

## 10. ACCESS, TRAFFIC AND TRANSPORT

### Executive Summary

This chapter provides an assessment of the likely significant effects from the proposed varied development on access, traffic and transport. This chapter has been prepared by Ramboll, with reference to the Guidelines for the Environmental Assessment of Road Traffic (the Institute of Environmental Assessment (IEA), 1993).

The baseline data has been updated with Automatic Traffic Count (ATC) data for the most recent year available (2017) for the same or comparable locations used in the ES. The estimated traffic movement numbers have been calculated based on benchmark data from a recent wind farm development. The Applicant provided input on the temporal distribution of the traffic movements based on the likely construction programme.

It is proposed that a construction phase traffic management plan is implemented, in consultation with the Shetland Islands Council (SIC), as required by condition attached to the relevant section 36 consent<sup>1</sup>.

Following the application of proposed mitigation measures, no significant effects are predicted either for the proposed varied development; or, for the proposed varied development in combination with relevant cumulative wind farm developments. Furthermore, there would be **no difference** between the effects identified for the consented Viking Wind Farm and the proposed varied development.

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<sup>1</sup> Condition 30 (Annex 2, part 2) of the relevant section 36 consent requires a TMP to be submitted for the approval of the Planning Authority prior to the commencement of the development.

## 10.1 Introduction

- 10.1.1 This chapter provides an assessment of the potential effects from the proposed varied development on access, traffic and transport. The specific objectives of the chapter are to:
- describe the baseline;
  - summarise the assessment methodology and significance criteria used in completing the impact assessment;
  - describe the likely significant effects of the consented Viking Wind Farm and the proposed varied development;
  - describe the mitigation measures proposed to address likely significant effects;
  - assess the significance of residual effects remaining following the implementation of mitigation; and
  - provide an assessment of how the likely significant effects of the proposed varied development differ from the effects of the consented Viking Wind Farm.
- 10.1.2 This chapter has been prepared by Ramboll Environment and Health UK Limited (Ramboll), with reference to the Guidelines for the Environmental Assessment of Road Traffic (the Institute of Environmental Assessment (IEA), 1993).
- 10.1.3 This chapter is supported by:
- Technical Appendix 10.1: Estimated Traffic Movements.
- 10.1.4 Figures 10.1 – 10.3 are referenced in the text where relevant.

## 10.2 Assessment Methodology and Significance Criteria

### *Scope of Assessment*

- 10.2.1 This assessment considers likely significant resulting from the consented Viking Wind Farm and the proposed varied development, as described in Chapter 2 (Description of Development) of this EIA Report.
- 10.2.2 The baseline data used has been updated with Automatic Traffic Count (ATC) data for the most recent year available (2017) for the same or comparable locations as were used in the ES and ES Addendum. The estimated traffic movement numbers used have been calculated on a pro-rata basis (per turbine) using the traffic management plan prepared for the recent Stronelairg Wind Farm (recently constructed) with input from the Applicant on construction programme and temporal distribution of the trips.
- 10.2.3 All access points or traffic movements associated with the Delting and Collafirth quadrants of the scheme assessed in the ES have been scoped out of this assessment as they were removed from the consented Viking Wind Farm.

### *Development Phases*

- 10.2.4 There are three phases of development to be considered: the construction, the operational and the decommissioning phases. During construction, vehicles would access the site transporting construction staff, construction materials (aggregates, cement, steel bar etc) and plant items. This phase would involve the greatest number of vehicle movements to and from the site.
- 10.2.5 Once the proposed varied development is operational, it is envisaged that the amount of traffic associated with the proposed varied development would be minimal. Regular visits would be made to the site for maintenance work; however this would involve relatively low numbers of Light

Goods Vehicle and an occasional need for an HGV to access the site for maintenance and repairs. On this basis, operational traffic is scoped out from further assessment.

- 10.2.6 As described in Chapter 2 Description of Development, the decommissioning of the proposed varied development would generate traffic movements for activities similar to the reverse of construction but probably not involving the movement of abnormal loads (paragraph 2.8.3 above). It is anticipated that traffic generation would be less than for the construction phase therefore the construction phase is taken as a 'worst case' for assessment purposes. As such there is no separate assessment of decommissioning traffic.

### ***Study Area***

- 10.2.7 The study area comprises the parts of the road network that may be used by construction vehicles accessing the site. Key access routes are shown in Figure 10.1.

### ***Scoping and Consultation***

- 10.2.8 No formal scoping or pre-application consultation was completed for the proposed development. This chapter has been prepared with reference to the ES and ES Addendum, which addressed issues raised by SIC.

- 10.2.9 Based on the ES and ES Addendum, the key access, traffic and transport issues include:

- traffic generation and related issues of driver delay; and
- cumulative effects.

### ***Effects scoped out of assessment***

- 10.2.10 Traffic associated with operation of the proposed varied development is expected to be low and is unlikely to give rise to any appreciable traffic effects. Assessment of operational traffic has therefore been scoped out of this assessment.

### ***Overview***

- 10.2.11 This chapter has been prepared by Ramboll, with reference to the Guidelines for the Environmental Assessment of Road Traffic (the Institute of Environmental Assessment (IEA), 1993).

- 10.2.12 The following rules, taken from the IEA's guidelines, have been used as a screening process to define the scale and extent of this assessment:

- Rule 1 - Include highway links where traffic flows are predicted to increase by more than 30% (or where the number of heavy goods vehicles is predicted to increase by more than 30%); and
- Rule 2 - Include any other specifically sensitive areas where traffic flows are predicted to increase by 10% or more.

- 10.2.13 It should be noted that increases below 10% are generally considered to be insignificant given that daily variations in background traffic flow may fluctuate by this amount. Changes in traffic flows below this level are therefore assumed to result in no discernible environmental impact.

### ***Baseline Assessment – Methodology***

#### ***Desk Surveys***

- 10.2.14 In undertaking the baseline assessment, various data sources and documents were reviewed. These included:

- Consultation Responses to the ES Scoping Report;
- ES and ES Addendum;

- 2017 traffic flow data;
- Review of any roads hierarchy promoted in relevant Local Transport Strategies;
- OS plans to derive a local area roads network; and
- Consideration of potential supply locations for construction materials, if not available on-site, to inform extent of local area roads network potentially affected.

*Field Survey Techniques*

10.2.15 Field surveys were undertaken for the ES to enhance the understanding of the roads network in the study area, and to identify potential constraints on that network. These included:

- Visual inspection of all roads identified in the study area network; and
- Photographic record of any constraints.

10.2.16 The field surveys were not repeated for the 2018 assessment because the results from the 2009 ES are still considered relevant.

**Effects Evaluation - Methodology**

*Receptor Sensitivity*

10.2.17 The assessment of receptor sensitivity is based on the criteria identified in Table 10.1. The classification of settlements and road links was based upon professional judgement.

<b>Table 10.1: Receptor Sensitivity Criteria</b>			
<b>Receptor Sensitivity</b>	<b>Low</b>	<b>Medium</b>	<b>High</b>
Location	Small rural settlement, few community or public facilities or services.	Intermediate sized rural settlement, containing some community or public facilities and services.	Large rural settlement containing a high number of community and public services and facilities.
Location	Little or no traffic calming or traffic management measures.	Some traffic calming or traffic management measures.	Traffic control signals, waiting and loading restrictions, traffic calming measures.
Link	Trunk or A-class road, constructed to accommodate significant HGV composition.	Local A or B class roads, capable of regular use by HGV traffic.	Minor rural roads, not constructed to accommodate frequent use by HGVs.

*Impact Magnitude*

10.2.18 The impacts are likely to cover changes in traffic, changes in levels of road safety and changes to vehicle delays. The magnitude of the impact of increased traffic volumes was measured against criteria set out in the IEA guidance (1993). The magnitude of the change (perceived and actual) on road safety was considered against traffic volume and composition, and vehicle speed. The effect on vehicle delay is measured against journey time and junction delay. These magnitudes are classified using the following criteria identified in Table 10.2.

<b>Table 10.2: Impact Magnitude Criteria</b>			
<b>Impact Magnitude</b>	<b>Low</b>	<b>Medium</b>	<b>High</b>
Effect	Increase in traffic flows of under 10%.	Increase in traffic flows between 10% and 30%.	Increase in traffic flows of over 30%.

**Table 10.2: Impact Magnitude Criteria**

	The proposals could occasionally cause a minor modification to routes, or a very slight delay in present. schedules, or on activities in the short-term.	The proposals could result in changes to the existing traffic routes or activities such that some delays or rescheduling could be required, which cause inconvenience.	The proposals could result in an appreciable change in terms of length and/or duration to the present traffic routes or schedules or activities, which may result in hardship.
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*Effects Significance*

10.2.19 The results from the receptor sensitivity and impact magnitude classifications were correlated and classified using the four-point effect significance scale in Table 10.3.

**Table 10.3: Effects Significance Summary**

Magnitude/Sensitivity	Low	Medium	High
Low	Negligible	Minor	Moderate
Medium	Minor	Moderate	Moderate
High	Moderate	Moderate	Major

10.2.20 Where the effect has been assessed as major or moderate these are considered as significant. Effects assessed as minor or negligible have been considered not significant.

**Limitations of Assessment**

10.2.21 This is a semi quantitative assessment that includes some professional judgement of conditions. Much of the assessment concerns traffic levels in rural areas and on minor roads, for which there is a lack of continuously recorded traffic flow data. The assessment methodology is considered appropriate for the purposes of the EIA Report.

10.2.22 The assessment is based upon the following design features:

- Stone will be sourced from borrow pits on-site;
- Concrete will be batched on-site;
- Construction traffic requirements have been developed and are included in Table 10.7 and 10.8;
- Due to the nature of materials and plant required on site, the majority of vehicles utilised will be Heavy Goods Vehicles;
- The construction programme is estimated to be over four years (reduced from the five years assumed in the ES); and
- Construction personnel/deliveries have been estimated by the Applicant as an average of one hundred vehicles accessing the site per day.

**10.3 Baseline Conditions**

**Context**

10.3.1 The main road (A970) linking the north and south of the mainland runs through the middle of the site, separating the Kergord and Nesting Quadrants. The B9071 runs east-west to the north of the site, linking the A970 with the east coast. The B9075 runs around the eastern and southern boundary of the southern section of the site and links in to the A970. There are also some minor branching roads to properties, particularly along the east coast. The site is therefore in relatively close proximity to a well-defined road network, but some access points rely on less well-developed

roads for final access. The baseline review focuses on the nature of the surrounding road infrastructure and the level of traffic that uses these roads. The following section is an inventory of the possible routes to the site and the most recent data on volumes of traffic that are currently using them.

### **Designations**

- 10.3.2 The A970 is designated as being part of National Cycle Network Route 1, which itself forms part of the North Sea Cycle Route. None of the roads on Shetland are designated as a Trunk Road.

### **Desk Studies**

#### *Review of Roads Hierarchy*

- 10.3.3 SIC's Local Transport Strategy identifies the importance of the Spine Road and Ferry Route network in providing primary links. This Spine Road Network was taken as the hierarchy of roads on Shetland, and consultation for the ES with SIC concluded that the Spine Road network should be used as much as possible for reaching the proposed Site Access Junctions. The proposed access routes are shown in Figure 10.1.

#### *Review of Department for Transport Traffic Data*

- 10.3.4 A review was undertaken of traffic summary data provided by the Department for Transport website<sup>2</sup>, with attention focusing on Annual Average Daily Flow (AADF) and where available the average percentage of HGVs. This is summarised in Table 10.4. Data for the most recent year available was used, which was for 2017. In some cases, the numbers provided have been estimated by the DfT where ATC data was unavailable.
- 10.3.5 In general, the data indicate low to moderate traffic flows on the rural sections of road. The location with the highest levels of traffic is on A970 Holmsgarth Road in Lerwick, which carries commuter traffic into the town, and is set close to the area of main industrial and commercial activity, followed by the A970 at Veensgarth which is between Lerwick and Tingwall Airport. Elsewhere traffic flows average between 3000-3500 vehicles on an average day along the A970 Spine Road. Traffic decreases significantly north of Voe on the A968 and particularly north of Sullom Voe terminal.
- 10.3.6 The 2017 AADF values, with the percentage of HGVs are shown in Figure 10.2.

<b>DfT Site Code</b>	<b>Route</b>	<b>2017 AADF</b>	<b>2017 HGV %</b>
1188	A970 North of Catfirth at Sand Water	3033	8.0
50849	A970 South of Voe	3558	7.7
74267	A970 at Loch of Voe/B9071 junctions	3062	9.9
31003	A970 South of Girlsta at Voe-head	3118	6.2
11001	A970 East of Veensgarth	5866	4.8
11002	A970 North of Lerwick	8401	6.4
20997	A968 North of Voe	1256	8.0
21001	A971 West of Tingwall	2193	2.1

<sup>2</sup> <https://www.dft.gov.uk/traffic-counts/cp.php?la=Shetland+Islands>. Accessed 2 August 2018

10.3.7 The data available from SIC that was used in the ES has not been reproduced here because it dates from 2003 – 2005 so is considered to be out of date, and the monitoring points supplied are considered to be adequately covered by the DfT data above.

**Field Studies**

10.3.8 A site visit was undertaken for the ES to visually assess the general nature and condition of the routes being considered. The areas under consideration form two quadrants, split by the A970 on a north-south axis. Access to both development areas will be taken from the local roads adjoining the A970. References to ‘Access Point’ numbers are based on the same numbers used in the ES for consistency.

**Primary Abnormal Indivisible Load (AIL) Routes and General Construction Traffic Routes**

10.3.9 Table 10.5 shows the proposed access points and type, also shown on Figure 10.1.

<b>Table 10.5: Access Points and Purpose</b>		
<b>Quadrant</b>	<b>Location</b>	<b>Purpose/Comment</b>
Kergord	A970 Hamarigrind Scord (Access Point 4)	AIL and non-AIL access. Would be a staggered junction.
	B9075 Setter House (Access Point 6)	AIL and non-AIL access.
	B9075 Lamba Scord	AIL and non-AIL access.
	A971 Scord of Sound	AIL and non-AIL access. Construction traffic using this access would approach and depart via the A971 past Tingwall and would therefore not use the B9075 through Weisdale.
Nesting	A970 East of Hamarigrind Scord (Access Point 4)	AIL and non-AIL access. Would be a staggered junction.
	A970 East of Sand Water (Access Point 8)	AIL and non-AIL access.

*Lerwick to A971 Access Point (Scord of Sound)*

10.3.10 The route leaves Lerwick to the north along the the A970. At the Burn of the Dale the road sweeps right and the route continues north to the A970/A971 junction. A left turn is made at the junction and the route continues on the A971 to a final right turn at the A971 Access Point at the Scord of Sound.

*Lerwick to Access Point 4 (Hamarigrind Scord) and Access Point 8 (east of Sandwater)*

10.3.11 The route leaves Lerwick to the north along the the A970. At the Burn of the Dale the road sweeps right and the route continues north past the A970/A971 junction and the A970/B9075 junction. A right turn is made at Access Point 8 (east of Sandwater). To reach Access Point 4, continue north past Access Point 8 and past the A970/B9075 junction to Hamarigrind Scord. The route is either left or right at the Access Point, depending on the final location.

*Lerwick to the Lamba Scord Access Point and Access Point 6 (Upper Kergord)*

10.3.12 As above to the A970/B9075 junction, where a left turn is taken at the junction (a separate application which will be made for an upgrade to Sandwater Road will include a junction improvement at the A970/B9075). The route then continues along the B9075 to a right turn at the Access Point at Lamba Scord (a new junction will be designed and constructed as part of the Sandwater upgrade.) Continuing past the Access Point at Lamba Scord a right turn follows at the

Burn of Weisdale to enter Access Point 6 (a new junction will be designed and constructed as part of the Sandwater upgrade).

### **Alternative A11 & General Construction Traffic Routes**

#### *Other Routes - Spine Road – Lerwick to Sullom Voe (A970 – A968 – B9076)*

- 10.3.13 This route forms the spine from which either of the potential development quadrants will be reached. It runs from Lerwick to the oil terminal and port facility at Sullom Voe. Outwith Lerwick the road is generally two carriageway and 7.3 m wide with side markings and hard edge strips. The road passes various junctions but there is no direct frontage activity on this section until the settlement of Voe. The A968 turns right from the A970 within Voe, a small community with residential and community frontages and a 30 mph speed limit.
- 10.3.14 The A968 continues as 7.3 m carriageway, with edge markings and hard edges and good alignment narrowing to 7 m, with some tighter bends with chevron markings. The A968 joins the B9076 to Sullom Voe at a simple priority junction. The B9076 continuing westward as 7.3 m carriageway with edge markings. At Quoys of Garth the B9076 turns southwest towards Sella Ness then Scatsta Airport; Sullom Voe Oil Terminal continues westward at the Quoys of Garth for a further 1.5 km to the main access gates.

#### *Other Routes – Dales Voe/Greenhead Base nr Lerwick to Spine Road*

- 10.3.15 The route from Dales Voe Base is a 7.5 m A-class specification road which climbs gently from the base. There is one short stretch of carriageway which features a tighter bend and a sharp summit. The road then continues south to join the access road to the Greenhead Base. At this junction traffic to and from the Greenhead Base has priority, although the geometry of the junction suggests that the Greenhead access is the 'side arm' of the junction. The road then passes through the Gremista industrial estate, progressing onwards to join the A970 at the northern outskirts of Lerwick.

### **Modifying Influences**

- 10.3.16 Modifying influences include committed developments in the general area which will alter traffic volumes, new or altered roads layouts, and potential impositions of vehicle weight or size restrictions not already in effect. Committed development relevant to the assessment of cumulative construction traffic effects is described later in this chapter (see 'Cumulative Effects'). At the time of the ES, SIC noted three locations where structural assessments will be required. These are shown in Figure 10.3.

### **Summary**

- 10.3.17 A summary of the Route Lengths from Lerwick to each of the potential windfarm access locations windfarm is shown in Table 10.6.

<b>Table 10.6: Route Option Summary</b>				
<b>Route Option</b>	<b>Length</b>	<b>Length of A-Class Road</b>	<b>Sensitive Locations</b>	<b>Network Constraints</b>
Nesting Quadrant (Northern Section) or Kergord Quadrant (central section)	25 km	100%		
Kergord Quadrant (B9075)	21 km	90%		B9075 Junctions
Nesting Quadrant (Southern section) (A970)	18 km	100%		



**Table 10.6: Route Option Summary**

Kergord South (A971)	22 km	100%		A970/A971 Junction
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### **Receptor Sensitivity**

10.3.18 This section considers the level of sensitivity of receptors to the increase in vehicle movements associated with the construction phase, as outlined above. The settlements identified all lie on at least one of the potential routes to the development sites from Lerwick Quayside, Scalloway or Sullom Voe and consideration has been given to the size and function of each settlement, particular characteristics identified during the Baseline Review and the preferred route strategy. The results are shown in Table 10.7.

**Table 10.7: Receptor Sensitivity**

Receptor	Sensitivity	Comments
<b>Settlements</b>		
Lerwick North	Low	Existing industrial estate and relatively high traffic volumes.
Voe	Medium	Small settlement, frontages set back, primary school, on street parking.
Tingwall Airport	Low	Small settlement
Whiteness	Low	Small settlement
Haggersta	Low	Small settlement
Hellister	Low	Small settlement
Weisdale	Low	Small settlement
<b>Road Links</b>		
A970 North of Catfirth at Sand Water	Low	A-class road, capable of accommodating significant HGV composition.
A970 South of Voe	Low	A-class road, capable of accommodating significant HGV composition.
A970 at Loch of Voe/B9071 junctions	Low	A-class road, capable of accommodating significant HGV composition.
A970 South of Girlsta at Voe-head	Low	A-class road, capable of accommodating significant HGV composition.
A970 East of Veensgarth	Low	A-class road, capable of accommodating significant HGV composition.
A970 North of Lerwick	Low	A-class road, capable of accommodating significant HGV composition.
A968 North of Voe	Low	A-class road, capable of accommodating significant HGV composition.
A971 West of Tingwall	Low	A-class road, capable of accommodating significant HGV composition.

## **10.4 Assessment of Effects**

10.4.1 Table 10.8 shows estimated HGV traffic associated estimated numbers for the proposed varied development, which are the same as for the consented Viking Wind Farm. Since 2009 there have

been some changes in the assumptions used for traffic volumes - the numbers presented in Table 10.7 have been based on a recent benchmark project (Stronelairg Wind Farm – pro-rata per turbine).

- 10.4.2 Construction duration has been adjusted from the five-year programme used in the ES to a four-year programme (see Table 2.3 in Chapter 2: Description of Development).

Item	103 Turbines		
	Total Number	Delivery Days	Average Per Day
Construction plant (in)	273	96	2.8
Construction plant (out)	273	96	2.8
Concrete – Aggregate	192	144	1.3
Concrete – Cement	521	504	1.0
Concrete – Sand	2625	504	5.2
Cabling Sand	47	144	0.3
Balance of Deliveries <sup>3</sup>	2149	1104	1.9
Total HGV Vehicles	5807	1104	5.3 <sup>4</sup>

- 10.4.3 In the case of AILs (see Table 10.9), the number of deliveries for the consented scheme will be the same as for the proposed varied development. It has been assumed that AIL deliveries would take place throughout the duration of the turbine erection period (10 months, 6 working days a week), equating to a total of 40 weeks or 240 working days). It is assumed that each AIL will require its own transporter (i.e. that each vehicle can only carry one component). In the event that a vehicle can carry more than one load, the total number would be reduced.

Item	103 Turbines		
	Total Number	Delivery Days	Average Per Day
Foundation Ring	103	240	0.4
First Tower Section	103	240	0.4
Second Tower Section	103	240	0.4
Third Tower Section	103	240	0.4
Nacelle	103	240	0.4
Blade	309	240	1.3
Hub	103	240	0.4
Drive Train	103	240	0.4
Total AIL Vehicles	1030	240	4.3

<sup>3</sup> Balance of deliveries comprises miscellaneous items such as cabling, control room equipment, reinforcing steel, plant fuel, substation plant, culvert pipes, box culverts, geotextile membrane and transformers

<sup>4</sup> Average per day does include delivery of Construction Plant, however these movements will be predominantly in the first and last weeks of the Construction Phase

**Construction Effects**

*Vehicle Movements*

10.4.4 When considering the impact of construction traffic on the local roads network, there are several sites for which traffic data is available (Figure 10.2). The flows at these locations are shown in Table 10.10 along with the predicted increase in HGV traffic at those locations attributable to construction traffic.

<b>Table 10.10: Existing and Predicted HGV Flows</b>				
<b>Location</b>	<b>2017 AADF</b>	<b>2017 HGV</b>	<b>Predicted Average Daily Increase of HGV (2-way movements)<sup>5</sup></b>	<b>Percentage Increase in HGV (2-way movements)</b>
A970 North of Catfirth at Sand Water	3033	243	19.2	7.9%
A970 South of Voe	3558	275	19.2	7.0%
A970 at Loch of Voe/B9071 junctions	3062	303	19.2	6.3%
A970 South of Girlsta at Voe-head	3118	192	19.2	10.0%
A970 East of Veensgarth	5866	281	19.2	6.8%
A970 North of Lerwick	8401	536	19.2	3.6%
A968 North of Voe	1256	101	19.2	19.0%
A971 West of Tingwall	2193	45	19.2	42.7%

10.4.5 In addition to considering the effect of congestion related to the arrival and departure of heavy goods vehicles, traffic from staff travelling to and from the site in smaller vehicles (cars and light goods vehicles) and miscellaneous deliveries has also been considered. Evidence from other sites suggests that the number of staff vehicles/deliveries is likely to be of the magnitude of 117 round trips (arriving and then leaving). The scale of this increase in vehicle numbers at the relevant traffic count locations is shown in Table 10.11. The vehicle composition is expected to be a combination of off-road vehicles (such as Land Rovers) and minibus/crewcab vehicles (Transit type vehicles).

<sup>5</sup> Note that for the purposes of this assessment, because the split of HGV movements across the road network cannot be known with certainty (because it is dependent on the ports used) a conservative approach has been taken which assumes that all HGV movements may pass all locations. This represents a worst-case scenario which would not occur in reality. The number of HGV movements has been calculated from both the total average daily HGV vehicle number in Table 10.8 and the total average daily abnormal loads detailed in Table 10.9.

Location	2017 AADF	Predicted Average Daily Increase of Non-HGV (2-way movements) <sup>6</sup>	Percentage Increase in Non-HGV (2-way movements)
A970 North of Catfirth at Sand Water	3033	117	3.9%
A970 South of Voe	3558	117	3.3%
A970 at Loch of Voe/B9071 junctions	3062	117	3.8%
A970 South of Girlsta at Voe-head	3118	117	3.8%
A970 East of Veensgarth	5866	117	2.0%
A970 North of Lerwick	8402	117	1.4%
A968 North of Voe	1256	117	9.3%
A971 West of Tingwall	2193	117	5.3%

10.4.6 The combined impact of HGV and staff traffic at the relevant sites is shown in Table 10.12.

Location	2017 AADF	Total Increase in Vehicles (2-way movements) <sup>7</sup>	Percentage Increase in Vehicles (2-way movements)
A970 North of Catfirth at Sand Water	3033	136.2	4.5%
A970 South of Voe	3558	136.2	3.8%
A970 at Loch of Voe/B9071 junctions	3062	136.2	4.4%
A970 South of Girlsta at Voe-head	3118	136.2	4.4%
A970 East of Veensgarth	5866	136.2	2.3%
A970 North of Lerwick	8402	136.2	1.6%
A968 North of Voe	1256	136.2	10.8%
A971 West of Tingwall	2193	136.2	6.2%

10.4.7 The predicted additional number of vehicles of all types during the construction phase is below the 30% threshold (Rule 1) in the EIA Guidelines at all locations. The magnitude of the effect of construction traffic is summarised in Table 10.13.

<sup>6</sup> Note that for the purposes of this assessment, because the split of non-HGV movements across the road network cannot be known with certainty (because it is dependent on where workers travel from) a conservative approach has been taken which assumes that all vehicles movements may pass all locations. This represents a worst-case scenario which would not occur in reality

<sup>7</sup> Note that for the purposes of this assessment, because the split of movements across the road network cannot be known with certainty (because it is dependent on the ports used and where workers travel from) a conservative approach has been taken which assumes that all vehicle movements may pass all locations. This represents a worst-case scenario which would not occur in reality

<b>Table 10.13: Magnitude of Construction Traffic Effects</b>		
<b>Impact/Location</b>	<b>Magnitude</b>	<b>Comments</b>
Increase in HGV movements		
A970 North of Catfirth at Sand Water	Low	
A970 South of Voe	Low	
A970 at Loch of Voe/B9071 junctions	Low	
A970 South of Girlsta at Voe-head	Medium	
A970 East of Veensgarth	Low	
A970 North of Lerwick	Low	
A968 North of Voe	Medium	
A971 West of Tingwall	High	Very low baseline HGV flows
Increase in non-HGV movements		
A970 North of Catfirth at Sand Water	Low	
A970 South of Voe	Low	
A970 at Loch of Voe/B9071 junctions	Low	
A970 South of Girlsta at Voe-head	Low	
A970 East of Veensgarth	Low	
A970 North of Lerwick	Low	
A968 North of Voe	Low	Movements would be peaked at the start and end of the working day.
A971 West of Tingwall	Low	Movements would be peaked at the start and end of the working day.
Increase in combined vehicle flows		
A970 North of Catfirth at Sand Water	Low	
A970 South of Voe	Low	
A970 at Loch of Voe/B9071 junctions	Low	
A970 South of Girlsta at Voe-head	Low	
A970 East of Veensgarth	Low	
A970 North of Lerwick	Low	
A968 North of Voe	Medium	Movements would be peaked at the start and end of the working day.
A971 West of Tingwall	Low	Very low baseline HGV flows.

### *Effect Significance*

- 10.4.8 As shown in Table 10.10, there are two receptors (settlements) along the road network considered to be potentially affected by traffic movements (congestion): Lerwick North which is considered to be low sensitivity and Voe which is considered to be medium sensitivity.
- 10.4.9 The traffic count location on the A970 north of Lerwick is predicted to be subject to a low magnitude increase and as this is a low sensitivity location the significance of the effect is predicted to be **negligible (non-significant)** in EIA terms).
- 10.4.10 The settlement of Voe is represented by the traffic count locations on the A970 south of Voe and the A968 north of Voe. South of Voe the magnitude of increase is predicted to be low and therefore the significance of effect is predicted to be **low (non-significant)** in EIA terms). North of Voe the magnitude of increase is predicted to be medium and therefore, prior to the application of mitigation, the significance of effect is predicted to be **moderate (a significant)** effect in EIA terms).
- 10.4.11 Although the predicted number of construction traffic vehicle movements through Voe would be the same at both locations, the baseline traffic flows on the A968 north of Voe are significantly lower than on the A970 south of Voe (2017 AADF of 1,256 and 3,558 respectively) which suggests that approximately two-thirds of the vehicles entering Voe from the south either stop in Voe or take the A970 towards Brae rather than taking the turning onto the A968 in the middle of the settlement. Therefore, only the parts of Voe along the A968 would be subject to a significant increase in traffic movements and the parts of Voe along the A970 would see non-significant effects. It should also be noted that part of the settlement (Lower Voe) is located off the A970 on the B9071 and this location is not expected to see any increase in traffic. It may be noted in any case that the preferred delivery option is from Lerwick and this means that actual increase in traffic would be less than predicted.
- 10.4.12 All road links assessed are considered to be of low sensitivity because of their A-class status and ability to accommodate HGV traffic. At the majority of links, a low or medium magnitude of increase in traffic is predicted and therefore the significance of the effects will be **negligible or low (non-significant)** in EIA terms).
- 10.4.13 Road links with medium or high magnitudes of change are the A971 west of Tingwall, the A970 North of Catfirth at Sand Water, and the A970 south of Girlsta at Voe-head. None of these links are considered to be sensitive to the change in traffic flows because they do not pass through any settlement. Due to the high magnitude of change for HGV movements at the A971 west of Tingwall, and in the absence of mitigation, the significance of effect is predicted to be **moderate (a significant)** effect in EIA terms). It should be noted nevertheless that this assessment has taken a very conservative approach in assuming that the maximum number of vehicle movements would occur at all locations, which would not be the case in reality and therefore the magnitude of change would very likely be lower than predicted.

### *Cumulative Effects*

- 10.4.14 The ES Addendum reported potential cumulative effects with the Total Laggan – Tormore Onshore ES (Shetland Gas Plant) which was under construction at that time. Construction of the Shetland Gas Plant development was completed in 2016 and therefore there are no longer any potential cumulative construction traffic effects. Any operational traffic from the Shetland Gas Plant will be included in the baseline traffic data used in this assessment, which is for 2017.
- 10.4.15 Other major construction projects which may give rise to cumulative traffic effects are limited to other large-scale wind farm developments. The list of cumulative wind farms considered in Chapter 4: Landscape and Visual Impact Assessment of this EIA Report was reviewed and of the wind farms on the Shetland Islands that are either currently in the planning system or consented but as yet unbuilt, only two wind farms (Beaw Field and Mossy Hill) are of a sufficient size to

generate material numbers of construction traffic movements. Beaw Field Wind Farm received Section 36 consent in November 2017 and Mossy Hill Wind Farm is at the application stage, with a planning application having been submitted by Peel Energy in June 2018<sup>8</sup>. Other consented but unbuilt wind farms (Hillhead, Brae and Culterfield) are small scale (1 – 3 turbines) and have therefore been excluded from the cumulative effects assessment.

- 10.4.16 Beaw Field Wind Farm has consent for the construction of 17 turbines and is located on the island of Yell which is not connected to Mainland by road (requiring a ferry crossing). The ES produced for Beaw Field Wind Farm states that some of the construction traffic is expected to arrive on Yell by boat, but that depending on the location of suppliers it is possible that traffic may also need to use the road network on Mainland to access the ferry port to Yell. Therefore, roads on Mainland including the A970 (between Hillside and the B9075 at Sand Water), A968 (between Hillside and Booth of Toft Ferry) and B9076 (between Brae and the A968 at Pund of Loot) that are within the study area of the proposed varied development may be used for Beaw Field construction traffic. These roads links are represented by the ATC count locations referred to as 'A970 South of Voe', 'A970 at Voe/B9071 junctions' and 'A968 North of Voe' in the tables above.
- 10.4.17 The planning application for the proposed Mossy Hill Wind Farm has 12 turbines and is located on Mainland, to the west of Lerwick. The ES produced for the proposed Mossy Hill Wind Farm states that the principal route for construction traffic would be from Greenhead Base port along the A970 west from Lerwick to Bridge of Fitch and then continuing west on the A970 towards Scalloway, depending upon the site access point being used. Therefore, there is potential for cumulative effects with the proposed varied development construction traffic between Greenhead Base and the A970 at Bridge of Fitch (where construction traffic for the proposed varied development would head north on the A970). This road link is represented by the ATC count location referred to as 'A970 North of Lerwick' in the tables above.
- 10.4.18 The Transport Assessments prepared for both Beaw Field and Mossy Hill assess predicted construction traffic movements during the peak construction month in order to assess a reasonable worst-case scenario. Those movements are reproduced in Table 10.14 for the applicable ATC count locations, together with the traffic movements associated with the proposed varied development.

<b>Location</b>	<b>Source</b>	<b>Predicted Average Daily Increase of Non-HGV (2-way movements)<sup>9</sup></b>	<b>Predicted Average Daily Increase of HGV (2-way movements)</b>
A968 North of Voe	Viking	117	19.0
	Beaw Field	32	10.0
	Combined	149	29.0
A970 at Loch of Voe/B9071 junctions	Viking	117	6.3
	Beaw Field	32	10.0
	Combined	149	16.3
A970 South of Voe	Viking	117	7.0

<sup>8</sup> Planning application reference: 2018/186/PPF

<sup>9</sup> Note that for the purposes of this assessment, because the split of movements across the road network cannot be known with certainty (because it is dependent on where workers and materials travel from) a conservative approach has been taken which assumes that all vehicles movements may pass all locations. This represents a worst-case scenario which would not occur in reality

	Beaw Field	32	10.0
	Combined	149	17.0
A970 North of Lerwick	Viking	117	3.6
	Mossy Hill	42	71.0
	Combined	159	74.6

10.4.19 The cumulative movements are combined with baseline flows to give total predicted increase in movements (see Table 10.15).

Location	2017 AADF	2017 HGV	Predicted Average Daily Increase of Non-HGV	% Increase in Non-HGV	Predicted Average Daily Increase of HGV	% increase in HGV	Total Increase	Total % Increase
A968 North of Voe	1256	101	117	9.3%	19.2	19.0%	136.2	28.3%
A970 at Loch of Voe/B9071 junctions	3062	303	117	3.8%	19.2	6.3%	136.2	10.1%
A970 South of Voe	3558	275	117	3.3%	19.2	7.0%	136.2	10.3%
A970 North of Lerwick	8402	536	117	1.4%	19.2	3.6%	136.2	5.0%

10.4.20 The magnitude of the effects of cumulative predicted increases is low at all locations except the A968 North of Voe where a medium magnitude of change could occur. This road link is characterised by low baseline flows when compared to other locations on the road network and therefore larger percentage changes occur from the same absolute increase as experienced at other locations. It should be noted that this assessment has assumed a number of worst case scenarios:

- That the peak month of construction for the Beaw Field and Mossy Hill Wind Farms would overlap with the construction period for the proposed varied development (outside the peak month the cumulative effects would be lower than shown here); and
- That all of the construction traffic for the proposed varied development would use all routes. As explained above this assumption has been made because at this stage it is not known which routes would be used by non-HGV traffic and HGV deliveries, so a worst-case scenario has been assumed that all traffic would use all routes; a scenario that could not occur in reality. Therefore, the predicted traffic movements given in the tables above will be over-estimates and the increases will also be over-estimated.

10.4.21 For all of the links described above the cumulative construction traffic effects are predicted to be **non-significant** in EIA terms.



10.4.22 The settlement of Voe is represented by the traffic count locations on the A970 South of Voe and the A968 North of Voe. South of Voe the magnitude of increase is predicted to be low and therefore the significance of effect is predicted to be low (non-significant in EIA terms). North of Voe the magnitude of cumulative construction traffic increase is predicted to be medium and therefore, prior to the application of mitigation measures, the significance of effect is predicted to be **moderate** (a **significant effect** in EIA terms).

#### *Abnormal Loads*

10.4.23 Structural assessments and upgrades will be required in some locations in order to accommodate ALLs. Figure 10.3 identifies the relevant works and locations.

## **10.5 Mitigation**

10.5.1 This section outlines the various types of mitigation proposed as part of the proposed varied development.

### ***Concrete Batching***

10.5.2 It is proposed that the concrete works on this site will be carried out by installing batching plants on-site, and to deliver aggregate and cement (and possibly water if site water is unsuitable) in tippers and tankers. Aggregates can be delivered for storage prior to use over a longer period than ready mixed concrete. By batching on-site, the number of vehicle loads required is significantly reduced over the duration of the construction phase. On-site batching also gives a greater degree of quality control over the concrete mixing process, eliminating the possibility of ready-mix vehicles arriving on-site only to have their load rejected due to quality issues, necessitating additional vehicle trips to provide the shortfall.

### ***Traffic Management Measures***

10.5.3 In addition to the specification of the preferred access route and the detailed phasing of construction traffic, additional measures and initiatives will be introduced to minimise the intrusive effects of construction-related traffic. Measures proposed are:

- Regulated site working hours in accordance with condition 11<sup>10</sup>, which states that construction work with the potential to create nuisance will only take place between the hours of 0700 and 1900 on Monday to Friday, 0700 to 1600 on Saturday with no working on a Sunday or local/national public holidays unless approved by the Planning Authority. Deliveries to the site (excluding ALLs) would be limited to 0800 – 1800, Monday to Friday, and 0900 to 1200 on Saturday.
- Where appropriate, additional warning and speed control signs will be installed, temporarily or otherwise, with the agreement of the roads authority.
- A construction liaison committee should be established to ensure the smooth management of the project / public interface. Traffic management is likely to be an issue considered by the liaison committee. It is proposed that representatives of the Applicant, the construction contractors, the local community, and, if appropriate, the Police form the committee. This committee will form a means of communicating and updating on forthcoming activities and dealing with any issues arising.
- Driver's induction to include:
  - A safety briefing;
  - The need for appropriate care and speed control;

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<sup>10</sup> Condition 11 (Annex 2, part 2) of the relevant section 36 consent

- Identification of specific sensitive areas;
- Identification of the specified route;
- The requirement not to deviate from the specified route; and
- Preferred routes for non-abnormal load construction traffic will be agreed with Shetland Islands Council and included in the construction/traffic management plan, prior to construction starting.

**Sandwater Road and Kergord Access Track**

10.5.4 A separate planning application is currently under consideration by SIC in relation to the proposed upgrade of Kergord access track between the B9075 road and the upper Kergord converter station (SIC planning application reference: 2016/226/PPF). In addition, an EIA screening request has been submitted in relation to the provision of a new section of road to replace a section of the existing B9075 (Sandwater Road). A planning application for this road improvement would be submitted upon the receipt of an EIA screening opinion from SIC. Neither of these proposals form part of the description of development and are being progressed via separate consenting processes.

**Roads Structural Alterations**

10.5.5 To allow for project traffic to pass, structural alterations or assessments will be made at the locations set out in Table 10.16 (see also Figure 10.3).

<b>Table 10.16: Structural Alterations</b>		
<b>Location Reference (Figure 10.3)</b>	<b>Description</b>	<b>Details</b>
1	A968/A970 Junction Upgrade at Voe	An OS Swept Path assessment has been carried out of this location. Areas of vehicle wheels over-running and the vehicle body/load over-sailing out with the road boundary and potentially clashing with existing street furniture have been identified. A topo survey of this location has been carried out and a swept path using the topo will be complete to identify the final road works requirements on wind turbine supplier selection.
2	A971 Bridge near Olligarth; structural assessment	Structural assessment to be carried out for abnormal load deliveries post CfD in September 2019.
3	A970 Bridge near Girlsta; structural assessment	Structural assessment to be carried out for abnormal load deliveries post CfD in September 2019.
4	A970 Access Point 8 (east of Sandwater)	New junction to be designed and constructed in accordance with SIC roads department requirements as part of wind farm construction.
5	B9075 new carriageway upgrade which includes creation of a junction/access point at Lamba Scord	New junction to be designed and constructed in accordance with SIC roads department requirements as part of new Sandwater Road construction.
6	B9075 Access Point 6 (near Upper Kergord track entrance)	New junction to be designed and constructed in accordance with SIC roads department

<b>Table 10.16: Structural Alterations</b>		
		requirements as part of new Sandwater Road construction.
7	B9075/A970 junction upgrade	New junction to be designed and constructed in accordance with SIC roads department requirements as part of new Sandwater Road construction.
8	Access Point 4, A970 Hamarigrind Scord	New junction to be designed and constructed in accordance with SIC roads department requirements as part of wind farm construction.
9	B9076/A968 Junction at Mossbank; structural assessment	The SIC have not in recent correspondence flagged this as requiring a structural assessment. Looks to be a culvert, not a bridge. Structural assessment can be carried out for abnormal load deliveries post CfD in September 2019 if necessary.
10	Sella Ness access junction upgrade B9076	Shall require a swept path assessment if the selected wind turbine supplier proposes to use Sella Ness for component delivery. Currently Greenhead base and Sullom Voe Construction Jetty are the proposed ports of entry.
11	A971 Access Point (Scord of Sound)	New junction to be designed and constructed in accordance with SIC roads department requirements as part of wind farm construction.
12	Gremista Road/A970 Junction	An OS Swept Path assessment has been carried out of this location. Areas of vehicle wheels over-running and the vehicle body/load over-sailing out with the road boundary and potentially clashing with existing street furniture have been identified. A topo survey of this location has been carried out and a swept path using the topo will be complete to identify the final road works requirements on wind turbine supplier selection.
13	Greenhead Access Road Left Bend	An OS Swept Path assessment has been carried out of this location. Areas of the vehicle body/load over-sailing out with the road boundary and potentially clashing with existing street furniture have been identified. The final road works requirements to complete the manoeuvre will be identified on wind turbine supplier selection.

### ***Car Pooling (B9075/A970 Junction)***

10.5.6 The B9075/A970 junction is currently used as an informal car park by people car-pooling to commute to Sullom Voe. An opportunity exists to incorporate improved parking arrangements for these people at or near the junction, either by making use of road widening at the junction itself or by making use of parts of the proposed construction compound and access track (on the A970 about 680 m south of the junction) after wind farm construction is complete. The Applicant will work with Shetland Islands Council to provide such facilities.

### ***Use of Dales Voe and Greenhead Ports***

10.5.7 Use of Dales Voe and Greenhead Ports for arrival of AILs and non-AILs to Shetland was considered during the initial project design stages, prior to submission of the 2009 application. The current strategy for the proposed varied development is based on using Lerwick as the preferred location

for importing turbine blades, and other heavy components including nacelles. However, the option exists to use other ports including Dales Voe and Greenhead, and all options will be reviewed when detailed construction plans are developed. This access, traffic and transport assessment has considered the use of Sella Ness/Sullom Voe as well as Dales Voe and Greenhead Ports.

### ***Road/Junction Improvements***

10.5.8 Mitigation will involve the construction of new access points. These are likely to be in the form of widened priority junctions wide enough to handle the abnormal loads as well as general construction traffic. Junction upgrades include: the A968/A970 junction at Voe, the Sella Ness access junction (B9076) and the A970/B9075 junction upgrade, however the latter will be covered in the Sandwater Road upgrade, which is covered in a separate application. In addition, improvements to five existing accesses are also necessary along with some street furniture movements.

## **10.6 Summary of Residual Effects**

### ***Introduction***

10.6.1 This section identifies the likely significant environmental effects of the proposed varied development. The purpose is to present the main residual effects of the scheme, taking into account the proposed mitigation measures as outlined above.

### ***Adverse Effects***

10.6.2 The likely adverse effects of the proposed varied development on traffic and transport are expected to be limited to the construction phase and are predicted to comprise:

- Adverse effect on the local highway network at one settlement (Voe) resulting from the construction traffic and movement of abnormal loads. Traffic management measures to ensure the efficient transport of components and materials to the site are considered to reduce the significance of this impact from moderate to **low (non-significant in EIA terms)**;
- The significance of moderate adverse cumulative construction traffic effects from the proposed varied development and the Beaw Field Wind Farm on the local highway network at one settlement (Voe) is also predicted to reduce from moderate to low (non-significant in EIA terms), following the application of mitigation measures including a Traffic Management Plan; and
- No significant effects have been identified for any of the road links in the study area.

### ***Beneficial Effects***

10.6.3 The main beneficial environmental effects of the proposed varied development are as follows:

- As a result of the proposed varied development, proposed junction improvements at Sella Ness, A968/B9076 Junction south of Mossbank and A968/A970 Junction at Voe will result in larger junctions with increased capacity and potentially safer designs.
- Localised widening and route improvement at on the B9075 at Sand Water, and potential for improved parking at the B9075/A970 junction will improve the safety and operation of the road network.

### ***Comparison of Effects from Consented Scheme***

10.6.4 The traffic movements for both the consented Viking Wind Farm and the proposed varied development are predicted to be the same. No additional access, road or structure improvements are required for the proposed varied development compared to the consented Viking Wind Farm.

Consequently, there is no difference between the predicted access, traffic and transport effects for the consented Viking Wind Farm and the proposed varied development.

### Conclusion

- 10.6.5 As far as possible, any impact arising from the proposed varied development has been mitigated to ensure that the impact on the environment and other road users is as limited as possible. Following the application of the mitigation measures, including a Traffic Management Plan, all of the residual effects are assessed as non-significant. There are no differences in the predicted access, traffic and transport effects between the consented Viking Wind Farm and the proposed varied development.

### List of Figures

- Figure 10.1: Access Routes  
Figure 10.2: Traffic Count Locations  
Figure 10.3: Structural Assessments and Upgrades

### Glossary and Abbreviations

Abbreviation	Expanded Term / Definition
Construction Phase	the period of time associated with the site preparation and construction of the development.
Construction Traffic	vehicles associated with site preparation and supply of plant and equipment, construction materials and labour during the construction phase. All these vehicles are expected to be less than 44 tonnes Gross Vehicle Weight.
Operational Phase	the period of time after construction has been completed, when the development has been commissioned and is producing electricity.
Goods Vehicles	Light Goods Vehicles (LGV) under 7.5 tonne Gross Vehicle Weight; and Heavy Goods Vehicles (HGV) over 7.5 tonne Gross Vehicle Weight, but under 44 tonne Gross Vehicle Weight, operating within normal Construction & Use (C&U) Legislation. This excludes any vehicles designed or constructed to convey Abnormal Indivisible Loads under Special Types General Orders (1-3) or Special Order Permission Limits (i.e.: the turbines, blades and tower sections).
Automatic Traffic Counter (ATC) data	traffic volume data undertaken at locations by Transport Scotland and Shetland Islands Council.
NRTF	National Road Traffic Forecast.
AADT/F	Annual Average Daily Traffic/Flow.
Sandwater Upgrade	Request for screening opinion for proposal to realign B9075 Sandwater Road for a distance of 2.26km between junction with A970 at Sandwater, westwards to the junction with the C class road to Upper Kergord (Ref. No: 2018/201/SCR)
CAR	Water Environment (Controlled Activities) (Scotland) Regulations 2011, as amended (CAR) by SEPA
PPP	Pollution Prevention Planning
DMRB	Design Manual for Roads and Bridges
AIL	Abnormal Indivisible Loads

