Longpark
Wind Farm

ADDENDUM TO ENVIRONMENTAL STATEMENT

12 JANUARY 2006

VOLUME 1: TEXT

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1 INTRODUCTION

1.1 BACKGROUND

1.1.1 Wind Prospect Developments Ltd (Wind Prospect) submitted an application for planning permission to Scottish Borders Council (Application Ref. 04/00317/FUL) in February 2004 to erect eighteen wind turbines and ancillary structures around Longpark Plantation (approximately 3.5km southeast of Stow and 5km north of Galashiels) for the purpose of generating electricity from wind energy.

1.1.2 An Environmental Statement in four volumes accompanied the planning application.

1.1.3 Prior to determination of the planning application by Scottish Borders Council, further discussions with Scottish Natural Heritage and the Council resulted in Wind Prospect altering the proposed layout of the development and increasing the number of turbines to nineteen, as detailed in the two volumes of "*Longpark Wind Farm - Additional information submitted to Scottish Borders Council to accompany Planning Application Ref. 04/00317/FUL*" submitted to Scottish Borders Council on 22 October 2004.

1.1.4 The planning application was determined on 31st August 2005 and permission was refused. Wind Prospect are in the process of appealing this decision to the Scottish Ministers under Section 47 of the Town and Country Planning (Scotland) Act 1997.

1.1.5 In light of the amendments to the planning application prior to its determination by Scottish Borders Council, Volumes 1 and 2 of this document act to update the original Environmental Statement in accordance with a request made by the Scottish Executive in their letter dated 6th December 2004 pursuant to Regulation 19 of the Environmental Impact Assessment (Scotland) Regulations 1999.

1.2 SCOPE AND SUMMARY OF CHANGES TO WIND FARM LAYOUT

1.2.1 Volumes 1 and 2 of "*Longpark Wind Farm - Additional information submitted to Scottish Borders Council to accompany Planning Application Ref. 04/00317/FUL*" dated 22 October 2004 explain the rationale for the changes to the original layout.

1.2.2 Layout Version 5 (hereafter referred to as the "revised layout") allowed for:

- Re-numbering of turbines (numbers quoted below relate to those shown in the revised the layout, **Figure 1.2, Volume 2**)
- An additional turbine (turbine 19)
- Significant relocation – turbines 17, 18
- Minor relocation to turbines 3, 5, 7, 8, 9, 11, 13, 14, 15, 16
- Turbines in same location – turbines 1, 2, 4, 6, 10, 12
- Increase in height by ten metres of turbines 5, 6, 9,13

1.2.3 In the case of the ten turbines that had minor relocations, essentially the difference in the distances was minor and the variations in ground levels were also relatively minor. As outlined above the key changes included the addition of one turbine, the significant relocation of 2 turbines and an increase in height of four turbines.

1.2.4 The original layout given in the Environmental Statement is shown in **Figures 1.1 and 1.3** of this document. The revised layout is shown in **Figures 1.2 and 1.4**.

1.2.5 The following sections re-assess the environmental impacts of the revised layout and should be read as *addenda* to the original Environmental Statement. It was considered that the following assessments would benefit from revision:

- Landscape and Visual effects
- Visual effects from residential properties
- Cumulative Landscape and Visual effects
- Ecology
- Cultural Heritage
- Noise
- Access and Traffic
- Electricity Production

and that, in light of representations by third parties, it would be beneficial to provide further information on the potential impacts concerning:

- Private water supplies
- Shadow flicker
- Tourism and Recreation

2 LANDSCAPE AND VISUAL EFFECTS

2.1 BACKGROUND

2.1.1 RSK ENSR were commissioned by Wind Prospect to prepare a Landscape and Visual Impact Assessment (LVIA) for the proposed Longpark Wind Farm. The results of this assessment were included within the original Environmental Statement which accompanied the planning application.

2.1.2 In light of changes to the wind farm layout, this chapter serves an addendum to the original LVIA.

2.2 REVISED ZONE OF VISUAL INFLUENCE (ZVI)

30km radius ZVI

2.2.1 Following production of a new ZVI (**Figure 2.1**) for the revised layout, it indicates that the extent of visibility of up to 19 turbines is more extensive particularly to the North-east, slightly more extensive to the East, East-south-east, South-east and South-south-east. The extent of visibility to the South-west, West and North-west is essentially unchanged.

5km radius ZVI

2.2.2 Following production of a new ZVI (**Figure 2.2**) for the revised layout, it indicates the extent of visibility of up to 19 turbines. The additional areas outlined below include areas that were previously assessed to have the potential to see the blade tips of between 10-13 turbines and, with regard to the revised layout, are now assessed to have the potential to see the blade tips of between 15-19 turbines. The additional areas that now lie within the 15-19 turbine (blade tip) visibility include:

- Marginally more extensive to the north-east at a distance of 1.5km from the centre of the wind farm; approximate area 0.4 sq. km
- Slightly more extensive to the north-east between a distance of 3km - 4.5km from the centre of the wind farm, approximate area 2.25 sq. km
- Slightly more extensive to the east between a distance of 3.5km – 5km from the centre of the wind farm, approximate area 2.5 sq. km

- Marginally more extensive to the east-south-east at a distance of 1.75km from the centre of the wind farm, approximate area 0.3sq. km
- The extent of visibility to the south-east, south, south-west, west and North-west is essentially unchanged

2.2.3 Within the 5km radius, the additional areas as outlined above are essentially across areas of open land and land given over to conifer plantations. The areas to the north-east and east include the properties at Allanshaws and Wooplaw.

2.2.4 Overall the extent of visible area of between 10-14 turbines is slightly reduced from all directions and the overall % of extent of visibility of the smaller overall number of turbines between (1-4 and 5-9) generally increases in all directions.

2.3 REVISED PHOTOMONTAGES

2.3.1 Photomontages have been produced to reflect the changes to the turbine layout. **Figures 2.3 to 2.21** show the appearance of the revised layout from each of the nineteen viewpoints portrayed in the original ES.

2.3.2 Based on the revised ZVIs, together with visualisations on the photomontages, **Table 2.1** presents a summary of the changes between the original wind farm layout and the revised layout.

Table 2.1 Comparisons table (original assessment shown in shaded boxes; assessment of revised layout shown in unshaded boxes)

Viewpoint number	Location	Distance to Nearest Turbine	Direction of View	Potential no. of visible tips/hubs	Magnitude of Change	Significance of Effect	Distance to Nearest Turbine	Potential no. of visible tips/hubs	Summary of changes (comparing revised layout to original layout)	Magnitude of Change	Significance of Effect
1	Entrance to Allanshaws Farm	125m	SE	18 Hubs 18 Tips	Very Large	Major Adverse	125m	19 Hubs 19 Tips	More ordered, balanced and regular turbine layout across whole development, particularly to centre. 'Rhythm' (rise and fall of turbine heights) undulating across the view reflect background topography. From this closest viewpoint magnitude and significance remain the same.	Very Large	Major Adverse
2	Near Wooplaw	559m	W	7 Hubs 12 Tips	Very Large	Major Adverse	557m	9 Hubs 14 Tips	From this viewpoint little change between two layouts, an additional turbine to the north. From this close range viewpoint magnitude and significance remain the same.	Very Large	Major Adverse
3	Road to Hawksnest	1049m	NW	9 Hubs 16 Tips	Very Large/ Large	Moderate/ Major Adverse	797m	11 Hubs 18 Tips	More ordered and regular spacing, more turbines visible within more orderly rows. More constant height of turbines across the view, reflecting the more constant topography (very gentle undulations) within which the wind farm is sited. From this close range viewpoint magnitude and significance remain the same.	Very Large/ Large	Moderate/ Major Adverse
4	Allanshaws Farm	1426m	SW	8 Hubs 10 Tips	Medium/ Large	Moderate/ Major Adverse	1479m	8 Hubs 12 Tips	Turbine layout essentially the same, but more constant turbine heights across the view. From this close range viewpoint magnitude and significance remain the same.	Medium/Large	Moderate/ Major Adverse

Viewpoint number	Location	Distance to Nearest Turbine	Direction of View	Potential no. of visible tips/hubs	Magnitude of Change	Significance of Effect	Distance to Nearest Turbine	Potential no. of visible tips/hubs	Summary of changes (comparing revised layout to original layout)	Magnitude of Change	Significance of Effect
5	Whitelee	2085m	NE	15 Hubs 17 Tips	Very Large for residential properties Large for road users	Major Adverse	2099m	16 Hubs 18 Tips	More extensive development across ridgeline, additional turbine noticeable. On the whole, the spacing between turbines is more even and the layout is more ordered achieving a loosely arcing grid. The most prominent turbines complement the ridgeline topography with a fairly uniform height. From this close range viewpoint magnitude and significance remain the same for high sensitive receptors (residential properties).	Very Large	Major Adverse
6	B6362 NE of Stow	2355m	S	8 Hubs 17 Tips	Medium	Moderate Adverse	2353m	9 Hubs 18 Tips	Minimal differences in layout and heights from this viewpoint. From this close range viewpoint magnitude and significance remain the same.	Medium	Moderate Adverse
7	A7 NW of Stow	3648m	SE	4 Hubs 11 Tips	Medium/ Small	Moderate/ Minor Adverse	3648m	4 Hubs 11 Tips	Very little change between the two layouts, turbines marginally lower in height protruding above ridgeline. From this medium range viewpoint magnitude and significance remain the same.	Medium/Small	Moderate/ Minor Adverse
8	Langshaw	3808m	NW	7 Hubs 10 Tips	Small/ Very Small	Moderate/ Minor Adverse	3595m	7 Hubs 11 Tips	Turbines slightly more apparent in the view behind vegetation although only a perceptible change would result. From this close – medium range viewpoint magnitude and significance remain the same.	Small/ Very Small	Moderate/ Minor Adverse

Viewpoint number	Location	Distance to Nearest Turbine	Direction of View	Potential no. of visible tips/hubs	Magnitude of Change	Significance of Effect	Distance to Nearest Turbine	Potential no. of visible tips/hubs	Summary of changes (comparing revised layout to original layout)	Magnitude of Change	Significance of Effect
9	B710 to SW of the Site / Torwoodlee Walk SNH Round Route	4087m	NE	12 Hubs 17 Tips	Medium	Moderate Adverse	4347m	14 Hubs 19 Tips	More ordered and balanced arrangement across the ridgeline. Better balance of turbines spaced in a more regular pattern. Height of turbines as seen protruding above the ridge is more constant and complements and follows the topography. Better rhythm of turbines across the ridgeline. Wind farm will still be noticeable in the view and turbines would still be conspicuous elements. Magnitude and significance remain the same	Medium	Moderate Adverse
10	Southern Upland Way Near Bluecairn	4624m	W	10 Hubs 16 Tips	Medium	Moderate Adverse	4666m	14 Hubs 19 Tips	More extensive wind farm layout across the view. More uniform height of turbines, more regular spacing and more ordered. Better rhythm of turbines across and below the ridge. Wind farm will still be noticeable in the view and turbines would still be conspicuous elements. Magnitude and significance remain the same.	Medium	Moderate Adverse
11	Southern Upland Way Near Woodheads Hill	5103m	SW	9 Hubs 15 Tips	Medium/ Small	Moderate Adverse	5103m	11 Hubs 17 Tips	Overall turbines marginally lower above the ridgeline. More well ordered and balanced arrangement along the ridge. Rhythm of turbines (taller then lower heights) complement undulations in topography. Turbines would still be noticeable and evident in the landscape from this middle distance viewpoint. Magnitude and significance remain the same.	Medium/Small	Moderate Adverse

Viewpoint number	Location	Distance to Nearest Turbine	Direction of View	Potential no. of visible tips/hubs	Magnitude of Change	Significance of Effect	Distance to Nearest Turbine	Potential no. of visible tips/hubs	Summary of changes (comparing revised layout to original layout)	Magnitude of Change	Significance of Effect
12	Meigle Hill	5579m	N	18 Hubs 18 Tips	Large/ Medium	Moderate Adverse	5387m	18 Hubs 19 Tips	Revised layout encompasses the same extent of undulating topography, but overall at a more constant elevation. Layout marginally more balanced from this view. Across the wind farm the more constant turbine heights complement the undulations in the topography. Magnitude and significance remain the same.	Large/ Medium	Moderate Adverse
13	Windlestraw Law	9472m	E	17 Hubs 18 Tips	Medium/ Small	Minor Adverse	9472m	19 Hubs 19 Tips	From this longer distance (9.47kms) the changes to the layout and height of turbines is barely perceptible.	Medium/Small	Minor Adverse
14	Southern Upland Way at Three Brethren	10412m	NE	18 Hubs 18 Tips	Medium/ Small	Moderate Adverse	10401m	19 Hubs 19 Tips	Overall the turbine arrangement is more ordered and less fragmented across the hillside. Wind farm is slightly more compact with the turbines more uniform in height. . Magnitude and significance remain the same.	Medium/Small	Moderate Adverse
15	Eildon Hills	11384m	NW	18 Hubs 18 Tips	Small	Moderate Adverse	11255m	17 Hubs 19 Tips	Wind farm layout is more ordered within some semblance of rows (not too formal). Magnitude and significance remain the same	Small	Moderate Adverse
16	Scott's View	13325m	NW	1 Hubs 8 Tips	Negligible	Minor Adverse	13259m	12 Hubs 18 Tips	Turbines may be visible in a regular set of slightly separated groupings across the ridgeline. From this long distance viewpoint the changes in the wind farm layout will be almost imperceptible. Magnitude and significance remain the same	Negligible	Minor Adverse

Viewpoint number	Location	Distance to Nearest Turbine	Direction of View	Potential no. of visible tips/hubs	Magnitude of Change	Significance of Effect	Distance to Nearest Turbine	Potential no. of visible tips/hubs	Summary of changes (comparing revised layout to original layout)	Magnitude of Change	Significance of Effect
17	A699/Golf Course	13478m	N	18 Hubs 18 Tips	Very Small	Minor Adverse	13289m	12 Hubs 18 Tips	Regular and ordered arrangement of turbines along distant ridgeline. Not all turbines available in the view. From this long distance viewpoint the changes in the wind farm layout will be almost imperceptible. Magnitude and significance remain the same	Very Small	Minor Adverse
18	Dun Law	14027m	S	18 Hubs 18 Tips	Very Small	Negligible	14207m	14 Hubs 19 Tips	Wind farm would just be perceptible on skyline with the turbines of a more constant height above the ridgeline, more balanced. Magnitude and significance remain the same.	Very Small	Negligible
19	Southern Uplands Way near Rutherfords Cairn	18441m	SW	18 Hubs 18 Tips	Negligible	Minor Adverse	18441m	15 Hubs 19 Tips	Little to choose between the two layouts. Revised layout slightly more compact and marginally less fragmented across the hillside. Magnitude and significance remain the same.	Negligible	Minor Adverse

For the purposes of this assessment and in reference to the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 1999, 'significant' visual effects would be those effects assessed to be Severe, Major or Major/Moderate

2.4 SUMMARY OF RESIDUAL IMPACT AND SIGNIFICANCE FOR REVISED LAYOUT

2.4.1 The conclusions of the updated assessment for the revised layout does not alter the conclusions reached in the original assessment. The revised layout provides a more coherent, ordered and uniform grid pattern, with more even spacing between the turbines. The layout and overall height of turbines responds more positively, complements, and is more sensitive to one of the key characteristics of the prevailing local landscape character of undulating topography.

2.4.2 In addition the changes to the layout has responded more positively to other key characteristics of the local landscape character, the hedgebanks, stone dykes and conifer plantations. The layout requires minimal removal of field boundaries, no removal of adjacent blocks and belts of conifer plantation and in the main the turbines are set out to closely follow the alignments of hedgebanks and dykes.

2.4.3 From the close distance viewpoint of Whitelee (Viewpoint 5) 2km to the south-west and from the middle distance viewpoint on the B710 (Viewpoint 9), 4km to the south-west, the revised layout is considered to be more ordered and the spacing between the turbines more even within a loosely arcing grid. The same improvements to the layout are achieved from viewpoints to the north-east on the Southern Upland Way (Viewpoint 11) at 5km distance and from Miegle Hill (Viewpoint 12) 5.5km to the south-west.

2.4.4 The changes to the layout and height of turbines has not altered the predicted magnitude of change or significance of effect from any of the viewpoints.

2.4.5 In reviewing the revised layout, SNH consider that there is likely to be some moderate improvement in the layout of the wind farm and that, on the whole, the spacing between turbines is more even and the layout is more ordered. SNH consider that in views such as those listed above (Viewpoints 5, 9, 11 and 12), this revised design more sensitively relates to the underlying landscape character of the area.

3 VISUAL EFFECTS FROM RESIDENTIAL PROPERTIES

3.1 BACKGROUND

3.1.1 Following the submission of the Environmental Statement in February 2004, Wind Prospect undertook further consultations with Scottish Borders Council, primarily to review the proposed layout of the wind turbines.

3.1.2 As part of those further discussions, the issue of the potential for visual effects on residential properties within 5km from the proposed site was raised. Wind Prospect agreed to undertake a further desk based assessment and a site survey in order to determine from which properties within the 5km radius that a view of the turbines could be gained.

3.2 GUIDANCE

3.2.1 From within 5km it can be anticipated that the wind farm is likely to be a prominent / relatively prominent feature within the landscape. The following references comment on the issue that different distances have on the perception of a wind farm development within an open landscape.

3.2.2 Guidance contained within The University of Newcastle (2002) '*Visual Assessment of Windfarms Best Practice*', Scottish Natural Heritage Commissioned Report F01AA303A, Para 3.1.2. states that:

> *"Scottish Executive (2002)(Planning Advice Note 45) offers the following general guide (Table 3) to the effect that distance has on the perception of a windfarm development in an open landscape (without relating this to tower height, but having earlier referred to turbines of tower height >70m and rotor diameters of >80m):*

Table 3: General Perception of a Wind Farm in an Open Landscape

Distance	***Perception***
Up to 2 kms	*Likely to be a prominent feature*
2-5 kms	*Relatively prominent*
5-15 kms	*Only prominent in clear visibility – seen as part of the wider landscape*
15-30 kms	*Only seen in very clear visibility – a minor element in the landscape*

Source: PAN 45 (revised 2002): Renewable Energy Technologies.

> *A similar table appeared in the Draft NPPG6 Consultation Document (2000), and the comments made on that Draft are of interest. The British Wind Energy Association (BWEA) offered that "significant visual effects of wind turbines are only experienced within 5 km; beyond 15 km wind turbines can generally only be seen in very clear visibility and even when visible are likely to be a minor element in the landscape."*

3.2.3 The SNH document '*Guidelines on the Environmental Impact of Wind Farms and Small Scale Hydroelectric Schemes*' also supports this statement, and states:

"A wind farm is usually seen as a dominant focus when viewed from distances up to 2km…At this distance, movement of the turbines is clear and may collectively convey a distinct rhythm…….wind turbines are likely to be seen as one of the key features of the landscape rather than the dominant feature between 2 and 5km away…At greater distances than this up to 15km a wind farm is usually only prominent in clear visibility conditions and is seen as part of the wider landscape composition, although blade movement may still be discernable…"

3.3 PROPERTY IDENTIFICATION

3.3.1 In order to undertake the assessment, Ordnance Survey Address Point data (held to be accurate on 15 October 2004), was purchased in order to ensure that all properties within the 5km radius could be accurately plotted onto OS base plans @ 1:10,000 and 1:25,000 scale mapping.

3.3.2 A ZVI (**Figure 2.2**) was prepared based on the revised layout, in order to determine which properties fell within the zone and as a consequence may have a potential view of the turbines.

3.3.3 Using the ZVI data, a site survey was then undertaken to assess the potential visibility of the turbines from individual properties.

3.3.4 A total of 1,715 postal addresses were listed on the Address Point data, 325 of which were residential postal addresses shown by the ZVI to have potential visibility of turbines. The site survey included an assessment from publicly accessible locations in close proximity to all 325 properties. The assessment was deemed to be a good indication of the potential visibility from all of the 325 properties.

3.4 PROPERTY CATEGORISATION

3.4.1 Visibility levels were categorised as follows:

Category A: Properties with the potential for clear, direct or oblique views of turbines
Category B: Properties with potential to have direct or oblique views of turbines, but which are partially or fully screened
Category C: Properties with potential to have slight, negligible or no views of turbines

3.4.2 Those properties which might have a potential view of the turbines, including grid references and distance from the nearest turbine, are listed in the **Appendix** at the rear of this Volume. **Figure 3.1** identifies those properties determined to have a view of the turbines subdivided into the different Category levels (A-C).

3.4.3 Out of the total of 325 residential postal addresses included on the data within a 5km radius of the proposed site, the categories were allocated as follows:

Category A: 7 properties
Category B: 99 properties
Category C: 219 properties

3.4.4 The following assessment to determine the significance of visual effect concentrates on the 7 properties allocated as Category A, which are listed in **Table 3.1**.

Table 3.1

Address	Postcode	Easting	Northing	Distance from nearest turbine (metres)
Allanshaws Farm House	TD1 2QB	3490972	6437451	1445
The Stables Cottage, Whitelee	TD1 2NG	3466938	6394699	2214
1 Over Langshaw Cottages	TD1 2PE	3524258	6399708	4253
2 Over Langshaw Cottages	TD1 2PE	3524271	6399768	4252
3 Over Langshaw Cottages	TD1 2PE	3524265	6399854	4248
4 Over Langshaw Cottages	TD1 2PE	3524234	6399980	4240
5 Over Langshaw Cottages	TD1 2PE	3524237	6400015	4239

3.5 VISUAL ASSESSMENT METHODOLOGY

3.5.1 The methodologies used for this assessment are based on guidance contained within "*Guidelines for Landscape & Visual Impact Assessment, Second Edition*", published by The Landscape Institute and Institute of Environmental Management and Assessment (2002).

3.5.2 The Visual Assessment assesses the change that would result to existing views and visual amenity to receptors. This takes into account the sensitivity and importance of receptor groups and the nature, scale or magnitude and duration of the change. The assessment of visual impact from any one location takes into account:

- distance of viewpoint from the closest turbine
- number and proportion of turbines visible
- degree of visual intrusion or extent and nature of the view that would be occupied by the development
- arrangement of turbines
- whether turbines would be seen against a backcloth of land or against the sky
- sensitivity of the viewpoint and receptors
- change in character or quality of the view compared to the existing

3.5.3 The properties or locations from which the proposed development will be visible are known as 'visual receptors'. For the purposes of this assessment visual receptors from residential properties are attributed with a High sensitivity grading. The grading is based on the receptors sensitivity to change and are summarised thus:

Table 3.2: Receptor sensitivity

Receptor Sensitivity	Description
High	Occupiers of residential properties. Users of outdoor recreational facilities, including public rights of way, whose attention or interest may be focused on the landscape Communities where the development results in changes in the landscape setting or valued views enjoyed by the community.
Medium	People travelling through or past the affected landscape in cars, on trains or other transport routes where higher speeds are involved and views sporadic and short-lived. People engaged in outdoor recreation where enjoyment of the landscape is incidental rather than the main interest.
Low	People at their place of work, Industrial facilities.

3.5.4 The visibility of the proposals and the magnitude of its impact upon a view are dependent on a range of factors, including the location of the viewpoint, the distance of the view, the angle of the sun, the time of year and weather conditions. Of equal importance will be whether the site is seen completely, or in part; whether the site appears on the skyline; with a backcloth of land or vegetation; or with a complex foreground; and whether the site forms part of an expansive landscape or is visible within a restricted view. The aspect of dwellings and whether the view is from a main window or a secondary window, which may be used less frequently, is also a consideration. From highways the direction and speed of travel are also considered.

3.5.5 In order to evaluate what the visual impact of the development will be and what can be done to ameliorate the impact, it is necessary to describe the existing situation to provide a basis against which any change can be assessed. Each assessment of visual impact has therefore been made taking into consideration the character and quality of the existing view.

Table 3.3: Magnitude of change

Magnitude	Descriptors
Very Large	The development would result in a dramatic change in the existing view and /or would cause a dramatic change in the quality and / or character of the view. The turbines would appear large scale and /or form the dominant elements within the overall view and/or may be in full view the observer or receptor. Commanding, controlling the view.
Large	The development would result in a prominent change in the existing view and /or would cause a prominent change in the quality and /or character of the view. The turbines would form prominent elements within the overall view and/or may be easily noticed by the observer or receptor. Standing out, striking, sharp, unmistakeable, easily seen.
Medium	The development would result in a noticeable change in the existing view and /or would cause a noticeable change in the quality and /or character of the view. The turbines would form conspicuous elements within the overall view and/or may be readily noticed by the observer or receptor. Noticeable, distinct, catching the eye or attention, clearly visible, well defined.
Small	The development would result in a perceptible change in the existing view, and/or without affecting the overall quality and/or character of the view. The turbines would form an apparent small element in the wider landscape that may be missed by the casual observer or receptor. Visible, evident, obvious.
Very Small	The development would result in a barely perceptible change in the existing view, and/or without affecting the overall quality and /or would form an inconspicuous minor element in the wider landscape that may be missed by the casual observer or receptor. Lacking sharpness of definition, not obvious, indistinct, not clear, obscure, blurred, indefinite.
Negligible	Only a small part of the development would be discernible and/or it is at such a distance that no change to the existing view can be appreciated. Weak, not legible, near limit of acuity of human eye.

3.5.6 The assessment of the significance of effects is a result of the assessment of magnitude of the change related to the assessment of sensitivity of the receptor and is summarised in **Table 3.4**.

Table 3.4: Significance of visual effect

Magnitude	Sensitivity		
	High	**Medium**	**Low**
Very Large	Severe Adverse	Major Adverse	Moderate/Major Adverse
Large	Major Adverse	Moderate/Major Adverse	Moderate Adverse
Medium	Moderate/Major Adverse	Moderate Adverse	Moderate/Minor Adverse
Small	Moderate Adverse	Moderate/Minor Adverse	Minor Adverse
Very Small	Moderate/Minor Adverse	Minor Adverse	Negligible
Negligible	Minor Adverse	Negligible	Nil

For the purposes of this assessment and in reference to the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 1999, 'significant' visual effects would be those effects assessed to be Severe, Major or Major/Moderate.

3.6 VISUAL ASSESSMENT

3.6.1 To further assist this assessment, wireframe visualisations were prepared from each of the 7 properties based on Turbine Layout 5, and are shown in **Figures 3.2 to 3.8.** Assessments are given below for each of the properties.

3.6.2 **Table 3.5** summarises the potential visual effects on these properties.

Allanshaws Farm House (Figure 3.2)

The wireframe prepared for this property is in (virtually) the same location as Viewpoint 4 included within the original ES.

Short range, oblique views towards the proposed site are available from the farmhouse. The view to the southwest towards the site is dominated by large scale, open rough grazed rush pasture, and semi improved pastoral fields in a regular pattern, defined by dry stonewalls

A long gently undulating ridgeline forms the immediate horizon, land uses along the ridgeline are dominated by poorly drained pasture interspersed with belts of mature deciduous woodland.

Predicted view: The wireframe on illustrates the predicted view of Layout 5. The image suggest that eight hubs and twelve blade tips of the turbines will be visible from this location giving a total of twelve turbines, two more than the original layout (Turbines 17 & 19). The nearest turbine will be located approximately 1.442km away (Turbine 4). From this property the wind farm arrangement will be visible as an ordered, and regular turbine layout along the ridgeline, with a regular 'rhythm' (rise and fall) of turbine heights.

Three of the turbines will be partially screened behind a belt of woodland within a background of sky, with nine turbines visible protruding above the grassy ridge to a range essentially three different heights within a background of sky. The turbines would occupy approximately 50º of the field of view.

The nine turbines above the grassy ridgeline would stand out and be easily seen as large scale vertical moving elements breaking the skyline of the view, the three turbines behind the woodland would be less noticeable, by the filtering /partial screening effect of the trees.

Change in the view: Oblique views from the farmhouse across the open, rising fields would become interrupted by the presence of the turbines. The development would result in a prominent change in the existing view and would cause a noticeable change in the quality and character of the view. In particular the nine turbines above the grassy ridgeline would form prominent elements within the overall view, which would be easily noticed by the observer or receptor. The turbines behind the woodland would be clearly visible and well defined and catch the eye, but would be marginally less noticeable than the others.

Predicted magnitude of change: Medium to Large.

Predicted significance of effect: Moderate to Major

The Stables Cottage Whitelee (Figure 3.3)

From this location middle range direct views towards the proposed site are available from the rear of the property. The land rises immediately behind the property and the house is set at a slightly lower level than the immediate ground to the rear The prevailing topography creates an enclosed valley, and views are focussed along the valley, which are terminated by the ridge above Halkburn. To the valley floor narrow pastoral fields are defined by drystone walls and post and wire fencing. Linear deciduous woodland cross the valley slopes. To the east of the valley, the spur of the lower slopes of William Law rises steeply and features areas of gorse, bracken and deciduous vegetation to the lower slopes. Rectilinear coniferous plantations are a feature of the upper slopes and along the ridgelines.

Predicted view: The wireframe illustrates the predicted view of Layout 5. The wireframe indicates that a total of 17 turbines are potentially available in the view, including twelve hubs and seventeen blade tips of the. The total number of turbines is the same as the original layout. The nearest turbine (Turbine 17) will be located approximately 2.21km away, with the hubs and blades seen above the middle distant horizon line. Layout 5 presents a more extensive development across ridgeline, with the 4 turbines along the ridgeline in the forefront of the wind farm are prominent (Turbines 10, 14, 17 and 18), although the heights of these turbines do complement the variation in the ridgeline topography. From this view the 'stacking' of turbines 7, 10 and 13 one behind the other is particularly noticeable.

The intermittent belts of coniferous plantations along the ridgeline will assist in partially screening the lower sections of the majority of the turbines, particularly those in the centre and to the west of the wind farm. The turbines would be striking elements standing out backgrounded by the sky and would occupy approximately 40^{o} of the field of view. In particular the turbines in the centre and to the east of the wind farm would be unmistakeable as large scale vertical moving elements protruding well into the skyline.

Change in the view: The presence of the turbines would intrude on the direct views from the rear of this property, across the open, undulating fields, and may act as a focal point. The development would result in a prominent change in the existing view and would cause a prominent change in the quality and character of the view. The turbines would form prominent elements within the overall view with the majority of the turbines visible, which may be easily noticed by the observer or receptor.

Predicted magnitude of change: Large.

Predicted significance of effect: Major adverse

1 Over Langshaw Cottages (Figure 3.4)

The row of cottages are located to the east of the hamlet of Langshaw in an elevated location. Principal views from all the cottages are directed essentially to the west-south-west across the Gala Water towards Miegle Hill and the valley occupied by the A72. Middle distance, more oblique, views towards the proposed wind farm are available to the north-west. Views are across an undulating grassland landscape of essentially medium to large irregular fields defined by a mixture of drystone walls and post and wire fencing. Within the landscape the coniferous woodlands are a particular feature, occasionally acting as shelterbelts associated to hilltop farmsteads.

Predicted view: The wireframe illustrates the predicted view for Layout 5. The wireframe suggest that eleven hubs and nineteen blade tips of the turbines will be visible along the ridgeline. The nearest turbine (Turbine 19 – the additional turbine) will be located approximately 4.25 km away.

The turbines will be clearly visible along the ridgeline within ordered, well balanced arrangement. The rhythm of the turbines as they follow the ridgeline is regular and complements the gentle undulations of the ridgeline topography.

The turbines may be seen backgrounded by the sky and would occupy approximately 55° of the field of view and from this distance the turbines would be clearly visible and well defined elements. The existing middle distant hill top vegetation may screen and filter views of the towers and hubs. The turbines would be noticeable as medium sized vertical moving elements breaking the skyline of the view.

Change in the view: The development would result in a noticeable change in the existing view, and would cause a noticeable change in the overall quality and character of the view. The turbines would form conspicuous elements in the overall view and may be readily noticed by the casual observer or receptor.

Predicted magnitude of change: Medium.

Predicted significance of effect: Moderate.

2 Over Langshaw Cottages (Figure 3.5)

The view from this adjoining cottage is virtually identical to that described above for No. 1 Over Langshaw Cottages. The total number of turbines, potential availability of views of hub and blade tips remains the same, consequently, the change in the view would be noticeable and the turbines would be conspicuous.

Predicted magnitude of change: Medium.

Predicted significance of effect: Moderate.

3 Over Langshaw Cottages (Figure 3.6)

The view from this adjacent cottage is virtually identical to that described above for No. 1 Over Langshaw Cottages. The total number of turbines, potential availability of views of hub and blade tips remains the same, consequently, the change in the view would be noticeable and the turbines would be conspicuous.

Predicted magnitude of change: Medium.

Predicted significance of effect: Moderate.

4 Over Langshaw Cottages (Figure 3.7)

The view from this adjacent cottage is virtually identical to that described above for No. 1 Over Langshaw Cottages. The total number of turbines, potential availability of views of hub and blade tips remains the same, consequently, the change in the view would be noticeable and the turbines would be conspicuous.

Predicted magnitude of change: Medium.

Predicted significance of effect: Moderate.

5 Over Langshaw Cottages (Figure 3.8)

The view from this adjacent cottage is virtually identical to that described above for No. 1 Over Langshaw Cottages. The total number of turbines, potential availability of views of hub and blade tips remains the same, consequently, the change in the view would be noticeable and the turbines would be conspicuous.

Predicted magnitude of change: Medium.

Predicted significance of effect: Moderate.

Table 3.5: Summary of Residual Visual Effects

View Point Location	OS Grid Refs.	Direction of View	Approx. distance to nearest turbine (m)	Potential No. of Tips/Hubs Visible	Visual Receptor Sensitivity	Magnitude of Change	Significance of effect
Allanshaws Farm House	3490972 6437451	SW	1445	9 Hubs 12 Tips	High	Medium/Large	Moderate/ Major Adverse
The Stables Cottage Whitelee	3466938 6394699	NNE	2214	12 Hubs 17 Tips	High	Large	Major Adverse
1,Over Langshaw Cottages	3524258 6399708	W	4253	12 Hubs 19 Tips	High	Medium	Moderate Adverse
2,Over Langshaw Cottages	3524271 6399768	W	4252	12 Hubs 19 Tips	High	Medium	Moderate Adverse
3,Over Langshaw Cottages	3524265 6399854	W	4248	12 Hubs 19 Tips	High	Medium	Moderate Adverse
4,Over Langshaw Cottages	3524234 6399980	W	4240	12 Hubs 19 Tips	High	Medium	Moderate Adverse
5,Over Langshaw Cottages	3524237 6400015	W	4239	12 Hubs 19 Tips	High	Medium	Moderate Adverse

For the purposes of this assessment and in reference to the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations, 'significant' visual effects would be those effects assessed to be Severe, Major or Major/Moderate.

3.7 SUMMARY OF RESIDUAL IMPACT AND SIGNIFICANCE FOR RESIDENTIAL PROPERTIES

3.7.1 From a total of 1,715 postal addresses located within a 5km radius of the proposed wind farm, only 325 residential properties were shown to fall within the ZVI with a potential view of the proposed turbines.

3.7.2 The ZVI only takes into account ground level topography and does not take into account low level screening, which may result due to drystone dykes, trees or man-made structures such as buildings, therefore it presents the maximum theoretical visibility and should be verified by site survey.

3.7.3 Subsequently, the site survey undertaken in close proximity to all 301 properties concluded that a total of 7 properties had the potential to be classified within Category A: 'Properties with the potential for clear, direct or oblique views of turbines'.

3.7.4 This detailed assessment of the revised layout from those 7 properties has concluded that only 2 of those properties (Allanshaws Farm House and The Stables Cottage, Whitelee) can be assessed to be subject to a 'significant' visual effect under the Regulations.

3.7.5 For a development of this type, with the potential to have a high percentage of significant visual effects from high sensitive receptors such as residential properties the actual number of properties affected is very limited.

4 CUMULATIVE LANDSCAPE AND VISUAL EFFECTS

4.1 INTRODUCTION

4.1.1 Since February 2004, there have been a number of changes in the issues regarding other wind farm applications within the 30km radius of the Longpark wind farm. A number of new applications to develop wind farms have been submitted to the local planning authority and a number of planning applications for wind farms that were at the scoping stage in February 2004 have since been determined. The current situation is indicated in **Table 4.1.**

Table 4.1

Wind Farm	Approx Distance from Longpark Wind Farm (km)	Status
Bowbeat	*18.5*	*Existing/ operational*
Dun Law	*14.6*	*Existing/ operational*
Crystal Rig	*31.0*	*Existing/ operational*
Black Hill	*28.2*	*Consented (not built)*
Minch Moor	*13.6*	*Proposed (planning application submitted)*
Sell Moor	*0.1*	*Refused*
Toddleburn	11	Refused and Appealed
Dun Law (extension)	15	Deferred
Crystal Rig (extension)	31.0	Consented (under construction)
Fallago Ridge	20.0	Proposed (planning application submitted)
Broadmeadows	13.0	Proposed (planning application submitted)
Falla Hill	15.0	Proposed (planning application submitted)
Carcant	14.4	Proposed (planning application submitted)

Wind farms indicated in *italic text* have previously been assessed as part of the cumulative effects section in the original ES of February 2004

4.2 ASSESSMENT

4.2.1 This assessment has included all of the wind farms included in **Table 4.1** (with the exception of Sell Moor which has been refused and not appealed), the locations of which are indicated in **Figure 4.1**.

4.2.2 The locations of all the wind farms (with the exception of Sell Moor) are indicated on the ZVI on **Figure 4.1**.

4.2.3 In order to assess the residual cumulative effects in relation to the current situation as of December 2005, updated ZVIs have been prepared and are shown in **Figures 4.1, 4.2, 4.3**.

4.2.4 A revised set of wireframes and photomontages have also been produced (**Figures 4.4 to 4.32**) from 13 of the 14 viewpoints originally assessed within the cumulative effects section of the original ES, together with two additional viewpoints (Viewpoints 3 and 6).

4.2.5 For each viewpoint the wind farms indicated in **Table 4.2** (with the exception of Sell Moor) were assessed. The updated assessment includes a brief summary of any changes in the view and the consequential effect on the predicted cumulative magnitude of change and the cumulative significance of effect has been determined. The conclusions of the updated assessment are presented in summary in **Table 4.3.**

4.2.6 The assessment in **Table 4.3** should be read in conjunction with the detailed assessment of cumulative effects from the viewpoints included in Section 9.4 of the ES.

Viewpoint no.	Location	Receptor Sensitivity	Description	Summary of Changes	Predicated Cumulative Magnitude of Change	Predicated Cumulative Significance of Effect
1	Entrance to Allanshaws Farm	High	An additional 12 turbines of Broadmeadows wind farm at a distance of 13km will be seen in combination with Longpark and Minch Moor wind farms. The additional turbines are located at approx. same distance as Minch Moor windfarm and the two developments will appear as one contiguous development above distant ridgeline.	Within the expansive view the additional turbines will result in a barely perceptible change in the existing view and would form a minor element in the wider landscape. From this viewpoint the cumulative magnitude of change and cumulative significance of effect remain the same.	Very small	Moderate/Minor Adverse
2	Near Wooplaw	Medium	Additional turbines of Broadmeadows wind farm at a distance of 13km will be seen in combination with Longpark and Minch Moor wind farms. The additional turbines are located at approx. same distance as Minch Moor windfarm and the two developments will appear as one contiguous development along distant ridgeline	Within the expansive view the additional turbines will result in a barely perceptible change in the existing view and would form a minor element in the wider landscape. From this viewpoint the cumulative magnitude of change and cumulative significance of effect remain the same.	Very small	Minor Adverse

Viewpoint no.	Location	Receptor Sensitivity	Description	Summary of Changes	Predicated Cumulative Magnitude of Change	Predicated Cumulative Significance of Effect
3	View from road to Hawksnest	Medium	Views to the north-east from the access road to Hawksnest include distance views to the proposed wind farm at Fallago Rigg approximately 17km distant. This wind farm would be discernible in succession to Longpark located along a distant ridgeline and would form a minor element within the wider view. Further in succession to the east the Black Hill wind farm may just be discernible, but only a small part of the development would be discernible and at such long distance that no change in the existing view could be appreciated.	This viewpoint has not been previously assessed as part of the cumulative assessment. Within views to the north-east to east the cumulative magnitude of change would be very small with a barely perceptible change in the existing view. The significance of cumulative effects of the Fallago Rigg and Black Hill wind farms would be minor.	Very small	Minor Adverse

Viewpoint no.	Location	Receptor Sensitivity	Description	Summary of Changes	Predicated Cumulative Magnitude of Change	Predicated Cumulative Significance of Effect
6	B6362 North-east of Stow	Medium	From this viewpoint looking south-west, the wind farms of Broadmeadows and Minch Moor will be visible in combination with Longpark. In wide succession to the north the wind farms of Toddleburn and Dun Law Extension will be visible in combination. At a distance of 14.5km the turbines of Broadmeadows will be very small in scale, however the turbines of Minch Moor are essentially screened by intervening topography. At a distance of 7.5km the turbines of the closest wind farm at Toddleburn will be more visible but partially contained within the rising topography behind, however, the turbines will be more apparent with the blade tips rising just above the ridgeline. The turbines will appear as small scale elements within the expansive view. At a distance of 11.5km the turbines of Dun Law extension are essentially screened by intervening topography and will be very small elements within the wider view.	This viewpoint has not been previously assessed as part of the cumulative assessment. Within the wide expansive view the cumulative magnitude of change is assessed to be small, overall the turbines would form an apparent, but small scale elements in the wider landscape and the developments would result in a perceptible change in the view. The cumulative significance of effects would be moderate/minor from this public highway.	Small	Moderate/Minor Adverse

Viewpoint no.	Location	Receptor Sensitivity	Description	Summary of Changes	Predicated Cumulative Magnitude of Change	Predicated Cumulative Significance of Effect
9	B710 to SW of the Site / Torwoodlee Walk SNH Round Route	High/medium	In views to the north, no change in the original assessment of the view can be anticipated. The majority of the turbines of Toddleburn, Dun Law and Dun Law extension will be effectively screened by topography or vegetation. Towards the southwest in succession the wind farm of Broadmeadows at a distance of 13km may be available in the view. Minch Moor wind farm is effectively screened by topography.	The introduction of Broadmeadows wind farm to the southwest in succession to Longpark result in barely perceptible change to the existing view. From this distance within the expansive view the turbines Broadmeadows turbines would form inconspicuous elements within the wider view. The introduction of Broadmeadows wind farm will result in a very small cumulative magnitude of change and a moderate – minor cumulative significance of effect. Increase in the cumulative magnitude of change and the cumulative significance of effect.	Very small	Moderate/minor – Minor Adverse

Viewpoint no.	Location	Receptor Sensitivity	Description	Summary of Changes	Predicated Cumulative Magnitude of Change	Predicated Cumulative Significance of Effect
10	Southern Upland Way Near Bluecairn	High	To the southwest an additional 12 turbines of Broadmeadows wind farm at a distance of 13km will be seen in combination with Minch Moor wind farm. The additional turbines are located at approx. same distance as Minch Moor windfarm and the two developments will appear as one contiguous development above distant ridgeline. In succession the Longpark turbines would be visible and further in succession to the northeast at a distance of 16km the Fallago Rigg turbines would be very small scale elements protruding above a distant ridgeline. In further succession to the east the turbines of the Black Hill wind farm will be barely discernible at a distance of 23.5km. It is not possible to see Bowbeat, Carcant, Toddleburn or Dun Law wind farms.	From this expansive viewpoint the introduction of Broadmeadows, Fallago Ridge and Black Hill wind farms would constitute a very small cumulative magnitude of change and a minor cumulative significance of effect. The two additional wind farms would only be seen in wide succession to Longpark and would be at such a distance that the turbines would form an inconspicuous minor element within the wider view. Increase in the cumulative magnitude of change and the cumulative significance of effect.	Very small	Moderate/Minor Adverse

Viewpoint no.	Location	Receptor Sensitivity	Description	Summary of Changes	Predicated Cumulative Magnitude of Change	Predicated Cumulative Significance of Effect
11	Southern Upland Way Near Woodheads hill	High	Toddleburn wind farm at 9.5km distant would be seen in succession to Longpark but is effectively screened by topography. The two more extensive wind farms at Dun Law would be visible as one contiguous development as small scale elements protruding above the distant ridgeline. In succession to the northeast the turbines of Fallago Rigg would be indistinct very small scale elements and further to the east in succession the very distant turbines of Black Hill would be barely discernible.	The introduction of the Toddleburn wind farm would have no effect on the existing view, however, the more extensive development of the Dun Law extension would result in a perceptible change to the existing view. In addition the introduction of the turbines at Fallago Rigg would constitute an inconspicuous minor element in the wider landscape. The turbines at Black Hill would be very weak elements. Increase in the cumulative magnitude of change and the cumulative significance of effect.	Small	Moderate Adverse

Viewpoint no.	Location	Receptor Sensitivity	Description	Summary of Changes	Predicated Cumulative Magnitude of Change	Predicated Cumulative Significance of Effect
12	Meigle Hill	Low	To the southwest the introduction of Broadmeadows wind farm into the view at a distance of 6.7km from the viewpoint would constitute a noticeable change in the existing view. The additional 13 turbines would be clearly visible and well defined across a ridgeline at medium range. These turbines would be seen in combination to the Minch Moor wind farm, but both of these wind farms would be seen in succession to Longpark. To the north the wind farms of Toddleburn at 16.5km distant, Dun Law and Dun Law extension 21kms, would be seen in succession to Longpark, however the Longpark turbines would be more apparent within the view being at much closer distance (5.5km). Further to the northeast the Fallago Rigg turbines could also be visible in combination with Longpark, however they are at long distance and would be barely discernible within the view. In further succession to the east the turbines at Black Hill at a distance of 32km would not be legible within the view.	The introduction of the Broadmeadows wind farm into the view would constitute a medium cumulative magnitude of change when seen in association with other wind farm developments from this viewpoint. The introduction of Toddleburn, Dun Law and Dun Law extension would have a minimal effect on the existing assessed view, with the developments at Fallago Rigg and Black Hill having no additional cumulative effect. Increase in the cumulative magnitude of change and the cumulative significance of effect.	Medium	Moderate /Minor Adverse

Viewpoint no.	Location	Receptor Sensitivity	Description	Summary of Changes	Predicated Cumulative Magnitude of Change	Predicated Cumulative Significance of Effect
13	Windlestraw Law	Low	The introduction of Broadmeadows at a distance of 10.5kms to the southwest in combination to the Minch Moor wind farm will be perceived as a contiguous development. In succession further to the northwest the Bowbeat turbines will be noticeable elements protruding above a medium range ridgeline. Further in succession the wind farms of Dun Law and Dun Law extension, Toddleburn, Crystal Rigg Phase 1 & 2 and Fallago Rigg are all closely grouped along a range of ridges at varying distance. All these wind farms would be seen in combination, with Toddleburn at 12km being the closest development , but from this distance being very small in scale. In succession further to the east the Black hill wind farm will not be discernible at 37.5km and further to the east Longpark at a distance of 9.4km will be more noticeable within the view.	The introduction of the Broadmeadows and Toddleburn wind farms would constitute a small and very small cumulative magnitude of change, however the other additional developments of Dun Law extension, Crystal Rigg Phase 2, Fallago Rigg and Black Hill would have minimal cumulative effect than previously assessed. Overall the updated cumulative effect remains the same.	Medium	Moderate/Minor Adverse

Viewpoint no.	Location	Receptor Sensitivity	Description	Summary of Changes	Predicated Cumulative Magnitude of Change	Predicated Cumulative Significance of Effect
14	Southern Upland Way at Three Brethren	High	From this viewpoint there is little change to the view assessed in the ES. The exception being the removal of the Lauder Common (Sell Moor) wind farm originally proposed at 12.5km from the viewpoint and the introduction of the Fallago Rigg wind farm at 29km distant. Consequently the introduction of the additional turbines will have no discernible effect on the previously assessed viewpoint.	Within the expansive view the additional turbines will result in a barely perceptible change in the existing view and would form a minor element in the wider landscape. From this viewpoint the cumulative magnitude of change and cumulative significance of effect remain the same.	Very small	Moderate/Minor Adverse
15	Eildon Hills	High	From this viewpoint there is little change to the view assessed in the ES. The exception being the removal of the Lauder Common (Sell Moor) wind farm originally proposed at 12km from the viewpoint and the introduction of the Fallago Rigg wind farm at 26km distant and Falla Hill at 28km distant. Consequently the introduction of the additional turbines will have no discernible effect on the previously assessed viewpoint.	All of the wind farm developments are at considerable distance from the viewpoint, the closest being Longpark at 11km. Within the expansive view the additional turbines will result in a barely perceptible change in the existing view and would form a minor element in the wider landscape. From this viewpoint the cumulative magnitude of change and cumulative significance of effect remain the same.	Very small	Moderate/Minor Adverse

Viewpoint no.	Location	Receptor Sensitivity	Description	Summary of Changes	Predicated Cumulative Magnitude of Change	Predicated Cumulative Significance of Effect
16	Scott's View	High	From this viewpoint there is little change to the view assessed in the ES. The exception being the removal of the Lauder Common (Sell Moor) wind farm originally proposed at 14km from the viewpoint.	From this viewpoint the cumulative magnitude of change and cumulative significance of effect remain the same.	Very small	Moderate/Minor Adverse
17	A699/Golf Course	High/medium/medium	The Longpark wind farm is located in the centre of the viewpoint at a distance of 13km, with the Dun Law and Dun Law extension wind farms seen in combination beyond and almost directly behind Longpark at a distance of 29km. Further to the east and in combination the additional turbines of the Fallago Rigg wind farm may just be discernible at a distance of 31km.	The introduction of the Dun Law extension and Fallago Rigg will have a negligible cumulative effect on the view, being located at such a long distance from the viewpoint the turbines will be barely legible and very weak elements within the wider view. From this viewpoint the cumulative magnitude of change and cumulative significance of effect remain the same.	Negligible/Nil	Nil

Viewpoint no.	Location	Receptor Sensitivity	Description	Summary of Changes	Predicated Cumulative Magnitude of Change	Predicated Cumulative Significance of Effect
18	Dun Law	Low	The viewpoint is dominated by the turbines of both the existing and proposed Dun Law turbines. To the west, the Toddleburn and Longpark wind farms are visible in combination, with the Toddleburn turbines being at closer distance (3.5km) and more apparent in the view. In succession the turbines of the Fallago Rigg wind farm are visible at a distance of 9km.	The introduction of the extended Dun Law development, Toddleburn and Fallago Rigg turbines in association with Longpark would increase the magnitude of cumulative change to large, essentially due to the prominence of the additional Dun Law turbines and not as a consequence of the other more distant developments. The addition of Longpark in the wider view would not add significantly to the cumulative effect. Increase in the cumulative magnitude of change and the cumulative significance of effect.	Large	Moderate Adverse

Viewpoint no.	Location	Receptor Sensitivity	Description	Summary of Changes	Predicated Cumulative Magnitude of Change	Predicated Cumulative Significance of Effect
19	Southern Uplands Way near Rutherfords Cairn	High	The addition of the wind farms at Fallago Rigg at 4.5km distant will constitute a medium magnitude of change in this viewpoint as this wind farm would constitute a noticeable change in the existing view. From this viewpoint the wind farm at Fallago Rigg is in the opposite direction to Longpark and would only be seen in wide succession to Longpark and the majority of the other wind farms. In addition the wind farms at Broadmeadows at 31km distant and Toddleburn at 16km will increase the number of turbines available within the view. Broadmeadows is at such a distance that there will be no discernible change in the view and the turbines at Toddleburn will be very small in scale and would form inconspicuous minor elements in the wider view.	The introduction of the Fallago Rigg wind farm is the main reason to increase the magnitude of cumulative change and the significance of cumulative effect due to the close distance of the development. . All the other wind farms including Longpark are a minimum of 12km from the viewpoint resulting in a range of cumulative magnitude of change ranging from small-negligible. The addition of Longpark in the wider view would not add significantly to the cumulative effect The introduction of the Toddleburn wind farm will have minimal impact on the overall cumulative effects of the wind farm developments available in the expansive view. Increase in the cumulative magnitude of change and the cumulative significance of effect.	Medium (Fallago Rigg) Small – Negligible (all other wind farms)	Moderate/ Major - Moderate Adverse

For the purposes of this assessment and in reference to the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations (1999), 'significant' visual effects would be those effects assessed to be Severe, Major or Major/Moderate.

4.3 SUMMARY OF CUMULATIVE EFFECTS

4.3.1 Prior to the submission of the Longpark Wind Farm planning application in February 2004, 7 further wind farm applications have been submitted, including those that were at the scoping stage at the time of the original ES. One wind farm at Sell Moor (the closest to the Longpark development) has been refused and consequently has not been assessed as part of this study

4.3.2 The wind farm at Toddleburn, 11km to the north of Longpark is now the closest proposed development.

4.3.3 With regard to the significance of residual cumulative effects, the conclusions of this updated assessment confirm that from the 15 viewpoints:

- 2 viewpoints will be subject to moderate adverse effects (Viewpoints 11 and 18)
- 9 viewpoints will be subject to moderate/minor adverse effects (Viewpoints 1, 6, 9, 10, 12, 13, 14, 15 and 16)
- 2 viewpoints will be subject to minor adverse effects (Viewpoints 2 and 3)
- 1 viewpoint will have no adverse effect (Viewpoint 17)

4.3.4 In accordance with the Regulations, the residual effects from these viewpoints are not classified as being a 'significant' visual effect.

4.3.5 However, one viewpoint (Viewpoint 19, Southern Upland Way at Rutherfords Cairn), is assessed to be subject to a Moderate/Major adverse effect, primarily as a result of the proximity of the proposed wind farm at Fallago Rigg which is proposed to be constructed 4.5km from the viewpoint. The Fallago Rigg wind farm is in the opposite direction to Longpark.

4.3.6 Taking into account all of the 12 wind farms now assessed as part of the baseline assessment, it is determined that there is an increase in the residual cumulative effect from 6 of the 15 viewpoints assessed (Viewpoints 9, 10, 11, 12, 18 and 19).

4.3.7 The conclusions reached in the original assessment are still valid in regard to the overall occurrence of views of the proposed Longpark wind farm in addition to those wind farms that are either existing or proposed that form part of the baseline. Overall the occurrence of views are very limited and the presence of Longpark would not add significantly to the overall cumulative effect.

4.3.8 Indeed, with regard to the potential for cumulative effects of Longpark in relation to the closest wind farm forming part of the baseline assessment (Toddleburn), Scottish Natural Heritage have stated that:

> *"We consider, …that the combination of Longpark and Toddleburn is unlikely to have adverse cumulative landscape and visual impacts of a significance to warrant an objection from SNH."*

5 ECOLOGY

5.1 INTRODUCTION

5.1.1 Breeding bird and habitat surveys were commissioned by Wind Prospect to provide baseline information on the ornithological and ecological interest of a proposed wind farm site at Longpark, Scottish Borders. The report on this work formed part of the Environmental Statement (ES) to support that application.

5.1.2 The layout of that proposed wind farm has recently been updated, including an increase from 18 to 19 turbines. The old and the new layouts are shown on **Figures 1.1 and 1.2** respectively. The purpose of this chapter is to provide an update to the assessment of ecological effects of the updated scheme, in comparison to that as originally submitted. Ecological issues were not identified as being potentially significant with that previous layout, and no objection to the scheme was made by Scottish Natural Heritage or RSPB on ecological grounds.

5.1.3 The specific objectives of this work were to:

- Use the baseline survey data to assess the effects of the updated layout of the wind farm on breeding birds
- Use the baseline survey data to assess the effects of the updated layout of the wind farm on the site's ecological habitats
- Compare the effects of the updated layout with that presented in the ES, to determine if the new layout makes any material difference to the potential ecological effects of the scheme

5.1.4 Details of the study area and survey methods for the baseline work were given in the ES and are not repeated here.

5.2 EFFECTS OF THE UPDATED LAYOUT ON BREEDING BIRDS

5.2.1 The breeding bird populations found within the study area during the baseline surveys are summarised in **Table 5.1**. This Table also gives the numbers of these that were found within the potential breeding bird impact zones (taken conservatively as 300m, the greatest distance at which displacement of breeding birds has been reported (Percival 2005)).

Table 5.1 Breeding bird population estimates at Longpark, 2003.

Species	Total number of pairs in study area	Number of pairs <300m from ES turbine locations	Number of pairs <300m from updated turbine locations
Buzzard	1	1	1
Merlin [H]	(1)	0	(1)
Red Grouse [L]	2	0	0
Red-legged Partridge	3	2	3
Pheasant	22	12	19
Oystercatcher [L]	2	2	2
Lapwing [L]	15	1	1
Snipe [L]	3	1	1
Curlew [L]	7	3	4
Stock Dove [L]	1	1	1
Woodpigeon	29	26	28
Great Spotted Woodpecker	2	2	2
Skylark [M]	46	18	22
Meadow Pipit [L]	49	28	36
Pied Wagtail	1	1	1
Wren	14	11	12
Dunnock [L]	5	4	4
Robin	10	7	7
Wheatear	4	2	4
Blackbird	12	8	9
Song Thrush [M]	17	12	13
Mistle Thrush [L]	5	4	4
Blackcap	1	1	1
Chiffchaff	2	2	2
Willow Warbler [L]	23	15	16
Goldcrest [L]	14	13	13
Long-tailed Tit	1	1	1
Coal Tit	15	14	14
Blue Tit	5	3	3
Great Tit	3	1	1
Rook	50	50	50
Carrion Crow	4	4	4
Chaffinch	37	27	27
Goldfinch	4	2	2
Linnet [M]	6	5	6
Redpoll [L]	5	4	4

Superscript letter indicates sensitivity, H = high, M = medium, L = low.

5.2.2 The differences in breeding bird numbers between the original and the updated layout potential impact zones are very minor. A merlin was seen during one of the baseline surveys, though no specific evidence of breeding activity was observed, and it was concluded in the ES this was likely to refer to an individual foraging in the area but breeding elsewhere. This sighting was 380m from the nearest turbine in the original layout but 260m in the updated layout. Under current SNH

guidance merlin would be considered as high sensitivity, through their listing on Annex 1 of the EU Birds Directive and Schedule 1 of the Wildlife and Countryside Act. Given that the whole development is outside any of this species' preferred upland moorland habitat, there would not be likely to be any significant effect on this species, with either the original or the updated layout.

5.2.3 Three species breeding within the study area were identified in the ES as medium sensitivity, skylark, song thrush and linnet. There are very slightly higher populations within the potential impact zone of the updated layout, but these differences are not sufficiently large to make any difference to the conclusions reached in the ES. There would not be any significant effects on these species.

5.2.4 Differences in the numbers of low sensitivity species within the potential impacts zones were similarly small (see **Table 5.1**), and there would not be any significant effects on any of these species.

5.2.5 None of the differences in the breeding bird populations within the potential impact zone of the updated layout are of a sufficient scale to make any material difference to the assessment presented in the ES. Hence the conclusion reached in the ES there that there would not be any significant effect of the scheme on breeding birds is equally applicable to the updated layout.

5.3 EFFECTS OF THE UPDATED LAYOUT ON ECOLOGICAL HABITATS

5.3.1 **Figure 5.1** shows the ES and the updated wind farm layouts overlaid onto the baseline Phase 1 habitat map. The direct habitat losses that would result from the two layouts are summarised in **Table 5.2**, for each component of the development.

5.3.2 Generally the differences between the two layouts are minor. The updated layout has an extra turbine and so the loss to the turbines bases and crane pads is slightly greater. However the additional loss is of improved grassland of no particular ecological value. The length of access track would be slightly less with the updated layout, with no loss of the more valuable marshy grassland habitat (compared with a small – but non-significant - loss for the original layout). None of these differences would be sufficient to materially change the conclusions of the assessment presented in the ES. No significant effects were predicted then and that remains the case with the updated layout.

Table 5.2. Habitat take for the ES and the updated layout.

Habitat Take with ES Layout	Habitat Take with Updated Layout
Wind turbine bases: 17 on improved grassland, 1 on neutral grassland = 0.38 ha. improved grassland + 0.02 ha. neutral grassland	 18 on improved grassland, 1 on neutral grassland = 0.41 ha. improved grassland + 0.02 ha. neutral grassland
Crane Pads: 0.15 ha. each = 2.57 ha. improved grassland + 0.15 ha. neutral grassland	 = 2.61 ha. improved grassland + 0.26 ha. neutral grassland
Access Track (new): 7.12km (all on improved grassland except 125m of neutral grass and 165m marshy grassland). = 4.10 ha. improved grassland + 0.08 ha. neutral grassland + 0.10 ha. marshy grassland	 6.95km (all on improved grassland except 200m of neutral grass). = 4.05 ha. improved grassland + 0.12 ha. neutral grassland
Access Track (upgraded): 3.02km (all on improved grassland) = 1.81 ha.	 As ES
Switchgear Building: = 0.03 ha. (all on improved grassland)	 As ES
Borrow Pits: = 2.54 ha. (all on improved grassland)	 As ES

5.4 EFFECTS OF THE UPDATED LAYOUT ON OTHER ECOLOGICAL FEATURES

5.4.1 No other protected species were noted during the baseline surveys, though it was identified in the ES that the habitats present could potentially hold badgers, and that red squirrels could be present in the coniferous plantations (though this would be unaffected by the development). As specified in the ES, in order to check whether any badgers moved into the site prior to construction, the area within 30m of the turbine locations and the access tracks and underground cable route would be checked again prior to construction to ensure that no badger setts are damaged during construction, to comply with the 1992 Protection of Badgers Act. If any were found in this zone the turbines/tracks will be micro-sited away from such setts to ensure a 30m minimum separation. The updated layout would therefore make no material difference to the assessment for any of the other features of ecological interest within the study area.

5.5 REFERENCES

Percival, S. M. 2005. *Birds and wind farms: what are the real issues?* British Birds **98**:194-204.

6 CULTURAL HERITAGE

6.1 BACKGROUND

6.1.1 This chapter considers the effects on cultural heritage interests of the revised layout for the proposed wind farm at Longpark, Halkburn, near Stow, Scottish Borders (NGR: NT 476 423 centred). It has been undertaken by CFA Archaeology Ltd.

6.1.2 The revision to the scheme has resulted in two significant changes affecting cultural heritage issues:

- The number of turbines has been increased from 18 to 19 and several turbines have been repositioned most notably the positioning of three turbines (T17-19) in the SE of the proposed development area

- Following comments from Historic Scotland, in a letter dated 22 September 2004, the wind farm layout has been redesigned partly in order to mitigate the predicted adverse effect on the setting of Bow Castle scheduled Broch

- The revised ZVI (**Figure 2.1**) predicts an additional area of visibility 20-30km from the proposed wind farm around Hawick, well to the South of the proposed wind farm. There are no appreciable changes to the ZVI within the 10km Cultural Heritage study area.

6.2 METHODS

6.2.1 The specific objectives of the cultural heritage study for the revised scheme were to:

- review the cultural heritage baseline against the revised development layout, identify any predicted impacts on cultural heritage features arising from the construction and operation of the revised layout and, where appropriate, recommend mitigation measures to avoid, reduce or offset the predicted effects

- review the predicted adverse effect on Bow Castle broch against the revised scheme using wireframes and photomontages

- review and assess the indirect effects of the revised scheme on key receptors in the wider landscape, based on the revised ZVI map

6.2.2 The addendum assessment has been conducted in accordance with the methodology set out in Chapters 11 of the original ES. Where relevant, changes to the predicted direct and indirect effects have been identified and appropriate mitigation measures have been proposed.

6.3 VARIATION FROM ORIGINAL EFFECTS

6.3.1 Changes to the predicted direct and indirect effects have been identified and appropriate mitigation measures have been proposed. The Evaluation Criteria and the Method of Prediction of Change used in this addendum are the same as those described in Chapters 11.3 and 11.5 of the original ES.

Changes to effects on sites within the proposed development area

6.3.2 The revisions to the proposed layout of the wind farm have resulted in no new predicted effects. The layout avoids the significant archaeological features although there remain a number of places where access tracks intersect with areas of field clearance. In accordance with the original assessment, these effects are considered to be not significant.

Changes to effects on key external receptors

6.3.3 The revised wind farm layout has resulted in a reduction of the predicted adverse, indirect effect on the setting of Bow Castle scheduled Broch. The repositioning of those turbines closest to Bow Castle, including the removal of Turbine 3, has been accepted by Historic Scotland as appropriate mitigation (HS letter 18 November 2004).

6.3.4 The revised scheme layout has resulted in only minor changes to the ZVI map and there is no appreciable change to the ZVI within the 10km assessment zone. The maximum number of turbines visible from any location has increased from 18 to 19, an increase that is not considered significant.

6.3.5 There are no additional predicted indirect visual effects on any SAM, Listed Building, Conservation Area or Historic Gardens and Designed Landscape within the 10km assessment zone, arising from the revised ZVI. The increase in the number of turbines potentially visible from any location from 18 to 19 is considered to be not significant. There is therefore no change to the predicted effect on external receptors arising from the proposed revised layout.

6.4 MITIGATION

6.4.1 The revised scheme layout has resulted in no additional effects to those predicted by the original assessment. Therefore, it is considered that the mitigation proposals put forward in the original ES are sufficient to reduce and offset the predicted effects arising from the proposed development. A strategy for mitigation would be presented in a Written Scheme of Investigation (WSI) and agreed in advance of the commencement of construction with Scottish Borders Council.

6.5 SUMMARY

6.5.1 The boundary of the proposed development area remains unchanged. Therefore, there is no change to the potentially affected cultural heritage baseline within the revised proposed development area.

6.5.2 The revised turbine layout increases the number of turbines from 18 to 19 and involves the repositioning of several turbines, most notably the positioning of three turbines (T17-19) in the SE of the proposed development area. In addition the turbine originally closest to Bow Broch (Site **36**) has been repositioned. The closest turbine (T2) is now 900m to the NE of the scheduled broch. The layout has taken account of the cultural heritage baseline within the proposed development area and avoids all significant features.

6.5.3 The revised proposed layout has resulted in minor changes to the theoretical visibility of the wind farm from points in the wider landscape (shown in **Figure 2.1**). The most noticeable change is the addition of an area of visual reference around Hawick, well to the South of the proposed wind farm. The additional areas of visibility all lie between 20-30km from the proposed wind farm.

6.5.4 The revised development proposals have been assessed against the existing cultural heritage baseline. There are no predicted additional effects, therefore, the effect of the revised development on the cultural heritage resource is considered to be not significant in terms of the *Environmental Impact Assessment (Scotland) Regulations 1999*.

7 NOISE

7.1 INTRODUCTION

7.1.1 In late 2003 ACIA carried out an assessment of the background noise levels affecting residential properties neighbouring the proposed Longpark Wind Farm in the Scottish Borders. The plan at that stage was to erect 18 wind turbines each rated at approximately 2.5MW, most likely manufactured by Nordex.

7.1.2 Since the submission of the original planning application, and following discussion with statutory consultees, the original layout has been revised, as described in Chapter 1.

7.1.3 Clearly, there is a possibility that the revised turbine locations and heights might have some effect on the noise levels received at noise-sensitive locations. This chapter considers the effects and summarises the changes in noise levels expected if the wind farm were to be permitted and constructed as revised.

7.2 METHODOLOGY

7.2.1 The noise levels were recalculated using the method used in October and November 2003, which assumes hemispherical sound radiation and makes allowances for the effects of distance, terrain, and intervening barriers. The allowances made for the effects of distance, screening, ground absorption and atmospheric attenuation in the 'typical worst case' were the same as before. For reference purposes, the nearest turbines to each residential property, and their distances from the properties, are shown in **Table 7.1**.

Table 7.1 Minimum separation distances for 'original' and 'revised' layouts

Receiver location	Original layout		Revised layout	
	Nearest turbine	Distance, metres	Nearest turbine	Distance, metres
Wooplaw	T18	757	T16	831
Allanshaws	T12	1481	T4	1481
Bow Farm Cottages	T3	1612	T5	1743
Halkburn House	T3	1034	T17	979
Torsonce Mains	T1	1198	T1	1197
Bowshank	T3	1213	T5	1490
Bowland School House	T3	1826	T9	2200

7.3 ASSESSMENT

7.3.1 The proposed noise limit at each property remains unchanged, and the assumptions about background noise levels at each (for 'quiet daytime' or 'night-time' periods) also remain valid. **Table 7.2** shows the 'quiet daytime' background noise levels, and **Table 7.3** the noise limits derived from them. **Table 7.4** compares the results of the noise prediction calculations for the 'original' and 'revised' schemes at each of the noise-sensitive properties, taking into account the increased hub heights of four of the turbines and the addition of a 19th turbine. A negative 'change' value indicates a reduction in noise level.

Table 7.2 Quiet daytime background noise levels $L_{A90,10min}$ at prediction locations

wind speed ms^{-1} :	3	4	5	6	7	8	9	10
Wooplaw	21.1	24.9	28.6	32.1	35.5	38.7	41.7	44.6
Allanshaws	21.1	24.9	28.6	32.1	35.5	38.7	41.7	44.6
Bow Farm Cottages	31.7	32.1	32.9	34.0	35.4	37.2	39.3	41.8
Halkburn House	31.0	33.4	35.5	37.4	39.0	40.4	41.5	42.3
Torsonce Mains	31.7	32.1	32.9	34.0	35.4	37.2	39.3	41.8
Bowshank	31.0	33.4	35.5	37.4	39.0	40.4	41.5	42.3
Bowland School House	31.7	32.1	32.9	34.0	35.4	37.2	39.3	41.8

Table 7.3 Daytime noise limits $L_{A90,10min}$ dB

wind speed ms^{-1}	3	4	5	6	7	8	9	10
Wooplaw	35.0	35.0	35.0	37.1	40.5	43.7	46.7	49.6
Allanshaws	35.0	35.0	35.0	37.1	40.5	43.7	46.7	49.6
Bow Farm Cottages	36.7	37.1	37.9	39.0	40.4	42.2	44.3	46.8
Halkburn House	36.0	38.4	40.5	42.4	44.0	45.4	46.5	47.3
Torsonce Mains	36.7	37.1	37.9	39.0	40.4	42.2	44.3	46.8
Bowshank	36.0	38.4	40.5	42.4	44.0	45.4	46.5	47.3
Bowland School House	36.7	37.1	37.9	39.0	40.4	42.2	44.3	46.8

Table 7.4 Predicted noise levels $L_{A90,10min}$ dB

wind speed ms^{-1}	3	4	5	6	7	8	9	10
Wooplaw: Original layout	31.3	33.0	34.3	35.2	36.0	36.9	37.4	38.1
Revised layout	31.2	32.9	34.2	35.1	35.9	36.8	37.3	38.0
change	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Allanshaws: Original layout	27.7	29.4	30.7	31.6	32.4	33.3	33.8	34.5
Revised layout	27.9	29.6	30.9	31.8	32.6	33.5	34.0	34.7
change	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Bow Farm Cottages: Original layout	26.8	28.5	29.8	30.7	31.5	32.4	32.9	33.6
Revised layout	26.6	28.3	29.6	30.5	31.3	32.2	32.7	33.4
change	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
Halkburn House: Original layout	30.3	32.0	33.3	34.2	35.0	35.9	36.4	37.1
Revised layout	30.6	32.3	33.6	34.5	35.3	36.2	36.7	37.4
change	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Torsonce Mains: Original layout	28.0	29.7	31.0	31.9	32.7	33.6	34.1	34.8
Revised layout	28.0	29.7	31.0	31.9	32.7	33.6	34.1	34.8
change	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bowshank: Original layout	28.2	29.9	31.2	32.1	32.9	33.8	34.3	35.0
Revised layout	27.7	29.4	30.7	31.6	32.4	33.3	33.8	34.5
change	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5
Bowland School House: Original layout	25.6	27.3	28.6	29.5	30.3	31.2	31.7	32.4
Revised layout	25.6	27.3	28.6	29.5	30.3	31.2	31.7	32.4
change	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

7.3.2 **Table 7.5** shows a comparison of the 'new' wind farm noise levels with the daytime noise limits, to the nearest whole decibel. A negative value indicates that the turbine noise is lower than the limit.

Table 7.5 Comparison with daytime noise limits dB

wind speed ms^{-1}	3	4	5	6	7	8	9	10
Wooplaw	-4	-2	-1	-2	-5	-7	-9	-12
Allanshaws	-7	-5	-4	-5	-8	-10	-13	-15
Bow Farm Cottages	-10	-9	-8	-8	-9	-10	-12	-13
Halkburn House	-5	-6	-7	-8	-9	-9	-10	-10
Torsonce Mains	-9	-7	-7	-7	-8	-9	-10	-12
Bowshank	-8	-9	-10	-11	-12	-12	-13	-13
Bowland School House	-11	-10	-9	-10	-10	-11	-13	-14

7.4 CONCLUSIONS

7.4.1 The revised turbine locations, the increases to four of the turbine hub heights, and the addition of an additional turbine result in minimal changes in noise levels compared with the original layout. The resulting worst case noise levels have reduced in some cases, but mostly there is no significant change. The greatest increase calculated is 0.3dB, which is insignificant. The proposed wind farm is able to meet the noise limits arising from the application of the ETSU-R-97 recommendations.

7.4.2 It is therefore concluded that there would be no loss of amenity for local residents if the scheme were to be permitted, as there will be no significant environmental effects.

8 ACCESS AND TRAFFIC

8.1 INTRODUCTION

8.1.1 Due to the changes made to the wind farm layout (detailed in Chapter 1 and **Figures 1.3 and 1.4**) there will be some change to the levels of traffic identified in Chapter 5 the original ES. These changes are detailed below.

8.2 EFFECTS

8.2.1 The revised layout has several changes, shown in **Table 8.1**, compared to the original layout, which have the potential to effect the volume of site traffic during the construction phase:

Table 8.1

Original Layout	Revised Layout	Potential effect
18 turbines	19 turbines	Increased traffic entering and leaving site
18 turbine bases	19 turbine bases	Increased traffic entering and leaving site
18 crane hardstandings	19 crane hardstandings	Increased traffic within site
7.12 km of access track	6.95 km of access track	Decreased traffic within site

8.2.2 The increase in the number of turbines from 18 to 19 will have the following effects which will increase the volume of traffic entering and leaving the site:

- Additional trailer lorry deliveries of turbine towers
- Additional trailer lorry deliveries of turbine blades
- Additional concrete mixer deliveries

8.2.3 The 60 metre turbine towers are delivered in two sections. The additional turbine in the revised layout will therefore create two additional return journeys to the site.

8.2.4 The turbine blades are likely to be delivered individually. The additional turbine in the revised layout will therefore create three additional return journeys to the site.

8.2.5 The cement mixers and aggregate deliveries required for an additional turbine would result in an additional 54 return journeys.

8.2.6 The increase in the number of crane hardstandings from 18 to 19 will not cause an increase in the volume of traffic entering and leaving the site, since material for the hardstandings will be sourced from on-site borrow pits.

8.2.7 The reduction in the length of access track will not cause a decrease in the volume of traffic entering and leaving the site, since material for the hardstandings will be sourced from on-site borrow pits.

8.2.8 The total anticipated return vehicle movements during the construction period are shown in **Table 8.2**.

Table 8.2 Anticipated vehicle movements during construction period

	Number of return vehicle movements in each month														
Month number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	***TOTAL***
Articulated trailer lorries															
Site de/mobilisation	10	10			15			10				4	5	25	**79**
Cables				10	15										**25**
Foundation reinforcement	5	20	10	5											**40**
Towers								10	20	20	10				**60**
Nacelles								5	10	3					**18**
Blades								10	20	20	5				**55**
Transformer				10	10										**20**
Switchgear House	10		10			25	25								**70**
Concrete mixers /aggregate delivery															
Foundations		343	343	343											**1029**
Cranes															
Main crane							1								**1**
Crane ballast							2								**2**
150t Auxiliary crane	1						2								**3**
TOTAL	**26**	**355**	**345**	**350**	**40**	**25**	**30**	**35**	**50**	**43**	**15**	**4**	**5**	**25**	**1402**

8.3 SIGNIFICANCE OF EFFECTS

8.3.1 JMP Consultants Limited act as consultants for the Scottish Executive Trunk Road Network Management Division (TRNMD). In their letter to Scottish Borders Council (22 March 2004) they state that:

"The proposed development represents an intensification of use of this site and will increase associated traffic movement, particularly during the construction phase."

8.3.2 When considering the number of anticipated return vehicle trips over the 14 month construction period, totalling 1348 for the original wind farm layout, JMP Consultants Limited in the same letter also state:

"However, the percentage increase in traffic is such that the proposed development is likely to have minimal environmental impact on the trunk road network."

8.3.3 Construction of the revised layout would result in 1402 anticipated return vehicle trips over the 14 month construction period, an increase of 54.

8.4 MITIGATION

8.4.1 The impacts of construction traffic would be mitigated through adoption of the following measures:

- The use of on-site borrow pits for the sourcing of material will very substantially reduce the volume of traffic entering and leaving the site which would have resulted had material been sourced from an external quarry

- All construction vehicle movements, on and off site, will be at times to be agreed with the local planning authority

- The erection of statutory warning road signs, traffic lights and temporary lighting at the site entrance and leading up to the site entrance on the A7 will be agreed with the local authority highways department and TRNMD prior to the commencement of any construction works

- Vehicles transporting long loads will be subject to movement orders and will be escorted onto the site as required by the local police

- The operation of wheel washers would be compulsory for all vehicles exiting the site to ensure mud and debris is not deposited on the carriageway

- Only one site entrance from the A7 is to be used

8.5 CONCLUSIONS

8.5.1 It can be concluded that 1402 vehicle trips over 14 months, compared to 1348, would have no additional significant impact on the percentage increase in traffic on the trunk road network.

8.5.2 The final route for transportation of turbine components along the Trunk Road Network will be agreed with TRNMB, following liaison with the South East Unit Area Manager, as recommended by JMP Consultants Limited.

9 ELECTRICITY PRODUCTION

9.1 INTRODUCTION

9.1.1 The revised layout results in an increased number of turbines, from 18 to 19 and with a 10 metre increase in height of four of the turbines. The installed capacity of the proposed wind farm has therefore increased from 45 to 47.5 megawatts.

9.1.2 This will result in different levels of electricity generation to that given in Chapter 3 of the original ES and, consequently, differences to contributions towards targets to reduce greenhouse gas emissions.

9.2 ELECTRICITY PRODUCTION

9.2.1 The predicted site output per year (A) is calculated as follows:

A = C x 0.3 x 8760

where:

C is the rated capacity of the wind farm in MW, being the amount of electricity produced by the wind farm when each wind turbine is operating at full power. In the case of the proposed development, assuming that eighteen Nordex N80 wind turbines are utilised, this is 47.5MW.

0.3 is a constant, the capacity factor, which takes into account the intermittent nature of the wind, the availability of the wind turbines and array losses.

8760 is the number of hours in a year

9.2.2 For the proposed development, this results in a predicted output of:

47.5 x 0.3 x 8760 = **124, 830** megawatt hour s per year

9.2.3 The average annual UK household electricity consumption is **4600** kilowatt hours[1], or 4.6 megawatt hours.

9.2.4 The proposed development would therefore generate, on average, enough electricity to meet the needs of 124, 830/ 4600 = **27,130** homes.

[1] Calculated using data from the Digest of United Kingdom Energy Statistics 2005 and confirmed by DTI

9.3 REDUCTION OF GREENHOUSE GAS EMISSIONS

9.3.1 According to the Digest of United Kingdom Energy Statistics 2005, it is estimated that carbon dioxide (CO_2) emissions from power stations accounted for 30% of the UK's total CO_2 emissions in 2004.

9.3.2 For a given level of national electricity demand, every kilowatt-hour (KWh) produced from a non-polluting source such as a wind turbine replaces one produced by a fossil fuel power station.

9.3.3 The CO_2 emissions saved by using wind power instead of coal-fired power stations has been under debate over the last fifteen years as the energy mix has changed and cleaner fossil fuel technologies have been introduced.

9.3.4 A number of organisations including Ofgem, the DTI and the British Wind Energy Association (BWEA) have provided various figures for CO_2 emission saving over the last decade. In 1999 the New and Renewable Energy Prospects Paper published by the DTI included an annexe setting out the life cycle emissions of a range of generating technologies; a CO_2 average for the energy mix from 1993 was included as being 638g per kWh. The savings of a particular renewable energy technology was intended to be placed against that average to provide the CO_2 savings.

9.3.5 A more recent CO_2 savings figure of 430g/kWh has been given by Ofgem for wind against the current energy mix. However, this figure needs to be interpreted in the context of the current energy mix. The current energy mix includes about 17% nuclear which is allocated no emissions of CO_2 in most calculations. Since nuclear is the essential baseload plant which wind is never likely to displace, the actual emissions savings against the fossil fuels that wind will be displacing would be around 17% higher than the figure above, at about 520g/kWh.

9.3.6 The British Wind Energy Association (BWEA) has also produced its own figure for CO_2 emissions savings of 860g/kWh.

9.3.7 In order to best predict the CO_2 emission savings from the development, a range of figures has been used from a minimum of 520g/kWh as adapted from the Ofgem figure to a maximum of 860g/kWh as quoted by the BWEA. The SO_2 and NO_2 emission saving figures have also been provided by the BWEA. The figures used to predict the emission saving from the development are as follows:

CO_2	520 - 860	grammes per kWh
SO_2	10	grammes per kWh
NO_x	3	grammes per kWh

9.3.8 It should be noted that the maximum figure in the CO_2 range is lower than the 1999 range of figures arrived at by the Parliamentary Office of Science and Technology and which were used in the original Environmental Statement in February 2004. Their range of 936g/kWh – 1079g/kWh has not been adapted to the changes in the energy mix over the past 5 years or the reduction in gaseous emissions from conventional power sources due to the increase in efficiency and the use of pollution abatement equipment.

9.3.9 Since the proposed scheme would generate approximately 124,830 megawatt hours per year, using the above figures it can be calculated that it would result in the following reductions in levels of atmospheric emissions:

CO_2	64, 912 - 107, 354	tonnes per annum
SO_2	1248	tonnes per annum
NO_x	374	tonnes per annum

9.3.10 It is estimated that the energy input required to manufacture and erect a wind turbine would be recovered from its output in approximately six months.

9.3.11 The proposed Longpark wind farm would make a significant contribution to the reduction of atmospheric pollution.

10 PRIVATE WATER SUPPLIES

10.1 INTRODUCTION

10.1.1 EnviroCentre were commissioned by Wind Prospect Ltd to undertake a desk based assessment of the potential impacts of the proposed Longpark Wind Farm on private water supplies in the surrounding area.

10.1.2 The report is structured to initially provide an overview of the present conditions at and around the proposed site. The private water supplies in the area are then identified and assessed in relation to the proposed development. An assessment of the potential impacts on the private water supplies is undertaken along with proposing suitable mitigation measures to reduce these risks.

10.2 SITE DESCRIPTION AND BASELINE CONDITIONS

Site Description

10.2.1 The proposed Longpark Wind Farm lies approximately 5km north of Galashiels in the Scottish Borders, centred on National Grid Reference NT 477 422 as shown in **Figure 8.1**. The proposals extend to 19 wind turbines with associated access tracks and switchgear. The site ranges in elevation from 280mAOD (Above Ordnance Datum) to 370mAOD and the surrounding landscape is characterised by rolling hills with the land use being upland grazing and some woodland.

Catchment draining from wind farm site

10.2.2 The proposed wind farm lies predominantly within the catchment of the Halk Burn which drains southwards to the Gala Water as shown in **Figure 8.2**. The site also drains to two tributaries that flow eastwards to the Allan Water, which then flows southwards to the River Tweed.

Underlying geology

10.2.3 The solid geology comprises sedimentary rocks of predominantly Silurian Llandovery (greywackes)[2], while the drift cover across the site is predominantly boulder clay and moranic drift, which will tend to thin across the higher ground[3].

[2] British Geological Survey (2001). Solid Geology Map, UK North Sheet, 1:625,000 scale, 4th Edition.
[3] British Geological Survey (1977). Geological Survey Ten Mile Map, North Sheet, 1st Edition.

Underlying hydrogeology

10.2.4 The hydrogeological map of Scotland[4] identifies the site area as being underlain by impermeable rocks, generally without groundwater except at shallow depths. Groundwater will generally be confined to near surface cracks and joints. Any springs are likely to produce weakly mineralised water.

Baseline water quality

10.2.5 There are no records available from SEPA's website detailing the water quality of the Halk Burn or any of the other tributaries draining from areas that may be impacted, however, the surrounding watercourses that are monitored are of good quality (SEPA Water Quality Classification A2) as shown in **Figure 8.3**.

10.2.6 The water quality has not been tested as part of this investigation, however, as the water resources are already developed in this area, it is not believed that there are issues with the existing water quality. The catchment feeding the supply is mainly open ground with some woodland. The hills are used for grazing livestock, so there may be a risk of occasional bacteriological contamination, which is common to private water supplies. This risk will depend upon a range of factors including weather conditions, presence of livestock, security around the source, storage within systems and any treatment present.

10.3 PRIVATE WATER SUPPLIES

Information review

10.3.1 The private water supplies in the catchment area containing the proposed wind farm have been identified through contacting local farms and consulting with the Environmental Health Department of the Scottish Borders Council at Galashiels. Three main private water supplies have been identified in the surface water catchments draining from the site. These are at Wooplaw, Halkburn and Whitelee, as shown in **Figures 8.1 and 8.2**, and described in more detail within the following sections.

[4] British Geological Survey (1988). Hydrogeological Map of Scotland.

Wooplaw

10.3.2 This supply is fed from a spring in the hillside above the farm and is operated by Mr Moffat, Wooplaw Farm. It serves three houses and the farm. It reportedly does not provide a large volume of water, however, the supply is constant and reliable, with no records of the source becoming dry. It provides water to feeding troughs throughout the farm, although this demand is reduced during dry summer periods in line with the capacity available.

10.3.3 This supply is at an elevation of 350mAOD, approximately 300m from the site boundary and 470m from the nearest turbine (T12). Turbines T8 and T12 at approximately 360mAOD, lie above the elevation of the supply, and although in an adjoining catchment to the wind farm, there may be connectivity between catchments in providing water for the source of the spring.

Halkburn

10.3.4 This supply is fed from a spring on the hillside above Halkburn Farm and is operated by Mr Musgrove, Halkburn Farm. The supply serves four houses and the farm (three families), and has been in operation since at least 1925. The quantity of water within the supply has not historically been an issue, with sufficient water being available through dry summer periods and has been upgraded by the present owners.

10.3.5 This supply is on the edge of the site boundary and approximately 330m from the nearest turbine (T13). This turbine is at a similar elevation, however, it lies in a separate sub catchment that flows to the west, away from the supply. There is another turbine (T17) 400m up gradient within the same sub catchment as the supply, although it is approximately 50m higher in elevation.

Whitelee

10.3.6 This supply is spring fed and lies within the catchment of the Halk Burn on the slopes of Caitha Hill. This supply is approximately 2km away from the site and is outwith the drainage paths from the site. There is unlikely to be any direct connection between the site and this supply.

Summary of Water Supplies

10.3.7 The three water supplies are summarised in **Table 8.1** below. These show that the supply at Wooplaw is the most sensitive to any possible change due to its small catchment and high elevation. Halkburn is closest to the turbines at around 330m, and although the closest turbine

(T13) is at a similar level, it lies within a separate sub catchment of the Halk Burn. Whitelee is considered to be at a distance far enough away from the site for any impacts to be negligible.

Table 8.1: Summary of Private Water Supplies in Relation to Proposed Wind Farm

Private Water Supply			Details of Nearest Turbine from Proposed Wind Farm		
Location	Source	Approximate Level (mAOD)	Nearest Turbine Number	Distance from Supply (m)	Approximate Level (mAOD)
1. Wooplaw	Spring	350	T8	660	360
			T12	470	360
2. Halkburn	Spring	290	T13	330	290
			T17	400	340
3. Whitelee	Spring	230	T13	2,000	290
			T17	2,000	340

10.4 POTENTIAL IMPACTS AND MITIGATION MEASURES

Risks to Water Resources

10.4.1 The main risks from the development will be from any reduction in the quantity or quality of water available. None of the identified private water supplies in the area are directly fed from main burns, so the main risks to these sources will be from risks to overland flows or sub surface flows, rather than defined watercourses.

Quantity of Water

10.4.2 The quantity of water reaching private water supplies can be impacted through the following main ways:

- change in direction of surface runoff through construction activities and associated drainage
- alteration to the ground conditions causing changes in the sub-surface flow of water

10.4.3 The activities that can cause these to occur are:

- Formation of access tracks and drainage
- Formation of turbine bases and working areas
- Excavation of borrow pits

10.4.4 The main mitigation measures that will be used to minimise the risk of these activities altering the quantity of water are:

- Ensure drainage from access tracks follow closely the existing surface water drainage pattern
- Ensure adequate cross camber on roads to prevent road being used as drainage channel
- Minimise excavations below the water table where possible
- Where excavation below water table has to take place, groundwater should be pumped and treated prior to discharge back to surrounding land

Quality of Water

10.4.5 The quality of water can be impacted by the introduction of the following into the water:

- Sediment – fines can enter the sub surface zone and clog sub surface flowpaths
- Oils/fuel – List I substances under the Groundwater Regulations 1998
- Cement/concrete – alkaline nature of concrete can be harmful

10.4.6 The risk of these entering the water will be highest during the construction phase. This risk will decrease to a low level during operation of the site. The mitigation measures that will be undertaken are as follows:

Sediment

- Adopt good site construction practice
- Use of roadside drainage ditches with frequent offlets to buffer areas or silt traps
- Avoid fast flowing surface water flowing through open excavations wherever possible

Cement/Concrete

- Ensure areas to be poured are dry and pump water away if required
- All shutters to be securely sealed to prevent egress of concrete
- Any storage of materials on site to be on low permeability hardstanding

Oils and Fuels

- Documented emergency procedure for event of accidental spillage, with particular emphasis on private water supplies
- Store oils and fuels in bunded area of low permeability hardstanding
- Refuelling to be undertaken using drip trays at all times and within site compound where possible
- Regular maintenance of plant/equipment/vehicles to reduce risk of leakage
- Bunds on external transformers to prevent leakage of oils and fuels

10.5 ASSESSMENT OF POTENTIAL EFFECTS

10.5.1 **Table 8.2** assesses the potential effects of the development on the quantity and quality of domestic water supplies.

Table 8.2 Assessment of potential effects

Phase	Potential Effect	Duration	Magnitude	Mitigation	Residual Impact (Nature)
Construction	Reduction in water quantity.	Short term	Moderate	Minimise excavations below the water table where possible. Where excavation below water table has to take place, groundwater should be pumped and treated prior to discharge back to surrounding land. Monitor performance of private water supplies. Make provision for alternative water supply if required.	Minor (Adverse)
		Long term	Moderate	Ensure drainage from access tracks follow closely the existing surface water drainage pattern. Ensure adequate cross camber on roads to prevent road being used as drainage channel.	Minor (Adverse)
	Reduction in water quality - sediment	Short term	Moderate	Adopt good site construction practice. Use of roadside drainage ditches with frequent offlets to buffer areas or silt traps. Avoid fast flowing surface water flowing through open excavations wherever possible.	Minor (Adverse)
	Reduction in water quality - cement / concrete	Short term	Minor	Ensure areas to be poured are dry and pump water away if required. All shutters to be securely sealed to prevent egress of concrete. Any storage of materials on site to be on low permeability hardstanding.	Minor (Adverse)
	Reduction in water quality –oils and fuels	Short term	Minor	Documented emergency procedure for event of accidental spillage, with particular emphasis on private water supplies. Store oils and fuels in bunded area of low permeability hardstanding. Refuelling to be undertaken using drip trays at all times and within site compound where possible. Regular maintenance of plant/equipment/vehicles to reduce risk of leakage. Bunds on external transformers to prevent leakage of oils and fuels.	Minor (Adverse)
Operational	Reduction in water quantity and quality	Medium-long term	Minor	Maintenance of roadside drainage and camber on roads. Monitor performance of private water supplies. Documented emergency procedure for event of accidental spillage, with particular emphasis on private water supplies.	Minor (Adverse)
Decommissioning	Reduction in water quality	Short-term	Minor	As per construction phase.	Minor (Adverse)

10.6 SUMMARY

10.6.1 Three private water supplies have been identified in the catchments in and immediately adjacent to the proposed wind farm. Of these, the supply to Wooplaw is the most sensitive to change due to its elevated position and smaller catchment. The supply at Halkburn is less sensitive, while the Whitelee supply is far enough removed for the risk to be negligible.

10.6.2 With best practice construction techniques and design incorporating the proposed mitigation measures, the risk to water quality and quantity in the supplies will be minimal.

10.6.3 This assessment will be reviewed if further information on local ground conditions or any other relevant information becomes available as the proposals progress.

10.6.4 The water supplies at Wooplaw and Halkburn would be monitored during construction to ensure that if any changes occur, they are detected at an early stage. Also, provision would be made for a temporary water supply to be made available if the quality or quantity of the supply is directly impacted by the construction.

11 SHADOW FLICKER

11.1 POLICY CONTEXT

11.1.1 PAN 45 (Section 64) states the following with regard to shadow flicker:

> *Under certain combinations of geographical position, time of day and time of year, the sun may pass behind the rotor and cast a shadow over neighbouring properties. When the blades rotate, the shadow flicks on and off; the effect is known as "shadow flicker". It occurs only within buildings where the flicker appears through a narrow window opening. The seasonal duration of this effect can be calculated from the geometry of the machine and the latitude of the potential site. Where this could be a problem, developers should provide calculations to quantify the effect. In most cases however, where separation is provided between wind turbines and nearby dwellings (as a general rule 10 rotor diameters), "shadow flicker" should not be a problem."*

11.1.2 Furthermore, the Companion Guide for PPS 22: Planning for Renewable Energy (Technical Annex: Wind; Section 76) states:

> *"Shadow flicker can be mitigated by siting wind turbines at sufficient distance from residences likely to be affected. Flicker effects have been proven to occur only within ten rotor diameters of a turbine. Therefore if the turbine has 80m diameter blades, the potential shadow flicker effect could be felt up to 800m from a turbine."*

11.1.3 Additionally, only properties within 130 degrees either side of north, relative to the turbines, can be affected in the UK.

11.2 ASSESSMENT

11.2.1 There are no residential properties within 800 metres of a turbine and within 130 degrees either side of north relative to a turbine in the revised layout.

11.2.2 It is therefore concluded that no residents within the vicinity of the turbines would experience a nuisance from shadow flicker.

11.2.3 If, for any unexpected reason, any property was found to be experiencing a nuisance from shadow flicker during operation of the wind farm, the offending turbine would be shut down for the period during which shadow flicker nuisance could occur.

12 TOURISM AND RECREATION

12.1 INTRODUCTION

12.1.1 This chapter assesses the potential effects of the proposed wind farm on tourism and recreation. It examines local visitor attractions and tourism issues associated with the local area.

12.1.2 It does not consider the visual impact of the wind farm on visitors to the area, which is assessed in Chapter 8 of the Environmental Statement.

12.2 BASELINE

12.2.1 The tourism sector is an important contributor to the region's economic performance. In 2002 (the most recent year for which Scottish Borders Council holds full records), UK residents took some 0.5 million tourist trips to the Scottish Borders and spent a total of 1.7million bednights and £82 million in the area.

12.2.2 **Table 12.1** shows the distribution of tourism in Scotland in 2002. It shows that the Scottish Borders received the fewest number of visits and the second lowest level of tourist spending from UK residents compared to all other areas of Scotland. Scottish Borders also received the joint lowest number of visits from overseas residents.

12.2.3 According to the *2004 Visitor Attraction Monitor* published by VistScotland, there are 27 'visitor attractions' in the Scottish Borders on which tourism is focussed, in which a visitor attraction is described as:

> '*…an attraction where the main purpose is sightseeing. The attraction must be a permanent established excursion destination, a primary purpose of which is to allow access for entertainment, interest, or education; rather than being primarily a retail outlet or a venue for sporting, theatrical, or film performances. It must be open to the public, without prior booking, for published periods each year, and should be capable of attracting day visitors or tourists as well as local residents. In addition, the attraction must be a single business, under a single management, so that it is capable of answering the economic questions on revenue, employment, etc.*'

12.2.4 **Table 12.2** identifies these visitor attractions and shows their distance from the proposed wind farm site and whether wind turbines might be visible.

12.2.5 There are no known rights of way within the proposed wind farm site. The Scottish Rights of Way and Access Society (ScotWays) have confirmed that the National Catalogue of Rights of Way map does not show any rights of way on either Bow Farm or Halkburn Farm and this has also been confirmed by the Scottish Borders Council Access Officer.

12.2.6 There are no National Cycle Routes near to the proposed wind farm. The nearest is National Cycle Route 1 which at its nearest is approximately 7km south of the proposed wind farm.

12.2.7 The Southern Upland Way, at its nearest point to the wind farm, lies approximately 5km to the east.

12.2.8 Other areas within the Scottish Borders are popular for hill walking, notably the Moorfoot Hills and the Lammermuir Hills.

Table 12.1 Distribution of tourism in Scotland, 2002.

Area	UK Residents		Overseas Residents	
	Trips (Millions)	Spending (£ Millions)	Visits (Millions)	Spending (£ Millions)
Aberdeen & Grampian	1.8	399	0.14	46
Angus & City of Dundee	0.6	78	0.05	16
Argyll, The Isles, Loch Lomond, Stirling and the Trossachs	2.4	431	0.21	52
Ayrshire & Arran	1.0	150	0.07	27
Dumfries & Galloway	0.9	175	0.04	7
Edinburgh & Lothians	4.0	798	0.87	284
- Edinburgh	3.5	754	0.85	267
Greater Glasgow & Clyde Valley	3.3	617	0.46	174
- Glasgow	3.0	580	0.40	148
Highlands of Scotland	2.4	475	0.36	96
Kingdom of Fife	0.7	128	0.09	39
Perthshire	1.1	192	0.09	29
Scottish Borders	0.5	82	0.04	9
Scotland Unspecified	-	-	0.04	19
TOTAL SCOTLAND	18.5	3,682	1.58	806

Source: Statistics on Tourism and Research (www.staruk.com), quoting United Kingdom Tourism Survey (sponsored by the UK statutory tourist boards, including VisitScotland) and International Passenger Survey (Office of National Statistics).

Table 12.2 Visitor Attractions in the Scottish Borders

Visitor attraction	Grid reference	Distance from Longpark (km)	Number of turbines visible**
Robert Clapperton Daylight Photographic Studio, Selkirk	347300, 628800	13.4	1-4
Mertoun Gardens, Melrose	361800, 631700	17.6	None
Ferniehurst Castle, Jedburgh	365400, 618100	29.9	None
Liddesdale Heritage Centre & Museum, Newcastleton	348100, 587200	55	None*
Robert Smail's Printing Works, Innerleithen	333200, 636700	15.5	None
Ayton Castle, Berwickshire	393000, 661500	49.3	None*
Eyemouth Museum, Eyemouth	394500, 664300	51.8	None*
The Three Hills Roman Heritage Centre, Melrose	354915, 634230	10.8	None
Trimontium Exhibition, Melrose	354740, 633970	10.9	1-4
Neidpath Castle, Peeblesshire	323600, 640200	17.7	None
Hermitage Castle, Roxburghshire	319800, 596300	46	None
Smailholm Tower, Roxburghshire	363700, 634600	17.7	None
Mellerstain House, Berwickshire	364800, 639200	17.4	None
Manderston, Duns	381200, 655200	36	None*
Thirlestane Castle, Lauder	353400, 647900	8.1	1-4
Jedburgh Castle Jail and Museum, Jedburgh	364820, 620200	27.9	None
Bowhill House and Country Park, Selkirk	342700, 628000	15	None
Harmony Garden's, Melrose	354500, 634400	10.4	None
Mary Queen of Scot's Visitor Centre, Jedburgh	365200, 620700	27.7	None
Jedforest Deer & Farm Park, Jedburgh	367400, 613300	35	None*
Priorwood Garden, Borders	354800, 634100	10.8	None
Paxton House, nr Berwick	393200, 651900	46.6	None*
Dawyck Botanic Garden, nr Peebles	316200, 635200	32.2	None
Dryburgh Abbey, Roxburghshire	359100, 631600	15.6	None
Jedburgh Abbey, Roxburghshire	364500, 619700	28.1	None
Melrose Abbey, Roxburghshire	355400, 634800	10.7	None
Floors Castle, Kelso	371100, 634100	24.8	None

*turbines were assumed to be not visible at distances >30km

** visibility determined according to ZVI, Figure 2.1

12.3 RECENT SURVEYS

12.3.1 Two separate surveys in 2002 have looked at the effect of wind farms on tourism in Scotland.

12.3.2 The Scottish Renewables Forum and the British Wind Energy Association commissioned a MORI poll in 2002[1]. When asked whether the presence of wind farms made any difference to the likelihood of them visiting an area, 91% of respondents maintained that it made no difference. Furthermore, only 8% felt that the existence of wind farms in an area had a negative effect.

12.3.3 A second survey carried out by VisitScotland in 2002[2] found that 75% of visitors were either positive or neutral towards wind farm development. Of those visitors who had seen wind farms, 63% said it would make no difference to their decision to holiday in Scotland if the number of wind farms were to increase.

12.4 ASSESSMENT OF EFFECTS

Visitor numbers

12.4.1 As shown in **Table 12.1**, the Scottish Borders receives very few visitors compared to other areas of Scotland. The recent surveys show that, amongst visitors, very few are of the opinion that wind farms have a negative effect on an area and that it is unlikely that wind farm development would impact on their decision to visit an area.

Visitor Attractions

12.4.2 Only three visitor attractions within 30km of the proposed wind farm were found to experience theoretical visibility of turbines (**Table 12.2**). Two of these (Robert Clapperton Daylight Photographic Studio, Selkirk and Trimontium Exhibition, Melrose) would in reality be screened from the wind farm by surrounding buildings. The visual effects on the third attraction, Thirlestane Castle, is assessed in Chapter 11 of the Environmental Statement.

Walking and Cycling

12.4.3 The Southern Upland Way and National Cycle Route 1 are the two main definable routes likely to be used by walkers and cyclists.

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[1] Source: *Tourist attitudes towards wind farms* (MORI Scotland, 2002)
[2] Source: *Investigation into the potential impact of wind farms on tourism in Scotland* (VistScotland, 2002)

12.4.4 With regard to National Cycle Route 1, at a distance of greater than 7km from the wind farm site and visibly screened from the wind farm by it being routed primarily on valley floors, it is considered that the impact of the development on users of this route would be minimal.

12.4.5 According to a report[1] by the Crichton Tourism Research Centre, commissioned by the Southern Uplands Partnership in 2004, into the current usership of the Southern Upland Way, the route was found to be "underutilised and as a result does not impact significantly on the economy of southern Scotland."

12.4.6 Nearly half of business respondents (44.2%) suggested that the Southern Upland Way provided no income for their business and 85% thought that the contribution was less than 10%.

12.4.7 The Moorfoot Hills and the Lammermuir Hills remain a popular area for hill walkers, although it is difficult to determine their level of usage. However, considering the findings of the recent surveys referred to previously, it can be determined that the proposed wind farm is unlikely to be seen negatively by these users.

12.4.8 Although there are no rights of way within the site, the Land Reform (Scotland) Act 2003 gives the public the right of responsible access to the site. It would be necessary, during the construction phase of the project only, to exclude the public from the site, in the interests of health and safety. However, this exclusion would be kept to a minimum period of time.

12.5 CONCLUSIONS

12.5.1 As shown in **Table 12.1**, the Scottish Borders receives very few visitors compared to other areas of Scotland. The recent surveys show that, amongst visitors, very few are of the opinion that wind farms have a negative effect on an area and that it is unlikely that wind farm development would impact on their decision to visit an area.

12.5.2 Turbines would be visible from only one visitor attraction and there is no evidence to suggest that this would have a negative impact.

12.5.3 Impacts on usage of National Cycle Route 1 and the Southern Upland Way would not be significant, especially considering the latter is held to be underutilised and of low importance to the local economy.

[1] Source: *Southern Upland Way user survey* (Southern Uplands Partnership, 2004)

12.5.4 Impacts on the number of people visiting the area to pursue hill walking is unlikely to be significant since recent surveys show that visitors are unlikely to be deterred from visiting an area due to the presence of wind farms.

12.5.5 Public rights of access to the site, under the Land Reform (Scotland) Act 2003, would only be restricted during the construction phase of the project, in the interests of health and safety.

APPENDIX A

A - PROPERTIES WITH POTENTIAL CLEAR DIRECT OR OBLIQUE VIEWS OF TURBINES
B - PROPERTIES WITH POTENTIAL PARTIAL/SCREENED DIRECT OR OBLIQUE VIEWS OF TURBINES
C - PROPERTIES WITH POTENTIAL SLIGHT/NEGLIGIBLE/NO VIEWS OF TURBINES

ID	Address	Town	Post code	Easting	Northing	Status
1	231 WOOD STREET	GALASHIELS	TD1 1RB	347511.3	637322.9	B
2	233 WOOD STREET	GALASHIELS	TD1 1RB	347511.3	637322.9	B
3	243 WOOD STREET	GALASHIELS	TD1 1RB	347472.3	637348.2	B
4	245 WOOD STREET	GALASHIELS	TD1 1RB	347472.3	637348.2	B
5	247 WOOD STREET	GALASHIELS	TD1 1RB	347459.3	637355.4	B
6	249 WOOD STREET	GALASHIELS	TD1 1RB	347453.6	637359.6	B
7	251 WOOD STREET	GALASHIELS	TD1 1RB	347422.4	637373.3	B
8	253 WOOD STREET	GALASHIELS	TD1 1RB	347382.3	637401.9	B
9	255 WOOD STREET	GALASHIELS	TD1 1RB	347376.8	637405.9	B
10	257 WOOD STREET	GALASHIELS	TD1 1RB	347363.9	637411.6	B
11	259 WOOD STREET	GALASHIELS	TD1 1RB	347357.9	637416.2	B
12	261 WOOD STREET	GALASHIELS	TD1 1RB	347345.7	637423.1	B
13	263 WOOD STREET	GALASHIELS	TD1 1RB	347340.7	637425.9	B
14	265 WOOD STREET	GALASHIELS	TD1 1RB	347294.6	637453.7	B
15	267 WOOD STREET	GALASHIELS	TD1 1RB	347288.8	637456.5	B
16	11 WESTWOOD GARDENS	GALASHIELS	TD1 1RD	3475856	6372069	B
17	12 WESTWOOD GARDENS	GALASHIELS	TD1 1RD	3475667	6372174	C
18	MOSSILEE FARM HOUSE	GALASHIELS	TD1 1TE	3480164	6359190	C
19	STANTLING CRAIGS	GALASHIELS	TD1 1TN	3432359	6391604	B
22	BOWLAND HOUSE	GALASHIELS	TD1 1UJ	3446752	6399342	C
23	CRAIGNEUK	GALASHIELS	TD1 1UQ	3464041	6389799	B
25	BEN BHRAGGIE MEIGLE HILL	GALASHIELS	TD1 1TG	3476788	6366080	B
27	1 TORWOODLEE MAINS COTTAGE	GALASHIELS	TD1 1UB	3466525	6378228	C
28	2 TORWOODLEE MAINS COTTAGE	GALASHIELS	TD1 1UB	3466613	6378306	C
29	3 TORWOODLEE MAINS COTTAGE	GALASHIELS	TD1 1UB	3466781	6378352	C
30	4 TORWOODLEE MAINS COTTAGE	GALASHIELS	TD1 1UB	3466870	6378401	C
31	BIRNHAM BALNAKIEL	GALASHIELS	TD1 1TQ	3471342	6375179	C
32	1 BALNAKIEL COTTAGES	GALASHIELS	TD1 1TQ	3472142	6375405	B
33	2 BALNAKIEL COTTAGES	GALASHIELS	TD1 1TQ	3472142	6375405	B
34	DANERNE BALNAKIEL	GALASHIELS	TD1 1TQ	3472088	6375044	C
35	OSTRODA BALNAKIEL	GALASHIELS	TD1 1TQ	3472436	6374165	B
36	BALNAKIEL LODGE	GALASHIELS	TD1 1TQ	3472337	6375315	B
37	TORVIEW BALNAKIEL	GALASHIELS	TD1 1TQ	3472003	6375060	C
38	MORLICH BALNAKIEL	GALASHIELS	TD1 1TQ	3471804	6375119	C
40	LOWER FARMHOUSE TORWOODLEE MAINS	GALASHIELS	TD1 1UB	3465829	6378356	C
41	16 WESTWOOD GARDENS	GALASHIELS	TD1 1RD	3476053	6371930	B
42	BALNAKIEL HOUSE	GALASHIELS	TD1 1TQ	3471444	6375615	B
43	UPPER FARMHOUSE TORWOODLEE MAINS	GALASHIELS	TD1 1UB	3465200	6377751	C
46	20 LAUDER ROAD	STOW	TD1 2QW	3460755	6447305	C
47	22 LAUDER ROAD	STOW	TD1 2QW	3460521	6447477	C
48	24 LAUDER ROAD	STOW	TD1 2QW	3460481	6447583	C

49	26 LAUDER ROAD	STOW	TD1 2QW	3460411	6447774	C
50	28 LAUDER ROAD	STOW	TD1 2QW	3460409	6447920	C
51	14 GALASHIELS ROAD	STOW	TD1 2QY	3452526	6452583	C
52	16 GALASHIELS ROAD	STOW	TD1 2QY	3452750	6452514	C
53	18 GALASHIELS ROAD	STOW	TD1 2QY	3452859	6452423	C
54	20 GALASHIELS ROAD	STOW	TD1 2QY	3453011	6452413	C
55	22 GALASHIELS ROAD	STOW	TD1 2QY	3453497	6452034	C
57	132 GALASHIELS ROAD	STOW	TD1 2RA	3456637	6451097	C
58	142 GALASHIELS ROAD	STOW	TD1 2RA	3456965	6450789	C
59	146 GALASHIELS ROAD	STOW	TD1 2RA	3457067	6450722	C
60	166 GALASHIELS ROAD	STOW	TD1 2RA	3457686	6450035	C
61	139 GALASHIELS ROAD	STOW	TD1 2RE	3457075	6451175	C
62	141 GALASHIELS ROAD	STOW	TD1 2RE	3457094	6451095	C
63	143 GALASHIELS ROAD	STOW	TD1 2RE	3457263	6451051	C
64	149 GALASHIELS ROAD	STOW	TD1 2RE	3457537	6450643	C
65	151 GALASHIELS ROAD	STOW	TD1 2RE	3457588	6450584	C
66	155 GALASHIELS ROAD	STOW	TD1 2RE	3457717	6450485	C
67	171 GALASHIELS ROAD	STOW	TD1 2RE	3458030	6449982	C
68	173 GALASHIELS ROAD	STOW	TD1 2RE	3458219	6449860	C
69	179 GALASHIELS ROAD	STOW	TD1 2RE	3458662	6449460	C
70	193 GALASHIELS ROAD	STOW	TD1 2RE	3458915	6448787	C
71	195 GALASHIELS ROAD	STOW	TD1 2RE	3458928	6448688	C
72	197 GALASHIELS ROAD	STOW	TD1 2RE	3459026	6448538	C
73	199 GALASHIELS ROAD	STOW	TD1 2RE	3459080	6448459	C
74	205 GALASHIELS ROAD	STOW	TD1 2RE	3459398	6448068	C
75	209 GALASHIELS ROAD	STOW	TD1 2RE	3459582	6447882	C
76	103 GALASHIELS ROAD	STOW	TD1 2RF	3456287	6451604	C
77	105 GALASHIELS ROAD	STOW	TD1 2RF	3456360	6451529	C
78	107 GALASHIELS ROAD	STOW	TD1 2RF	3456443	6451529	C
79	109 GALASHIELS ROAD	STOW	TD1 2RF	3456485	6451485	C
80	111 GALASHIELS ROAD	STOW	TD1 2RF	3456563	6451434	C
81	113 GALASHIELS ROAD	STOW	TD1 2RF	3456608	6451408	C
82	115 GALASHIELS ROAD	STOW	TD1 2RF	3456657	6451385	C
83	117 GALASHIELS ROAD	STOW	TD1 2RF	3456742	6451390	C
84	119 GALASHIELS ROAD	STOW	TD1 2RF	3456485	6451485	C
85	121 GALASHIELS ROAD	STOW	TD1 2RF	3456563	6451434	C
86	1 HILL TERRACE	STOW	TD1 2RG	3456840	6451681	B
87	2 HILL TERRACE	STOW	TD1 2RG	3456872	6451719	B
88	3 HILL TERRACE	STOW	TD1 2RG	3456939	6451773	B
89	4 HILL TERRACE	STOW	TD1 2RG	3456979	6451807	B
90	5 HILL TERRACE	STOW	TD1 2RG	3457041	6451853	B
91	6 HILL TERRACE	STOW	TD1 2RG	3457094	6451880	B
92	1 COCKHOLM CRESCENT	STOW	TD1 2RH	3457800	6453302	C
93	10 COCKHOLM CRESCENT	STOW	TD1 2RH	3457413	6453579	C
94	11 COCKHOLM CRESCENT	STOW	TD1 2RH	3457429	6452952	C
95	12 COCKHOLM CRESCENT	STOW	TD1 2RH	3457334	6453507	C
96	13 COCKHOLM CRESCENT	STOW	TD1 2RH	3457422	6452766	C
97	14 COCKHOLM CRESCENT	STOW	TD1 2RH	3457238	6453378	B
98	15 COCKHOLM CRESCENT	STOW	TD1 2RH	3457470	6452666	C
99	16 COCKHOLM CRESCENT	STOW	TD1 2RH	3457182	6453290	B
100	17 COCKHOLM CRESCENT	STOW	TD1 2RH	3457360	6452430	B
101	18 COCKHOLM CRESCENT	STOW	TD1 2RH	3457157	6453073	B
102	19 COCKHOLM CRESCENT	STOW	TD1 2RH	3457270	6452370	B
103	2 COCKHOLM CRESCENT	STOW	TD1 2RH	3457883	6453868	C

104	20 COCKHOLM CRESCENT	STOW	TD1 2RH	3457084	6452980	B
105	21 COCKHOLM CRESCENT	STOW	TD1 2RH	3457137	6452277	B
106	22 COCKHOLM CRESCENT	STOW	TD1 2RH	3457089	6452787	B
107	23 COCKHOLM CRESCENT	STOW	TD1 2RH	3457039	6452211	B
108	24 COCKHOLM CRESCENT	STOW	TD1 2RH	3457033	6452703	B
109	25 COCKHOLM CRESCENT	STOW	TD1 2RH	3456911	6452118	B
110	26 COCKHOLM CRESCENT	STOW	TD1 2RH	3456922	6452570	B
111	27 COCKHOLM CRESCENT	STOW	TD1 2RH	3456871	6452037	B
112	28 COCKHOLM CRESCENT	STOW	TD1 2RH	3456860	6452482	B
113	3 COCKHOLM CRESCENT	STOW	TD1 2RH	3457711	6453434	C
114	30 COCKHOLM CRESCENT	STOW	TD1 2RH	3456757	6452346	B
115	32 COCKHOLM CRESCENT	STOW	TD1 2RH	3456669	6452304	B
116	42 COCKHOLM CRESCENT	STOW	TD1 2RH	3457800	6453744	C
117	5 COCKHOLM CRESCENT	STOW	TD1 2RH	3457532	6453318	C
118	6 COCKHOLM CRESCENT	STOW	TD1 2RH	3457648	6453688	C
119	7 COCKHOLM CRESCENT	STOW	TD1 2RH	3457480	6453229	C
120	8 COCKHOLM CRESCENT	STOW	TD1 2RH	3457546	6453663	C
121	9 COCKHOLM CRESCENT	STOW	TD1 2RH	3457497	6453048	C
122	1 CRAIGEND ROAD	STOW	TD1 2RJ	3456893	6451320	C
123	11 CRAIGEND ROAD	STOW	TD1 2RJ	3457108	6451657	C
124	15 CRAIGEND ROAD	STOW	TD1 2RJ	3457352	6451615	C
125	19 CRAIGEND ROAD	STOW	TD1 2RJ	3457642	6451955	C
126	31 CRAIGEND ROAD	STOW	TD1 2RJ	3457724	6452976	C
128	9 CRAIGEND ROAD	STOW	TD1 2RJ	3457140	6451461	C
129	28 CRAIGEND ROAD	STOW	TD1 2RN	3458073	6452621	C
130	32 CRAIGEND ROAD	STOW	TD1 2RN	3458056	6452926	C
131	34 CRAIGEND ROAD	STOW	TD1 2RN	3458037	6452975	C
132	36 CRAIGEND ROAD	STOW	TD1 2RN	3458049	6453043	C
133	38 CRAIGEND ROAD	STOW	TD1 2RN	3458063	6453104	C
134	40 CRAIGEND ROAD	STOW	TD1 2RN	3458091	6453255	C
135	42 CRAIGEND ROAD	STOW	TD1 2RN	3458109	6453355	C
136	44 CRAIGEND ROAD	STOW	TD1 2RN	3458140	6453516	C
137	46 CRAIGEND ROAD	STOW	TD1 2RN	3458196	6453579	C
138	1 GALABANK COTTAGES	STOW	TD1 2RP	3443618	6457528	C
139	10 GALABANK COTTAGES	STOW	TD1 2RP	3444388	6457109	B
140	2 GALABANK COTTAGES	STOW	TD1 2RP	3443689	6457514	C
141	3 GALABANK COTTAGES	STOW	TD1 2RP	3444028	6457251	C
142	5 GALABANK COTTAGES	STOW	TD1 2RP	3444110	6457271	B
143	6 GALABANK COTTAGES	STOW	TD1 2RP	3444135	6457204	C
144	7 GALABANK COTTAGES	STOW	TD1 2RP	3444173	6457180	C
145	8 GALABANK COTTAGES	STOW	TD1 2RP	3444230	6457150	C
146	15 GALASHIELS ROAD	STOW	TD1 2RQ	3452710	6452940	C
147	19 GALASHIELS ROAD	STOW	TD1 2RQ	3453078	6452737	C
148	59 GALASHIELS ROAD	STOW	TD1 2RQ	3454394	6452289	B
149	91 GALASHIELS ROAD	STOW	TD1 2RQ	3455626	6451809	C
150	93 GALASHIELS ROAD	STOW	TD1 2RQ	3455835	6451793	C
151	95 GALASHIELS ROAD	STOW	TD1 2RQ	3455835	6451793	C
152	1 MILL ROAD	STOW	TD1 2SD	3457402	6449201	C
153	2 MILL ROAD	STOW	TD1 2SD	3457480	6449035	C
154	3 MILL ROAD	STOW	TD1 2SD	3457467	6448838	C
155	4 MILL ROAD	STOW	TD1 2SD	3457466	6448600	C
156	5 MILL ROAD	STOW	TD1 2SD	3457522	6448253	C
157	6 MILL ROAD	STOW	TD1 2SD	3457475	6448035	C
158	22 STATION ROAD	STOW	TD1 2SH	3456931	6446397	B

159	24 STATION ROAD	STOW	TD1 2SH	3456931	6446397	B
160	26 STATION ROAD	STOW	TD1 2SH	3456834	6446364	B
161	28 STATION ROAD	STOW	TD1 2SH	3456834	6446364	B
162	30 STATION ROAD	STOW	TD1 2SH	3456693	6446404	B
163	32 STATION ROAD	STOW	TD1 2SH	3456693	6446404	B
164	34 STATION ROAD	STOW	TD1 2SH	3456609	6446511	B
165	36 STATION ROAD	STOW	TD1 2SH	3456609	6446511	B
166	46 STATION ROAD	STOW	TD1 2SH	3456481	6446757	C
167	48 STATION ROAD	STOW	TD1 2SH	3456481	6446757	C
168	50 STATION ROAD	STOW	TD1 2SH	3456429	6446822	C
169	52 STATION ROAD	STOW	TD1 2SH	3456429	6446822	C
170	STOW MILL	STOW	TD1 2RB	3456786	6449516	B
171	1 MANORPARK	STOW	TD1 2RD	3457769	6448586	B
172	2 MANORPARK	STOW	TD1 2RD	3457895	6448755	B
173	3 MANORPARK	STOW	TD1 2RD	3458052	6448866	B
174	4 MANORPARK	STOW	TD1 2RD	3458199	6448951	B
175	211 GALASHIELS ROAD	STOW	TD1 2RE	3459724	6447616	C
176	11a CRAIGEND ROAD	STOW	TD1 2RJ	3457108	6451657	C
177	WHITELEE FARM HOUSE	GALASHIELS	TD1 2NG	3465378	6397020	C
178	WHITELEE HOUSE	GALASHIELS	TD1 2NG	3465501	6394106	C
179	WHITELEE LODGE	GALASHIELS	TD1 2NG	3466285	6394781	C
180	HALKBURN FARM HOUSE	GALASHIELS	TD1 2NQ	3470929	6407156	C
181	LANGSHAW SMITHY	GALASHIELS	TD1 2PA	3515754	6397486	B
183	OLD BLUECAIRN	GALASHIELS	TD1 2PU	3529810	6419056	B
184	BLUECAIRN FARM HOUSE	GALASHIELS	TD1 2PU	3533142	6419538	C
185	THREEPWOOD	GALASHIELS	TD1 2PY	3511047	6428170	C
186	THREEPWOOD LODGE	GALASHIELS	TD1 2PY	3512205	6425619	B
187	WOOPLAW FARM HOUSE	GALASHIELS	TD1 2QA	3494475	6420640	C
188	WOOPLAW HOUSE	GALASHIELS	TD1 2QA	3500537	6419405	C
189	THE HERMITAGE	STOW	TD1 2RB	3456374	6449477	C
190	THE MILL HOUSE	STOW	TD1 2RB	3457014	6449146	B
191	CRAIGEND FARMHOUSE	STOW	TD1 2RW	3458349	6456110	C
192	CATHPAIR FARMHOUSE	STOW	TD1 2SB	3466627	6467959	C
193	CATHPAIR LODGE	STOW	TD1 2SB	3464845	6467214	C
196	FERNIEHIRST FARMHOUSE	STOW	TD1 2SP	3446169	6417487	B
197	LUGATE FARMHOUSE	STOW	TD1 2SR	3444437	6436858	C
198	WATHERSTON FARMHOUSE	STOW	TD1 2ST	3440719	6461811	C
199	BOW FARMHOUSE	STOW	TD1 2SW	3451159	6416461	C
200	CAERKETTON THREEPWOOD	GALASHIELS	TD1 2PY	3511047	6428170	C
201	LANGSHAW LODGE	GALASHIELS	TD1 2PD	3517106	6397130	C
202	OVER LANGSHAW FARM HOUSE	GALASHIELS	TD1 2PE	3523180	6401875	C
203	HAWKSNEST	GALASHIELS	TD1 2QD	3493400	6410135	B
204	134-140 GALASHIELS ROAD	STOW	TD1 2RA	3456735	6451021	C
205	157-159 GALASHIELS ROAD	STOW	TD1 2RE	3457722	6450373	C
206	21 GALASHIELS ROAD	STOW	TD1 2RQ	3453430	6452600	B
207	23 GALASHIELS ROAD	STOW	TD1 2RQ	3453737	6452531	B
208	1-2 COLMSLIE HILL FARM COTTAGES	GALASHIELS	TD1 2PZ	3513675	6413966	C
209	MILL COTTAGE LANGSHAW	GALASHIELS	TD1 2PA	3515783	6397692	B
210	2 MILL COURT	STOW	TD1 2SE	3457493	6449774	C
211	4 MILL COURT	STOW	TD1 2SE	3457493	6449774	C
212	6 MILL COURT	STOW	TD1 2SE	3457402	6449710	C
213	8 MILL COURT	STOW	TD1 2SE	3457402	6449710	C
214	10 MILL COURT	STOW	TD1 2SE	3457322	6449731	C
215	12 MILL COURT	STOW	TD1 2SE	3457322	6449731	C

216	14 MILL COURT	STOW	TD1 2SE	3457194	6449725	C
217	16 MILL COURT	STOW	TD1 2SE	3457194	6449725	C
218	18 MILL COURT	STOW	TD1 2SE	3457118	6449686	C
219	20 MILL COURT	STOW	TD1 2SE	3457118	6449686	C
220	22 MILL COURT	STOW	TD1 2SE	3457017	6449711	C
221	24 MILL COURT	STOW	TD1 2SE	3457017	6449711	C
222	REIVERS VIEW LANGSHAW	GALASHIELS	TD1 2PA	3515678	6397947	B
223	WATHERSTON WEST HOUSE	STOW	TD1 2ST	3439738	6461658	B
224	5 LUGATE COTTAGES	STOW	TD1 2SR	3444439	6438785	C
225	6 LUGATE COTTAGES	STOW	TD1 2SR	3444521	6438762	C
226	1 STAGEHALL FARM COTTAGES	STOW	TD1 2SS	3454689	6444742	B
227	2 STAGEHALL FARM COTTAGES	STOW	TD1 2SS	3454887	6444515	B
228	3 STAGEHALL FARM COTTAGES	STOW	TD1 2SS	3454963	6445171	B
229	4 STAGEHALL FARM COTTAGES	STOW	TD1 2SS	3454962	6445253	B
230	5 STAGEHALL FARM COTTAGES	STOW	TD1 2SS	3455361	6445662	B
231	6 STAGEHALL FARM COTTAGES	STOW	TD1 2SS	3455384	6445779	B
233	SEDGEBROOK LANGSHAW	GALASHIELS	TD1 2PA	3515493	6396923	B
234	SPRINGFIELD HAWKSNEST	GALASHIELS	TD1 2QD	3494224	6407766	C
235	HOLMLEA CRAIGEND	STOW	TD1 2RW	3458175	6455387	C
236	5 MANORPARK	STOW	TD1 2RD	3458423	6448843	B
237	1 HALKBURN FARM COTTAGES	GALASHIELS	TD1 2NQ	3470551	6409394	B
238	2 HALKBURN FARM COTTAGES	GALASHIELS	TD1 2NQ	3470619	6409335	B
239	1 THREEPWOOD FARM COTTAGES	GALASHIELS	TD1 2PY	3511639	6428855	C
240	2 THREEPWOOD FARM COTTAGES	GALASHIELS	TD1 2PY	3511768	6429042	C
241	ALLANSHAWS FARM HOUSE	GALASHIELS	TD1 2QB	3490972	6437451	A
242	1 CRAIGEND FARM COTTAGES	STOW	TD1 2RW	3460009	6458226	C
243	2 CRAIGEND FARM COTTAGES	STOW	TD1 2RW	3460036	6458269	C
244	3 CRAIGEND FARM COTTAGES	STOW	TD1 2RW	3460121	6458345	C
245	4 CRAIGEND FARM COTTAGES	STOW	TD1 2RW	3460196	6458411	C
250	NORTH COTTAGE WATHERSTON	STOW	TD1 2ST	3439829	6459786	B
251	SOUTH COTTAGE WATHERSTON	STOW	TD1 2ST	3439814	6459725	B
252	3 CATHPAIR FARM COTTAGES	STOW	TD1 2SB	3468227	6468466	C
253	1 OVER LANGSHAW COTTAGES	GALASHIELS	TD1 2PE	3524258	6399708	A
254	2 OVER LANGSHAW COTTAGES	GALASHIELS	TD1 2PE	3524271	6399768	A
255	3 OVER LANGSHAW COTTAGES	GALASHIELS	TD1 2PE	3524265	6399854	A
256	4 OVER LANGSHAW COTTAGES	GALASHIELS	TD1 2PE	3524234	6399980	A
257	3 COLMSLIE HILL FARM COTTAGES	GALASHIELS	TD1 2PZ	3513497	6413732	C
258	MOSSBANK LANGSHAW	GALASHIELS	TD1 2PD	3517995	6396852	C
259	17 CRAIGEND ROAD	STOW	TD1 2RJ	3457420	6451717	C
260	21 CRAIGEND ROAD	STOW	TD1 2RJ	3457680	6452281	C
261	THE STABLES COTTAGE WHITELEE	GALASHIELS	TD1 2NG	3466938	6394699	A
262	173a GALASHIELS ROAD	STOW	TD1 2RE	3458219	6449860	C
263	127 GALASHIELS ROAD	STOW	TD1 2RF	3456742	6451390	C
264	25 GALASHIELS ROAD	STOW	TD1 2RQ	3453946	6452433	B
265	37 STATION ROAD	STOW	TD1 2SQ	3456159	6446294	C
266	THE HIDEAWAY	STOW	TD1 2SR	3444357	6438805	C
268	169 GALASHIELS ROAD	STOW	TD1 2RE	3457991	6450048	C
269	SOUTH WING FLAT 168 GALASHIELS ROAD	STOW	TD1 2RA	3457871	6449654	C

270	SOUTH WING COTTAGE 168 GALASHIELS ROAD	STOW	TD1 2RA	3457871	6449654	C
271	OLD MANORHEAD 186 GALASHIELS ROAD	STOW	TD1 2RA	3457871	6449654	C
272	5 OVER LANGSHAW COTTAGES	GALASHIELS	TD1 2PE	3524237	6400015	A
273	5 MILL COURT	STOW	TD1 2SE	3457233	6449421	C
274	7 MILL COURT	STOW	TD1 2SE	3457139	6449404	C
275	KEEPERS COTTAGE CATHPAIR	STOW	TD1 2SB	3469155	6467241	C
276	GARDENERS COTTAGE CATHPAIR	STOW	TD1 2SB	3469058	6466972	C
277	177 GALASHIELS ROAD	STOW	TD1 2RE	3458540	6449727	C
280	7 MANORPARK	STOW	TD1 2RD	3457735	6449151	C
281	9 MANORPARK	STOW	TD1 2RD	3457742	6448986	C
282	77 GALASHIELS ROAD	STOW	TD1 2RQ	3455313	6452127	B
283	203 GALASHIELS ROAD	STOW	TD1 2RE	3459298	6448251	C
284	201 GALASHIELS ROAD	STOW	TD1 2RE	3459213	6448371	C
285	48 CRAIGEND ROAD	STOW	TD1 2RN	3458257	6453745	C
286	31 COCKHOLM CRESCENT	STOW	TD1 2RH	3456381	6451900	B
287	41 STATION ROAD	STOW	TD1 2SQ	3455937	6446688	C
288	WEST MOSSHOUSES	GALASHIELS	TD1 2PG	3530333	6396502	C
290	SOUTHWING COTTAGE GALASHIELS ROAD	STOW	TD1 2RA	3457871	6449654	C
291	50 CRAIGEND ROAD	STOW	TD1 2RN	3458330	6454090	C
292	52 CRAIGEND ROAD	STOW	TD1 2RN	3458365	6454329	C
293	OLD FARM HOUSE ALLANSHAWS	GALASHIELS	TD1 2QB	3491625	6438331	B
294	TAIGH NA SEUDAR LUGATE	STOW	TD1 2SR	3443250	6436615	C
295	FERNIEHURST FARM COTTAGE	STOW	TD1 2SP	3445485	6416427	B
296	KENNEL COTTAGE CATHPAIR	STOW	TD1 2SB	3468165	6468484	C
297	WATHERSTON MILLHOUSE	STOW	TD1 2ST	3439831	6461616	B
298	HILLVIEW WHITELEE	GALASHIELS	TD1 2NG	3466145	6396703	B
299	SPRINGFIELD OVER LANGSHAW	GALASHIELS	TD1 2PE	3523726	6400964	B
300	SAWMILL COTTAGE THREEPWOOD	GALASHIELS	TD1 2PY	3510468	6428588	C
301	EAST MOSSHOUSES	GALASHIELS	TD1 2PG	3530410	6396514	C
303	CRUACHAN WOOPLAW FARM	GALASHIELS	TD1 2QA	3495466	6420961	C
304	SHELHOPE HAWKSNEST	GALASHIELS	TD1 2QD	3493312	6410882	B
305	HAWKSNEST FARM	GALASHIELS	TD1 2QD	3494048	6410061	C
306	LUGATE FARM COTTAGE	STOW	TD1 2SR	3444181	6437125	C
307	2 CRAIGEND ROAD	STOW	TD1 2RN	3457509	6451401	C
308	224 GALASHIELS ROAD	STOW	TD1 2RA	3459134	6446748	C
309	161GALASHIELS ROAD	STOW	TD1 2RE	3457782	6450303	C
310	BRAESIDE WHITELEE	GALASHIELS	TD1 2NG	3466132	6396557	B
311	BEECHLEA MANORPARK	STOW	TD1 2RD	3457736	6449253	C
313	73 GALASHIELS ROAD	STOW	TD1 2RQ	3454832	6452252	B
314	75 GALASHIELS ROAD	STOW	TD1 2RQ	3455055	6452174	B
315	6 CRAIGEND ROAD	STOW	TD1 2RN	3457650	6451496	C
316	HALKBURN HOUSE	GALASHIELS	TD1 2NQ	3470678	6406714	C
317	168 GALASHIELS ROAD	STOW	TD1 2RA	3457665	6449887	C
318	158 GALASHIELS ROAD	STOW	TD1 2RA	3457559	6450236	C
319	160 GALASHIELS ROAD	STOW	TD1 2RA	3457546	6450165	C
320	162 GALASHIELS ROAD	STOW	TD1 2RA	3457546	6450165	C
321	4 GALASHIELS ROAD	STOW	TD1 2RN	3457582	6451448	C
322	8 CRAIGEND ROAD	STOW	TD1 2RN	3457723	6451546	C
323	39 STATION ROAD	STOW	TD1 2SQ	3456159	6446294	C
325	MUIRCLEUCH FARM	LAUDER	TD2 6RG	3511389	6454369	B

SUMMARY OF RESULTS

TOTAL NO. POSTAL ADDRESSES WITHIN STUDY AREA (5KM BUFFER AROUND EACH TURBINE)	**1715**
TOTAL NO. RESIDENTIAL POSTAL ADDRESSES WITHIN ZVI	**325**
TOTAL NO. RESIDENTIAL POSTAL ADDRESSES WITHIN ZVI ASSESSED AS **A -** PROPERTIES WITH POTENTIAL CLEAR DIRECT OR OBLIQUE VIEWS OF TURBINES	**7**
TOTAL NO. RESIDENTIAL POSTAL ADDRESSES WITHIN ZVI ASSESSED AS **B** - PROPERTIES WITH POTENTIAL PARTIAL/SCREENED DIRECT OR OBLIQUE VIEWS OF TURBINES	**99**
TOTAL NO. RESIDENTIAL POSTAL ADDRESSES WITHIN ZVI ASSESSED AS **C** - PROPERTIES WITH POTENTIAL SLIGHT/NEGLIGIBLE/NO VIEWS OF TURBINES	**219**

Postal address information obtained from Ordnance Survey Address Point data 15/10/2004.

Assessment made following desk based assessment using Ordnance Survey 1:10,000 scale and 1:25,000 scale mapping, and field survey observations.