 at John o' Groats. The A836 travels through a number of small settlements on this stretch, the largest of which being Castletown, near to Dunnet. The B876 also meets the A386 at Castletown linking the town with Wick, although this is the more minor (in road status terms) of three routes between Wick and the north coast of Caithness. Castletown is home to a number of amenities as well as homes for the elderly, schools, churches and an industrial estate. The baseline traffic described later in this section includes vehicles which have either left or are travelling into Castletown.

22.40 Within the immediate vicinity of the Project the A836 provides the only access to the harbour at Gills Bay from which operates a roll on-roll off (RO-RO) ferry to Orkney. Other activity at Gills Bay includes occasional use by small fishing vessels and small survey vessels. Several more minor roads link into the A836 to provide access to dispersed settlements in the area. Potential cable routes for the MeyGen Project are located along these link roads. The only concentration of housing and services in the immediate vicinity is at Canisbay, to the south of Ness of Quoys, where there is a Primary school, post-office/shop and bus stop.

22.41 The A836 is part of the North and West Highlands National Tourist Route which is approximately 224km long. The route starts in Ullapool on the west coast, goes through mountains and the villages of Achiltibuie, Lochinver and Kinlochbervie, and Durness in the north-west of Scotland. From Durness, the route heads east to John o' Groats.

22.5.4 Cyclists

22.42 During the site visit a number of cyclists were observed along both the A836 and adjoining minor roads. John o' Groats is a popular start point or destination for cyclists travelling the length of the UK to or from Lands End. There is no official route in the area around John o' Groats but cyclists will normally choose to make use of National Cycle Route 1, as shown on Figure 22.1, or use the road network directly south along the A99 between John o' Groats and Wick. The Canisbay Loop is a local cycle route running from Brough near to Dunnet Head along minor roads and linking to the A836 near Castle of Mey before it passes through the Project area, through Gills and circling back through Canisbay and continuing on the minor roads before returning to Brough. This route is shown on Figure 22.1.

22.5.5 Other road users

22.43 No major route bus services operate in the area, however there is a local service between John o' Groats and Thurso which offers connections to Wick, Inverness and elsewhere in the Highlands. The bus stops for the local service are shown on Figure 22.1.

22.44 Cruise liners visit Scrabster each year, carrying up to 1,500 passengers each. Most of the shore excursions are in the form of half day coach tours. The passengers are split in half with half doing the tour in the morning and the other half in the afternoon. Generally this sees approximately 12 coaches in use for the larger cruise liners and six for the smaller ones. The main shore excursion from Scrabster is the Castle of Mey and normally about 75% of the tours will go there. Scenic tours including Dunnett Head, Duncansby Head and John o' Groats are also popular, accounting for approximately 20% with the remainder being made up of the Pulteney distillery in Wick and Strathnaver Museum (West of Thurso).

22.45 The cruise business in Scrabster has been growing slowly but steadily over the past few years. In 2010 there were nine cruise arrivals, in 2011 there were 10 and in 2012 there are provisional expectations of 12 vessels (Scrabster Harbour Master *pers comm.,* 2011).

22.46 Information has been gathered on examples of abnormal loads which have used the local road network. Table 22.6 describes the various sizes and weights of the loads and the routes taken.

Load Description	Weight	Width	Length	Route
Submarine Used Fuel Flask and transporter	90 tonnes (total trailer weight 120 tonnes approx).	3m approx	Approx 9m	From MoD Vulcan site (by Dounreay) to Inverness rail head via Thurso town centre (Princes Street and Thurso river bridge).
Forsse wind farm blades (steered trailor)	Approx 25 tonnes.	-	32m	A9 to Forsse (E of Thurso) via Thurso town centre.
Dounreay Fuel Movements (planned)	Estimated at 40 tonnes but not confirmed.	3m approx	No more than 15m	From Dounreay to Georgemas Junction via Thurso town centre.

Load Description	Weight	Width	Length	Route
Gordonbush Wind Farm components	110 tonnes (150 tonnes trailer weight).	4m	40 trailer + 10m tractor unit	Invergordon to Gordonbush (by Brora).
Tow Heads	220 tonnes (total trailer weight 270 approx).	6m approx	32m approx	From Wick Quayside to Bridge of Wester (East of Wick).
350 tonne mobile crane	76 tonnes approx.	3m approx	18m approx	Aberdeen via Inverness and Thurso to Scrabster and Dounreay.

Table 22.6: Examples of abnormal loads

22.5.6 Road users

22.5.7 Baseline traffic volumes

22.47 As construction activities for the Project will continue throughout the year this assessment has looked at the seasonality of vehicle trips. A component of seasonality is due to tourism so an indication of the level of change throughout the tourist season has been obtained from VisitScotland for the Thurso Information Centre which opens from April to October each year. In 2009 and 2010 the quietest months were April and October, with the busiest month being August. In 2010 the number of visitors increased between April and August by approximately 460%. The figures provided by VisitScotland represent footfall statistics and are not split according to mode of travel however they do provide a strong indication of the seasonal nature of tourism in the region.

22.48 Assuming the baseline local traffic remains consistent throughout the year, several week-long periods in 2010 and 2011 have been selected to provide the baseline traffic levels for the A836 from the data supplied by Transport Scotland (location shown on Figure 22.1), taking into account the busy month of August and the quiet months of April and October. Weeks in each month have been chosen at random to provide this snapshot. A week in February has been chosen to further understand the traffic levels outside of the normal tourist season, and a week in July 2011 has also been selected as it is the most recent data available for the A836.

22.49 Using the NRTF growth factor of 1.53% per year the potential baseline traffic levels in 2015 have been predicted. True and predicted traffic levels split by total vehicles and HGVs are presented in Table 22.7 on a per week basis during the core hours of 0800 to 1800.

22.50 The table demonstrates that the busiest month agrees with the predictions due to increased tourism activity in the month of August and with there being less vehicle activity during February, outside the tourist season.

22.51 A slight increase in the number of HGVs is seen during the summer months of July and August, but in percentage terms the number of HGV trips counted per week remains fairly consistent throughout the year. For the purposes of this assessment the NRTF growth factor has been applied to predict the number of HGV trips in 2015.

Month (2010 – 2011)	Total trips (present)	Total HGVs (present)	Total trips (2015)	Total HGVs (2015)
August	14,709	399	15,869	430
October	10,787	323	11,638	348
February	9,053	330	9,767	356
April	10,279	287	11,090	309
July	11,066	368	11,939	397

Table 22.7: Typical and predicted seasonal baseline two-way traffic flow for the A836 (Transport Scotland)

22.52 Data provided by Transport Scotland for the A9 did not include classification of vehicle type. However, the Annual Average Daily Traffic (AADT) between 01 June 2010 and 31 May 2011 has been calculated at approximately 535 vehicles (two-way flow). Based on the data supplied for the A836 it has been assumed that a similar percentage of HGVs use the A9; 3% of 535 vehicles is equivalent to approximately 16 HGVs potentially using the A9 at Thurso each day. Based on the importance of the A9 for freight, it is likely that this figure is an under-estimate. The location of this count at Thurso is shown on Figure 22.1.

22.6 Impacts during Construction and Installation

22.6.1 Impact 22.1: Road traffic congestion associated with PCC site

22.53 MeyGen has provided information on the likely HGV numbers associated with the construction phase of the proposed Project. The most intensive activity is in year 3 and relates to HGV activity for the disposal of spoil from the HDD bores and traffic associated with PCUB construction. There could also potentially be abnormal sized loads associated with HDD site establishment. It is therefore this activity which has been used as the worst case scenario in this impact assessment. It is assumed that all spoil and water for bentonite mixing for the balance of the HDD bores in 2015 will be transported evenly over an eight month period. This equates to approximately 50 HGV trips per week and is compared to predicted HGV levels in 2015 in Table 22.8.

Month (2010 – 2011)	Total trips (2015 baseline)	Total HGVs (2015)	Construction worker vehicles two-way trips per week	Const. HGVs two-way trips per week	Total vehicles (2015 baseline + const.)	Total HGVs (2015 baseline + const.)	% Increase all vehicles	% Increase HGVs
Aug	15,869	430	240	50	16,159	480	2	12
Oct	11,638	348	240	50	11,928	398	2	14
Feb	9,767	356	240	50	10,057	406	3	14
Apr	11,090	309	240	50	11,380	360	3	16
Jul	11,939	397	240	50	12,229	447	2	13

Table 22.8: Comparison of predicted weekly construction HGV trips with predicted traffic baseline

22.54 Air quality has been considered in accordance with the JMP response to the EIA Scoping Report whereby the significance of changes likely to affect air quality are judged by thresholds. The predicted change is *not* on a road with more than 10,000 annual average daily traffic (AADT) numbers (as defined in the Environmental Protection UK "Development Control: Planning for Air Quality" publication). In addition, the second set of criteria posed by JMP for air quality screening (according to the "Design Manual for Roads and Bridges") is not met by the construction aspects of this development:

- Road alignment will not change by 5m or more;
- Daily traffic flows will not change by 1,000 AADT or more;
- HGV flows will not change by 200 AADT or more;
- Daily average speed will not change by 10km/h or more; and
- Peak hour speeds will not change by 20km/h or more.

22.55 Air quality issues have therefore been scoped out and are not considered further.

22.56 Some of the HGV trips are tankers containing bentonite drilling fluid (a mixture of bentonite and water). It may be appropriate to use an alternative water supply (such as a mains water pipe) and therefore the number of trips would decrease dramatically. These figures therefore represent a true worst case scenario.

22.57 It has been assumed that the likely routes taken by construction traffic will be along the A9 to the outskirts of Thurso before turning onto the A836 through Castletown. The route is shown on Figure 22.1.

22.58 Using the traffic numbers presented in Table 22.8 calculations have been made to assess the potential increase in HGV numbers and total vehicle numbers using the A836. As a worst case (i.e. with the potential for the largest percentage increase in HGV numbers) a week in April has been selected as the comparison week. An additional 50 HGV trips per week is equivalent to an increase of approximately 16%.

22.59 Furthermore, the contribution of up to 40 construction workers, each with their own vehicle, even when combined with HGV trips results in an increase to total predicted trips in 2015 of only 3%. The influence of HGV traffic is therefore considered the worst case impact. Marine construction personnel will have a similar minimal affect on the overall traffic levels in the area.

22.60 In addition it should be noted that the Project is not introducing any new types of traffic to the region. All roads are designed for and as can be seen by the traffic figures, they will routinely carry HGV traffic.

Impact significance

22.61 Considering the definitions of sensitivity presented earlier in this section, construction traffic will travel through at least one built-up area with a number of sensitive receptors (Castletown). The sensitivity for this impact is therefore considered medium. Due to the change in baseline conditions (increased HGV traffic) of 16% and the acknowledgement that the impact is unlikely to be more than temporary independent occurrences over a constrained period of time the magnitude is considered minor.

Sensitivity of receptor	Magnitude of impact	Consequence	Significance
Medium	Minor	Minor	Not Significant

MITIGATION IN RELATION TO IMPACT 22.1

- Although no significant impact has been identified. Mitigation measures have been provided on a precautionary approach to ensure this remains the case.
- During the onshore construction phase Project contractors will preferentially use the A836.
- Liaison with the local community and users of the area regarding overall construction activities such as details of types, levels, timing and routing of traffic will help to reduce the sensitivity of the receptors to change.
- The layout of the site has a large pull in area for large vehicles to avoid blocking the road.
- The large deliveries will be planned and marshalled so they so not coincide with each other and to avoid the peak traffic times on the local roads infrastructure.
- A member of the construction management team will liaise and co-ordinate with the local community to ensure that deliveries do not coincide with significant local events.
- The construction team will publicise when deliveries using large or slow moving equipment is planned to inform local road users.

22.6.2 Impact 22.2: Alteration of Road traffic congestion during cable installation

22.62 The Project will involve cable routes from the PCC to the grid connection as well as creation of a new permanent road access point at the PCC. The permanent road access will also be used for the temporary access for HDD activities as well as for the laydown area for all cable laying works.

22.63 The maximum cable route distance for any phase of the Project is approximately 5 to 6km. Based on assumption of 0.1km per day per cable, the maximum approximate duration of installing the cables from the PCC to grid connection for the Project will take approximately 60 days.

22.64 Much of the cable routes are along or near to minor roads in the area, or cross roads in the area, therefore there will be restrictions to traffic flow during the period of installation.

Impact significance

22.65 Considering the definitions of sensitivity presented earlier in this section the installation of cables may interact with some sensitive receptors, however works will not occur in any built-up areas. Sensitivity is therefore considered to be low. Due to the change in baseline conditions (alteration of the road network) the magnitude of impact is considered minor (the attributes of the road network will only be partially changed in the case of the access road, and barely distinguishable in terms of the cable routes).

Sensitivity of receptor	Magnitude of impact	Consequence	Significance
Low	Minor	Minor	Not Significant

MITIGATION IN RELATION TO IMPACT 22.2

- Although no significant impact has been identified mitigation measures have been provided on a precautionary approach to ensure this remains the case.
- The local community will be kept informed of when and where restrictions in traffic flow during cable installation and construction of the permanent access road to the PCC will occur, and identify measures to limit restrictions.

22.6.3 Impact 22.3: Road traffic congestion associated with transport of offshore components to assembly site

22.66 MeyGen has provided information on the likely numbers of abnormal loads associated with the transport of offshore (TSSs and turbines) components to a nearby assembly site (assumed to be Scrabster). Each turbine may require up to a maximum of three abnormal load/size trips.

22.67 Over the three year duration of construction for the maximum proposed 86 turbines, this may equate to 306 abnormal load/size trips on the trunk road network over three years of which 222 will take place in year 3 assuming no more than 1 load per day this equates to 2 abnormal loads every 3 days. The manufacturing locations are unknown therefore the route assessed here assumes the start is within easy access of the A9 or a similar trunk road, and is south of the Dornoch Firth. These loads are expected to travel at speeds between 12 and 40 miles per hour dependent on gross vehicle weight and therefore below the national speed limit of the road which is set at 60 miles per hour for cars and other light vehicles and 50 miles per hour for HGVs.

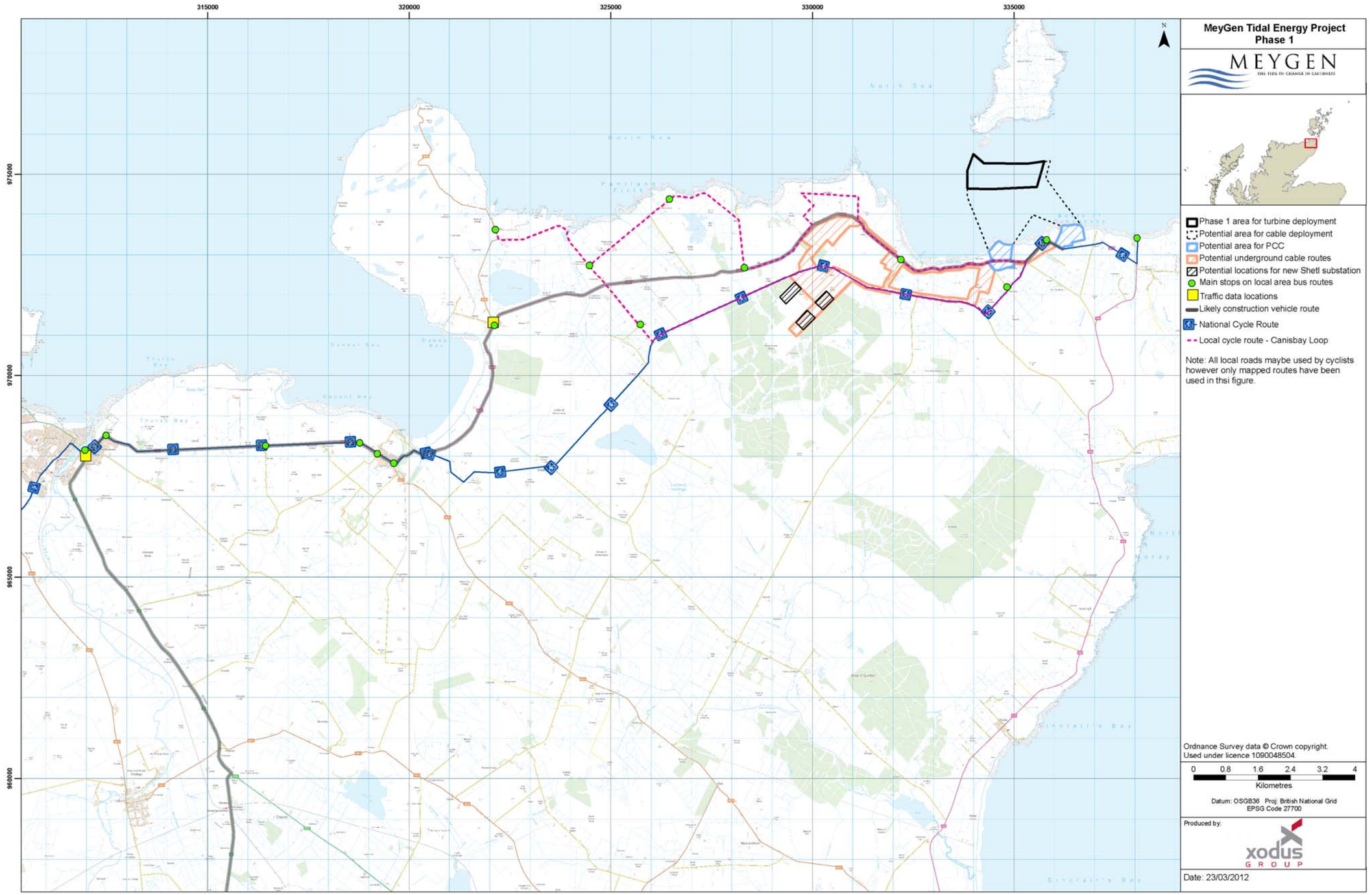

Figure 22.1: The transport network in the vicinity of the Project

22.68 The trunk road network, specifically the A9, is a priority freight route and is therefore an appropriate road for transporting components. Advice from The Highland Council is that transport of onshore wind turbine components is resulting in increased journey time for users of the A9. This sensitivity to reduction in speed (and consequent increase in congestion during busy periods) is therefore considered in the assessment of this impact.

22.69 Information on abnormal loads for the region (along the A9 and through Thurso) indicates that the road network is suitable for such loads without causing danger to other road users or users/property adjacent to the road network. Traffic lights in Thurso town centre have been altered to allow large loads to swing at the bridge end (Sir George's Street – Triall Street corner junction). This illustrates an acceptance of abnormal loads using this route providing they are appropriately managed.

Impact significance

22.70 Given that the loads may travel through several built-up areas with sensitive receptors the sensitivity is considered to be Medium. The magnitude of impact, due to abnormal loads reducing the average speed of traffic on a busy route (and potentially cause congestion), and due to the number of slow and abnormal load/size trips required, is considered to be moderate.

Sensitivity of receptor	Magnitude of impact	Consequence	Significance
Medium	Moderate	Moderate	Significant

MITIGATION IN RELATION TO IMPACT 22.3

- A range of traffic management mitigation measures will be adopted:
- If turbine components are to be transported to the Caithness area by road, a traffic management plan should be developed in discussion with Transport Scotland and Transerv who is responsible for the management of the north west Scotland trunk road network as well as the local communities along the proposed route. The traffic management plan will include provision for:
  - Deliveries using large or slow moving equipment will be planned to avoid peak traffic times
  - Deliveries using large or slow moving equipment will be planned so they do not coincide with each other.
  - The operations team will publicise when deliveries using large or slow moving equipment is planned to inform local road users and communities along the route.

Residual impact

22.71 The implementation of the proposed traffic management plan will ensure that the magnitude of impact is reduced to minor.

Sensitivity of receptor	Magnitude of impact	Consequence	Significance
Medium	Minor	Minor	Not Significant

22.7 Impacts during Operations and Maintenance

22.7.1 Impact 22.4: Traffic congestion during operation and maintenance

22.72 The only traffic associated with the operation of the Project will be for manning the PCC and infrequent maintenance activity. No operational access to onshore cable routes is required. Maintenance of the PCC will only be two or three times per year with travel to the site in the form of a small van. Ongoing operation may require up to five people once fully commissioned. It is assumed that this equates to five individual vehicles.

22.73 Marine maintenance workers associated with Scrabster or other ports in the region are the subject of a general upgrade of regional port and harbour facilities in the Pentland Firth and Orkney Waters (PFOW) area and the associated increase in traffic as part of these upgrades is not within the scope of this EIA. In total 50 workers are expected to be associated with the operations and maintenance of the Project. In the context of Dounreay (1900 current workers) this number is relatively insignificant and there is the potential that the Dounreay workforce will be decreasing. The Project may be making use of this already available workforce and so the overall workforce in the area may not increase by the full 50 workers.

22.74 In comparison to the quietest time of year, February, this equates to an increase of 2% relating to all vehicles (based on 2014 predicted traffic levels).

Impact significance

22.75 Given that traffic going to and from the PCC may be from a variety of locations and travel may be by ordinary light vehicle through one built-up area with sensitive receptors, it may be considered that the sensitivity is medium. As the magnitude of increase in vehicle numbers is 2%, the magnitude of impact may be considered to be negligible.

Sensitivity of receptor	Magnitude of impact	Consequence	Significance
Medium	Negligible	Negligible	Not Significant

MITIGATION IN RELATION TO IMPACT 22.4

- No proposed mitigation as no significant impact predicted.

22.8 Impacts during Decommissioning

22.76 Decommissioning activities for the offshore and onshore infrastructure are unlikely to require any higher numbers of abnormal load trips or HGV trips as described under the potential impacts for construction in Section 22.6. The types of impact that will be experienced and the conclusions regarding impact significance, assuming the implementation of the same mitigation, will be the same or less than during construction and installation.

22.9 Potential Variances in Environmental Impacts

22.77 There are alternative transport options associated with the Project relating specifically to different options for grid connection and for the duration of construction works. The impact assessment presented in this section has used only the worst case vehicle numbers and construction options therefore selection of alternative Project options (e.g. grid connection at the PCC for years one and two) will result in a reduced environmental impact.

22.78 Should nearby assembly of offshore components not be possible assembly may occur elsewhere with turbines and TSSs transported to the Inner Sound by sea. This would remove the identified potential impact on the trunk road network due to the transport of turbine and TSS components.

22.10 Cumulative Impacts

22.10.1 Introduction

22.79 MeyGen has in consultation with Marine Scotland and Highland Council identified a list of other projects (MeyGen, 2011) which together with the Project may result in potential cumulative impacts. The list of these projects including details of their status at the time of the EIA and a map showing their location is provided in Section 8; Table 8.3 and Figure 8.1 respectively.

22.80 Having considered the information presently available in the public domain on the projects for which there is a potential for cumulative impacts, Table 22.9 indicates those with the potential to result in cumulative impacts from a transportation and access perspective. The consideration of which projects could result in potential cumulative impacts is based on the results of the project specific impact assessment together with the expert judgement of the specialist consultant.

Project title	Potential for cumulative impact	Project title	Potential for cumulative impact	Project title	Potential for cumulative impact
MeyGen Limited, MeyGen Tidal Energy Project, Phase 2	✓	SHETL, HVDC cable (onshore to an existing substation near Keith in Moray)	×	OPL, Ocean Power Technologies (OPT) wave power ocean trial	×
ScottishPower Renewables UK Limited, Ness of Duncansby Tidal Energy Project	✓	Brough Head Wave Farm Limited, Brough Head Wave Energy Project	×	MORL, Moray Offshore Renewables Ltd (MORL) offshore windfarm	×
Pelamis Wave Power, Farr Point Wave Energy Project	×	SSE Renewables Developments (UK) Limited, Costa Head Wave Energy Project	×	SSE and Talisman, Beatrice offshore Windfarm Demonstrator Project	×
Sea Generation (Brough Ness) Limited, Brough Ness Tidal Energy Project	×	EON Climate & Renewables UK Developments Limited, West Orkney North Wave Energy Project	×	BOWL, Beatrice Offshore Windfarm Ltd (BOWL) offshore windfarm	×
Cantick Head Tidal Development Limited, Cantick Head Tidal Energy Project	×	EON Climate & Renewables UK Developments Limited, West Orkney South Wave Energy Project	×	Northern Isles Salmon, Chalmers Hope salmon cage site	×
SSE, Caithness HVDC Connection - Converter station	✓	ScottishPower Renewables UK Limited, Marwick Head Wave Energy Project	×	Northern Isles Salmon, Pegal Bay salmon cage site	×
SSE, Caithness HVDC Connection - Cable	✓	SSE Renewables Developments (UK) Limited, Westray South Tidal Energy Project	×	Northern Isles Salmon, Lyrawa salmon cage site	×
RWE npower renewables, Stroupster Windfarm	✓	EMEC, Wave Energy test site (Billia Croo, Orkney)	×	Scottish Sea Farms, Bring Head salmon cage site	×
SSE, Gills Bay 132 kV / 33 k V Substation Phase 1: substation and overhead cables (AC)	✓	EMEC, Tidal energy test site (Fall of Warness, Orkney)	×	Northern Isles Salmon, Cava South salmon cage site	×
SSE, Gills Bay 132 kV / 33 k V Substation Phase 2: HVDC converter station and new DC buried cable	✓	EMEC, Intermediate wave energy test site (St Mary's Bay, Orkney)	×	Scottish Sea Farms, Toyness salmon cage site	×
SHETL, HVDC cable (offshore	×	EMEC, Intermediate tidal energy	×	Northern Isles Salmon, West	×
Moray Firth)		test site (Head of Holland, Orkney)		Fara salmon cage site	

Table 22.9: Summary of potential cumulative impacts

22.81 The following sections summarise the nature of the potential cumulative impacts for each potential project phase:

- Construction and installation;
- Operations and maintenance; and
- Decommissioning.

22.10.2 Potential cumulative impacts during construction and installation

22.82 The Highland Council Local Transport Strategy (2010) recognises the potential for growth in the region, particularly due to the PFOW leasing round for marine energy projects. The only known construction timeline at this stage is for the proposed Gills Bay Substation (SSE Power Distribution) which is intended for construction commencing April 2013.

22.83 HDD is the most intensive construction activity. The first year of HDD work will add much fewer HGV trips to the baseline than has been assessed in this section for year 3. Other MeyGen construction activities involve smaller numbers of vehicles and whilst construction activity may overlap with construction of the substation it will not be an activity involving large numbers of trips. It is therefore expected and assuming that the principles of the Project mitigation are adopted across the SSE substation project and are insignificant that the cumulative effects of these two projects will be minimal.

22.84 Further projects identified in the region, but without construction timescales, may add to the volume of traffic predicted for the MeyGen Project, however without details of their construction it is not possible to reasonably assess the potential cumulative effect.

22.10.3 Potential cumulative impacts during operations and maintenance

22.85 During operational phase the Project adds 2% to the predicted traffic levels (of 2015). Given that the other identified terrestrial projects in the region are energy related and unlikely to be high trip-generating projects, the cumulative effect of the Project in combination with other terrestrial projects in the region is not considered significant. In terms of the Project as a whole, the terrestrial operational workforce is not expected to increase considerably.

22.86 Offshore maintenance activities will bring an increase in workforce numbers required to service the offshore components however these numbers are part of a wider strategic upgrade to port and harbour facilities in the region and are therefore not part of the scope of this EIA.

22.10.4 Potential cumulative impacts during decommissioning

22.87 Although it is possible that a number of the impacts that may occur during decommissioning (e.g. noise emissions, transport of components) could act cumulatively with other developments, there is limited scope for much of this since it is unknown at this stage if other developments offering the potential for cumulative impact would be decommissioned at the same time as this development, or that of the

MeyGen Phase 2 development (which would likely be decommissioned at the same time as the proposed development).

22.10.5 Mitigation requirements for potential cumulative impacts

22.88 No mitigation is required over and above the Project specific mitigation.

22.11 Proposed Monitoring

22.89 No monitoring required.

22.12 Summary and Conclusions

22.90 All aspects of the Project have been considered in transportation and road access terms under the relevant guidelines for the environmental assessment of road traffic.

22.91 In a multi-faceted project a series of activities have the potential for interactions with sensitive receptors on or around the local road network or the trunk road network. Construction activities all involve the use of HGVs, therefore the most intensive period and number of HGVs has been considered in the assessment (HDD works during year 3). Similarly, a worst case estimate for the number of abnormal loads required for transport of offshore components to a nearby assembly site has been assessed (although transport by sea is an alternative). Worker trips to either the onshore construction site or to a port or harbour from which offshore maintenance activities will be conducted have formed part of the revised predicted traffic levels but found to have a negligible percentage impact on overall predicted traffic levels (taking 2015 as the base year).

22.92 All potential impacts identified have been found to be manageable during the course of the Project. Principle mitigation is recommended in the form of strong communication with the local community regarding the traffic requirements of the construction phase, and for a traffic management plan covering the transport of the offshore components. This plan would enable the Project team and its contractors to work with the local authority and trunk road managers (The Highland Council and Scotland Transerv, respectively) to ensure that all potential impacts are minimised.

22.93 The operational phase is found to be of negligible significance considering the existing traffic levels in the area and taking into consideration forecasted growth in the region. The amount of operational traffic is expected to remain constant for the Project whilst the overall traffic levels in the area are expected to increase.

22.94 In conclusion it is recommended that with the implementation of mitigation measures this Project should not be rejected on transport grounds.

22.13 References

Department of Transport, (2007). Guidance on Transport Assessment.

The Highland Council, (2010). Local Transport Strategy 2010/11 – 2013/14 (Department of Transport, Environmental and Community Services).

Institute of Environmental Assessment, (2003). Guidelines for the Environmental Assessment of Road Traffic.

Scottish Executive, (2005). Transport Assessment and Implementation: A Guide.

Transport Scotland, (2011). Automatic Traffic Count Data (various locations around the Highland region).

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