Cloiche Wind Farm

Technical Appendix 13.1: Transport Assessment

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1 INTRODUCTION

1.1 WYG was commissioned by SSE Renewables ("the Applicant") to undertake an assessment of the transport aspects of the proposed Cloiche Wind Farm, hereafter referred to as the 'Proposed Development' or 'the Site'. The Site is located in the Scottish Highlands to the south east of Loch Ness.

1.2 The Site lies adjacent to Stronelairg Wind Farm which began operation in 2018.

1.3 This Transport Assessment (TA) identifies the key transport and access matters associated with the Proposed Development, including the proposed routing for construction traffic including abnormal loads. The TA identifies the predicted number and distribution of construction traffic movements and details where mitigation measures are required to accommodate the proposed movements.

1.4 The TA considers the impacts during the construction phase of the Proposed Development, when volumes of traffic generation are anticipated to be at their greatest due to the delivery of equipment and construction materials. In line with IEMA guidelines, severance, driver delay, pedestrian delay, pedestrian amenity, fear and intimidation as well as accidents and safety have evaluated in isolation for the proposed Cloiche Wind Farm. Additionally, these receptors were evaluated cumulatively considering other committed and in-planning wind farms to produce a worst-case scenario. The operational phase of the Proposed Development is not anticipated to have any significant impacts on the public road network as a result of the low levels of traffic that are forecast.

1.5 All turbine blade loads would originate from Kyle of Lochalsh and access the site via the A87 to Invergarry then the A82 to Fort Augustus before following the same route as HGV traffic. All other turbine components would be delivered to Corpach and would also access the site via the A82 from the south. An Abnormal Load Route Assessment has been undertaken and is included as Technical Appendix 13.2

1.6 This TA has been prepared in accordance with instructions from the Applicant on the above project details. No liability is accepted for the use of all or part of this

Report Structure

1.7 Following this introductory chapter, the TA is structured as follows:

- **Chapter Two** describes the Proposed Development along with details of the proposed abnormal loads;
- **Chapter Three** sets out details of relevant local and national policy and guidance;
- **Chapter Four** sets out the assessment stages considered within the TA;
- **Chapter Five** details the baseline transport conditions encountered within the study area;
- **Chapter Six sets** out estimates of development traffic flows**;**
- **Chapter Seven provides** details of the traffic impact assessment;
- **Chapter Eight sets** out construction traffic management proposals;
- **Chapter Nine** summarises the findings of the Transport Assessment and outlines the key conclusions.

2 PROPOSED DEVELOPMENT

Site Description

2.1 The Proposed Development would consist of 36 turbines, each up to a maximum tip height of 149.9m and the following associated infrastructure:

- Thirty-six wind turbines of up to 149.9m tip height with internal transformers;
- Crane hardstanding and associated laydown area at each wind turbine location;
- On site access tracks;
- A new on-site substation;
- A network of underground cabling to connect each wind turbine to the on-site substation;
- A LiDAR unit to collect meteorological and wind speed data, and associated hard stand; and
- Any associated ancillary works required.

2.2 In addition to the permanent components, the construction phase would comprise the following temporary facilities:

- Reuse of former main site compound area (utilised for Stronelairg Wind Farm and Glendoe Hydroelectric Scheme) adjacent to the B862, including welfare facilities, site cabins, and parking;
- Reuse of further site compound areas on the plateau, as well as storage areas;
- Reuse of a former concrete batching plant area on the plateau, for a temporary concrete batching plant; and
- Borrow pits, comprising a combination of reuse of existing borrow pits created for Stronelairg Wind Farm, and new borrow pits.

2.3 Access to the Proposed Development is proposed via the existing junction to Stronelairg Wind Farm and Glendoe Hydroelectric Scheme on the B862, located

to the north east of Fort Augustus. It is anticipated that all construction traffic will access the Site from the west of the B862.

2.4 The location of the Proposed Development is indicated in Figure 13.1.

Proposed Turbine Details

2.5 The 36 turbines proposed as part of the development would have a tip height of up to 149.9m and a rotor diameter of up to 136m. It is anticipated that the total generating capacity will be in excess of 50MW depending on the final choice of turbine.

2.6 SSE indicated that they wish to consider access for up to 67m long blade turbines being transported to Site.

2.7 A Route Assessment is included in Appendix C and considers a 67m long Vestas V136 blade with tower loads up to 29.6m in length and up to 4.3m wide considered to provide a worst-case assessment scenario for a variety of different options.

3 POLICY CONTEXT

Introduction

3.1 A review of relevant transport and planning policies has been undertaken and is summarised below. The review provides the basis for the wider development context of wind farm proposals.

National Policy

Scottish National Planning Framework (NPF)

3.2 The Scottish National Planning Framework (NPF) sets the context for development planning in Scotland and provides a framework for the spatial development of Scotland as a whole. It sets out the Government's development priorities over the next 20-30 years and identifies national developments which support the development strategy. Scotland's third National Planning Framework 3 was laid in the Scottish Parliament on June 23, 2014.

Scottish Planning Policy (2014)

3.3 In relation to transport and access matters, SPP notes:

"286. Where a new development or a change of use is likely to generate a significant increase in the number of trips, a transport assessment should be carried out. This should identify any potential cumulative effects which need to be addressed; and

290. Development proposals that have the potential to affect the performance or safety of the strategic transport network need to be fully assessed to determine their impact. Where existing infrastructure has the capacity to accommodate a development without adverse impacts on safety or unacceptable impacts on operational performance, further investment in the network is not likely to be required. Where such investment is required, the cost of the mitigation measures required to ensure the continued safe and effective operation of the network will have to be met by the developer."

Planning Advice Note (PAN) 75

3.4 PAN75: Planning for Transport provides advice on the requirements for Transport Assessments as follows:

"requires a transport assessment to be produced for significant travel generating developments. Transport Assessment is a tool that enables delivery of policy aiming to integrate transport and land use planning."

"All planning applications that involve the generation of person trips should provide information which covers the transport implications of the development. The level of detail will be proportionate to the complexity and scale of the impact of the proposal...For smaller developments the information on transport implications will enable local authorities to monitor potential cumulative impact and for larger developments it will form part of a scoping exercise for a full transport assessment. Development applications will therefore be assessed by relevant parties at levels of detail corresponding to their potential impact."

Onshore Wind Turbines: Online Renewables Planning Advice (May 2014)

3.5 The Scottish Government introduced online renewables advice in February 2011 which has been regularly updated since then. The most recent specific advice note regarding onshore wind turbines was published in May 2014. The advice note identifies the typical planning considerations in determining applications for onshore wind turbines including landscape impact, impacts on wildlife and ecology, shadow flicker, noise, ice throw, aviation, road traffic impacts, cumulative impacts and decommissioning.

3.6 In terms of road traffic impacts, the guidance notes that in siting wind turbines close to major roads, pre-application discussions are advisable. This is particularly important for the movement of large components (abnormal load routing) during the construction period, periodic maintenance and for decommissioning.

Transport Assessment Guidance (2012)

3.7 Transport Scotland's (TS) Transport Assessment Guidance was published in 2012. It aims to assist in the preparation of Transport Assessments (TA) for development proposals in Scotland such that the likely transport impacts can be identified and dealt with as early as possible in the planning process. The document sets out requirements according to the scale of development being proposed.

3.8 The document notes that a TA will be required where a development is likely to have significant transport impacts but that the specific scope and contents of a TA will vary for developments, depending on location, scale and type of development.

Guidelines for the Environmental Assessment of Road Traffic, IEMA (1993)

3.9 The document includes guidance on how the sensitivity of receptors should be assessed, contains rules to help determine which links in the study area should be considered for detailed assessment and identifies the key impacts that are most important when assessing the magnitude of traffic effects from an individual development.

Local Policy

3.10 The Highland Council (THC) Local Transport Strategy (LTS), 2010

3.11 The document refers to the road network across rural areas being characterised by 'winding single carriageway roads with passing places'. Reference is also made to the additional pressure that can be placed on sub-standard roads. The LTS notes that in terms of timber transport, there are initiatives such as tyre pressure moderation which are reducing the damaging effect of forestry lorries on rural roads. The LTS also mentions the many bridges which are subject to weight restrictions in the Local Authority area. The LTS states that "where possible, the Council, through its Lifeline Bridges programme will invest in the bridges to maintain access either by removing weight restrictions or reducing the

weight restriction effect of HGV vehicles." The aim of the Lifeline Bridges programme is to assist the economy of the area by allowing the efficient transport of essential goods and services and also providing for industries that are heavily dependent on large vehicle transport.

4 ASSESSMENT STAGES

4.1 There are three stages that this assessment considers:

- The Construction Phase of the project;
- The Operational Phase of the project; and
- The Decommissioning Phase of the project.

4.2 Of these phases, the greatest traffic volumes are associated with the project construction phase. The operational phases are restricted to occasional maintenance operations which generate much lower volumes of traffic that are not considered to be more than daily traffic variation levels on the road network.

4.3 The decommissioning phase involves fewer trips on the network than the construction phase, as elements of infrastructure such as access tracks are often left in place, adding to local infrastructure.

4.4 The 'worst case' transport scenario is therefore the construction phase and this assessment concentrates on this phase of the Proposed Development. It should be noted however that the construction effects are short lived and temporary in nature.

5 BASELINE CONDITIONS

Road Network

5.1 The road network included in the assessment was identified through an assessment of the likely routes between suppliers of equipment and materials and the Site. Roads forming the study area are shown in Figure 13.1 and include:

- A82 between Inverness and Fort William;
- A87 between Invergarry and Kyle of Lochalsh; and
- B862 between Fort Augustus and Inverness.

5.2 A brief summary of the characteristics of each section of road is provided below:

- A82 - runs south to north between Glasgow and Inverness with a mixture of rural sections subject to the national speed limit and urban sections including through Fort William and Fort Augustus where the speed limit drops to 30mph.
- A87 - is a two-way rural single carriageway road subject to the national speed limit except where it passes through settlements including Invergarry, where the speed limit reduces to 40mph and Kyle of Lochalsh where the speed limit reduces to 30mph.
- B862 - is a two-way rural single carriageway road subject to the national speed limit except where it passes through settlements including the section east of Fort Augustus where the speed limit reduces to 30mph. The road provides access to small hamlets and dwellings in the study area and also provides an alternative route towards Inverness avoiding the A82.

Data Collection Methodology

5.3 Four Department for Transport (DfT) count sites and two survey sites that would allow an estimate of the potential impacts of the construction phase to be made were identified. To gauge the existing road usage, 2018 survey data was obtained from the DfT sites and Automatic Traffic Count (ATC) surveys were

undertaken during a seven-day period in September 2019 (considered a neutral period within the calendar year) at the following locations:

1. Department for Transport Count site 40762 – A82 south of Invergarry;
2. Department for Transport Count site 10760 – A82 north of Invergarry;
3. Department for Transport Count site 50707 – A82 south of Invermoriston;
4. Department for Transport Count site 30776 – A87 south of its junction with the A887;
5. 7-day ATC and speed survey – B862 Fort Augustus; and
6. 7-day ATC and speed survey – B862 west of Glendoe Hydroelectric Scheme site access.

5.4 The locations of the DfT and ATC survey sites are illustrated in Figure 13.1.

Existing Traffic Conditions

5.5 The traffic counters allowed the traffic flows to be split into vehicle classes and the data has been summarised into cars/ light goods vehicles (Lights) and HGVs (all goods vehicles >3.5 tonnes gross maximum weight).

5.6 Table 5.1 summarises the 24-hour average daily traffic data collected at the count sites.

Table 5.1 Existing Traffic Movements (Daily Average Two-way Flows)

Survey Location	Cars/ Lights	HGV	Total
A82 south of Invergarry (DFT)	3962	364	4326
A82 north of Invergarry (DFT)	2883	263	3146
A82 south of Invermoriston (DFT)	2442	237	2679
A87 south of its junction with the A887 (DFT)	1480	109	1589
B862 west of Glendoe Hydroelectric Scheme site access (Commissioned)	683	265	948
B862 Fort Augustus (Commissioned)	591	217	808

Baseline Traffic Conditions

5.7 Construction of the Proposed Development is likely to take 36 months with the peak period potentially falling during 2024, depending if and when consent is granted.

5.8 Any lengthening in the construction programme for the Proposed Development would have a reduced effect on the surrounding road network in peak period trip generation terms.

5.9 Future year baseline traffic flows were determined by applying a National Road Traffic Forecast (NRTF) 2024 high growth factor to the existing traffic flows within the study area, the year where construction traffic is projected to be at its peak. Traffic flows associated with nearby operational wind farms were captured within the existing traffic flows.

5.10 The NRTF high growth factor for 2018 to 2024 is 1.0838 and from 2019 to 2024 is 1.0679. These factors were applied to the 2018 DfT and 2019 ATC survey data respectively. The resulting future year baseline traffic flows are shown in Table 5.2.

Table 5.2 Future Year Baseline Traffic (Weekday Average Two-way Flows)

Survey Location	Cars + Lights	HGV	Total
A82 south of Invergarry (DFT)	4294	395	4689
A82 north of Invergarry (DFT)	3125	285	3410
A82 south of Invermoriston (DFT)	2647	257	2904
A87 south of its junction with the A887 (DFT)	1604	118	1722
B862 west of Glendoe Hydroelectric Scheme site access (Commissioned)	729	287	1017
B862 Fort Augustus (Commissioned)	631	232	863

Speed Survey

5.11 The ATC sites used to provide traffic volume data for two locations on the B862 was also used to collect speed statistics. The two-way 5-day average and 85th percentile speeds observed at the count location are summarised in Table 5.3.

Table 5.3 Speed Summary (Weekday Average Two-Way)

Survey Location	Average Speed (MPH)	85th Percentile Speed (MPH)	Speed Limit (MPH)
B862 west of Glendoe Hydroelectric Scheme site access (Commissioned)	31.9	32.2	30
B862 Fort Augustus (Commissioned)	21.7	28.6	30

5.12 The speed survey data indicates that the average and 85th percentile speeds immediately east of Fort Augustus are below the speed limit. However, the speed survey data from the site west of the Glendoe Hydroelectric Scheme site access suggests that both the average and 85th percentile speeds are greater than the speed limit.

Accident History

5.13 Road traffic personal injury accident data was obtained from the stats 19 national accident record database extracted from www.cyclestreets.net/collisions and www.crashmaps.co.uk for the five years from the start of 2014 over a study area comprising the road network indicated in Figure 13.1.

5.14 The data is collected by the police about road traffic crashes occurring on British roads where someone is injured with the severity of injury defined as follows:

- Slight – minor injury treated at the scene;
- Serious – injury for which the person is detained in hospital; and
- Fatal – the person dies within 30 days of the accident.

5.15 The data indicated that over the network reviewed, which is approximately 239 km in length (two way), an average of 39 accidents occur every year of

which 76% are classified as "slight", 21% as "serious" and 3% as "fatal" by the police officer(s) reporting and recording the personal injury accident.

5.16 Table 5.4 summarises of the accident data.

Table 5.4 Accident Data Summary 2014-2018

Section of Study Area	2014	2015	2016	2017	2018	TOTAL
A82 – Inverness to Fort William	22	18	36	18	16	110
A87 – Invergarry to Kyle of Lochalsh	18	12	16	16	14	76
B862 – Fort Augustus to Inverness	4	2	0	0	3	9

5.17 No common cause or accident location has been identified in the analysis that would point to a specific road safety issue.

Footpath and Cycle Network

5.18 A review of foot and cycle paths that may be affected by the movement of construction traffic was undertaken.

5.19 The Highland Council's web page indicates that close to the Site, Core Path IN16.01 (Kilchuimen Burial Ground and River tarff), IN16.06 (Campsite to Fort Augustus by Caledonian Canal), IN16.17 (Fort Augustus Abbey loop), IN16.05 (Caledonian Canal from Bridge of Oich to Fort Augustus) and IN16.04 (Caledonian Canal to A82 by church) all connect in to either the A82 or B826 approximately 2.8km west of the Site. However, none of these core paths cross any of these roads which will be used by construction traffic. A footway is provided along a section of east side of the B862 linking between Core Paths IN16.01 and IN16.17 which also forms a signed walking route and likely to be utilised by users of these routes.

6 DEVELOPMENT TRIPS

Derivation of Development Traffic Flows

6.1 During the 36-month construction period, the following traffic would require access to the to the site:

- Staff transport, either cars or staff minibuses;
- Construction equipment and materials, deliveries of machinery and supplies such as cement materials; and
- Abnormal loads consisting of the wind turbine sections and a heavy lift crane.

6.2 Average monthly traffic flow data were used to establish the construction trips associated with the site based on the assumptions detailed in the following sections.

Staff Traffic

6.3 Staff would arrive in non-HGV vehicles and where possible would be encouraged to car share. The workforce on-site would depend on the activities undertaken, but, based on previous wind farm construction site experience; the maximum number is expected to be around 66 per day during the peak of construction.

6.4 For the purposes of estimating traffic movements, it has been assumed that 66% of staff would be transported by minibus carrying up to 16 people and 33% would arrive by car / LGV (single occupancy has been assumed as the worst case at this stage with potentially fewer movements through car sharing).

6.5 Based on these assumptions, staff transport cars and LGVs would account for a maximum of 87 two-way vehicle trips per day.

General Construction Traffic

6.6 An estimate of cement, sand and steel reinforcement requirements for the turbine foundations was based on experience of previous developments. It was assumed that concrete would be batched on-site which reduces the vehicle movements required for deliveries by approximately one third compared with use

of ready-mix concrete. The total estimated trips required for the delivery of the concrete and steel reinforcement is summarised in Tables 6.1 and 6.2.

6.7 Aggregate materials would be required to construct the wearing course of the access tracks, crane hardstandings and turning heads and foundations for the temporary construction compounds and electrical substation. All material will be excavated from borrow pits on-site. Therefore, traffic movements on the local road network associated with the aggregate for the access tracks will be negligible and have not been included within the assessment.

Table 6.1: Cement and Sand Deliveries

Material	Total Weight (Tonnes)	Lorry Capacity (m^3)	Number of Lorries	Number of movements
Cement & Sand	20,340	20	1,627	3,254

Table 6.2: Steel Reinforcement Deliveries

Material	Total Weight (Tonnes)	Lorry Capacity (Tonnes)	Number of Lorries	Number of movements
Steel Reinforcement	3,600	30	120	240

6.8 An allowance has also been made for the laying of a geotextile membrane along the length of the track network. The total estimated trips are summarised in Table 6.3.

Table 6.3: Geotextile Membrane Deliveries

Material	Total Length (m)	Number of Drums	Lorry Capacity (Drums) / No Lorries	Number of movements
Geotextile Membrane	25,961	346	20 / 18	36

6.9 Electrical cables would be laid in trenches along the access track between the turbine locations and the onsite substation. The cables would be buried in sand to protect them from damage. Cabling sand would be imported to the site. The total estimated number of trips required to deliver the electrical cables and cabling sand is summarised in Tables 6.4 and 6.5.

Table 6.4: Cabling Movements

Material	Total Length (m)	Length per drum / Number of Drums	Drums per Lorry / No Lorries	Number of movements
Electrical Cabling	25,961	500 / 156	9 / 18	36

Table 6.5: Cabling Trench Movements

Material	Total Volume (m^3)	Density (te) / Lorry Capacity (m^3)	Number of Lorries	Number of movements
Cabling Sand	25,961	1.6 / 20	701	1,402

6.10 It was assumed that there would be one service delivery (food/drink) per working day throughout the 36-month programme. This equates to 44 vehicle movements per month (22 trips inbound and 22 trips outbound).

6.11 It was assumed that construction would take place over a 22 working day month.

Turbine Transport

6.12 The turbines are broken down into components for transport to the site. The hub, nacelle, drive train and blade and tower sections are classified as Abnormal Indivisible Loads (AIL) due to their weight, length, width and height when loaded.

6.13 For the purposes of the report, the worst-case numbers of components requiring transport are illustrated in Table 6.6. It should be noted that the actual turbines

installed on the site may have fewer tower sections, resulting in fewer loads being transported.

Table 6.6: Turbine Component Deliveries

Component	Maximum No. Per Turbine
Blades	3
Tower sections	4
Hub	1
Nacelle	1
Drive Train	1
Container	1
Transformer	1
Footings	1
Site parts (shared Containers)	0.2
Total Movements	13.2
Number of Turbines	36
Total Vehicle Deliveries	475
Total Vehicle Movements	950

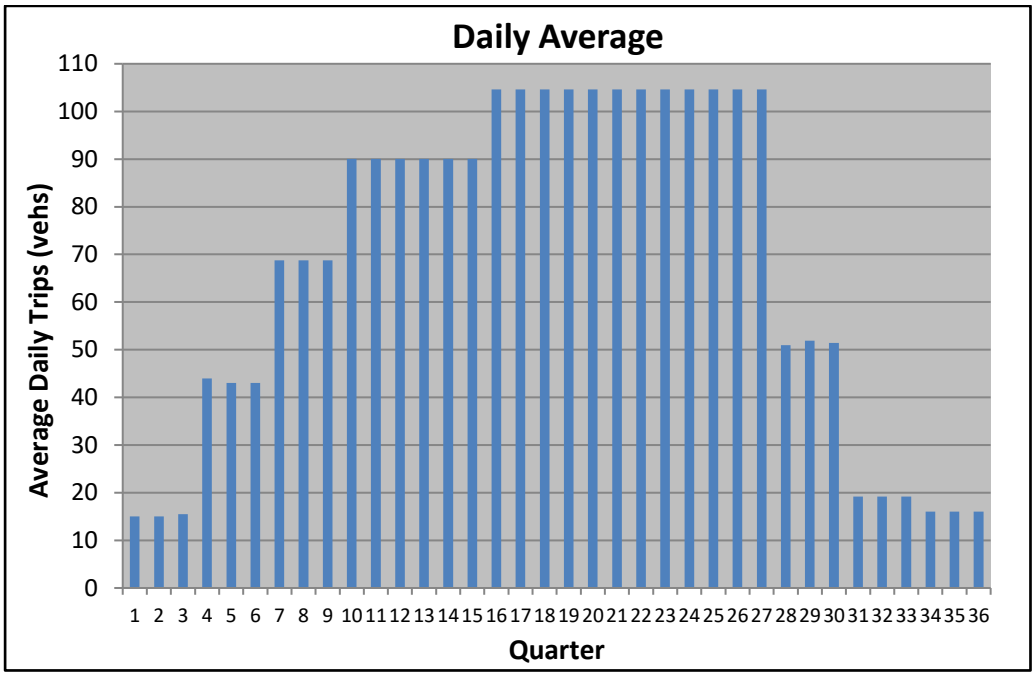
6.14 In addition to the turbine deliveries, two high capacity erection cranes would be needed to offload some components and erect the turbines. The cranes are likely to be mobile cranes with a capacity up to 1,000 tonnes that are escorted by boom and ballast trucks to allow full mobilisation on-site. Smaller erector cranes would also be present to allow the assembly of the main cranes and to ease the overall erection of the turbines.

Total Construction Traffic

6.15 The total estimated construction traffic movements are detailed in the main delivery schedule table provided in Appendix B of this report.

6.16 The average daily construction trips across the construction programme is illustrated in Graph 6.1.

Graph 6.1 Average Daily Construction Trips



Development Traffic Distribution

6.17 The origin of vehicle traffic will depend on the location of staff accommodation and the source of materials being imported. It is likely that staff will be accommodated across a wide area. There are several potential concrete plants including Breedon and Leiths Scotland both situated at Fort William and Tarmac Dunain Mains Quarry Inverness and Mid Lairgs Quarry south of Inverness.

6.18 HGV traffic will be required to use the A82 and B862 from its junction with the A82 then access the Site from the west via the B862. The choice of HGV route was based on the identifying the most suitable route between the Site access and the primary Trunk or A-Class road network. The chosen route was identified as the most suitable route to achieve this, avoiding impact on other potentially sensitive receptors including Farr and Stratherrick Primary Schools located north of the Site on the B862 and B861 respectively.

6.19 All turbine blade loads will originate from Kyle of Lochalsh and access the site via the A87 to Invergarry then the A82 to Fort Augustus before following the same

route as HGV traffic. All other turbine components will be delivered to Corpach and will also access the site via the A82 from the south.

6.20 It is assumed that the B862 west of the Site access will be the preferred access route for all traffic. In order to assess a worst-case scenario, it has been assumed for the purpose of this assessment that all traffic will approach the Site from the west on the B862.

6.21 All traffic distribution assumptions are shown in Table 6.7.

Table 6.7 Construction Traffic Distribution Assumptions

Road	Staff	Turbine Transport/Escorts	Cranes	Sand/Cement	Other
A82 south of Invergarry (DFT)	20.00%	50.00%	50.00%	50.00%	20.00%
A82 north of Invergarry (DFT)	25.00%	100.00%	50.00%	50.00%	25.00%
A82 south of Invermoriston (DFT)	75.00%	0.00%	50.00%	50.00%	75.00%
A87 south of its junction with the A887 (DFT)	5.00%	50.00%	0.00%	0.00%	5.00%
B862 west of Stronelairg site access (Commissioned)	100.00%	100.00%	100.00%	100.00%	100.00%
B862 Fort Augustus (Commissioned)	100.00%	100.00%	100.00%	100.00%	100.00%

Conclusions

6.22 The results conclude that the peak period of construction is anticipated to occur during months 16-27 of the 36-month programme. This corresponds with the delivery of stone for cement materials for turbine foundations and sand for cabling trenches. During the busiest months, activities are anticipated to generate an average of 105 two-way vehicle trips per day of which 87 would be made by LGV (site staff) and 18 by HGV.

The traffic impact assessment focuses on the peak period traffic flows to illustrate the potential impacts on the study network.

7 TRAFFIC IMPACT ASSESSMENT

Construction Traffic

7.1 The future year baseline traffic data was combined with the peak daily construction traffic flows to estimate the total trips on the study network during the peak of the construction phase. This was then distributed across the network.

7.2 Table 7.1 illustrates the peak weekday construction traffic flow; Table 7.2 the weekday and future year baseline plus peak construction traffic (total) flows and Table 7.3 the percentage increase in total traffic over baseline traffic.

Table 7.1: Peak Construction Traffic (Weekday Average Two-Way Flows)

Survey Location	Cars / LGV	HGV	Total
A82 south of Invergarry (DFT)	18	6	25
A82 north of Invergarry (DFT)	24	8	32
A82 south of Invermoriston (DFT)	63	9	72
A87 south of its junction with the A887 (DFT)	6	2	7
B862 west of Glen Doe site access (Commissioned)	87	18	105
B862 Fort Augustus (Commissioned)	87	18	105

Table 7.2: Total Traffic Flows (Weekday Average Two-Way Flows)

Survey Location	Cars / LGV	HGV	Total
A82 south of Invergarry (DFT)	4312	401	4713
A82 north of Invergarry (DFT)	3149	293	3442
A82 south of Invermoriston (DFT)	2710	266	2976
A87 south of its junction with the A887 (DFT)	1610	120	1730
B862 west of Glen Doe site access (Commissioned)	816	305	1121
B862 Fort Augustus (Commissioned)	718	249	967

Table 7.3: Percentage Increase Total vs Future Year Baseline (Weekday Average Two-Way Flows)

Survey Location	Cars / LGV	HGV	Total
A82 south of Invergarry (DFT)	0.43%	1.65%	0.53%
A82 north of Invergarry (DFT)	0.77%	2.92%	0.95%
A82 south of Invermoriston (DFT)	2.38%	3.66%	2.49%
A87 south of its junction with the A887 (DFT)	0.35%	1.55%	0.43%
B862 west of Glen Doe site access (Commissioned)	11.92%	6.17%	10.29%
B862 Fort Augustus (Commissioned)	13.77%	7.65%	12.13%

7.3 It is anticipated that should any weekend working take place, it would involve limited numbers of staff and associated vehicle movements and no deliveries by HGVs; no detailed analysis has therefore been undertaken.

7.4 The results indicate that, total traffic movements are only predicted to increase by more than 30% on the B862. HGV movements are not anticipated to increase by more than 10% on the A82, A87 and B862.

7.5 The greatest impact of construction traffic would be experienced on the B862 which reflects the low number of trips on this section of the road network.

7.6 In real terms, the maximum number of additional HGV movements per hour on any link averages less than 5 within the peak month of construction activity.

7.7 This volume of additional traffic is not considered to present a concern in terms of the link capacity.

Operational Traffic

7.8 It is predicted that during the operation of the site (expected to be for 25 years from commissioning) there would be an average of 2 vehicle movements per week for maintenance purposes. Also, there may be occasional abnormal load movements to deliver replacement components in the unlikely event of a major failure.

Decommissioning Traffic

7.9 Prior to decommissioning of the site, a traffic assessment would be undertaken, and appropriate traffic management procedures followed. It is anticipated that the number of associated movements would be less than during the construction phase and that the number of abnormal loads would be drastically reduced.

Cumulative Assessment

7.10 Consideration was given to the cumulative impact of the Proposed Development plus other cumulative developments that are both committed and subject of valid planning applications which would impact on the study area. It was considered that Glenshero, Dell, Aberarder and Millennium South wind farms should be included in the assessment. Cuclachy, Beinn Mhor, Cnoc An Eas, and Druim Bra wind farms were not included having been refused planning consent.

7.11 It is highly unlikely that the construction programmes for the Proposed Development and the identified wind farms would coincide. However, for the purposes of this assessment it was assumed that the peak periods of the construction programmes would overlap and as such, the cumulative assessment has considered the worst-case scenario.

7.12 Peak period traffic flows for the cumulative developments were extracted from planning documentation and added to the future year flows where they impact on the study area. Table 7.4 illustrates the weekday traffic flows associated with the three cumulative developments, Table 7.5 the Total Cumulative Traffic Flows (baseline traffic plus proposed development and cumulative wind farms) and Table 7.6 the percentage increase in cumulative traffic over baseline traffic.

Table 7.4: Cumulative Development Peak Construction Traffic (Weekday Average Two-Way Flows)

Survey Location	Cars / LGV	HGV	Total
A82 south of Invergarry (DFT)	144	103	247
A82 north of Invergarry (DFT)	128	86	214
A82 south of Invermoriston (DFT)	88	93	181
A87 south of its junction with the A887 (DFT)	48	31	79
B862 west of Glen Doe site access (Commissioned)	220	152	372
B862 Fort Augustus (Commissioned)	220	152	372

Table 7.5: Total Cumulative Traffic Flows (Weekday Average Two-Way Flows)

Survey Location	Cars / LGV	HGV	Total
A82 south of Invergarry (DFT)	4456	504	4960
A82 north of Invergarry (DFT)	3276	379	3656
A82 south of Invermoriston (DFT)	2798	359	3157
A87 south of its junction with the A887 (DFT)	1658	151	1809
B862 west of Glen Doe site access (Commissioned)	1036	457	1493
B862 Fort Augustus (Commissioned)	938	401	1340

Table 7.6: Percentage Increase Cumulative vs Future Year Baseline (Weekday Average Two-Way Flows)

Survey Location	Cars / LGV	HGV	Total
A82 south of Invergarry (DFT)	3.78%	27.75%	5.80%
A82 north of Invergarry (DFT)	4.86%	33.09%	7.22%
A82 south of Invermoriston (DFT)	5.70%	39.87%	8.73%
A87 south of its junction with the A887 (DFT)	3.35%	27.79%	5.02%
B862 west of Glen Doe site access (Commissioned)	42.08%	59.10%	46.89%
B862 Fort Augustus (Commissioned)	48.63%	73.24%	55.24%

7.13 The results indicate that when considering the cumulative construction phases, total traffic increases on the A82 and A87. The predicted increase in traffic flows on the B862 relate to the Proposed Development and the effects of cumulative developments. Total HGV traffic movement flows would increase by more than 30% on the A82. Although, the total volume of traffic movements is not anticipated to increase by more than 10%.

7.14 Total traffic and HGV traffic movements are anticipated to increase by over 30% on the B862 at Fort Augustus. The B862 is a receptor of medium sensitivity designed to accommodate general traffic and HGV movements between primary destinations. The road has also previously been used during the construction of Stronelairg Wind Farm and Glendoe Hydroelectric Scheme. Therefore, on this basis the significance of any cumulative effects is considered to be minor and can be mitigated through the implementation of Construction Traffic Management Plans (CTMPs) associated with each individual development.

8 CONSTRUCTION TRAFFIC MANAGEMENT PROPOSALS

8.1 The chapter identifies the high-level proposals for managing the effects of vehicles associated with the proposed development during construction that would be incorporated into a site specific CTMP. The CTMP would be based on the proposals identified within this chapter should the proposed development be granted planning consent and when a contractor is appointed. A CTMP is intended to be a working document that evolves during the construction period.

Construction Phase

8.2 During the construction period, a community liaison group will be set up to disseminate information and take feedback and a project website will be set up and regularly updated to provide the latest information relating to traffic movements associated with vehicles accessing the site. This will be agreed with THC.

8.3 Information would also be provided relating to expected abnormal load convoy movements from Corpach and Kyle of Lochalsh through to the site accesses. It is hoped that this level of information will make residents aware of convoy movements and help reduce any potential conflicts.

8.4 All construction deliveries would be undertaken at appropriate times (to be discussed and agreed with the relevant roads authorities and police) with the aim to minimise the effect on the local road network. It is likely that the abnormal load convoys would travel in the early morning periods, before peak times while general construction traffic would generally avoid the morning and evening peak periods.

8.5 The following measures will be implemented during the construction phase through the CTMP:

- All materials delivery lorries (dry materials) will be sheeted to reduce dust and stop spillage on public roads;

- Specific training and disciplinary measures will be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway;
- Wheel wash facilities will be established at the site entrance;
- Working hours will be limited to between 0700 and 1900 Monday to Saturday though deliveries will be prohibited after 1300 on a Saturday except for abnormal load component delivery which could take place outside these hours;
- Avoidance of transit through the rural communities identified during arrival and departure times of schools with all construction traffic following the designated access route from the A82;
- Police escorts will be utilised for the movement of abnormal loads with the aim of having several vehicles in convoy to minimise the disruption caused to road users. Abnormal load escorts will also warn oncoming vehicles of approaching loads and will pull vehicles over to allow the convoy to pass. They will also pull the convoy over at predetermined locations allowing vehicles to pass reducing the risk of any large build-up of traffic;
- Appropriate traffic management measures will be put in place at the A82/B862 junction and along the B862 to avoid conflict with general traffic, subject to the agreement of THC;
- Appropriate traffic management measures will be put in place at the site access junction. Typical measures will include speed limit, HGV turning and crossing signs and/ or banksmen at the site access and warning signs; and
- Provision of construction updates on the project website and a newsletter to be distributed to residents within an agreed distance of the site.

8.6 All drivers will be required to attend an induction to include:

- A safety briefing;
- The need for appropriate care and speed control;
- A briefing on driver speed reduction agreements (to slow site traffic at sensitive locations);
- Identification of specific sensitive areas;
- Identification of the specified access route; and
- The requirement not to deviate from the specified route.

8.7 Video footage of the pre-construction phase condition of the abnormal loads access route and the construction vehicles route will be recorded to provide a baseline of the state of the road prior to any construction work commencing. This baseline will allow identification of any change in the road condition during the construction stage of the Proposed Development. Any necessary repairs will be coordinated with THC and Transport Scotland and any damage caused by traffic associated with the Proposed Development during the construction period that would be hazardous to public traffic will be repaired as soon as possible.

8.8 Damage to road infrastructure caused directly by construction traffic will be made good and street furniture that is removed on a temporary basis will be fully reinstated.

8.9 There will be a daily road edge review on the B862 and debris and mud will be removed from the carriageway using an on-site road sweeper to keep the road clean and safe.

Operational Phase Mitigation

8.10 Site entrance roads will be well maintained and monitored.

Decommissioning Phase Mitigation

8.11 Like the construction phase, an Abnormal Load Traffic Management Plan and Construction Traffic Management Plan will be prepared for the decommissioning phase.

9 SUMMARY & CONCLUSIONS

Summary

9.1 WYG was commissioned by SSE ("the Applicant") to undertake an assessment of the transport aspects of the Proposed Development. The site is located in the Scottish Highlands to the south east of Loch Ness.

9.2 Existing traffic data established a base point for determining the impact during the construction phase and was factored to future levels (2024 high growth) to help determine the effect of construction traffic on the local road network at its peak.

9.3 The results indicate that, except on the B862, total traffic movements are not predicted to increase by more than 10% on any routes. The greatest impact of construction traffic would be experienced on the B862. HGV movements are not anticipated to increase by more than 10% on any routes.

9.4 The maximum traffic impact associated with construction of the proposed development is predicted to occur between months 16 to 27 of the 36-month programme. During these months, an average of 18 HGV movements (or less than 5 per hour) is predicted per day and it is estimated that there would be a further 87 car and LGV movements per day to transport construction workers to and from the site.

9.5 A worst-case cumulative assessment, considering the coincidental construction of the proposed development with Dell, Aberarder, Glenshero and Millennium South Wind Farms concluded that total traffic flows on the A82 and A87 would not increase by more than 10%. However, total HGV traffic movements are anticipated to increase by more than 30% on the A82. Total traffic and HGV movements are anticipated to increase by over 30% on the B862 at Fort Augustus

9.6 The significance of any cumulative effects is considered to be minor and can be mitigated through the implementations of CTMPs associated with each individual development.

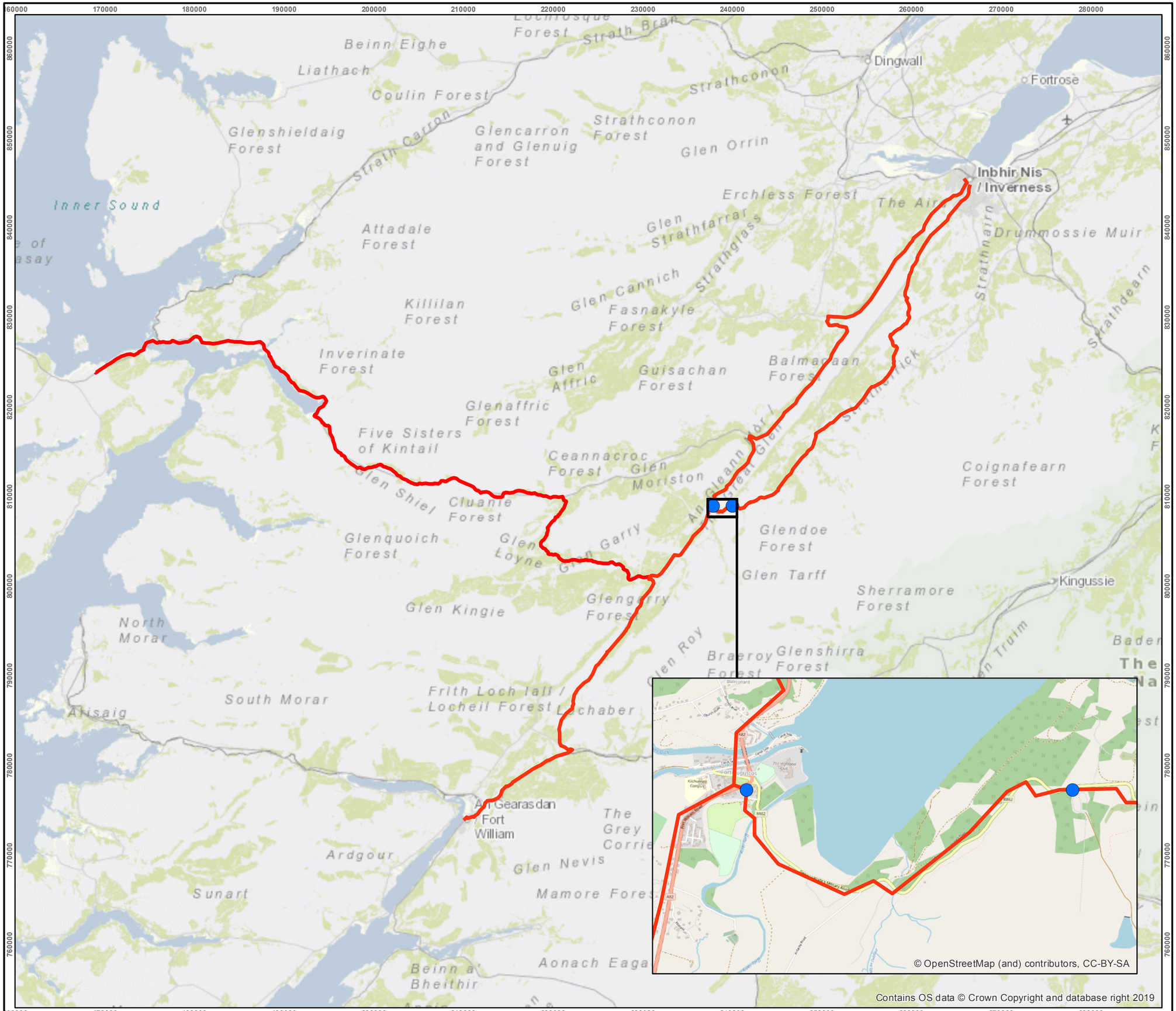
9.7 A review of the local road network was undertaken to assess the feasibility of transporting turbines to the site. No capacity issues are expected on any of the roads assessed due to the additional construction traffic movements associated with the proposed development as background traffic flows are very low and the links are of reasonable standard.

Conclusions

9.8 The assessment has identified the following:

- That the construction phase of the project would generate the highest level of traffic;
- The construction traffic during the most intensive phase of the construction programme would be short lived and temporary in nature;
- That total traffic movements are not predicted to increase by more than 10% on any routes within the study area except the B862;
- HGV movements are not anticipated to increase by more than 30% on any of the routes considered;
- That the surrounding road network has sufficient capacity to accommodate the temporary construction traffic;
- That the routes from the Ports of Entry at Corpach and Kyle of Lochalsh are suitable for turbine delivery; and
- That a construction traffic management plan for general construction traffic and abnormal traffic management plan are required to control construction traffic in the interests of road safety and efficiency.

FIGURES



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sse Renewables

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Key

- Study Area
- Traffic Count Location

0 2 4 6 8 10 km

Scale: 1:400,000 @ A3

N

Figure 13.1

Study Area and Traffic Count Location

Cloiche Wind Farm
EIA Report

APPENDIX A

Accident Data Summary

	Accident Data Analysis: Summary			
	A82	A87	B862	
	Inverness to Fort William	Invergarry To Kyle of Lochalsh	Fort Augustus to Inverness	Average
2018	16	14	3	33
2017	18	16	0	34
2016	36	16	0	52
2015	18	12	2	32
2014	22	18	4	44
			Total Average Per Year	39

TOTAL Length (All Roads)	**239km**	
Fatal	7	3.55%
Serious	41	20.81%
Slight	149	75.63%
	197	

APPENDIX B

Construction Traffic Profile

	Month																	
Activity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Site mobilisation	120	120	120															
General site delivery vehicles	4	4	4	16	16	16	28	28	28	36	36	36	36	36	36	40	40	40
Earth moving plant			10	20														
Reinforcement				10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Turbine Sand & Cement				137	137	137	137	137	137	137	137	137	137	137	137	137	137	137
Cable Deliveries										2	2	2	2	2	2	2	2	2
Cabling Sand										78	78	78	78	78	78	78	78	78
Geotextile separators										2	2	2	2	2	2	2	2	2
Delivery of HV electrical items										8	8	8	8	8	8	8	8	8
Cranage and related vehicles																6	6	6
AIL Escorts																64	64	64
Turbine transporters																63	63	63
Staff	185	185	185	740	740	740	1294	1294	1294	1664	1664	1664	1664	1664	1664	1848	1848	1848
Service (food/water etc)	22	22	22	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44
Total estimated movements	331	331	341	967	947	947	1513	1513	1513	1981	1981	1981	1981	1981	1981	2302	2302	2302
Working Days	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
Daily Average	15	15	16	44	43	43	69	69	69	90	90	90	90	90	90	105	105	105

Lights	8	8	8	34	34	34	59	59	59	76	76	76	76	76	76	87	87	87
HGV's	7	7	7	10	9	9	10	10	10	14	14	14	14	14	14	18	18	18

	Month																			
Activity	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	Total Movements	Vehicle Class
Site mobilisation																120	120	120	720	HGV
General site delivery vehicles	40	40	40	40	40	40	40	40	40	20	20	20	8	8	8	4	4	4	936	HGV
Earth moving plant											20	10							60	HGV
Reinforcement	10	10	10	10	10	10	10	10	10										240	HGV
Turbine Sand & Cement	137	137	137	137	137	137	137	137	137										3288	HGV
Cable Deliveries	2	2	2	2	2	2	2	2	2										36	HGV
Cabling Sand	78	78	78	78	78	78	78	78	78										1404	HGV
Geotextile separators	2	2	2	2	2	2	2	2	2										36	HGV
Delivery of HV electrical items	8	8	8	8	8	8	8	8	8										144	HGV
Cranage and related vehicles	6	6	6	6	6	6	6	6	6	6	6	6							90	HGV
AIL Escorts	64	64	64	64	64	64	64	64	64	64	64	64							960	Car+LGV
Turbine transporters	63	63	63	63	63	63	63	63	63	63	63	63							945	HGV
Staff	1848	1848	1848	1848	1848	1848	1848	1848	1848	924	924	924	370	370	370	185	185	185	43254	Car+LGV
Service (food/water etc)	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	1518	HGV
Total estimated movements	2302	2302	2302	2302	2302	2302	2302	2302	2302	1121	1141	1131	422	422	422	353	353	353	53631	
Working Days	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22		
Daily Average	105	105	105	105	105	105	105	105	105	51	52	51	19	19	19	16	16	16		

Lights	87	87	87	87	87	87	87	87	87	45	45	45	17	17	17	8	8	8
HGV's	18	18	18	18	18	18	18	18	18	6	7	7	2	2	2	8	8	8