

4. LANDSCAPE AND VISUAL AMENITY

Executive Summary

This chapter provides a review of the potential landscape and visual effects associated with the proposed variation to the consented Viking Wind Farm. It considers the potential for change to landscape, visual and cumulative landscape and visual effects resulting from an increase in turbine tip height of 10 m from 145 m (for the consented Viking Wind Farm) to 155 m (for the proposed varied development) and increase in rotor diameter from 110 m to up to 120 m.

The review has and involved the following activities:

- A landscape and visual appraisal (LVA) of the consented Viking Wind Farm, in order to provide a basis for comparison;
- An LVA of the proposed varied development, in order to identify any potential for changed effects;
- A cumulative LVA of both the consented Viking Wind Farm and the proposed varied development against an updated cumulative baseline; and
- A comparison of likely landscape, visual and cumulative effects identified for the consented Viking Wind Farm and the proposed varied development.

In addition, a separate assessment of turbine lighting effects was undertaken for the proposed varied development as an increase in turbine height above 150 m would result in a requirement for aviation warning lights.

The appraisal identified that significant landscape, visual and cumulative effects would occur to the landscape and visual baseline as a result of both the consented Viking Wind Farm and the proposed varied development. However, there would be no change in any effect rating for the proposed varied development when compared to the consented Viking Wind Farm. As such, it was concluded that the proposed variation would result in no change to landscape and visual effects when the effects turbine lighting are excluded from consideration.

The separate assessment of turbine lighting has identified that significant effects would occur to 13 of the viewpoints assessed within 10 km of the proposed varied development during low light and hours of darkness as a result of turbine lighting. The Applicant proposes to engage with aviation stakeholders to agree a turbine lighting solution which may reduce these effects. Discussions would include consideration of:

- Potential reduction of lighting intensity during good meteorological visibility;
- Radar activated lighting (should this be approved for use); and
- Potential for cardinal or strategic lighting on selected turbines.

4.1 Introduction and Background

- 4.1.1 This chapter provides a review of the potential landscape and visual effects associated with the proposed variation to the consented Viking Wind Farm, as described in Chapter 2 (Description of Development).
- 4.1.2 The review has been carried out by ASH design + assessment Ltd. (ASH), Chartered Landscape Architects, and in accordance with the Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (LI & IEMA, 2013) (GLVIA3).
- 4.1.3 This chapter is supported by:
- Technical Appendix 4.1: Criteria for Landscape and Visual Appraisal
 - Technical Appendix 4.2: Candidate Local Landscape Areas (cLLAs) Assessment;
 - Technical Appendix 4.3: Consented Viking Wind Farm Visual Effects Tables;
 - Technical Appendix 4.4: Proposed Varied Development Visual Effects Tables;
 - Technical Appendix 4.5: Technical Methodology for Visual Representation;
 - Technical Appendix 4.6: Turbine Lighting Visual Impact Assessment; and
 - Technical Appendix 4.7: 2009 Landscape and Visual Assessment: Excerpt from the Viking Wind Farm Environmental Statement (2009).
- 4.1.4 Figures 4.1 – 4.8.2 are referenced in the text where relevant, and listed in full at the end of this chapter.

4.2 Scope of Review and Assumptions

- 4.2.1 The purpose of this review is the identification of potential for material change in landscape and visual effects through consideration of the effects of the proposed varied development when compared to the effects of the consented Viking Wind Farm (consented in 2012).
- 4.2.2 For clarity, throughout this chapter the various iterations of the proposed Viking Wind Farm are defined as:
- **The Viking ES Application:** the 2009 development proposal submitted for the Section 36 application which was the subject of the original LVIA, comprising 150 turbines at 145 m tip height (Technical Appendix 4.7: Figure 9.2.1);
 - **The consented Viking Wind Farm:** the development as consented in 2012, comprising 103 turbines at 145 m tip height (Figure 4.2); and
 - **The proposed varied development:** the current S36C development proposal comprising the same 103 turbine layout as the consented Viking Wind Farm but at 155 m tip height (as described in Chapter 2 (Description of Development) (Figure 4.1).
- 4.2.3 The review therefore comprises the comparison of the results of a landscape and visual appraisal of the proposed varied development with landscape and visual effects likely to result from the consented Viking Wind Farm. However, as the consented Viking Wind Farm differs from that for which Landscape and Visual Impact Assessment (LVIA) was undertaken at ES stage (the Viking ES Application), an appraisal has also been undertaken for the consented Viking Wind Farm to provide a basis for the comparison.
- 4.2.4 The review has therefore involved the following activities:
- Review of the pre-consent landscape and visual baseline conditions including recognition of changes to the baseline since the original landscape and visual assessment for the Viking Wind Farm was undertaken as part of the 2009 Environmental Statement;
 - Landscape and visual appraisal of the consented Viking Wind Farm, in so far as it differs from the original 2009 ES LVIA (includes assessment of candidate Local Landscape Areas (cLLAs)

(regional landscape designation) which were identified subsequent to the 2009 LVIA being carried out);

- Landscape and visual appraisal of the proposed varied development focusing on key areas where potential change may occur;
- Comparison of landscape and visual effects anticipated for the proposed varied development with those likely to occur from the consented Viking Wind Farm, highlighting any areas where a change in effect may occur; and
- Review of both the consented Viking Wind Farm and the proposed varied development against the current cumulative wind farm baseline, identifying any areas where a difference in effect may occur.

4.2.5 In addition to the above, a separate assessment of the visual effects of turbine lighting has been undertaken and is presented in Technical Appendix 4.6 and summarised at the end of this Chapter.

4.2.6 This review does not comprise a full LVIA as the above approach is considered to be a proportionate level of assessment to identify any material change for the proposed varied development, which comprises a 10 m increase in turbine tip height (and associated increased hub height and rotor diameter) only and no change to any other aspect of the development.

4.2.7 This review cross refers to the landscape and visual appraisal findings and associated figures, included within the 2009 Viking ES Application LVIA and associated appendices (included in Technical Appendix 4.7 for ease of reference).

Study Area

4.2.8 A study area of 16 km from the outermost turbines has been adopted for the landscape and visual review. Using professional judgement and following review of the original 2009 LVIA, 15 km was considered to be a sufficient area to identify any material change in landscape and visual effects resulting from the proposed 10 m increase in turbine height. However, this has been increased to 16 km to include the town of Lerwick.

Limitations and Assumptions

4.2.9 This review is subject to the following limitations and assumptions:

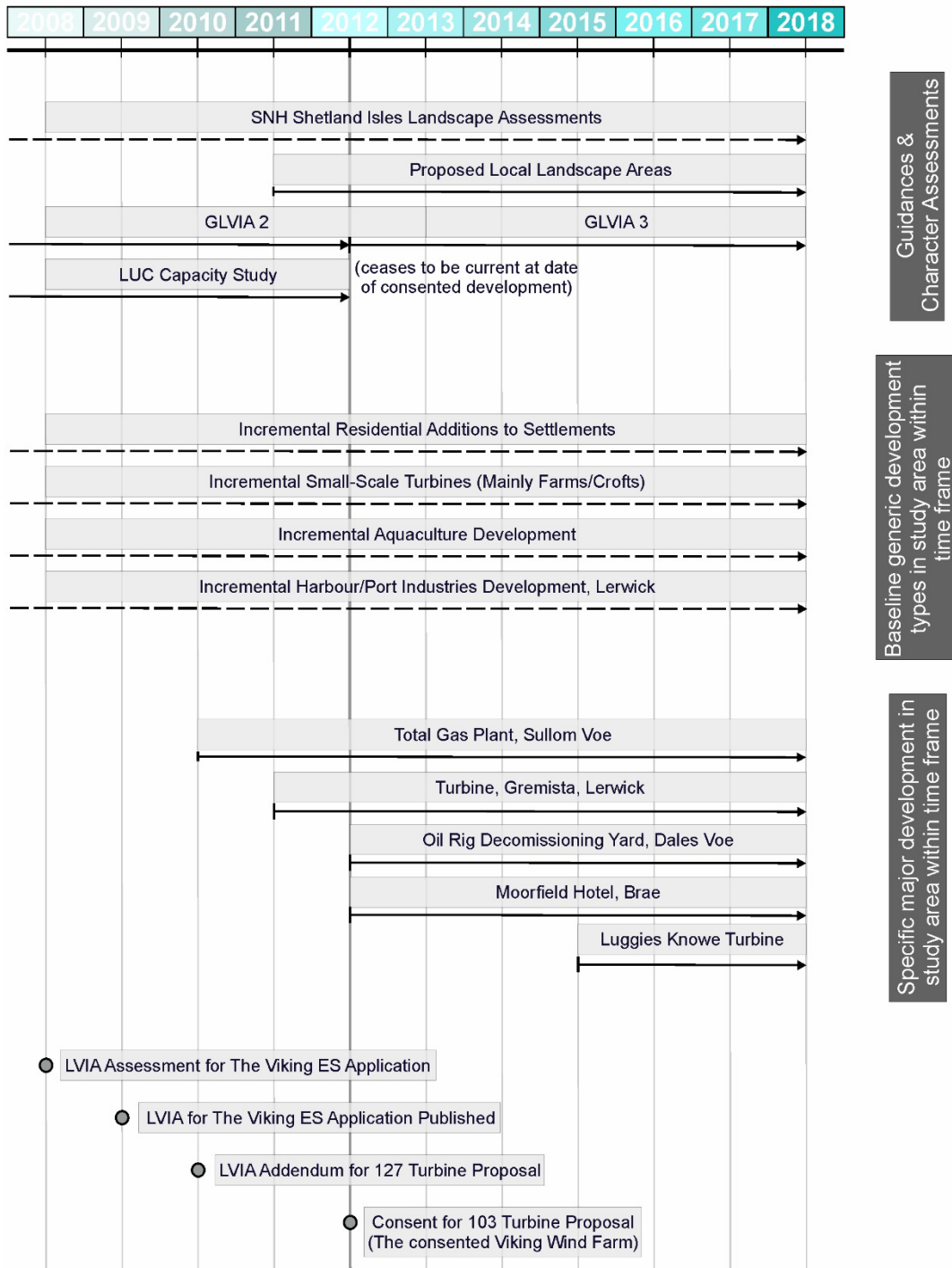
- This review considers the proposed varied development to comprise an increase in turbine tip height of 10 m (including associated increase in hub height and rotor diameter) only. It is assumed that the proposed varied development would be the same as the consented Viking Wind Farm in all other respects.
- The effects of turbine lighting are considered in a separate study which is appended to this report as Technical Appendix 4.6. The results of this separate study are summarised and given consideration in the conclusions of this review.
- As detailed in paragraph 4.2.6, this review does not comprise a full LVIA. However, it is considered a proportional approach to the proposed variation and sufficient to identify any material change between the effects of the consented Viking Wind Farm and the proposed varied development.
- Appraisal of the consented Viking Wind Farm has been based on an assumed landscape and visual resource of the study area in 2012 with likely changes in the baseline since the 2009 LVIA highlighted.
- For clarity, the cumulative LVA has been based on an updated cumulative baseline scenario including all operational and consented wind energy sites and those which are the subject of current application and appeal procedures, up to and including 24th August 2018. Sites at Scoping stage have not been included; and

- The LVA is based on original assessments undertaken for the 2009 LVIA and data collected at that time, updated by additional site survey and desk study in 2018. Therefore the viewpoints and landscape areas considered are based on those included in the 2009 LVIA. The exception is the addition of candidate Local Landscape Areas which, although not yet fully adopted into the planning system, were introduced in 2011, subsequent to the 2009 LVIA but prior to consent for the 103 turbine consented Viking Wind Farm being granted in April 2012. An excerpt from the 2009 LVIA is included as Technical Appendix 4.7.

Timeline of Events

4.2.10 In order to help fully understand the context of this review and the evolution of baseline development and LVIA guidance/ documentation over the last decade, a timeline has been produced (see Table 4.1). This summarises when the key LVIA studies were carried out during this period and how these relate to the generic and specific landscape and visual baseline changes and to changes in guidance and reference documentation. Although the 2010 LVIA Addendum is referenced here (the 127 turbine development under consideration at that time) it was effectively superseded by the consented Viking Wind farm and is therefore not considered further in this review.

Table 4.1: Viking Wind Farm LVIA Timeline



4.3 Methodology

4.3.1 There are two key activities which have been undertaken as part of this review: landscape and visual appraisal (carried out separately for the consented Viking Wind Farm and the proposed varied development); and a comparison of landscape and visual effects between both development scenarios.

Landscape and Visual Appraisal Methodology

4.3.2 This LVA has been undertaken in accordance with GLVIA 3 and has involved the following process:

- Establishment of the baseline scenario. The baseline for the appraisal of both the consented Viking Wind Farm and the proposed varied development is the pre-consent baseline scenario (i.e. the landscape and visual resource prior to any wind farm being constructed). As consent was obtained for the consented Viking Wind Farm in 2012, this therefore comprises an assumed 2012 baseline for the consented Viking Wind Farm, and a current (2018) baseline for the proposed varied development.
- Establishment of visual or landscape sensitivity. In most cases this is considered likely to be unchanged from the 2009 LVIA. However, where revised baseline studies have identified changes likely to result in an alteration to sensitivity, this has been highlighted;
- Appraisal of potential magnitude of effect;
- Appraisal of likely effect significance; and
- Update of the cumulative baseline scenario (operational and consented wind farm proposals and those at application or appeal status within 60 km of the proposed varied development) and appraisal of the potential for cumulative landscape and visual effects for both the consented Viking Wind Farm and the proposed varied development in association with this current baseline.

4.3.3 Detailed criteria employed for the identification of sensitivity, magnitude and significance are included in Technical Appendix 4.1.

Methodology for Comparison of Landscape and Visual Effects

4.3.4 The comparison of landscape and visual effects has involved the following considerations:

- Identification and analysis of areas of ‘new’ visibility which would result from the proposed variation, through the review of comparative ZTVs (Figure 4.2) and comparative wirelines from areas of new visibility;
- Identification and analysis of areas of ‘notably increased’ visibility which would result from the proposed variation through the review of comparative ZTVs (Figure 4.2) and comparative wirelines (Figures 4.7.1 to 4.7.17) alongside baseline photos and findings from the LVAs for the both development scenarios. This focuses on notable increases to visibility (e.g. more turbines visible, or more tips or hubs visible) rather than just increased visibility;
- Identification of new or increased cumulative visibility resulting from the proposed variation, through the use of ZTVs and cumulative wirelines; and
- Identification of potential for material change in landscape and visual and cumulative landscape and visual assessment conclusions.

Turbine Lighting Assessment Methodology

4.3.5 The methodology for the turbine lighting assessment is included in Technical Appendix 4.6.

4.4 Baseline Conditions

Pre-consent Landscape Baseline

Consented Viking Wind Farm LVA

4.4.1 The baseline landscape context is described in Chapter 8 of the 2009 LVIA (see Technical Appendix 4.7). The landscape context is largely unchanged in character since 2009 despite the gradual addition of a small degree of development. Additional development between 2009 and 2012 is generally small scale and localised, comprised of incremental residential additions to settlements, small scale turbines (mainly on farms and crofts) additional aquaculture development and harbour and port development (mainly at Lerwick). Larger scale change (as indicated in Table 4.1), has comprised the construction of a new gas plant development at Sullom Voe and a new turbine at

Gremista, near Lerwick. However, the gas plant development is of similar scale and type to the adjacent oil terminal and the Gremista turbine is seen in the context of the adjacent port industrial area and Lerwick. As such, key characteristics of the baseline landscape are considered broadly unchanged.

4.4.2 An addition to the 2009 baseline is the subsequent identification of candidate Local Landscape Areas (cLLAs), a regional landscape designation proposed by Shetland Islands Council (SIC) and awaiting final adoption. Eight of these areas fall within the study area, as shown on Figure 4.5 and as follows:

- Nibon and Mangaster cLLA
- Vementry and West Burrafirth cLLA
- Walls and Vaila cLLA
- Culswick and Westerwick cLLA
- Weisdale cLLA
- Gletness and Skellister cLLA
- Lunna Ness and Lunning cLLA; and
- Aithness and Noss cLLA

4.4.3 The reduced footprint of the consented Viking Wind Farm compared to the Viking ES Application layout results in some of the landscape designations no longer being relevant to the landscape and visual assessment. In addition, some other designated areas have been scoped out due to their being outwith the 16 km study area or being peripheral to the study area with only limited intervisibility (thereby being very unlikely to be significantly affected).

4.4.4 The list of designated landscapes included within the LVA therefore includes the following:

National Scenic Area (NSA)

- South West Mainland NSA (formerly Dunrossness and the Deeps NSA); and
- Muckle Roe NSA.

Inventory of Gardens and Designed Landscapes (GDL)

- Lunna House GDL.

Candidate Local Landscape Area (cLLA)

- Nibon and Mangaster cLLA;
- Vementry and West Burrafirth cLLA;
- Culswick and Westerwick cLLA;
- Weisdale cLLA;
- Gletness & Skellister cLLA; and
- Lunna Ness & Lunning cLLA.

4.4.5 Similarly a number of landscape character areas (LCAs) included in the 2009 assessment have been scoped out of the LVA due to their no longer falling within the study area or being peripheral with little intervisibility. The full list of LCAs considered in the LVA is as follows:

- LCA A1 South Mainland Spine;
- LCA A2 East and West Kame;
- LCA B2 Rounded Moorland Hills;
- LCA C1 West Mainland & Northmavine: Muckle Roe and Mangaster/Nibon Areas;
- LCA C3 Lunna Ness & Dragon Ness;
- LCA D1a Farmed & Settled Inland Valleys: Weisdale;

- LCA D1b Farmed & Settled Inland Valleys: Tingwall;
- LCA D2 Crofting & Grazing Inland Valleys: Cuckron;
- LCA D4a Peatland & Moorland Inland Valleys: Kergord and Petta Dale;
- LCA E1 Farmed Land;
- LCA E3 Coastal Crofting & Grazing Lands;
- LCA E5 West Mainland;
- LCA Lowland Crofting;
- LCA F1 Developed Areas;
- LCA F2 Nucleated Settlements;
- LCA F3 Farmed Land; and
- LCA F5 Scattered Settlements/Crofting & Grazing Land.

Proposed Varied Development LVA

- 4.4.6 The baseline landscape context for the LVA of the proposed varied development is largely unchanged from that for the consented Viking Wind Farm LVA. Continual incremental development which has taken place over the intervening years since 2012 has resulted in minimal increase in the size of existing residential and industrial areas. In addition, more notable developments include the oil-rig decommissioning yard at Dales Voe (near Lerwick), a turbine at Luggies Knowe and Moorfield Hotel at Brae. However, it is not considered that these features would alter the baseline key characteristics.
- 4.4.7 Landscape designations and LCAs considered in the LVA are the same as those considered for the consented Viking Wind Farm LVA.

Visual Baseline

- 4.4.8 Both of the LVAs for the consented Viking Windfarm and the proposed varied development have been based on an assessment of 17 representative viewpoints (VPs), selected from the 2009 LVIA VPs. These key VPs represent nearby receptors in buildings and on roads, footpaths and other nearby vantage points and have been taken from those used in the original LVIA for the Viking ES Application as shown in Table 4.2:

Table 4.2: Viewpoint Location and Justification

New VP No.	Location	Grid Reference	Reason for Selection in 2018 LVA	VP No. in Viking ES Application
1	The Burn of Lunklet	HU 36676 57546	Outdoor recreation area (footpath) / tourist destination	1
2	Aith Pier	HU 34650 55954	Settlement	2
3	Kergord Valley (Weisdale Mill)	HU 39503 53203	Outdoor site / tourist destination	3
4	Lunna House	HU 48656 69210	Designed landscape / historic site / tourist destination	6
5	Knab/ Knab Road, Lerwick	HU 47807 40770	Settlement	8
6	North Nesting (Laxfirth)	HU 47353 59712	Settlement	11
7	South Nesting	HU 46967 54160	Settlement	12

New VP No.	Location	Grid Reference	Reason for Selection in 2018 LVA	VP No. in Viking ES Application
8	Viewpoint from A971 between Bixter and Walls	HU 29327 52684	Main road between two settlements	13
9	Near Voe (Car Park at Laxo road junction)	HU 41343 62511	Viewpoint / car park	14
10	Vidlin	HU 48662 66079	Settlement	15
11	Whalsay (Clate)	54340 61523	Settlement	17
12	A970 Kames	HU 41446 59987	Road route	28
13	Wormadale Hill (A971)	HU 40285 462243	Viewpoint identified on OS maps	33
14	Busta Junction, Brae	HU 34825 67463	Settlement / important elevated pausing point on way to popular hotel	39
15	Mulla, Voe	HU 40340 64148	Settlement with elevated south-facing views	40
16	Laxo	HU 44423 63575	Settlement	41
17	Heglibister	HU 38760 517492	Road Route	43

4.4.9 Descriptions of the baseline view from each viewpoint are included in Technical Appendices 4.3 and 4.4.

Cumulative Baseline

4.4.10 The wind energy developments included in the cumulative baseline have been updated since the Viking ES (2009) Application LVIA for comparative review. A search of wind energy sites which are either operational, consented / under construction or the subject of a current valid planning application / appeal was undertaken in August 2018 within a 60 km search area of the consented Viking Wind Farm in accordance with best practice (SNH (2012) “*Assessing the Cumulative Impact of Onshore Wind Energy Developments*”). A total of ten developments were identified as shown on Figure 4.6 and detailed in Table 4.3 below.

Table 4.3: Other Wind Development Sites within 60 km of the Proposed Varied Development

Name	Number of Turbines	Hub Height	Tip Height
<i>Application / Appeal</i>			
Mossy Hill Wind Farm	12	78	145
<i>Consented / Under Construction</i>			
Beaw Field Wind Farm	17	93	145
Culterfield	3	45	67
Brae	1	23	33.5
Hillhead	1	30	39
Luggies Knowe (Gremista Wind Farm)	2	80	121

Name	Number of Turbines	Hub Height	Tip Height
<i>Operational</i>			
Hillhead	1	44	60.5
Garth (North Yell Wind Farm)	5	44	70
Luggies Knowe (Gremista Wind Farm)	1	80	121
Burradale (1)	3	45	68
Burradale (2)	2	44	70
Gremista	1	30	46

4.4.11 The cumulative baseline wind development scenario for the proposed varied development assumes that in addition to operational wind developments, all consented / under construction and application wind generation developments within the 60km search area, above 30 m tip height, have been built. The consented Viking Wind Farm is not included in the cumulative baseline.

4.4.12 The cumulative sites identified within the 60 km search area shown in Table 4.3 have been analysed. Of these, five sites were found to be of a much smaller height (less than 70m to tip) and extent (one of three turbines and the remainder solo turbines). These comprise Culterfield, Brae, Hillhead (operational and consented) and Gremista). Additionally, one site (Garth on North Yell), was very distant (over 40km away) and of different height and scale (70m to tip and 5 turbines in extent). These sites were therefore scoped out of the appraisal, with the exception of Gremista, which was retained due to its proximity to, and prominence from, Lerwick.

4.4.13 At approximately 20km distance, the consented Beaw Field Wind Farm on South Yell is of a similar scale to Viking in terms of height (145m to tip) although of a lesser extent (17 turbines) and has therefore been included in the cumulative appraisal. Mossy Hill, a site near Lerwick at application stage (145m to tip and 12 turbines in extent), is also of similar height and, in addition, is close to: Luggies Knowe, (3 turbines at 121m to tip with one turbine currently operational); Gremista (1 operational turbine 46 m to tip); and Burradale 1&2 (5 operational turbines at 68-70m to tip). On the assumption that all are constructed, together these developments (Mossy Hill, Luggies Knowe, Gremista and Burradale 1 and 2) would form a recognisable local cluster and have been appraised on this basis, hereafter referred to as “The Lerwick Cluster”. The Lerwick Cluster, and Beaw Field, have been identified as having the potential to result in cumulative effects with the proposed varied development and have therefore been considered within the cumulative appraisal.

4.5 Consented Viking Wind Farm LVA – Summary of Results

4.5.1 The main changes arising between the Viking ES Application LVIA and the consented Viking Wind Farm LVA, were changes in magnitude. Although the turbines were the same height and the two southern quadrants largely unaltered in layout (with the exception of the omission of a small number of turbines), the omission of the two northern quadrants entirely and a reduction from 150 to 103 turbines in total resulted in a considerably reduced development footprint to the north and subsequently reduced study area and ZTV coverage between these two layouts.

Landscape Designations and Landscape Character

4.5.2 Table 4.4 below, presents a summary of the consented Viking Wind Farm landscape appraisal findings.

Table 4.4: Summary of Appraisal of Effects of Consented Viking Wind Farm on Designated Landscapes and LCAs

Note:

- * indicates change of level of effect compared to 2009 LVIA.
- Where effects ratings differ from the 2009 LVIA, the previous rating is shown in brackets.

DESIGNATION/ CHARACTER AREA	CONSTRUCTION EFFECTS CONSENTED VIKING WIND FARM							OPERATIONAL EFFECTS CONSENTED VIKING WIND FARM						
	Negligible	Negligible/ Minor	Minor	Minor/ Moderate	Moderate	Moderate/ Major	Major	Negligible	Negligible/ Minor	Minor	Minor/ Moderate	Moderate	Moderate/ Major	Major
National Scenic Areas														
South West Mainland (formerly Dunrossness and the Deeps)			X	X						X	X			
Muckle Roe	X							X						
Inventory of Gardens and Designed Landscapes														
Lunna House				X							X			
Candidate Local Landscape Areas (cLLAs) (this proposed local designation did not exist in 2009)														
Nibon and Mangaster			X						X					
Vementry and West Burrafirth			X						X					
Culswick and Westerwick			X						X					
Weisdale					X							X		
Gletness & Skellister						X							X	
Lunna Ness & Lunning				X							X			
Landscape Character Areas														
A1 South Mainland Spine			X						X					
A2 East and West Kame						X							X	
B2 Rounded Moorland Hills			X	X					X	X				

DESIGNATION/ CHARACTER AREA	CONSTRUCTION EFFECTS CONSENTED VIKING WIND FARM							OPERATIONAL EFFECTS CONSENTED VIKING WIND FARM						
	Negligible	Negligible/ Minor	Minor	Minor/ Moderate	Moderate	Moderate/ Major	Major	Negligible	Negligible/ Minor	Minor	Minor/ Moderate	Moderate	Moderate/ Major	Major
*C1 West Mainland & Northmavine: Muckle Roe & Mangaster/Nibon Areas	X	X		(X)	(X)			X	X		(X)	(X)		
*C3 Lunna Ness & Dragon Ness			X	X		(X)				X	X		(X)	
D1a Farmed & Settled Inland Valleys: Weisdale						X						X		
D1b Farmed & Settled Inland Valleys: Tingwall				X							X			
D2 Crofting & Grazing Inland Valleys: Cuckron						X							X	
D4a Peatland & Moorland Inland Valleys: Kergord and Petta Dale							X							X
E1 Farmed Land					X							X		
*E3 Coastal Crofting & Grazing Lands (Some reduced effects on northern areas)				X	X						X	X		
E5 West Mainland Lowland Crofting				X							X			
F1 Developed Areas			X							X				
F2 Nucleated Settlements				X							X			
F3 Farmed Land			X							X				
*F5 Scattered Settlements/Crofting & Grazing Land (Some reduced effects on north western areas)			X	X	X	X				X	X	X	X	

Consented Viking Wind Farm Landscape Conclusions

4.5.3 It should be noted from Table 4.4 that a proportion of the effects are unchanged since the 2009 LVIA. However, as might be expected, there are nevertheless reduced and less widespread landscape effects arising from the 103-turbine consented Viking Wind Farm than from the 150-turbine 2009 Viking ES Application, due to the reduced footprint occasioned by the removal of 47 turbines. This resulted in a number of previously assessed designated areas and LCAs no longer

falling within the 16 km detailed study area and others being scoped out as they became marginal, with little or no intervisibility, to the extent that significant effects were considered highly unlikely. In addition there were reduced levels of effect compared to the 2009 LVIA in the following LCAs; C1 West Mainland & Northmavine: Muckle Roe & Mangaster/Nibon and C3 Lunna Ness & Dragon Ness (both no longer Significant); E3 Coastal Crofting & Grazing Lands and F5 Scattered Settlements/Crofting & Grazing Land (some reduced effects on northern LCAs).

4.5.4 The appraisal of the residual landscape effects arising from the consented Viking Wind Farm upon the landscape character of the study area can therefore be summarised as follows:

- No Significant Effects upon on nationally designated or protected sites such as the National Scenic Areas or Gardens and Designed Landscapes.
- Significant Effects upon the two locally designated cLLAs closest to the consented Viking Wind Farm; Weisdale and Gletness & Skellister, (not in existence when the 2009 LVIA for the Viking ES Application was published).
- Significant Effects upon a number of LCAs within the 16 km study area. In the East and West Kame LCA (A2), where a majority of the turbines would be situated, the magnitude of direct change would be such that moderate to major adverse landscape effects would be experienced. Where effects are indirect, these would be reduced to moderate, but nevertheless still significant. Significant effects would also be experienced for part of the Peatland and Moorland Inland Valleys landscape character type where the consented Viking Wind Farm would be located (Pettadale and Kergord LCA; D4a). Sensitivity to change here would be low to medium, but again, the degree of change would be high, resulting in both direct and indirect major effects. Elsewhere in the study area: moderate direct and indirect adverse landscape effects would be experienced by Coastal Crofting and Grazing Lands (E3) and the Scattered Settlements/ Crofting and Grazing Land (F5) LCAs. However, it should be noted that due to the widespread occurrence of these LCAs within the study area effects range down to minor-moderate and minor depending on distance from the consented Viking Wind Farm and significant effects are likely to be experienced only up to around 10 km. Indirect adverse landscape effects ranging from moderate, to moderate – major would also be experienced in part of the Farmed and Settled Inland Valleys (Weisdale, D1a), the Crofting and Grazing Inland Valleys: (Cuckron,D2) and the Farmed Land (E1), local character areas.
- No Significant Effects are likely on approximately two-thirds of the LCAs within the study area.

4.5.5 The appraisal of effects for the consented Viking Wind Farm has identified that moderate to major and therefore significant landscape effects would result from direct change resulting from the consented Viking Wind Farm, through the introduction of turbines and tracks, primarily within the East and West Kame LCA, the largest LCA of the study area. Some of the Peatland and Moorland Inland Valleys LCA where the consented Viking Wind Farm would be located (Pettadale and Kergord) would also receive some direct, major and therefore significant, effects. In addition, the coastal Crofting and Grazing Lands and the Scattered Settlements/ Crofting and Grazing Land LCAs would receive some very limited direct and significant effects.

4.5.6 In addition to those areas receiving significant direct effects, two locally designated cLLAs and a number of LCAs would receive significant indirect effects as a result of intervisibility with the consented Viking Wind Farm. These significant indirect effects are generally limited to those areas in close proximity to the consented Viking Wind farm where intervisibility has the potential to have a greater effect on the setting and hence character of the landscape.

4.5.7 To conclude, all significant landscape effects arising from the consented Viking Wind Farm would be found where direct change or large scale indirect changes are predicted. The periphery of the study area and all nationally designated or protected landscapes would not receive any significant landscape effects, either during construction or operation.

Visual Amenity

- 4.5.8 The findings of the consented Viking Wind Farm visual appraisal are presented in Technical Appendix 4.3: Consented Viking Wind Farm Visual Effects Tables. It also highlights changes in sensitivity value and /or effects between the 2009 LVIA and the consented Viking Wind Farm.
- 4.5.9 As can be seen in Technical Appendix 4.3, of the 17 key VPs considered for the consented Viking Wind Farm LVA, 13 of the representative receptor locations were found to receive significant visual effects as result of the consented Viking Wind Farm as follows:
- VP1: Burn of Lunklet (Major);
 - VP2: Aith Pier (Moderate – Major);
 - VP3: Kergord Valley (Weisdale Mill) (Major);
 - VP6: North Nesting (Laxfirth) (Moderate – Major);
 - VP7: South Nesting (Major);
 - VP8: A971 between Bixter and Walls (Moderate – Major);
 - VP9: Near Voe (car park at Laxo Road Junction (Moderate – Major);
 - VP10: Vidlin (Moderate)
 - VP11: Whalsay (Clate) (Moderate – Major);
 - VP12: A970 Kames (Major);
 - VP15: Mulla, Voe (Major);
 - VP16: Laxo (Major); and
 - VP17: Heglibister (Moderate – Major).
- 4.5.10 Some of these effects differed from those in the Viking ES Application LVIA on account of the reduced development footprint resulting in less / more distant visibility in northern areas (reduced to non-significant at VP4 (Lunna House) and VP14 (Busta Junction, Brae); and reduced but still significant at VP10 (Vidlin and VP11 Whalsay (Clate).
- 4.5.11 Some VPs recorded increased sensitivity on account of additional houses being constructed near the VP which in one case (VP16 (Laxo)) has led to an increase in effect (Major) since 2009, largely on account of the orientation of newly built houses towards the consented Viking Wind Farm. However apart from these highlighted differences other levels of effect at the viewpoints remain unchanged since the Viking ES Application LVIA.

Cumulative Effects

- 4.5.12 Cumulative ZTVs were run for the selected developments for a distance of 30 km and are presented in Figures 4.8.1 and 4.8.2. Due to the minimal difference between the consented Viking Wind Farm ZTV and proposed varied development ZTV, and for ease of viewing, these have been presented with only the proposed varied development ZTV included.

Landscape Designations and Character

- 4.5.13 A cumulative landscape appraisal for the consented Viking Wind Farm has been undertaken for designated landscapes and LCAs within the study area, which are covered by the cumulative ZTVs.
- 4.5.14 Considering firstly the potential cumulative effects in combination with the consented Beaw Field Wind Farm on South Yell, it can be seen in the Cumulative ZTV (Figure 4.8.1) that on land, the overlap of intervisibility would be mostly limited to high ground within the consented Viking Wind Farm site and the west side of Lunnasting (cLLA, LCAs B2,F5); high ground above Vidlin (cLLA,LCA F5) and the west side of Whalsay (LCA E3); and on high ground to the west of Sullom Voe (cLLA,LCA F5).

4.5.15 Although the ZTV was run at 30km, the wireline produced from CVP5 (Knab / Knab Road, Lerwick LCA F1) also indicates theoretical visibility from this location; but at over 40km distant this would be barely perceptible.

4.5.16 As can be seen in the Cumulative ZTV for the Lerwick Cluster (Figure 4.8.2), on land, the overlap of intervisibility would mostly be limited to high ground within the consented Viking Wind Farm site; the east side of Lunnasting (cLLA,LCA F5); high ground above Vidlin (cLLA,LCA F5); the south side of Whalsay (LCA E3); South Nesting (cLLALCA C3,E3, F5);high ground around Lerwick, Bressay and Tingwall (LCAs A1, A2, B2, F1,F2,F3 and F5); the NSA; and on high ground to the west between Bixter and Walls (cLLA,LCA B2,C1,E1,E5 and F5).

4.5.17 The results of the cumulative appraisal are summarised in Table 4.5, as follows:

Table 4.5: Cumulative Landscape Appraisal for the consented Viking Wind Farm

Landscape Character Type or Landscape Designation Falling Within Cumulative ZTV	Cumulative Sensitivity to Change	Magnitude of Cumulative Landscape Change (consented Viking Wind Farm)	Likely Cumulative Landscape Effect for consented Viking Wind Farm
South West Mainland NSA	High	Low-Negligible (with Lerwick Cluster)	Minor
Muckle Roe NSA	Medium-High	Negligible (with Lerwick Cluster/Beaw Field)	Negligible
Lunna House GDL	Medium	Negligible to Low (with Lerwick Cluster/Beaw Field)	Minor - Moderate
Nibon & Mangaster cLLA	Medium	Negligible - Low (with Beaw Field)	Minor
Vementry & West Burrafirth cLLA	Low-Medium	Negligible-Low (with Lerwick Cluster)	Minor
Culswick & Westerwick cLLA	Medium	Negligible (with Lerwick Cluster)	Negligible
Weisdale cLLA	Medium	Medium - High (with Lerwick Cluster)	Moderate - Major; significant
Gletness & Skellister cLLA	Medium	Medium to High (with Lerwick Cluster)	Moderate; significant
Lunna Ness & Lunning cLLA	Medium	Low - Medium (Lerwick Cluster/Beaw Field)	Minor - Moderate
A1 South Mainland Spine LCA	Medium to High	Low (with Lerwick Cluster)	Minor - Moderate
A2 East and West Kame LCA	Low	High (Beaw Field/Lerwick Cluster)	Moderate - Major; significant
B2 Rounded Moorland Hills LCA	Low-Medium	Low (with Beaw Field/Lerwick Cluster)	Minor
C1 West Mainland & Northmavine: Muckle Roe and Mangaster/Nibon Areas LCA	Medium	Low (with Beaw Field/Lerwick Cluster)	Minor
C3 Lunna Ness & Dragon Ness LCA	Medium	Low-Medium	Minor - Moderate;

Landscape Character Type or Landscape Designation Falling Within Cumulative ZTV	Cumulative Sensitivity to Change	Magnitude of Cumulative Landscape Change (consented Viking Wind Farm)	Likely Cumulative Landscape Effect for consented Viking Wind Farm
D1a Farmed & Settled Inland Valleys: Weisdale LCA	Medium	Medium – High (with Lerwick Cluster)	Moderate - Major; significant
D1b Farmed & Settled Inland Valleys: Tingwall LCA	High	Low (with Lerwick Cluster)	Minor - Moderate
D2 Crofting & Grazing Inland Valleys: Cuckron LCA	Medium	Medium-High (with Lerwick Cluster)	Moderate-Major; significant
D4a Peatland & Moorland Inland Valleys: Kergord and Petta Dale	Low	High (with Beaw Field/Lerwick Cluster)	Moderate; significant
E3 Coastal Crofting & Grazing Lands	Medium	Low (with Beaw Field/Lerwick Cluster)	Moderate; significant
E5 West Mainland Lowland Crofting	Low	Low (with Lerwick Cluster)	Minor
F1 Developed Areas	Low-Medium	Medium (with Lerwick Cluster)	Minor - Moderate
F2 Nucleated Settlements	Low - Medium	Low - Medium (with Lerwick Cluster/Beaw Field)	Minor - Moderate
F3 Farmed Land	Medium	Low (with Lerwick Cluster)	Moderate; significant
F5 Scattered Settlements/Crofting & Grazing Land	Medium	Medium (Beaw Field/Lerwick Cluster)	Moderate; significant

Visual Amenity

4.5.18 The Cumulative ZTVs (Figure 4.8.1 and 4.8.2) and wirelines (Figure 4.7.1 to 4.7.17) show that potential cumulative effects would occur at only four of the VPs as follows:

- VP5: Knab / Knab Road, Lerwick;
- VP10: Vidlin;
- VP11:Whalsay (Clate); and
- VP12: A970, Kames.

4.5.19 Cumulative wirelines for these four VPs are shown on Figure 4.7.5.2(a and b) (VP5, Knab/ Knab Road Lerwick); Figure 4.7.10.2 (VP10, Vidlin); Figure 4.7.11.2 (Whalsay (Clate)); and Figure 4.7.12.2(a to d) (A970, Kames).

4.5.20 A cumulative visual appraisal for the consented Viking Wind Farm has been undertaken for the four VPs as shown in Table 4.6 below.

Table 4.6: Cumulative Visual Appraisal for the consented Viking Wind Farm

Viewpoint (VP) with Potential for Cumulative Effects		Cumulative Sensitivity to Change	Magnitude of Cumulative Change (consented Viking Wind Farm)	Likely Cumulative Visual Effect for consented Viking Wind Farm
5	Knab/ Knab Road, Lerwick	Medium	Low (with Beaw Field/Lerwick Cluster)	Minor - Moderate
10	Vidlin	Medium	Medium (with Lerwick Cluster)	Moderate; significant
11	Whalsay (Clate)	High	Medium-High	Moderate - Major; significant
12	A970 Kames	Medium - High	High (Lerwick Cluster)	Moderate - Major; significant

4.6 Proposed Varied Development LVA

Summary of Proposed Varied Development LVA

- 4.6.1 An LVA was undertaken for the proposed varied development giving consideration to all the landscape designations and LCAs as well as the 17 VPs. Details of the VP appraisal are included in Technical Appendix 4.4 and provide the basis for this LVA. Consideration was given to how the changes resulting from the proposed varied development, and identified changes in baseline which have occurred since 2012, would affect the values identified for sensitivity and magnitude during the LVA for the consented Viking Wind Farm and whether this would lead to any increase in effects ratings. The LVA concluded that despite minimal changes in the baseline since 2012 and a marginally increased magnitude, all of the effects ratings for landscape, visual and cumulative effects would be the same as those for the consented Viking Wind Farm. As such, they are not reproduced here, although the minimal differences in magnitude are discussed in Section 4.7.

Turbine Lighting

- 4.6.2 Due to the height of proposed varied development (turbines being above 150 m to tip), turbine lighting would be required. However, as a lighting design had not been agreed at the time of the turbine lighting assessment, assumptions have been made with regard to the extent and type of lighting, based on CAA Advice Note, "*Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150 m Above Ground Level*" (the CAA policy statement). For the purpose of the assessment it has been assumed that all turbines would be lit with a medium intensity (2000 candela) light on top of the nacelle, as well as 32 candela lights in three directions on the turbine tower, half way between ground level and hub height.
- 4.6.3 A viewpoint based assessment of the effects of turbine lighting is included in Technical Appendix 4.6, assessed from 13 VPs.
- 4.6.4 The assessment of turbine lighting identifies that the visual effect of the lighting scenario recommended by CAA Advice Note would be significant from all but one of the VPs considered. All VPs receiving significant effects are within 10 km of the proposed varied development, with VP5 (Knab Road, Lerwick) being the only VP likely to be not significant, at just over 15 km from the proposed varied development.
- 4.6.5 It was therefore concluded that the effect of a medium intensity light on every turbine would be significant within 10 km of the proposed varied development. Further discussion with aviation stakeholders is therefore proposed to develop a lighting solution which may reduce these effects. Discussions would include consideration of:

- Potential reduction of lighting intensity during good meteorological visibility;
- Radar activated lighting (should this be approved for use); and
- Potential for cardinal or strategic lighting on selected turbines.

4.6.6 Because further discussion of turbine lighting options is proposed and a specific solution has not been agreed, the effects of lighting are not considered in the comparison of landscape and visual effects presented in Section 4.7 below.

4.7 Comparison of Effects between the Consented Viking Wind Farm and the Proposed Varied Development

4.7.1 This section of the review provides a comparison between the results of the consented Viking Wind Farm LVA and the proposed varied development LVA and a discussion of any differences in effect (other than in relation to turbine lighting).

4.7.2 As described in the Methodology (Section 4.3), areas of ‘new’ visibility and ‘notably increased’ visibility resulting from the proposed varied development in comparison with the consented Viking Wind Farm have been identified and analysed, as summarised in Table 4.7 below and illustrated in Figure 4.2.

Table 4.7: Areas of New and Notably Increased Visibility

<p>Identification and analysis of areas of ‘new’ visibility (shown as blue on Figure 4.2)</p>	<p>Very small areas of ‘new’ visibility have been identified on landward locations within the study area, none of which are considered to be important visual receptor locations:</p> <ul style="list-style-type: none"> • the south side of Fugla Ness, overlooking Sullom Voe; • short stretch of coastline just south of Sullom pier; • the tops of North Ward and South Ward, west of Trondavoe; • small area immediately to the west of Gonfirth; • small area east of Bixter; • small area at head of Seli Voe; and • point of Russa Ness. <p>Considering the size, locations, and nature of ‘new’ visibility, it is not anticipated that landscape and/or visual effects would change as a result of ‘new’ visibility of the proposed varied development, in comparison with the consented Viking Wind Farm.</p>
<p>Identification and analysis of areas of notably increased visibility</p>	<p>An increase in potential visibility of turbines may occur due to the 10 m increase in turbine tip height between the two schemes:</p> <p>Proposed varied development: 155m Consented Viking Wind Farm: 145m</p> <p>As illustrated in Figures 4.7.1 to 4.7.17, visibility of the wind farm is marginally increased from all VPs, but it would not constitute a notable increase from any VPs, even those closest to the proposal (i.e. VPs 1, 3, 9, 12, 16, 17). Therefore, it is not anticipated that landscape and/or visual effects would change as a result of ‘increased’ visibility of the proposed varied development, in comparison with the consented Viking Wind Farm.</p>

4.7.3 The comparative ZTV of these two schemes shown in Figure 4.2 illustrates that the increased tip height would marginally increase theoretical visibility from a few very small areas (shown in blue) within the study area, none of which would be considered sensitive visual receptor locations. This suggests that any changes would be barely perceptible when compared to the consented Viking Wind Farm.

4.7.4 Similarly, a review of the 17 viewpoint wirelines of the consented Viking Wind Farm baseline compared to the proposed varied development shows that the height increase may marginally

change the visual composition of the layout from some VPs, but not to the extent that the visual effect ratings would change.

- 4.7.5 This review of ‘new’ and ‘notably’ increased visibility has informed the following commentary on landscape and visual effects.

Effects on Landscape Character

- 4.7.6 The LVA for the proposed varied development concluded that the same landscape effects would be anticipated for the proposed varied development as anticipated for the consented Viking Wind Farm. These findings are presented in Table 4.8 below.

Table 4.8: Comparative Review of Landscape Effects

Landscape Character Type or Landscape Designation	Landscape Effect from consented Viking Wind Farm LVA	Landscape Effect from Proposed Varied Development LVA	Comparison of Effects
Shetland Islands NSA (South West Mainland)	Minor to Minor-Moderate	Minor to Minor-Moderate	No change to landscape effect
Shetland Islands NSA (Muckle Roe)	Negligible	Negligible	No change to landscape effect
Lunna House GDL	Minor-Moderate	Minor-Moderate	No change to landscape effect.
Nibon & Mangaster cLLA	Minor	Minor	No change to landscape effect.
Vementry & West Burrafirth cLLA	Minor	Minor	No change to landscape effect.
Culswick & Westerwick cLLA	Minor	Minor	No change to landscape effect.
Weisdale cLLA	Moderate; significant	Moderate; significant	No change to landscape effect.
Gletness & Skellister cLLA	Moderate-Major; significant	Moderate-Major; significant	No change to landscape effect.
Lunna Ness & Lunning cLLA	Minor-Moderate	Minor-Moderate	No change to landscape effect.
A1 South Mainland Spine LCA	Minor	Minor	No change to landscape effect.
A2 East and West Kame LCA	Moderate-Major; significant	Moderate-Major; significant	No change to landscape effect.
B2 Rounded Moorland Hills LCA	Minor to Minor-Moderate	Minor to Minor-Moderate	No change to landscape effect.
C1 West Mainland & Northmavine: Muckle Roe and Mangaster/Nibon Areas LCA	Negligible to Negligible-Minor	Negligible to Negligible-Minor	No change to landscape effect.
C3 Lunna Ness & Dragon Ness LCA	Minor to Moderate-Minor	Minor to Moderate-Minor	No change to landscape effect.
D1a Farmed & Settled Inland Valleys: Weisdale LCA	Moderate-Major; significant	Moderate-Major; significant	No change to landscape effect.

Landscape Character Type or Landscape Designation	Landscape Effect from consented Viking Wind Farm LVA	Landscape Effect from Proposed Varied Development LVA	Comparison of Effects
D1b Farmed & Settled Inland Valleys: Tingwall LCA	Minor-Moderate	Minor-Moderate	No change to landscape effect.
D2 Crofting & Grazing Inland Valleys: Cuckron LCA	Moderate-Major; significant	Moderate-Major; significant	No change to landscape effect.
D4a Peatland & Moorland Inland Valleys: Kergord and Petta Dale	Major; significant	Major; significant	No change to landscape effect.
E1 Farmed Land	Moderate; significant	Moderate; significant	No change to landscape effect.
E3 Coastal Crofting & Grazing Lands	Minor-Moderate to Moderate; significant	Minor-Moderate to Moderate; significant	No change to landscape effect.
E5 West Mainland Lowland Crofting	Minor-Moderate	Minor-Moderate	No change to landscape effect.
F1 Developed Areas	Minor	Minor	No change to landscape effect.
F2 Nucleated Settlements	Minor-Moderate	Minor-Moderate	No change to landscape effect.
F3 Farmed Land	Minor	Minor	No change to landscape effect.
F5 Scattered Settlements/Crofting & Grazing Land	Minor to Moderate-Major; significant	Minor to Moderate-Major; significant	No change to landscape effect.

Effects on Visual Amenity

- 4.7.7 The LVA for the proposed varied development concluded that the same visual effects would be anticipated for the proposed varied development as are anticipated for the consented Viking Wind Farm. The detailed appraisal is reported on in Technical Appendix 4.4 and these findings are summarised in Table 4.9 below.
- 4.7.8 It is important to note that the comparison in Table 4.9 below excludes the effects of lighting which are considered separately.

Table 4.9: Comparative Review of Visual Effects

Viewpoint (VP)	Visual Effect from Consented Viking Wind Farm LVA	Visual Effect from Proposed Varied Development LVA	Comparison of Effects
1 The Burn of Lunklet	Major; Significant	Major; Significant	No change to visual effect.
2 Aith Pier	Moderate-Major; Significant	Moderate-Major; Significant	No change to visual effect.
3 Kergord Valley (Weisdale Mill)	Major; Significant	Major; Significant	No change to visual effect.
4 Lunna House	Minor-Moderate	Minor-Moderate	No change to visual effect.

Viewpoint (VP)		Visual Effect from Consented Viking Wind Farm LVA	Visual Effect from Proposed Varied Development LVA	Comparison of Effects
5	Knab/ Knab Road, Lerwick	Minor	Minor	No change to visual effect.
6	North Nesting (Laxfirth)	Moderate-Major; Significant	Moderate-Major; Significant	No change to visual effect.
7	South Nesting	Major; Significant	Major; Significant	No change to visual effect.
8	Viewpoint from A971 between Bixter and Walls	Moderate-Major; Significant	Moderate-Major; Significant	No change to visual effect.
9	Near Voe (Car Park at Laxo road junction)	Moderate-Major; Significant	Moderate-Major; Significant	No change to visual effect.
10	Vidlin	Moderate; Significant	Moderate; Significant	No change to visual effect.
11	Whalsay (Clate)	Moderate-Major; Significant	Moderate-Major; Significant	No change to visual effect.
12	A970 Kames	Major; Significant	Major; Significant	No change to visual effect.
13	Wormadale Hill (A971)	Minor	Minor	No change to visual effect.
14	Busta Junction, Brae	Minor-Moderate	Minor-Moderate	No change to visual effect.
15	Mulla, Voe	Major; Significant	Major; Significant	No change to visual effect.
16	Laxo	Major; Significant	Major; Significant	No change to visual effect.
17	Heglibister	Moderate-Major; Significant	Moderate-Major; Significant	No change to visual effect.

Cumulative Effects

Cumulative Effects on Landscape Designations and Character

4.7.9 An appraisal of likely cumulative effects for both the consented Viking Wind Farm and the proposed varied development was undertaken concurrently. No difference was found between the results of these appraisals and therefore it is considered that the cumulative landscape effect of the proposed variation would be barely perceptible.

4.7.10 The comparative results are summarised in Table 4.10 below:

Table 4.10: Comparative Review of Cumulative Landscape Effects

Landscape Character Type or Landscape Designation Falling Within Cumulative ZTV	Cumulative Landscape Effect from Consented Viking Wind Farm LVA	Cumulative Landscape Effect from Proposed Varied Development LVA	Comparison of Effects
South West Mainland NSA	Minor	Minor	No change to landscape effect
Muckle Roe NSA	Negligible	Negligible	No change to landscape effect

Landscape Character Type or Landscape Designation Falling Within Cumulative ZTV	Cumulative Landscape Effect from Consented Viking Wind Farm LVA	Cumulative Landscape Effect from Proposed Varied Development LVA	Comparison of Effects
Lunna House GDL	Minor - Moderate	Minor - Moderate	No change to landscape effect.
Nibon & Mangaster cLLA	Minor	Minor	No change to landscape effect.
Vementry & West Burrafirth cLLA	Minor	Minor	No change to landscape effect.
Culswick & Westerwick cLLA	Negligible	Negligible	No change to landscape effect.
Weisdale cLLA	Moderate - Major; significant	Moderate - Major; significant	No change to landscape effect.
Gletness & Skellister cLLA	Moderate; significant	Moderate; significant	No change to landscape effect.
Lunna Ness & Lunning cLLA	Minor-Moderate	Minor-Moderate	No change to landscape effect.
A1 South Mainland Spine LCA	Minor - Moderate	Minor - Moderate	No change to landscape effect.
A2 East and West Kame LCA	Moderate - Major; significant	Moderate - Major; significant	No change to landscape effect.
B2 Rounded Moorland Hills LCA	Minor	Minor	No change to landscape effect.
C1 West Mainland & Northmavine: Muckle Roe and Mangaster/Nibon Areas LCA	Minor	Minor	No change to landscape effect.
C3 Lunna Ness & Dragon Ness LCA	Minor - Moderate	Minor - Moderate	No change to landscape effect.
D1a Farmed & Settled Inland Valleys: Weisdale LCA	Moderate - Major; significant	Moderate - Major; significant	No change to landscape effect.
D1b Farmed & Settled Inland Valleys: Tingwall LCA	Minor - Moderate	Minor - Moderate;	No change to landscape effect.
D2 Crofting & Grazing Inland Valleys: Cuckron LCA	Moderate - Major; significant	Moderate-Major; significant	No change to landscape effect.
D4a Peatland & Moorland Inland Valleys: Kergord and Petta Dale	Moderate; significant	Moderate; significant	No change to landscape effect.
E3 Coastal Crofting & Grazing Lands	Moderate; significant	Moderate; significant	No change to landscape effect.
E5 West Mainland Lowland Crofting	Minor	Minor	No change to landscape effect.
F1 Developed Areas	Minor - Moderate	Minor-Moderate	No change to landscape effect.
F2 Nucleated Settlements	Minor - Moderate	Minor – Moderate	No change to landscape effect.

Landscape Character Type or Landscape Designation Falling Within Cumulative ZTV	Cumulative Landscape Effect from Consented Viking Wind Farm LVA	Cumulative Landscape Effect from Proposed Varied Development LVA	Comparison of Effects
F3 Farmed Land	Moderate; significant	Moderate; significant	No change to landscape effect.
F5 Scattered Settlements/Crofting & Grazing Land	Moderate; significant	Moderate; significant	No change to landscape effect.

Cumulative Effects on Visual Amenity

4.7.11 An appraisal of likely cumulative effects for both the consented Viking Wind Farm and the proposed varied development was undertaken from four VPs where the cumulative ZTV indicates that cumulative effects may occur. No difference was found between the results of these appraisals and therefore it is considered that the cumulative visual effect of the proposed variation would be barely perceptible.

4.7.12 The comparative results are summarised in Table 4.11 below:

Table 4.11: Comparative Review of Cumulative Visual Effects

Viewpoint (VP) with Potential for Cumulative Effects	Cumulative Visual Effect from Consented Viking Wind Farm LVA	Cumulative Visual Effect from Proposed Varied Development LVA	Comparison of Effects
5 Knab / Knab Road, Lerwick	Minor - Moderate	Minor - Moderate	No change to visual effect.
10 Vidlin	Moderate; significant	Moderate; significant	No change to visual effect.
11 Whalsay (Clate)	Moderate - Major; significant	Moderate - Major; significant	No change to visual effect.
12 A970 Kames	Moderate - Major; significant	Moderate - Major; significant	No change to visual effect.

4.8 Conclusion

Landscape, Visual and Cumulative Effects of the Proposed Variation (Excluding Turbine Lighting)

4.8.1 A review of the proposed varied development has found that there would be no changes to the degree of landscape and visual effects (including cumulative landscape and visual effects) between the consented Viking Wind Farm and the proposed varied development excluding the effects of turbine lighting.

Effects of Turbine Lighting

- An assessment of turbine lighting undertaken for 13 viewpoints identified that the visual effect of a medium intensity light on every turbine, as required by CAA guidelines, would be significant from all but one of the VPs considered. Those VPs receiving significant effects are within 10 km of the proposed varied development with VP5 (Knab Road, Lerwick), located over 15 km from the proposed varied development, being the only VP likely to be not significant. It was therefore concluded that when taking turbine lighting into consideration, the inclusion of a medium intensity light on every turbine would result in significant effects during low light and night time conditions. However, the Applicant proposes to engage with aviation stakeholders to agree a lighting solution which may result in a reduced visual effect. Discussions would include consideration of the following: Potential reduction of lighting intensity during good meteorological visibility;

- Radar activated lighting (should this be approved for use); and
- Potential for cardinal or strategic lighting on selected turbines.

List of Figures

Figure 4.1: Proposed Varied Development ZTV.

Figure 4.2: Comparative ZTV of the Consented Viking Wind farm (145m Tip) and the Proposed Varied Development (155m Tip) Showing Viewpoint Locations.

Figure 4.3: Landscape Character Types.

Figure 4.4: Landscape Character Areas and Sensitivity;

Figure 4.5: Designated Landscape Areas and Proposed Development ZTV.

Figure 4.6: Cumulative Search Area.

Figure 4.7.1 – 4.7.17 – Visualisations and Wirelines of the Consented Viking Wind Farm and Proposed Varied Development.

Figure 4.8.1 and Figure 4.8.2 – Cumulative ZTV

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Glossary and Abbreviations

CAA	Civil Aviation Authority - The UK's specialist aviation regulator
DTM	Digital Terrain Model
EIA	Environmental Impact Assessment
GLVIA3	Guidelines for Landscape and Visual Impact Assessment (Third Edition) – Best practice guidance for undertaking LVIA.
GDL	A landscape or garden included on the Inventory of Gardens and Designed Landscapes
LCA	Landscape Character Area – An area defined within the Landscape Assessment of the Shetland Isles (Gillespies 1998) with a particular consistency of landscape character.
LVA	Landscape and Visual Appraisal – a high level review of potential landscape and visual effects with a focus on potential for significant effects.
LVIA	Landscape and Visual Impact Assessment – the assessment of the effects of a development on the existing landscape and visual amenity resource.
NSA	National Scenic Area – a national level designation applied to those landscapes considered to be of outstanding scenic value and requiring protection in the national interest.
cLLA	Candidate Local Landscape Area - a proposed regional level landscape designation identified by Shetland Islands Council.
SIC	Shetland Islands Council (the Planning Authority)
SNH	Scottish Natural Heritage – Statutory body to advise government and planning officials on landscape and natural heritage issues.
VP	Viewpoint
ZTV	Zone of Theoretical Visibility – a computer generated diagram which uses topographical information to illustrate areas within which views of a development may be theoretically obtained.

