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Applications cannot be validated until all necessary documentation has been submitted and the required fee has been paid.

Thank you for completing this application form:

ONLINE REFERENCE 000106922-002

The online ref number is the unique reference for your online form only. The Planning Authority will allocate an Application Number when your form is validated. Please quote this reference if you need to contact the Planning Authority about this application.

## Applicant or Agent Details

Are you an applicant, or an agent? \* (An agent is an architect, consultant or someone else acting on behalf of the applicant in connection with this application)

Applicant  Agent

## Agent Details

Please enter Agent details

Company/Organisation:

Ref. Number:

First Name: \*

Last Name: \*

Telephone Number: \*

Extension Number:

Mobile Number:

Fax Number:

Email Address: \*

You must enter a Building Name or Number, or both:\*

Building Name:

Building Number:

Address 1 (Street): \*

Address 2:

Town/City: \*

Country: \*

Postcode: \*

Is the applicant an individual or an organisation/corporate entity? \*

Individual  Organisation/Corporate entity

## Applicant Details

Please enter Applicant details

Title: *	<input type="text" value="Mr"/>	You must enter a Building Name or Number, or both:*	
Other Title:	<input type="text"/>		Building Name:
First Name: *	<input type="text" value="Alex"/>	Building Number:	<input type="text"/>
Last Name: *	<input type="text" value="Wilson"/>	Address 1 (Street): *	<input type="text" value="Earlston"/>
Company/Organisation:	<input type="text"/>	Address 2:	<input type="text"/>
Telephone Number:	<input type="text"/>	Town/City: *	<input type="text" value="Earlston"/>
Extension Number:	<input type="text"/>	Country: *	<input type="text" value="UK"/>
Mobile Number:	<input type="text"/>	Postcode: *	<input type="text" value="TD4 6AJ"/>
Fax Number:	<input type="text"/>		
Email Address:	<input type="text"/>		

## Site Address Details

Planning Authority:	<input type="text" value="Scottish Borders Council"/>		
Full postal address of the site (including postcode where available):			
Address 1:	<input type="text"/>	Address 5:	<input type="text"/>
Address 2:	<input type="text"/>	Town/City/Settlement:	<input type="text"/>
Address 3:	<input type="text"/>	Post Code:	<input type="text"/>
Address 4:	<input type="text"/>		
Please identify/describe the location of the site or sites.			
<input type="text" value="Within land boundary of Clackmae Farm, Earlston, TD4 6AJ."/>			
Northing	<input type="text" value="639152"/>	Easting	<input type="text" value="355703"/>

## Description of the Proposal

Please provide a description of the proposal to which your review relates. The description should be the same as given in the application form, or as amended with the agreement of the planning authority: \*  
(Max 500 characters)

Application for planning permission for a single wind turbine (with a 23.6m rotor diameter, 22.6m hub height and 34.4m blade tip height) and associated infrastructure.

## Type of Application

What type of application did you submit to the planning authority? \*

- Application for planning permission (including householder application but excluding application to work minerals).
- Application for planning permission in principle.
- Further application.
- Application for approval of matters specified in conditions.

What does your review relate to? \*

- Refusal Notice.
- Grant of permission with Conditions imposed.
- No decision reached within the prescribed period (two months after validation date or any agreed extension) – deemed refusal.

## Statement of reasons for seeking review

You must state in full, why you are seeking a review of the planning authority's decision (or failure to make a decision). Your statement must set out all matters you consider require to be taken into account in determining your review. If necessary this can be provided as a separate document in the 'Supporting Documents' section: \* (Max 500 characters)

Note: you are unlikely to have a further opportunity to add to your statement of appeal at a later date, so it is essential that you produce all of the information you want the decision-maker to take into account.

You should not however raise any new matter which was not before the planning authority at the time it decided your application (or at the time of expiry of the period of determination), unless you can demonstrate that the new matter could not have been raised before that time or that it not being raised before that time is a consequence of exceptional circumstances.

A Review Statement has been provided as a separate document in the 'Supporting Documents' section in order to fully explain the reason for this review.

In brief: The Review Statement will put forward the case that the proposed turbine will have an acceptable impact on Earlston which is compatible with the character of the village. The reason for the refusal of the application is therefore inadequate and as a result the planning decision should be overturned and the appeal allowed.

Have you raised any matters which were not before the appointed officer at the time the determination on your application was made? \*

Yes  No

Please provide a list of all supporting documents, materials and evidence which you wish to submit with your notice of review and intend to rely on in support of your review. You can attach these documents electronically later in the process: \* (Max 500 characters)

Review Statement, including Appendices RS1 & 2;  
ER: Environmental Report - VG Energy, January 2015;  
ZTV5: Appendix 4.3 of Environmental Report;  
VP2: Appendix 4.6 of Environmental Report;  
LRC: Letter - Response to Concerns, VG Energy, April 2015;  
RH: Report of Handling, Scottish Borders Council, April 2015;  
DL: Decision Letter, Scottish Borders Council, April 2015.

## Application Details

Please provide details of the application and decision.

What is the application reference number? \*

15/00179/FUL

What date was the application submitted to the planning authority? \*

20/02/15

What date was the decision issued by the planning authority? \*

24/04/15

## Review Procedure

The Local Review Body will decide on the procedure to be used to determine your review and may at any time during the review process require that further information or representations be made to enable them to determine the review. Further information may be required by one or a combination of procedures, such as: written submissions; the holding of one or more hearing sessions and/or inspecting the land which is the subject of the review case.

Can this review continue to a conclusion, in your opinion, based on a review of the relevant information provided by yourself and other parties only, without any further procedures? For example, written submission, hearing session, site inspection. \*

Yes  No

Please indicate what procedure (or combination of procedures) you think is most appropriate for the handling of your review. You may select more than one option if you wish the review to be conducted by a combination of procedures.

Please select a further procedure \*

Inspection of the land subject of the appeal. (Further details below are not required)

Please explain in detail in your own words why this further procedure is required and the matters set out in your statement of appeal it will deal with? \* (Max 500 characters)

To gain a thorough appreciation of the local area and Earlston in particular.

In the event that the Local Review Body appointed to consider your application decides to inspect the site, in your opinion:

Can the site be clearly seen from a road or public land? \*

Yes  No

Is it possible for the site to be accessed safely and without barriers to entry? \*

Yes  No

If there are reasons why you think the Local Review Body would be unable to undertake an unaccompanied site inspection, please explain here. (Max 500 characters)

## Checklist - Application for Notice of Review

Please complete the following checklist to make sure you have provided all the necessary information in support of your appeal. Failure to submit all this information may result in your appeal being deemed invalid.

Have you provided the name and address of the applicant? \*

Yes  No

Have you provided the date and reference number of the application which is the subject of this review? \*

Yes  No

If you are the agent, acting on behalf of the applicant, have you provided details of your name and address and indicated whether any notice or correspondence required in connection with the review should be sent to you or the applicant? \*

Yes  No  N/A

Have you provided a statement setting out your reasons for requiring a review and by what procedure (or combination of procedures) you wish the review to be conducted? \*

Yes  No

Note: You must state, in full, why you are seeking a review on your application. Your statement must set out all matters you consider require to be taken into account in determining your review. You may not have a further opportunity to add to your statement of review at a later date. It is therefore essential that you submit with your notice of review, all necessary information and evidence that you rely on and wish the Local Review Body to consider as part of your review.

Please attach a copy of all documents, material and evidence which you intend to rely on (e.g. plans and drawings) which are now the subject of this review \*

Yes  No

Note: Where the review relates to a further application e.g. renewal of planning permission or modification, variation or removal of a planning condition or where it relates to an application for approval of matters specified in conditions, it is advisable to provide the application reference number, approved plans and decision notice (if any) from the earlier consent.

## Declare - Notice of Review

I/We the applicant/agent certify that this is an application for review on the grounds stated.

Declaration Name: Siobhan Wolverson

Declaration Date: 17/07/2015

Submission Date: 17/07/2015





**WIND TURBINE DEVELOPMENT AT CLACKMAE:  
REVIEW STATEMENT FOR LOCAL REVIEW BODY  
(REFERENCE: 15/00179/FUL)**

SITE LOCATION: CLACKMAE, EARLSTON, TD4 6AJ

APPLICANT	MR ALEX WILSON
SITE NAME	CLACKMAE
APPLICANT NUMBER	06450
PREPARED BY	SW
EDITED BY	CB
APPROVED BY	

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## FOREWORD

R & A Wilson Ltd

Clackmae  
Earlston  
Berwickshire  
TD4 6AJ

7/17/2015

Dear Sirs,

I would like to take this opportunity to explain our desire to erect a wind turbine at Clackmae.

We are an energy dependent business and are exposed to the vagaries of market prices which can severely damage us during high cost periods. Unlike many turbine developments, we intend to use virtually all of the output in our business: Our motivation is not Feed-In Tariff payments, but simply an economic supply of power that has the bonus of being green and low carbon. In our considerations of how best to do this we have looked at many forms of power generation, from hydro to photovoltaic and Bio-digesters, and found they were not practical either in terms of clean power or economically viable in terms of our business.

In proposing a turbine I canvassed my neighbours locally before we incurred costs in applying for permission and had no objections from anyone. We have no desire to upset our community we live in and I honestly believe that the proposal will not affect anyone and will merge into the scenery.

Yours sincerely



Alex Wilson

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## 1 INTRODUCTION

The planning application for a single wind turbine with a hub height of 22.6m and blade tip height of 34.4m at Clackmae (reference 15/00179/FUL) was refused by Scottish Borders Council on the 24<sup>th</sup> April 2015. In order to appeal this decision, a Notice of Review is being submitted to the Local Review Body (LRB): This Review Statement is a continuation of the Notice of Review, providing a more detailed explanation of the reasons for this appeal.

The reports linked to the original planning application and discussed in this Review Statement are listed in Table 1.1; these will be referenced as indicated throughout.

**TABLE 1.1:** DOCUMENTS REFERRED TO WITHIN THIS REVIEW STATEMENT

DOCUMENT TITLE	REFERENCE
1. ENVIRONMENTAL REPORT – VG ENERGY, JANUARY 2015	ER
(A) APPENDIX 4.3 (ZTV TO 5KM, INCLUDING SCREENING FROM WOODLAND)	ZTV5
(B) APPENDIX 4.6 (VIEWPOINT 2 – WEST OF EARLSTON)	VP2
2. LETTER – RESPONSE TO CONCERNS - VG ENERGY, APRIL 2015	LRC
3. REPORT OF HANDLING – SCOTTISH BORDERS COUNCIL , APRIL 2015	RH

### 1.1 Reason for Refusal

The application was refused by Regulatory Services at Scottish Borders Council for the following reason:

*“The development would fail to comply with Policies G1 and D4 of the Consolidated Local Plan 2011 as a result of its adverse landscape and visual effects, most specifically on the setting of Earlston and receptors within the village, due to its prominent positioning above the skyline when viewed from the east of the application site.”*

The Council’s RH expands and explains this reason for refusal.

### 1.2 Reasons for Appeal

This Review Statement will put forward the case that the proposed turbine at Clackmae will have an acceptable landscape and visual impact on Earlston which is compatible with the character of the village. The reason for the refusal of the application is therefore inadequate and as a result the planning decision should be overturned and the appeal allowed.

The effect of the turbine on Earlston is the only reason for the refusal of the application. It has received no public objections and on a wider scale the RH recognises that:

- ◆ The scale of the proposed turbine is suited to the area;
- ◆ The amenity (visual impact, shadow flicker and noise) of those neighbours nearest to the development will not be significantly affected;
- ◆ Views of the turbine from the Southern Upland Way will be sufficiently screened; and
- ◆ The features and setting of the nearby Carolside and Leadervale Garden and Designed Landscape will also not be affected.

As this demonstrates, a large degree of work went into the design of this project so that it would be suited to the area. Following this, at the request of the Council, further investigative work was conducted after the full planning application was submitted in order to reconsider the suitability of other areas of the farm or another size of turbine. The LRC was produced following this investigation which fully explained why the selected size and position of the turbine remained the best option – these points will be touched on again later in this report.

Following the refusal of the planning permission, the applicant also commissioned further exploratory work into an alternative turbine location within the farm, which brought the turbine closer to the Southern Upland Way and a neighbouring property, but out of view from the west of Earlston. However, due to the increased distance between the alternative location and the dairy shed it is intended to feed into, the turbine would no longer be able to directly power the farm's expensive milking operations and the increased cost of cabling between it and the nearest grid connection point would be so high as to render the project financially unviable. The choice was then made by the applicant to appeal the decision of refusal.

As detailed in LRC, the size of this proposed turbine has been carefully selected by the applicant after investigating farms with wind energy developments and similar dairy operations to his own. The height of the turbine has been selected so that the necessary stable electricity production for the robotic milking system will be maintained, as increased heights yield more stable wind speeds; yet the turbine is low enough so the overall environmental impact of the development is minimal.

The remainder of this report will investigate the landscape and visual impact of the proposal on Earlston, with the findings showing that simple visibility from the west of Earlston of a turbine with a hub height of 22.6m and height to blade tip 34.4m, situated approximately 1.7km away, is not a valid reason for refusal. Policies G1 and D4 of the Scottish Borders Council (2011) '*Consolidated Local Plan*' will also be considered to show why the proposal complies with Council policy and should be approved.

### 1.3 Background Information

The specifications of the proposed turbine at Clackmae are detailed in Table 1.2.

**TABLE 1.2:** SPECIFICATIONS OF PROPOSED TURBINE

<b>TURBINE MODEL</b>	1 X NORTHERN POWER SYSTEMS (NPS) 100/24
<b>HUB HEIGHT</b>	22.6M
<b>ROTOR DIAMETER</b>	23.6M
<b>HEIGHT TO BLADE TIP</b>	34.4M
<b>COLOUR</b>	LIGHT GREY <sup>1</sup>

<sup>1</sup> Please note, the standard colour of the NPS has altered since planning was originally applied for – from white to light grey. However, the colour can be altered if required for planning permission

## 2 THE LANDSCAPE AND VISUAL EFFECT ON EARLSTON

The landscape and visual effects of the proposed turbine at Clackmae on the various receptors within Earlston, as well as the setting of the village in general, will be explored in the following section. VP2 will initially be considered as this is the main piece of evidence used by Regulatory Services in the RH to support the claim that the turbine's impact will be significant.

### 2.1 Viewpoint 2 – West of Earlston (VP2)

The visualisation submitted with the planning application representing the view of the proposed turbine from VP2 (Mill Road to the west of Earlston) was the only visualisation of those submitted which was a concern for Regulatory Services.

VP2 illustrates that the proposed turbine is visible on a hill to the northwest of the village, with the lower section of the turbine screened by both the woodland on the hill and an intervening section of woodland between the turbine and viewpoint. Although visible, the turbine is 1.7km from VP2 and therefore does not dominate or overwhelm views from this area of the village. It will be the only consistently moving feature, however the surrounding landscape contains a mixture of woodland, electrical lines, farming and a sports field, with the latter two being associated with occasionally moving elements (farm machinery and sports).

In regards to scale, the features in the foreground surrounding the sports field, namely the power lines, lampposts, rugby posts and trees, appear considerably taller than the proposed turbine due to the intervening distance. While the turbine will be visible above the horizon line from Earlston, this effect is not sizeable in comparison to the undulating land and it does not exceed the height of the trees in the foreground.

The turbine will therefore become another element of this mixed view and whilst there will be a visual impact, this will not be significant, as described in the RH.

### 2.2 Residential Receptors

The impact of the turbine on residents to the west of Earlston was examined and reported in the ER and again in the LRC. To fully examine the extent of the impact on residents for the purpose of this appeal, two maps have been attached to this report (Appendices RS1 and RS2) and are each discussed below.

#### 2.2.1 Appendix RS1

Appendix RS1 illustrates the elevations Above Ordnance Datum (AOD) throughout Earlston, in addition to highlighting the direction of the proposed turbine at Clackmae. The main conclusions which can be drawn using this map are:

- ◆ The height of the village rises from south to north, however there is little difference in elevation from east to west;
  - ◇ The result of this is that when standing in the middle to east of Earlston, buildings or tall vegetation to the west will generally screen views, unless there is a reasonable gap between the viewpoint and western building/vegetation so that wider landscape views can be appreciated;
- ◆ As the proposed turbine is located between 1.3km to 2.3km northwest and is 34.4m to blade tip, it will not overshadow Earlston and will be easily screened from the middle and east of Earlston by features closer to the receptor;
- ◆ We reported in the ER and LRC that on visiting the village to conduct the site assessment, we tried to obtain clear, unobstructed views of the turbine from the east of Earlston, however could not do so due to the intervening buildings and/or vegetation;
  - ◇ As per best practice guidelines referred to in the LRC,<sup>2</sup> VG Energy did not submit photos of these obstructions to prove this; however offered to do so in the LRC if Regulatory Services deemed it necessary;
- ◆ To conclude, we could not find any evidence through the site visit that residents within the middle to east of Earlston would be impacted by the proposed turbine. We also considered the distinctive church spires within the village with the outcome being the same. Appendix RS1 further supports this outcome.

The RH states that our argument that the majority of Earlston will be unaffected is “*inconclusive and does not provide significant comfort that this breach of skyline [shown in VP2] will not be apparent from other areas within and approaching the village.*” However, on visiting Earlston and seeing the proximity of the buildings to one another and the vegetation within the village, it is evident that the proposal will not have a significant visual impact.

### 2.2.2 Appendix RS2

Appendix RS2 highlights those properties within Earlston which have primary views towards the proposed turbine at Clackmae, that are either unobstructed, partially obstructed (by, for example, a row of trees across the road), or where upper floor views only may be possible. All other dwellings within Earlston either do not have primary views towards the turbine, are not within the Zone of Theoretical Visibility (ZTV), or have views which are completely obstructed by other buildings and/or vegetation.<sup>3</sup> The main conclusions which can be drawn using this map are:

- ◆ The proposed turbine will only be visible from the primary views of a small number of properties to the west of Earlston, and the views from a number of these will be partially obstructed by intervening features;

<sup>2</sup> Best practice dictates that visualisations which show no actual visibility of the proposal should not normally be included in an application, as per Scottish Natural Heritage (SNH; December 2014) ‘*Visual Representation of Wind Farms.*’

<sup>3</sup> This assessment has been conducted as accurately as possible, however there may be small inaccuracies

- ◆ Most of the dwellings, even in the west of Earlston, have primary views which either face in another direction from that of the proposal, or which are completely obstructed;
- ◆ Together with the evidence presented in VP2 showing representative views from this area, it can be confidently stated that for those dwellings with views towards the proposal, the turbine will not dominate these and its impact cannot be described as significant. Simple visibility of a turbine in the wider landscape is not a sufficient reason for refusal.

The RH states: *"The applicant's agents have acknowledged that the turbine will be visible from residential properties, but contend that the turbine will not overwhelm the skyline, and will simply add another feature to the view. To some extent, their conclusion is fair. However, I would not, ultimately share the view that the resulting landscape effect is acceptable in terms of the relationship between the turbine and its landscape context. The visibility of the turbine would affect range of residential receptors..."*

As Appendix RS2 demonstrates, the 'range' of residential receptors affected by this proposal is limited. The only argument against the proposal in this regard is that from primary views (some of which will be partially screened), a small number of residents in Earlston will be able to see the turbine in the wider landscape: This is not a sufficient reason to refuse a planning application. It has been ascertained through previous applications for wind energy developments that as no individual has the right to a view, in order to refuse permission in the public interest, the development must cause an unacceptable degree of harm to a property.<sup>4</sup> It can be stated with confidence that the proposed turbine at Clackmae will not render any property within Earlston an unattractive place to live to an extent that it becomes unpleasant, overwhelmed or oppressed; it therefore should not be refused on this basis.

### 2.3 Road Users Travelling Into or Out of Earlston

The two main roads which run into and out of Earlston are the A68 and A6105. An assessment of the cumulative sequential impact on both of these roads was conducted for the planning application and presented on pages 32 to 33 of the ER.

In regards to the A68, Appendix RS2 illustrates the extent of the ZTV of the proposed turbine on this road as it passes through the village (this is supported by ZTV5<sup>5</sup>). This visibility will occur for approximately 450m of the road as it passes through the west of Earlston. For those travelling northwards, the turbine will be in oblique views to the direction of travel until the road bends to the northwest, when it will be in direct views for circa 90m. Views towards the turbine will generally be open, although trees and houses lining the road will occasionally screen it from view. For those travelling southwards, the turbine will always remain in oblique views. Where a traveller on the A68 may catch a glimpse of the proposal, it will be part of the mixed landscape

<sup>4</sup> A: Appeal reference: APP/D0515/A/10/2123739; <https://acp.planningportal.gov.uk/ViewCase.aspx?Caseid=2123739&ColD=0> ;  
B: Report to Scottish Ministers on Spittal Hill, Caithness: [www.gov.scot/Resource/0039/00394955.pdf](http://www.gov.scot/Resource/0039/00394955.pdf)

<sup>5</sup> See Table 1.1 for full reference of this map



view represented through VP2 and will not dominate wider views or be directly associated with the village.

ZTV5 illustrates that the proposed turbine at Clackmae is theoretically visible from the length of the A6105 as it travels westwards through Earlston and meets the A68. Nevertheless, supported by the analysis presented in Chapter 2.2 above on the impacts on the middle to east of Earlston, the buildings within Earlston that line most of this road will screen any views of the turbine until the junction with the A68. At this point, trees lining the A68 are very likely to screen the turbine from view from the A6105, especially in warmer months when there are leaves on the trees. If the turbine is visible from this junction, it will be similar to the view represented in VP2 which, as stated previously, means that the turbine will be visible amongst wider landscape views, although will not overshadow the village to any extent.

As for the A6105 before it enters Earlston from the east, there will be no visibility of the turbine in combination with views over the village. This is due to the mixture of vegetation, buildings and higher banks of land lining the road which will screen the turbine from travelling receptors. There are two brief occasions when the turbine may be glimpsed from the road by those travelling west; however the village will not be visible at the same time. Additionally, as the turbine will be circa 2.7km and 3.5km distant at these two points, it will neither have a significant visual effect nor, as it is not visible alongside the village at any point, be associated with Earlston.

The RH states: *“The visibility of the turbine would affect... road users travelling through and into/out of Earlston”*

Although the turbine will be occasionally visible for travellers moving northwards for 450m of the A68 as it passes through Earlston, it will not dominate landscape views from this road or, due to distance, be coupled with the village. With the possible exception of the A6105/A68 junction, the turbine will not be visible at all from the A6105 as it passes through Earlston, and whilst a traveller moving westwards on this road may catch very infrequent glimpses of the turbine before entering the village, the development will not be seen within the same view as the village.

Road users travelling through Earlston on either the A68 or A6105 will also presumably be focussed on road conditions, with hazards such as pedestrians and parked cars being a larger concern than the surrounding landscape. By taking this and the limited visual impact of the proposal into account, it can be concluded that the turbine will have a minor effect on the road users travelling within and into or out of Earlston.

## 2.4 Other Receptors within Earlston

In addition to residents and road users, receptors will also include those undertaking activities such as sports (who are likely to use the facilities to the west and south of the village), shopping (with opportunities for this mainly found in the centre of the village) or visiting specific destinations (namely the church).

It has already been established that the centre and east of the village will not be visually impacted by the proposed turbine due to the presence of surrounding buildings, vegetation or high banks of land screening views. Activities such as shopping are therefore unlikely to be adversely affected by the presence of the turbine, and the distinctive spires of the church were carefully considered within the ER and LRC with no combined views deemed likely.

The sporting facilities to the west of the village are primarily for rugby and the turbine will be visible from this section of the village, as illustrated through VP2. Nevertheless, since surrounding landscape views are not important to sports such as rugby, their sensitivity to single wind turbine developments, such as that at Clackmae, is considered low. The turbine will therefore not have a significant effect on receptors using this area for sport.

## 2.5 The Setting of Earlston

The setting of Earlston is influenced by the higher farmland and woodland surrounding the village. This is important to the outskirts of the village and, although not often apparent when in the centre, a higher area of rolling farmland can occasionally be glimpsed at the end of a street. Nevertheless, whilst the gentle hills are a key landscape feature, they are fairly widespread and the proposal will not alter any existing landform, such as woodland, or interrupt views to a significant degree. This is because only one medium sized turbine is being proposed at Clackmae which, when considering the entirety of the hills surrounding Earlston, will not have an adverse effect.

Although it will be viewed above the horizon line from Earlston, the turbine will not be competing with key focal features important to the setting of the village, namely the distinctive church spires referenced previously, as per best practice guidelines.<sup>6</sup> The turbine will not have an overbearing relationship with the village and, as a result, the current setting of Earlston will be little altered.

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<sup>6</sup> Scottish Natural Heritage (SNH; 2012) *'Siting and design of small scale wind turbines of between 15 and 50 metres in height.'*

### 3 POLICY

The proposed turbine at Clackmae was refused on the basis of failing to comply with two policies in the Scottish Borders Council (2011) 'Consolidated Local Plan.' Taking into account the reasons for refusal and the size of the proposed development, the relevant sections of these policies are examined in turn below.

#### 3.1 Policy G1: Quality Standards for New Development

*"All new development will be expected to be of high quality in accordance with sustainability principles, designed to fit with Scottish Borders townscapes and to integrate with its landscape surroundings. The standards which will apply to all development are that:*

- 1. It is compatible with, and respects the character of the surrounding area, neighbouring uses, and neighbouring built form...*

*The policy is aimed at ensuring that all new development... is of a high quality and respects the environment in which it is contained. The policy does not aim to restrict good quality modern or innovative design but does aim to ensure that it does not negatively impact on the existing buildings, or surrounding landscape and visual amenity of the area..."*

The RH establishes that the only concern with the proposed turbine at Clackmae that the Council have is with its landscape and visual impact on Earlston. Although the turbine will be visible from an area of the village, it is argued in this Review Statement that due to its positioning, size and distance, it will not significantly alter the setting of Earlston, or adversely impact the receptors within the village. Whilst it will be visible above the horizon line, this single turbine will not have an overbearing presence on the village and, when visible, will simply be an additional feature in a mixed landscape view that does not negatively impact sensitive buildings or receptors.

It can therefore be stated that the proposal respects the character of the surrounding area; both its immediate surrounds (as recognised in the RH by Regulatory Services) and its wider surrounds which encompass Earlston.

### 3.2 Policy D4: Renewable Energy Development

*“Renewable energy developments will be approved provided that:*

- 1. There are no unacceptable adverse impacts on the natural heritage including the water environment, landscape, biodiversity, built environment and archaeological heritage, or that any adverse impacts can be satisfactorily mitigated;...*

*If there are judged to be significant adverse impacts that cannot be mitigated, the development will only be approved if the Council is satisfied that the contribution to wider economic and environmental benefits outweigh the potential damage to the environment or to tourism and recreation.”*

The 34.4m turbine at Clackmae will not have any adverse impact on the natural heritage, including the built environment of Earlston, although it will be visible from areas to the west of the village. Methods to mitigate this visibility were investigated on the Council's request after the planning application had been submitted (which led to the conclusions drawn in the LRC), and also at the applicant's request following the refusal of the planning application.

It was found that reducing the turbine height whilst keeping the 100kW production output would not noticeably change the visual impact on Earlston; whereas altering the turbine model to reduce both its height and output would only have a minimal effect. This would also have the disadvantage of reducing the productivity of the turbine, as the wind speeds at lower heights are both slower and more erratic. This would not only affect basic turbine efficiency, but would also have a negative knock-on effect on the robotic milking system used by the dairy at Clackmae, which, as noted previously, requires stability.

As the visual impact on the west of Earlston is not adverse, it can be argued that the benefits of the turbine, relating to improving the carbon footprint of the applicant's energy intensive dairy farm, outweigh the disadvantage of simply being able to see a single turbine in the distance from parts of the village.

## 4 CONCLUSION

This Review Statement has considered the reason for the refusal of the single wind turbine at Clackmae; that being the Regulatory Service's opinion that it will have a significant impact on the receptors within, and setting of, Earlston.

By considering the direction of the primary views of dwellings in Earlston compared to the location of the proposed turbine; as well as considering the layout of the village, both in terms of topography and its built environment; it has been argued within this Review Statement that the turbine will have a minimal impact on the village. It will only be visible from the west of Earlston and, whilst it will be visible above the horizon line, this is a small interruption in a mixed undulating farmed and wooded landscape which surrounds the village and therefore the setting will not be significantly affected.

It has been established that the turbine will not have an overwhelming presence on the village which would justify its refusal on the basis of public interest. Earlston will not become an unattractive place to live due to the turbine and dwellings within the village will not become unpleasant, overwhelmed or oppressed. For this reason, a refusal is not supported by national policies or precedents. There have also been no public objections to suggest that the proposal is unacceptable to residents.

The applicant has twice considered other locations for the turbine within the farm, as well as other turbine models. However, the location chosen is best suited to provide energy efficiently and directly to the dairy shed, which houses energy intensive milking operations. The turbine is also a suitable size to serve the farm's energy needs. Regulatory Service's note in the RH that:

*"The scale of the turbine is reasonably (though not completely) comfortable in the landscape setting generally, and its visual implications on routes and properties would not, on the whole, be significantly negative. The nearest neighbouring properties would not be significantly affected as a result of intervening distance, orientation, topography and tree screening. Views from the Southern Upland Way are sufficiently screened and the turbine would be set down below the skyline in that direction in any case. The proposal would add to the scattering of single turbines in the general area, but would not do so to any adverse degree given the distances and intervening screening/landscape changes between it and the nearest turbines."*

The refusal of the application therefore rests only on the turbine's landscape and visual effect on Earlston, which will be minimal rather than adverse. Simple visibility of the turbine in the landscape does not justify its refusal, especially when this visibility will have limited effect.

The proposed development has been designed in order to replace the traditional sources of energy currently used to power the dairy at Clackmae. This will not only help the farm to reduce its expensive energy bills, but will also help it to reduce its carbon footprint, which is necessary in order to retain its largest customer (Tesco) in the future. This is recognised as a legitimate material consideration in the RH and the benefits of this turbine outweigh the minimal landscape and visual effects on the west of Earlston. The proposal therefore complies with

Policies G1 and D4 of the '*Consolidated Local Plan*' (2011) and as a result the application should be approved.

## 5 APPENDICES

**Appendix RS1:** Earlston - Topography and Direction of Proposed Turbine

**Appendix RS2:** Earlston – Primary Views and Turbine Visibility







Newtown St Boswells Melrose TD6 0SA

Tel: 01835 825251

Fax: 01835 825071

Email: [itsystemadmin@scotborders.gov.uk](mailto:itsystemadmin@scotborders.gov.uk)

Applications cannot be validated until all necessary documentation has been submitted and the required fee has been paid.

Thank you for completing this application form:

ONLINE REFERENCE                      000106922-001

The online ref number is the unique reference for your online form only. The Planning Authority will allocate an Application Number when your form is validated. Please quote this reference if you need to contact the Planning Authority about this application.

## Type of Application

What is this application for? Please select one of the following: \*

We strongly recommend that you refer to the help text before you complete this section.

- Application for Planning Permission (including changes of use and surface mineral working)
- Application for Planning Permission in Principle
- Further Application, (including renewal of planning permission, modification, variation or removal of a planning condition etc)
- Application for Approval of Matters specified in conditions

## Description of Proposal

Please describe the proposal including any change of use: \* (Max 500 characters)

Application for planning permission for a single wind turbine (with a 23.6m rotor diameter, 22.6m hub height and 34.4m blade tip height) and associated infrastructure.

Is this a temporary permission? \*                       Yes  No

If a change of use is to be included in the proposal has it already taken place?  
(Answer 'No' if there is no change of use.) \*                       Yes  No

Have the works already been started or completed? \*

- No    Yes - Started    Yes - Completed

## Applicant or Agent Details

Are you an applicant, or an agent? \* (An agent is an architect, consultant or someone else acting on behalf of the applicant in connection with this application)                       Applicant  Agent

## Agent Details

Please enter Agent details

Company/Organisation:	VG Energy
Ref. Number:	
First Name: *	Siobhan
Last Name: *	Wolverson
Telephone Number: *	01467410056
Extension Number:	
Mobile Number:	
Fax Number:	
Email Address: *	siobhan@vgenenergy.co.uk

You must enter a Building Name or Number, or both:\*

Building Name:	Thainstone Agricultural Centre
Building Number:	
Address 1 (Street): *	Unit 7 Ground Floor
Address 2:	Thainstone Agricultural Centre
Town/City: *	Inverurie
Country: *	UK
Postcode: *	AB51 5WU

Is the applicant an individual or an organisation/corporate entity? \*

Individual  Organisation/Corporate entity

## Applicant Details

Please enter Applicant details

Title: *	Mr
Other Title:	
First Name: *	Alex
Last Name: *	Wilson
Company/Organisation:	
Telephone Number:	
Extension Number:	
Mobile Number:	
Fax Number:	
Email Address:	

You must enter a Building Name or Number, or both:\*

Building Name:	Clackmae Farmhouse
Building Number:	
Address 1 (Street): *	Earlston
Address 2:	
Town/City: *	Earlston
Country: *	UK
Postcode: *	TD4 6AJ

## Site Address Details

Planning Authority:

Scottish Borders Council

Full postal address of the site (including postcode where available):

Address 1:

Address 5:

Address 2:

Town/City/Settlement:

Address 3:

Post Code:

Address 4:

Please identify/describe the location of the site or sites.

Within land boundary of Clackmae Farm, Earliston, TD4 6AJ.

Northing

639152

Easting

355703

## Pre-Application Discussion

Have you discussed your proposal with the planning authority? \*

Yes  No

## Pre-Application Discussion Details

In what format was the feedback given? \*

Meeting  Telephone  Letter  Email

Please provide a description of the feedback you were given and the name of the officer who provided this feedback. If a processing agreement [note 1] is currently in place or if you are currently discussing a processing agreement with the planning authority, please provide details of this. (This will help the authority to deal with this application more efficiently.) \* (Max 500 characters)

Screening opinion

Title:

Mr

Other title:

First Name:

Stuart

Last Name:

Herkes

Correspondence Reference Number:

13/01407/SCO

Date (dd/mm/yyyy):

25/01/14

Note 1. A processing agreement involves setting out the key stages involved in determining a planning application, identifying what information is required and from whom and setting timescales for the delivery of various stages of the process.

## Site Area

Please state the site area:

928.00

Please state the measurement type used:

Hectares (ha)  Square Metres (sq.m)

## Existing Use

Please describe the current or most recent use: (Max 500 characters)

Agricultural.

## Access and Parking

Are you proposing a new or altered vehicle access to or from a public road? \*

Yes  No

If Yes please describe and show on your drawings the position of any existing, altered or new access points, highlighting the changes you propose to make. You should also show existing footpaths and note if there will be any impact on these.

Are you proposing any changes to public paths, public rights of way or affecting any public rights of access? \*

Yes  No

If Yes please show on your drawings the position of any affected areas highlighting the changes you propose to make, including arrangements for continuing or alternative public access.

How many vehicle parking spaces (garaging and open parking) currently exist on the application site? \*

0

How many vehicle parking spaces (garaging and open parking) do you propose on the site (i.e. the total of existing and any new spaces or a reduced number of spaces)? \*

0

Please show on your drawings the position of existing and proposed parking spaces and identify if these are for the use of particular types of vehicles (e.g. parking for disabled people, coaches, HGV vehicles, cycle spaces).

## Water Supply and Drainage Arrangements

Will your proposal require new or altered water supply or drainage arrangements? \*

Yes  No

Do your proposals make provision for sustainable drainage of surface water? (e.g. SUDS arrangements) \*

Yes  No

Note: -

Please include details of SUDS arrangements on your plans

Selecting 'No' to the above question means that you could be in breach of Environmental legislation.

Are you proposing to connect to the public water supply network? \*

Yes

No, using a private water supply

No connection required

If No, using a private water supply, please show on plans the supply and all works needed to provide it (on or off site).

## Assessment of Flood Risk

Is the site within an area of known risk of flooding? \*

Yes  No  Don't Know

If the site is within an area of known risk of flooding you may need to submit a Flood Risk Assessment before your application can be determined. You may wish to contact your Planning Authority or SEPA for advice on what information may be required.

Do you think your proposal may increase the flood risk elsewhere? \*

Yes  No  Don't Know

## Trees

Are there any trees on or adjacent to the application site? \*

Yes  No

If Yes, please mark on your drawings any trees, known protected trees and their canopy spread close to the proposal site and indicate if any are to be cut back or felled.

## Waste Storage and Collection

Do the plans incorporate areas to store and aid the collection of waste (including recycling)? \*

Yes  No

If Yes or No, please provide further details:(Max 500 characters)

Not applicable.

## Residential Units Including Conversion

Does your proposal include new or additional houses and/or flats? \*

Yes  No

## All Types of Non Housing Development - Proposed New Floorspace

Does your proposal alter or create non-residential floorspace? \*

Yes  No

## Schedule 3 Development

Does the proposal involve a form of development listed in Schedule 3 of the Town and Country Planning (Development Management Procedure (Scotland) Regulations 2013? \*

Yes  No  Don't Know

If yes, your proposal will additionally have to be advertised in a newspaper circulating in the area of the development. Your planning authority will do this on your behalf but will charge you a fee. Please check the planning authority's website for advice on the additional fee and add this to your planning fee.

If you are unsure whether your proposal involves a form of development listed in Schedule 3, please check the Help Text and Guidance notes before contacting your planning authority.

## Planning Service Employee/Elected Member Interest

Is the applicant, or the applicant's spouse/partner, either a member of staff within the planning service or an elected member of the planning authority? \*

Yes  No

## Certificates and Notices

CERTIFICATE AND NOTICE UNDER REGULATION 15 – TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT PROCEDURE) (SCOTLAND) REGULATIONS 2013

One Certificate must be completed and submitted along with this application form. This is most usually Certificate A, Form 1, Certificate B, Certificate C or Certificate E.

Are you/the applicant the sole owner of ALL the land? \*

Yes  No

Is any of the land part of an agricultural holding? \*

Yes  No

## Certificate Required

The following Land Ownership Certificate is required to complete this section of the proposal:

Certificate A

## Land Ownership Certificate

Certificate and Notice under Regulation 15 of the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013

Certificate A

I hereby certify that –

(1) - No person other than myself/the applicant was an owner (Any person who, in respect of any part of the land, is the owner or is the lessee under a lease thereof of which not less than 7 years remain unexpired.) of any part of the land to which the application relates at the beginning of the period of 21 days ending with the date of the accompanying application.

(2) - None of the land to which the application relates constitutes or forms part of an agricultural holding.

Signed: Stobhan Wolverson

On behalf of: Mr Alex Wilson

Date: 11/12/2014

Please tick here to certify this Certificate. \*

## Checklist - Application for Planning Permission

Town and County Planning (Scotland) Act 1997

The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013

Please take a few moments to complete the following checklist in order to ensure that you have provided all the necessary information in support of your application. Failure to submit sufficient information with your application may result in your application being deemed invalid. The planning authority will not start processing your application until it is valid.

a) If this is a further application where there is a variation of conditions attached to a previous consent, have you provided a statement to that effect? \*

Yes  No  Not applicable to this application

b) If this is an application for planning permission or planning permission in principle where there is a crown interest in the land, have you provided a statement to that effect? \*

Yes  No  Not applicable to this application

c) If this is an application for planning permission, planning permission in principle or a further application and the application is for development belonging to the categories of national or major developments (other than one under Section 42 of the planning Act), have you provided a Pre-Application Consultation Report? \*

Yes  No  Not applicable to this application

Town and County Planning (Scotland) Act 1997

The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013

d) If this is an application for planning permission and the application relates to development belonging to the categories of national or major developments and you do not benefit from exemption under Regulation 13 of The Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2013, have you provided a Design and Access Statement? \*

Yes  No  Not applicable to this application

e) If this is an application for planning permission and relates to development belonging to the category of local developments (subject to regulation 13. (2) and (3) of the Development Management Procedure (Scotland) Regulations 2013) have you provided a Design Statement? \*

Yes  No  Not applicable to this application

f) If your application relates to installation of an antenna to be employed in an electronic communication network, have you provided an ICNIRP Declaration? \*

Yes  No  Not applicable to this application

g) If this is an application for planning permission, planning permission in principle, an application for approval of matters specified in conditions or an application for mineral development, have you provided any other plans or drawings as necessary:

- Site Layout Plan or Block plan.
- Elevations.
- Floor plans.
- Cross sections.
- Roof plan.
- Master Plan/Framework Plan.
- Landscape plan.
- Photographs and/or photomontages.
- Other.

Provide copies of the following documents if applicable:

- |  |  |
|--|--|
| A copy of an Environmental Statement. *  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A |
| A Design Statement or Design and Access Statement. *                                   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> N/A |
| A Flood Risk Assessment. *   | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A |
| A Drainage Impact Assessment (including proposals for Sustainable Drainage Systems). * | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A |
| Drainage/SUDS layout. *  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A |
| A Transport Assessment or Travel Plan. *   | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A |
| Contaminated Land Assessment. *  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A |
| Habitat Survey. *  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A |
| A Processing Agreement *   | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A |

Other Statements (please specify). (Max 500 characters)

Environmental Report

## Declare - For Application to Planning Authority

I, the applicant/agent certify that this is an application to the planning authority as described in this form. The accompanying plans/drawings and additional information are provided as a part of this application .

Declaration Name: Siobhan Wolverson

Declaration Date: 20/01/2015

## Payment Details

Online payment: Transaction number not provided by partner ePayment service

Created: 19/02/2015 13:25








**Environmental Report for a Wind  
Turbine Development at Clackmae**

**Site Location:** Clackmae  
Earlston  
TD4 6AJ



APPLICANTS	MR ALEX WILSON
SITE NAME	CLACKMAE
CLIENT NUMBER	06450
PREPARED BY	SW
EDITED BY	EW
APPROVED BY	
DOCUMENT REVISION	1

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## **1. INTRODUCTION**

### **1.1 Planning Application**

This Environmental Report is being submitted to the Scottish Borders Council (SBC) as part of a planning application for the installation of a single Northern Power Systems (NPS) wind turbine, with a height to blade tip of 34.4m, at Clackmae, Earlston. The application for planning consent is made under the Town and Country Planning (Scotland) Act (as amended) 2006.

A Screening Opinion was received from SBC on the 25<sup>th</sup> January 2014 (reference: 13/01407/SCO), which stated that an Environmental Impact Assessment (EIA) would not be required for this planning application. Additional feedback was also received as part of this Screening Opinion from a number of relevant council departments and external organisations, such as Scottish Natural Heritage (SNH). This, along with further pre-application consultation conducted since, will be referred to where relevant throughout this report.

As per the advice issued through the Screening Opinion and subsequent pre-application discussions, this report will thoroughly examine the potential impacts of the proposal on various aspects of the environment, including: Amenity (landscape and visual impacts, noise emissions and shadow flicker); the historic environment; ecology; and other considerations such as recreation, tourism and business.

VG Energy has prepared this Environmental Report on behalf of Alex Wilson, who owns Clackmae.

### **1.2 Agent Information**

VG Energy is an Ayrshire based organisation involved in the planning, re-sale, installation and maintenance of wind turbines. Currently, there are more than sixty members of staff employed over three offices; with thirteen specialist staff within the planning department.

### **1.3 Applicant Information**

Alex and Ruth Wilson own Clackmae and are involved in dairy, sheep and arable (grain) farming. The farm supports five full-time and two part-time employees.

One of the two key reasons for this wind turbine application is to reduce the farm's exposure to energy markets. At the moment, the annual energy use of the dairy alone is 292,000kW, with the remainder of the farm (cattle, sheep and house) having an annual energy usage of 150,000kW. A wind turbine is the best option to help with the farm's rising bills due to its high output in comparison with other renewable technologies such as solar.

The proposed turbine has been situated close to the dairy shed, which houses facilities such as robotic milking, water pumps, water heating, waste pumps, parlour milking and scrapers. This is so the turbine can be connected directly to the meter house in the dairy in order to replace much of the traditional electricity source and reduce bills.

The second key reason for the proposed wind turbine is so that the owners can reduce the carbon footprint of their farming business. Their main customer is Tesco, who has recently conducted research into the carbon footprint of each of its products and has identified its agricultural suppliers as being responsible for generating much of the supermarket chain's total carbon emissions.<sup>1</sup> One of the main elements of the strategy for the Tesco Sustainable Dairy Group (TSDG) is to reduce the carbon footprint of the dairy farms which supply to the supermarket,<sup>2</sup> such as Clackmae. The renewable energy produced by this proposed turbine would therefore not only power much of the daily functions at Clackmae, but additionally offset some of the greenhouse gas emissions produced by its operations and livestock and thus help it retain this important customer.<sup>3</sup>

The Wilsons are therefore intending for this turbine to play a central role in the future of Clackmae. Farming operations are responsible for 20% of the total emissions produced in Scotland and therefore farms need to take steps to address this if they are to be successful in the future.<sup>4</sup>

---

<sup>1</sup> <http://www.theguardian.com/sustainable-business/tesco-reducing-carbon-emissions>

<sup>2</sup> <http://www.dairyroadmap.com/portfolio-items/tesco/>

<sup>3</sup> [http://www.tescopl.com/assets/files/cms/Tesco\\_Product\\_Carbon\\_Footprints\\_Summary%281%29.pdf](http://www.tescopl.com/assets/files/cms/Tesco_Product_Carbon_Footprints_Summary%281%29.pdf)

<sup>4</sup> SAC farm efficiency: <http://www.sac.ac.uk/climatechange/farmingforabetterclimate/fiveactions/>

## **2. PROJECT DESCRIPTION**

### **2.1 Site Description**

The land owned by the applicant has an area of approximately 326 hectares and comprises a mixture of grazing and arable fields. The proposed turbine is located to the southeast of the owned land, with the nearest town to the turbine being Earliston, approximately 1.3km southeast.

The turbine is in an area of the farm housing the dairy shed (162m northeast) and the farmstead (450m northeast). The dairy shed contains the meter which the proposed turbine will connect to for generation. The only electricity pylons running through the farm are situated circa 390m east of the dairy and turbine.

The turbine location is detailed in Appendix 2.1. It is in a field which is used for a rotation of grain and grass. Woodland can be found throughout the farm, with a belt of Semi-natural Woodland 108m west of the proposal and a strip of Ancient Woodland 175m north. Clackmae Burn runs through this latter area of woodland in a westerly direction until it reaches Leader Water, a Special Area of Conservation (SAC), outside the applicant's ownership boundary.

The proposed turbine is located at the edge of an existing access track, which runs from a local road circa 300m east; a further local road also passes through the farm in an east-west direction 520m north of the turbine. The nearest major road is the A68 approximately 930m east.

The summits of two hills, both of which are approximately 270m Above Ordnance Datum (AOD), are situated to the northwest and southwest of the applicant's land boundary. As a result, the elevation of the land falls to the east of the farm, with the proposed turbine being situated at 189m AOD. On the other side of these hills, the Southern Upland Way bounds the western border of the applicant's land boundary.

### **2.2 Site Selection**

Due to a number of site constraints, the field in which the turbine has been situated in has been identified as the most suitable for this development: Table 2.1 highlights those features taken into consideration in order to make this conclusion. A map of the site constraints has also been attached as Appendix 2.2.



**TABLE 2.1: TABLE OF CONSTRAINTS<sup>5</sup>**

FEATURE	GUIDELINES	REASONS
<b>ECOLOGY</b>	TIN 051 GUIDANCE STATES THAT A 50M BUFFER SHOULD BE MAINTAINED FROM ANY LINEAR FEATURE (SUCH AS HEDGEROWS, WOODLANDS AND WATER BODIES) INTO WHICH NO PART OF THE TURBINE INTRUDES.	THE TURBINE IS SITUATED 108M FROM THE NEAREST SECTION OF WOODLAND AND 206M FROM CLACKMAE BURN TO AVOID ANY POTENTIAL DAMAGE TO ECOLOGICAL FEATURES.
<b>SOUTHERN UPLAND WAY</b>	TO PROTECT RECEPTORS USING STRATEGIC PATHS SUCH AS THE SOUTHERN UPLAND WAY FROM SEQUENTIAL CUMULATIVE IMPACT, A 2KM BUFFER EXCLUDING WIND TURBINES IS RECOMMENDED AS PER SCOTTISH BORDERS SUPPLEMENTARY PLANNING GUIDANCE – WIND ENERGY (2011).	AS THE SOUTHERN UPLAND WAY BOUNDS THE WEST OF THE APPLICANT'S LAND BOUNDARY, THE PROPOSED TURBINE HAS BEEN LOCATED TO THE EAST, 1.8KM FROM THE PATH. DUE TO THE TOPOGRAPHY OF THE FARM, THE PROPOSAL WILL NOT VISUALLY IMPACT THE SOUTHERN UPLAND WAY (SEE CHAPTER 4). A BUFFER OF 1.5KM IS MORE APPROPRIATE FOR THIS UNDULATING SITE AND SIZE OF TURBINE.
<b>LANDSCAPE AND VISUAL IMPACT</b>	A CAPACITY STUDY <sup>6</sup> FOR THE SCOTTISH BORDERS HAS BEEN PUBLISHED, YET NOT FORMALLY ADOPTED BY THE COUNCIL. NEVERTHELESS THIS IS USED AS A GENERAL REFERENCE BY PLANNERS. IT CONSIDERS INDIVIDUAL TURBINES BETWEEN 25M AND 50M AS SUITABLE FOR THE LOCAL LANDSCAPE CHARACTER OF CLACKMAE.	AT 34.4M TO BLADE TIP, THE SINGLE TURBINE PROPOSED FOR THIS SITE WILL NOT HAVE A SIGNIFICANT IMPACT ON THE SURROUNDING AREA AND IS AN APPROPRIATE SIZE FOR THE LANDSCAPE.
<b>NOISE</b>	FOLLOWING GUIDANCE SET OUT IN ETSU-R-97, NOISE CANNOT EXCEED 35 DB(A) AT THE NEAREST SENSITIVE PROPERTIES OR 5DB ABOVE BACKGROUND NOISE (WHICHEVER IS THE GREATEST).	THE TURBINE IS 367M EAST OF THE NEAREST PROPERTY, 3 CLACKMAE FARM COTTAGES, AND IS IN LINE WITH ETSU GUIDANCE.
<b>ROADS</b>	WIND TURBINES NEED TO BE LOCATED THE HEIGHT OF THE TURBINE PLUS 50% FROM ROADS. <sup>7</sup>  (FOR THE PROPOSAL THIS IS 51.6M).	THE NEAREST ROAD IS CIRCA 300M EAST AND SO THERE ARE NO SAFETY ISSUES IN REGARDS TO THE TURBINE.
<b>GAS MAINS</b>	THE DISTANCE A TURBINE MUST BE LOCATED FROM A GAS MAIN IS THE HEIGHT OF THE TURBINE PLUS 50%.  (FOR THE PROPOSAL THIS IS 51.6M).	SGN CONNECTIONS, WHO ARE RESPONSIBLE FOR THE GAS MAINS NETWORK, HAVE CONFIRMED THAT THERE ARE NO GAS MAINS IN THE VICINITY OF THE PROPOSED TURBINE.
<b>RADAR</b>	THERE IS A 50KM CONSULTATION ZONE FOR ESKDALEMUIR. AS PER THE MOST RECENT INTERIM GUIDANCE (MAY 2014), FOLLOWING SUBMISSION OF A WIND ENERGY PLANNING APPLICATION WITHIN THIS ZONE, THE MINISTRY OF DEFENCE (MOD) WILL CALCULATE THE SEISMIC NOISE OF THE PROPOSAL.	THE TURBINE IS LOCATED 45KM FROM THIS SEISMIC MONITORING STATION AND THEREFORE THE MOD WILL BE NOTIFIED OF THE PROPOSAL FOLLOWING PLANNING SUBMISSION.

<sup>5</sup> For detailed information on the policies and guidance documents referred to within this table, please see the relevant chapters within this report which correspond with the features listed and/or Chapter 3: Relevant Planning Policy

<sup>6</sup> Ironside Farrar (2013) 'Wind Energy Consultancy: Landscape Capacity and Cumulative Impact'

<sup>7</sup> Transport Scotland guidance on wind turbine development: <http://www.scotland.gov.uk/Resource/0042/00422003.pdf>

## 2.3 Development Specifications

The proposed project has been designed with the intention of generating zero-carbon electricity through the utilisation of wind as a renewable energy source. The development will require the infrastructure associated with the wind turbine, an on-site control unit system and a meter house. The project will also require a crane pad, which will be located at the foundation of the turbine for component lifting.

The specifications of the proposed turbine are detailed in Table 2.2 and illustrated through Appendix 2.3.

**TABLE 2.2:** PROPOSED TURBINE SPECIFICATIONS

<b>TURBINE MODEL</b>	1 x NORTHERN POWER SYSTEMS (NPS) 100/24
<b>HUB HEIGHT</b>	22.6M
<b>ROTOR DIAMETER</b>	23.6M
<b>HEIGHT TO BLADE TIP</b>	34.4M
<b>COLOUR</b>	WHITE <sup>8</sup>

The access track route is displayed through Appendix 2.1; this illustrates that an existing track on the farm will be used for component delivery. Further details on this and the construction process in general are provided in Chapter 12.

## 2.4 Grid Connection

The turbine will be connected to a single storey meter house via underground cabling. The underground cabling will be laid adjacent to the access track and the meter house located next to the turbine foundations.

Connection to the National Grid will not be considered as part of this Environmental Report as consent falls under another process and the environmental legislation surrounding it is separate from that which is covered in this assessment. If necessary, the planning application for connection to the National Grid will also be carried out independently.

<sup>8</sup> Colour can be altered if considered necessary by SBC

### 3. RELEVANT PLANNING POLICY

#### 3.1 Environmental Impact Assessment (EIA)

The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 transpose the EIA Directive<sup>9</sup> into the Scottish planning system. An EIA systematically assesses the likely significant environmental effects of certain public and private projects.<sup>10</sup>

The Council issued a Screening Opinion in January 2014 and confirmed an EIA would not be required. Nevertheless, this Environmental Report focuses on the following environmental aspects which were highlighted by the Council and a number of other statutory consultees who also issued a response to the Screening Opinion request:

- ◆ The cumulative impact of the proposed turbine;
- ◆ The potential impact of the turbine on Rights of Way and Core Paths, especially the Southern Upland Way;
- ◆ The visual impact of the proposal on the Eildon and Leaderfoot National Scenic Area;
- ◆ The potential impact on Carolside and Leadervale Garden and Designed Landscape and its setting;
- ◆ The impact on Black Hill, both the Scenic Viewpoint and the fort; and
- ◆ The noise levels of the proposal for all noise sensitive receptors.

The project's development has been refined in order to avoid or reduce any foreseeable environmental conflicts. Potential impacts associated with all stages of the development, from construction through to decommissioning, have been thoroughly analysed. Where necessary, mitigation measures have been designed to alleviate any impacts as much as is feasibly possible.

#### 3.2 National Planning Policy and Legislation

##### 3.2.1 National Planning Policy

Policies which have been consulted throughout the process of this application include:

- ◆ Department of Energy and Climate Change (DECC; 2011) *'Planning our electric future: A White Paper for secure, affordable and low-carbon electricity;'*
- ◆ Scottish Government (2013) *'Electricity Generation Policy Statement;'*
- ◆ Scottish Government (2011) *'2020 Routemap for Renewable Energy in Scotland;'*<sup>11</sup>

<sup>9</sup> Council Directive 85/337/EEC, as amended by 97/11/EC, 2003/35/EC and 2009/31/EC.

<sup>10</sup> <http://www.scotland.gov.uk/Resource/Doc/350238/0117228.pdf>

- ◆ Climate Change (Scotland) Act 2009;<sup>12</sup>
- ◆ Planning Advice Note PAN 73: Rural Diversification;<sup>13</sup>
- ◆ The Scottish Government Renewables Action Plan 2009 (updated 2010);<sup>14</sup>
- ◆ National Planning Framework for Scotland 3 (NPF3) 2014;<sup>15</sup> and
- ◆ Renewables Advice – Onshore wind turbines (2011, updated 2014);<sup>16</sup>
- ◆ Scottish Planning Policy (SPP; 2014).

The documents above identify the need for renewable energy for a variety of reasons, including: Meeting the ambitious target of delivering 100% of gross electricity from renewables by 2020 set by the Scottish Government; the need to reduce greenhouse gases and carbon emissions; and to aid rural diversification.

### 3.3 Local Council

Planning policy and guidance issued by the SBC is currently in a transitional phase, with the replacement of the *‘Scottish Borders Consolidated Local Plan’* by the *‘Proposed Local Development Plan’* planned in spring 2015.

Relevant policies to the planning application which will be referenced throughout this report in the relevant chapters are:

- ◆ SESplan Strategic Development Planning Authority (SDPA; 2013) *‘Strategic Development Plan’*
- ◆ SBC (2013) *‘Proposed Local Development Plan’*
- ◆ SBC (2011) *‘Scottish Borders Consolidated Local Plan’*
- ◆ SBC (2012) *‘Local Landscape Designations’*
- ◆ SBC (2011) *‘Wind Energy’*

<sup>11</sup> Routemap 2020; <http://www.scotland.gov.uk/Publications/2011/08/04110353/5#onshorewind>

<sup>12</sup> Climate Change (Scotland) Act 2009; <http://www.scotland.gov.uk/Topics/Environment/climatechange/scotlands-action/climatechangeact>

<sup>13</sup> PAN 73; <http://www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning-Policy/themes/renewables>

<sup>14</sup> Scottish Govt. Renewables Action Plan; <http://www.scotland.gov.uk/Publications/2009/07/06095830/0>

<sup>15</sup> National Planning framework for Scotland; <http://www.scotland.gov.uk/Publications/2014/06/3539>

<sup>16</sup> Renewables advice 2014; <http://www.scotland.gov.uk/Resource/0045/00451413.pdf>

### 3.3.1 Policy Analysis

#### SESPLAN SDPA (2013) 'STRATEGIC DEVELOPMENT PLAN': POLICY 10 – SUSTAINABLE ENERGY TECHNOLOGIES

This proposed wind turbine at Clackmae is designed to generate renewable energy for the dairy on the farm. This decentralised supply of energy generation will help both the farm and SBC meet pressures regarding renewables.

#### SCOTTISH BORDERS COUNCIL (2013) 'PROPOSED LOCAL DEVELOPMENT PLAN': POLICY ED9 – RENEWABLE ENERGY DEVELOPMENT

This report illustrates that this proposal complies with this policy as there will be no unacceptable impacts on any aspect of the environment. The location and size of the turbine has been carefully selected in order to fit with the scale of the surrounding landscape and limit its impact on the local area, whilst being able to generate the amount of electricity required by this dairy farm.

#### SCOTTISH BORDERS COUNCIL (2011) 'WIND ENERGY'

This details the planning requirements for new and existing developments. It specifies a spatial framework for onshore wind energy developments, in addition to providing criteria for the assessment of all sizes of proposals.

The development categories identified through this supplementary guidance document are:

- ◆ Small scale (less than 20m)
- ◆ Medium scale (between 20m to 60m)
- ◆ Large scale (over 60m)
- ◆ Commercial Wind Farms (over 20MW)

The proposal at Clackmae is for a medium scale turbine (34.4m to blade tip). SPG Policy 6 states:

*"All applications for the aforesaid three categories will be judged on a case to case basis, making reference to policy D4 and the further policy guidance set out in paragraph 6.4 as well as the spatial strategy in Appendix E."*

Policy D4 of the 'Scottish Borders Consolidated Local Plan' and paragraph 6.4 of this SPG reference many topics, from landscape and visual impact to shadow flicker, which will be referenced in the relevant chapters throughout this report. Appendix E presents a map identifying different levels of constraints throughout the council area which will be further investigated in Chapters 4 and 6.

## **4. LANDSCAPE AND VISUAL IMPACT ASSESSMENT (LVIA)**

### **4.1 Introduction**

Landscape and visual impacts are considered separately within this chapter in accordance with published guidance, although the procedures for each are closely related. The distinction between landscape and visual impacts is set out below:

- ◆ Landscape impacts relate to the effects of the proposals on the physical and other characteristics of the landscape, and changes to its fabric, character and quality;
- ◆ Visual impacts relate to the effects on the character of views and the effects of those changes to the visual amenity experienced by visual receptors, such as residents, footpath users, tourists and users of recreational facilities.

The purpose of this assessment is to ascertain the likely landscape and visual effects of this proposed development at Clackmae. As has been established, the proposal is to install a 34.4m high wind turbine, which is classified as a medium scale development through SBC guidance.

The potential impacts of this development will be assessed in relation to the various guidelines which have been published relative to renewable energy, but will refer mostly to the Scottish Natural Heritage (SNH) publication '*Assessing the impact of small-scale wind energy proposals on the natural heritage*' (2014).

Other documentation used for the LVIA includes:

- ◆ Landscape Institute & Institute of Environmental Management & Assessment (LI-IEMA; 2013) *Guidelines for Landscape and Visual Impact Assessment. 3rd Edition*;
- ◆ Scottish Government (June 2014) *Scottish Planning Policy*;
- ◆ SNH (2014) *Visual Representation of Windfarms*;
- ◆ SNH (2012) *Assessing the Cumulative Impact of Onshore Wind Energy Developments*;
- ◆ ASH Consulting Group (1998) *The Borders Landscape Assessment: SNH Review No 112*
- ◆ SBC (2011) *Scottish Borders Consolidated Local Plan*;
- ◆ SBC (2011) *Wind Energy*;
- ◆ SBC (2012) *Local Landscape Designations*;
- ◆ SBC (2013) *Proposed Local Development Plan*; and
- ◆ Ironside Farrar (2013) *Wind Energy Consultancy: Landscape Capacity and Cumulative Impact: Final Report*

## 4.2 Methodology

The methodology for this assessment is, as best practice dictates, flexible. SNH suggests the following level of assessment should be undertaken for turbines between 15m and 50m in height:

*"A basic level of LVIA is likely to be required for the planning authority. The precise detail should be agreed by the planning authority but, as a minimum, we recommend:*

- ◆ *A Zone of Theoretical Visibility (ZTV) map covering an area up to 15km (radius) from the turbine/outermost turbines; and*
- ◆ *Wireline drawings and/or photomontages from a limited number of key viewpoints."*<sup>17</sup>

### 4.2.1 Study Area

As advised by the SNH guidance referenced above, a 15km ZTV has been established from the proposed turbine. From the produced ZTV, an appropriate study area of 8km has been identified that is proportional to the size and scale of this application and all potential impacts.

Through consultation with a Landscape Architect (J. Knight) at SBC, it has been confirmed that this 8km study area includes the assessment of cumulative effects from other existing and proposed wind energy developments.<sup>18</sup>

### 4.2.2 Procedure

Firstly, in order to assess the likely impacts of this development, a baseline of the existing landscape is established. The baseline landscape is the standard against which any change can be measured against and therefore the magnitude of change from this proposal determined. In order to do this, the location and context of the surrounding area has to be reviewed.

After identifying the baseline, the proposal is assessed to determine the significance of landscape and visual effects ('Significance of Effect'). Figure 4.1 is used to achieve this, in addition to professional judgement. The following terms are used:

- ◆ **Nature of Receptor:** The sensitivity / value / importance of the receptor;
- ◆ **Nature of Effect:** The magnitude / probability / reversibility of the effects of a development

The criteria shown within Figure 4.1 for the terms Nature of Effect and Significance of Effect are defined through Tables 4.1 and 4.2. As receptors vary depending on whether landscape or

<sup>17</sup> SNH (2014) 'Assessing the impact of small-scale wind energy proposals on the natural heritage'

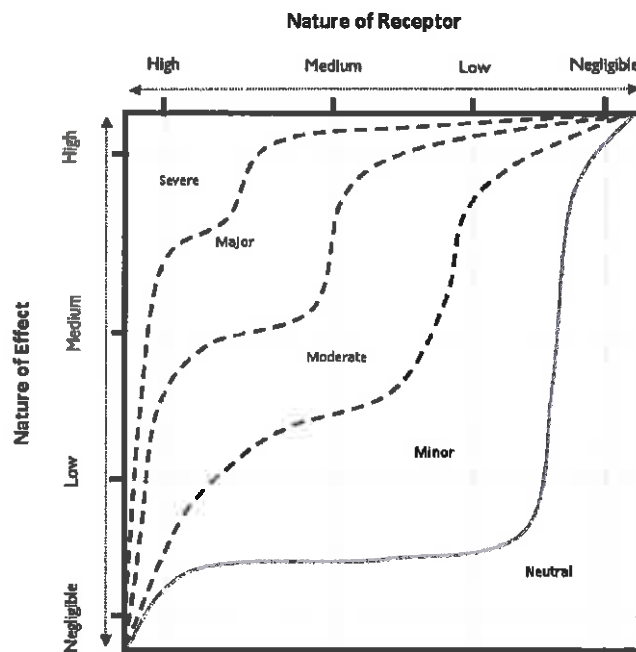
<sup>18</sup> Consultation response to Screening Opinion, made on 16/12/2013

visual impact is being considered, the term **Nature of Receptor** will be investigated in the appropriate sub-chapters below.

**TABLE 4.1:** DEFINITION OF CRITERIA USED TO DETERMINE NATURE OF EFFECT

CRITERIA	DEFINITION
NEGLECTIBLE	WHERE THE PROPOSAL WOULD CAUSE NO DISCERNIBLE DETERIORATION OR IMPROVEMENT.
LOW	WHERE THE PROPOSAL WOULD CAUSE A BARELY PERCEPTIBLE CHANGE.
MEDIUM	WHERE THE PROPOSAL WOULD CAUSE A NOTICEABLE CHANGE.
HIGH	WHERE THE PROPOSAL WOULD CAUSE A SIGNIFICANT CHANGE.

In this LVIA, those effects described as **Severe** and **Major** are described as significant effects as required by the Environmental Impact Assessment (Scotland) Regulations 2011. These are the effects that the assessor considers to be material in the decision making process.



**FIGURE 4.1:** MATRIX TO DETERMINE SIGNIFICANCE OF EFFECT<sup>19</sup>

<sup>19</sup> Adapted from Figure 6.3 of IEMA (2011) *The State of Environmental Impact assessment Practice in the UK*



**TABLE 4.2: MEANING OF TERMS USED WHEN DEFINING SIGNIFICANCE OF EFFECT**

CRITERIA	DEFINITION
NEUTRAL	THE PROPOSAL WOULD COMPLEMENT THE SCALE, LANDFORM AND PATTERN OF THE LANDSCAPE; MAINTAIN EXISTING LANDSCAPE QUALITY.
MINOR	THE PROPOSAL WOULD NOT QUITE FIT INTO THE LANDFORM AND SCALE OF THE LANDSCAPE; AFFECT AN AREA OF RECOGNISED LANDSCAPE CHARACTER.
MODERATE	THE PROPOSAL WOULD BE OUT OF SCALE WITH THE LANDSCAPE OR AT ODDS WITH THE LOCAL PATTERN AND LANDFORM; WOULD LEAVE AN ADVERSE IMPACT ON A LANDSCAPE OF RECOGNISED QUALITY.
MAJOR	THE PROPOSAL WOULD RESULT IN EFFECTS THAT CANNOT BE FULLY MITIGATED AND MAY CUMULATIVELY AMOUNT TO A SEVERE ADVERSE EFFECT; WOULD BE AT A CONSIDERABLE VARIANCE TO THE LANDSCAPE DEGRADING THE INTEGRITY OF THE LANDSCAPE; WOULD BE SUBSTANTIALLY DAMAGING TO A HIGH QUALITY LANDSCAPE.
SEVERE	THE PROPOSAL WOULD RESULT IN EFFECTS THAT ARE AT A COMPLETE VARIANCE WITH THE LANDFORM, SCALE AND PATTERN OF THE LANDSCAPE; WOULD PERMANENTLY DEGRADE, DIMINISH OR DESTROY THE INTEGRITY OF VALUED CHARACTERISTIC FEATURES, ELEMENTS AND/OR THEIR SETTING; WOULD CAUSE A VERY HIGH QUALITY LANDSCAPE TO BE PERMANENTLY CHANGED AND ITS QUALITY DIMINISHED.

#### 4.2.3 Zone of Theoretical Visibility (ZTV) and Viewpoint Selection

In order to aid assessment, two ZTVs have been calculated to define the extent or zone within which the proposed development may be visible. The first ZTV is based on topography only (Appendices 4.1 and 4.2), whilst the second also includes the screening effects from Ancient and Semi-Natural Woodland (Appendices 4.3 and 4.4).

To compute these ZTVs, a 'bare earth' or worst case scenario was calculated using Resoft™ WindFarm software. This is based on a digital terrain model (DTM) derived from Ordnance Survey Landform Panorama data (based on 10m height contours at a scale of 1:50,000). The ZTV was generated for receptors to a height of 2m, as recommended by the SNH guidance, 'Visual Representation of Windfarms' (2014).

These ZTVs provide a means of identifying potential receptors (areas of land used by the public and individual/groups of buildings) so that impact assessments from specific viewpoints can be undertaken. They also assist in the assessment of impact on different landscape character types and designated sites as they indicate whether a view may be obtained in these areas.

Viewpoints were selected from key points in the landscape using the woodland ZTV (Appendices 4.3 and 4.4). Seven viewpoints were agreed with Scottish Borders Landscape Architect, J. Knight, in advance of this study; however, following a site visit one of these locations was confirmed as unsuitable. This was a location to the east of Earlston, designed to assess the visual impact of the proposal on both this section of the village and its distinctive church spires. It was not possible to gain an unobstructed view towards the proposal from this area and therefore the proposal will not have an impact on this part of the village or the setting of the church and spires. An alternative viewpoint location was sought to the north of the village; however unobstructed views were not possible from here either.

The locations of the six viewpoints used for this study are displayed in Appendices 4.3 and 4.4. Photomontages and wireframe diagrams were produced from these viewpoints using Resoft™ WindFarm software and these are attached as Appendices 4.5 to 4.10.

#### 4.2.4 Cumulative Impact Methodology

*“Cumulative impacts can be defined as the additional changes caused by a proposed development in conjunction with other similar development.”<sup>20</sup>*

The purpose of the cumulative assessment is therefore to analyse the predicted cumulative effects on visual amenity caused by the proposed development, collectively with all the approved and proposed wind energy developments within the study area. Following the submission of a map showing all wind energy developments to 16km (Appendix 4.11), an 8km targeted study area was agreed with SBC.<sup>21</sup>

There are two types of cumulative visual impact:<sup>22</sup>

1. Combined: Where the receptor is able to see two or more developments from one viewpoint. This can either be:
  - a. In combination: More than one development is observable from a single static viewpoint in one arc of view (i.e. the receptor does not turn around). This can represent particular directional viewpoints or the view from the principal aspect of a residential property;
  - b. In succession: More than one development is observable from a single static viewpoint, with the receptor turning around to encompass more than one arc view (to 360°). This can represent high and open viewpoints, or views from all aspects of a residential property;
2. Sequential: More than one development is observable by a receptor visiting a series of viewpoints. These effects should be assessed for travel along regularly-used routes such as major roads, railway lines, ferry routes, popular paths, etc. Sequential effects may be frequent (features appearing regularly) or occasional (long time lapses between features).

The combined visibility of this proposal with others in the 8km study area will be considered throughout this LVIA and are shown in the visualisations if they can be seen alongside the proposal (Appendices 4.5 to 4.10). Sequential visibility on key routes will be assessed specifically in Chapter 4.6.

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<sup>20</sup> Guidelines for Landscape and Visual Impact Assessment, 2002 (Landscape Institute and IEMA)

<sup>21</sup> Landscape Architect, J.Knight, Consultation response to Screening Opinion, made on 16/12/2013

<sup>22</sup> Landscape Institute and Institute of Environmental Management & Assessment (2013) GLVIA3

### 4.3 Baseline Landscape Character and Capacity

The publication by the ASH Consulting Group (1998) *'The Borders Landscape Assessment: SNH Review No.112,'* divides the Scottish Borders into thirty distinctive Landscape Character Types (LCTs) and smaller Landscape Character Areas (LCAs) are identified within these. The main findings of this publication relevant to this proposal at Clackmae are summarised below.

#### 4.3.1 Landscape Character Types (LCTs)

The proposed turbine lies within the *'Undulating Grassland'* LCT; yet is only approximately 40m from the *'Pastoral Upland Fringe Valley,'* and therefore is in a transitional zone.

The main characteristics of the *'Undulating Grassland'* LCT include its large scale, undulating form, interspersed with steep gullies and narrow valleys. Land cover includes improved pasture, coniferous plantations, and medium density settlement. Visibility is considered high in general, although low in local areas with valleys and tree cover. The main population centres of Galashiels, Melrose and Hawick are considered the most visually sensitive areas, alongside the connecting routes between these.

In regards to the *'Pastoral Upland Fringe Valley'* LCT, characteristics include a medium scale pastoral valley with flat floor and narrow, wooded side valleys. Woodland is mainly broadleaf, with occasional coniferous plantations, scattered trees along rivers and policy woodland around mansion houses. There are also scattered villages and farmsteads, with Earlston being the important secondary centre within the LCT. Views are moderate in range, with intermediate horizons formed by woodland strips or the contours of side valleys.

#### 4.3.2 Landscape Character Areas (LCAs)

As with the LCTs, the proposed turbine is close to the border between two LCAs: It is within *'East Gala'* LCA, yet circa 40m from *'Lower Leader'* LCA.

The former is described as moderately to strongly undulating, with a mixture of gentle and steep slopes. Medium-sized conifers and pylons are locally prominent.

The *'Lower Leader'* LCA has an intimate landform, with mixed broadleaf and coniferous woodland being widespread. The distinctive peaks of Black Hill and White Hill are prominent features here, as is the A68 which runs in a north-south direction on the valley floor.

#### 4.3.3 Landscape Capacity

Landscape capacity refers to the potential ability of the landscape to absorb new landscape elements (in this case wind turbines) without sustaining unacceptable negative effects on its character. An assessment of the capacity of the Scottish Borders landscape has been produced by Ironside Farrar: *'Wind Energy Consultancy: Landscape Capacity and Cumulative Impact,'*

(2013). This uses the 1998 ASH report discussed above as a template and has been drafted with the intention that it will guide the Council in renewable energy policy. However, the Principal Planning Officer at SBC, Charles Johnston, confirmed this publication has not yet undergone a formal public consultation and therefore is not yet a material consideration to any wind energy applications.<sup>23</sup>

Whilst concerns have been raised with the Council that this document does not comply with Scottish Planning Policy in supporting renewable energy developments,<sup>24</sup> it is nevertheless a useful document in illustrating some key issues for wind energy proposals in LCAs and so SBC recommend referencing this.<sup>25</sup>

The Ironside Farrar report states that medium-sized turbines between 25m and 50m in height are considered suitable for both 'East Gald' and 'Lower Leader' LCAs, although a limited capacity is recognised here and individual turbines are preferred. The proposed turbine at Clackmae, which is 34.4m to tip height, is therefore suitable for these character areas. Although it may be in a marginal zone due to the Southern Upland Way to the west and larger settlements such as Melrose to the south, the visual assessment in Chapter 4.5 and the two ZTVs to 5km in particular (Appendices 4.1 and 4.3) show that the proposal will have a low to negligible impact on these sensitive areas.

#### 4.4 Assessment of Landscape Effects

There are a number of ways in which a proposed development could theoretically impact on the existing landscape:

- ◆ Direct impact on the existing landscape fabric due to the construction of the proposal, for example removal of structures or vegetation, erection of new structures;
- ◆ Impacts on the landscape character of the area or of designated sites during the construction phase of the proposal, for example due to the erection or removal of structures and activity associated with construction;
- ◆ Impacts on the landscape character of the area or of designated sites during the operation of the proposal for example due to the presence of new structures and due to activity associated with the operation of the proposal.

Table 4.3 provides the definition of the criteria used for Nature of Receptor in regards to landscape impact.

<sup>23</sup> Charles Johnston's response forwarded by SBC planner, Stuart Herkes, via email on 13.11.14

<sup>24</sup> Comments include those from TNEI Services and Infinis and can be found on SBC website

<sup>25</sup> Recommendation from Charles Johnston via email from Stuart Herkes on 13.11.14

**TABLE 4.3: DEFINITION OF CRITERIA USED TO DETERMINE NATURE OF RECEPTOR (LANDSCAPE)**

CRITERIA	DEFINITION
NEGLECTIBLE	LANDSCAPE AREAS ALREADY HEAVILY DEVELOPED AND INDUSTRIALISED; IDENTIFIED IN LANDSCAPE CAPACITY STUDY AS HAVING NO SENSITIVITY TO WIND ENERGY DEVELOPMENTS.
LOW	VAST, ROBUST LANDSCAPE AREAS WITH ONLY A SMALL NUMBER OF EXISTING WIND ENERGY DEVELOPMENTS; IDENTIFIED IN LANDSCAPE CAPACITY STUDY AS HAVING A LOW SENSITIVITY TO MEDIUM-SCALE WIND ENERGY DEVELOPMENTS.
MEDIUM	UNDULATING LANDSCAPE WHERE THE EXISTING SENSE OF SCALE MAY BE AFFECTED BY A WIND ENERGY DEVELOPMENT OF INAPPROPRIATE SCALE OR LOCATION, YET WITH NO IMPORTANT LANDSCAPE DESIGNATIONS; AN AREA WITH A NUMBER OF WELL-PLACED WIND ENERGY DEVELOPMENTS OF SUITABLE SCALE; IDENTIFIED IN LANDSCAPE CAPACITY STUDY AS HAVING A MEDIUM SENSITIVITY TO MEDIUM-SCALE WIND ENERGY DEVELOPMENTS.
HIGH	LANDSCAPES CONTAINING SENSITIVE SITES, SUCH AS GARDENS AND DESIGNED LANDSCAPES OR NATIONAL SCENIC AREAS (NSAs); AREAS WITH A NUMBER OF EXISTING WIND ENERGY DEVELOPMENTS CREATING AN ENVIRONMENT THAT CAN BE DESCRIBED AS 'A WIND ENERGY LANDSCAPE;' FLAT LANDSCAPES WHERE TURBINES WILL CREATE A SIGNIFICANT CONTRAST; IDENTIFIED IN LANDSCAPE CAPACITY STUDY AS HAVING A HIGH SENSITIVITY TO SMALL WIND ENERGY DEVELOPMENTS.

#### 4.4.2 Significance of Landscape Effect

Tables 4.4 to 4.7 assess the different elements of the landscape character and how significant the effect will be from the installation and operation of the proposed turbine.

**TABLE 4.4: LANDSCAPE CHARACTER TYPE 1**

RECEPTOR:	UNDULATING GRASSLAND	NATURE OF RECEPTOR:	MEDIUM
THIS LANDSCAPE OF MIXED UNDULATIONS COULD BE AFFECTED BY AN INAPPROPRIATELY SITED WIND ENERGY DEVELOPMENT; HOWEVER THE SCALE OF THE LANDSCAPE CAN ACCOMMODATE THE PROPOSED TURBINE AT CLACKMAE. IN ADDITION, THE FABRIC OF THE LANDSCAPE WILL NOT BE IMPACTED DURING CONSTRUCTION OR OPERATION OF THE TURBINE. WHILST A SECTION OF THE EILDON AND LEADERFOOT NSA IS WITHIN THIS LCT, THERE WILL BE NO LANDSCAPE IMPACT FROM THE PROPOSED TURBINE, WHICH IS 2KM FROM THE NSA (VISUAL IMPACT WILL BE CONSIDERED IN CHAPTER 4.5).			
NATURE OF EFFECT:	LOW	SIGNIFICANCE OF EFFECT:	MINOR

**TABLE 4.5: LANDSCAPE CHARACTER TYPE 2**

RECEPTOR:	PASTORAL UPLAND FRINGE VALLEY	NATURE OF RECEPTOR:	MEDIUM
THE MAIN CHARACTERISTICS OF THIS LCT, NAMELY THE VALLEYS AND WOODLAND, WILL NOT BE IMPACTED BY THE PROPOSED WIND TURBINE DURING EITHER CONSTRUCTION OR OPERATION. IN SIMILARITY WITH THE UNDULATING GRASSLAND LCT, WHILST A SECTION OF THE EILDON AND LEADERFOOT NSA IS WITHIN THIS LCT, THERE WILL BE NO LANDSCAPE IMPACT FROM THE PROPOSED TURBINE.			
NATURE OF EFFECT:	NEGLECTIBLE	SIGNIFICANCE OF EFFECT:	NEUTRAL

**TABLE 4.6: LANDSCAPE CHARACTER AREA 1**

<b>RECEPTOR:</b>	EAST GALA	<b>NATURE OF RECEPTOR:</b>	LOW
THE UNDULATING LANDSCAPE AND LOCALLY PROMINENT CONIFERS HELP TO SCREEN THE PROPOSED TURBINE FROM MUCH OF THIS LCA, YET THE TURBINE WILL NOT ALTER THE FABRIC OF THIS AREA, OR AFFECT THE SCALE OF THE HILLS. DURING CONSTRUCTION, NO NEW ACCESS TRACK WILL BE REQUIRED AS EXISTING ROADS AND FARM TRACKS WILL BE USED, THEREFORE NO ALTERATIONS WILL TAKE PLACE AT THIS TIME EITHER. WHILST A NEW FEATURE WILL BE IN PLACE DURING TURBINE OPERATION, THE TURBINE SIZE IS BELIEVED TO BE SUITED TO THIS LCA, AS INDICATED IN THE CAPACITY STUDY.			
<b>NATURE OF EFFECT:</b>	LOW	<b>SIGNIFICANCE OF EFFECT:</b>	MINOR

**TABLE 4.7: LANDSCAPE CHARACTER AREA 2**

<b>RECEPTOR:</b>	LOWER LEADER	<b>NATURE OF RECEPTOR:</b>	LOW
THE PROPOSED TURBINE WILL NOT ALTER THE CHARACTER OF THIS AREA IN REGARDS TO IMPACTING THE WOODLAND OR AFFECTING THE SCALE AND PROMINENCE OF BLACK AND WHITE HILLS. WITH THE A68 TRUNK ROAD BEING A NOTICEABLE FEATURE IN THIS LCA, THE PRESENCE OF MAN-MADE FEATURES IS CLEAR AND THEREFORE THE PRESENCE OF A SINGLE MEDIUM-SIZED OPERATING WIND TURBINE WILL NOT CONFLICT WITH THE OVERALL CHARACTER OF THE AREA.			
<b>NATURE OF EFFECT:</b>	LOW	<b>SIGNIFICANCE OF EFFECT:</b>	MINOR

## 4.5 Baseline Visual Receptors and Visual Effects

### 4.5.1 Introduction

Visual receptors are people assumed to be equally affected by change. Visual impacts relate to the change of views and the experienced visual amenity for a number of identified receptors.

This assessment sets out the existing visual conditions affecting the study area, and describes the visual effects of the proposed development.

In combination with professional judgement, the assessment on the significance of visual effects from the proposed development is reached using the matrix in Figure 4.1. The criteria for the term Nature of Receptor in regards to visual effect is defined in Table 4.8.

The Nature of Effect is also dependent on a number of factors:

- ◆ Distance of viewpoint from the development;
- ◆ Proportion of the field of view occupied by the development;
- ◆ Orientation or angle of view to the centre of development;
- ◆ Background to the development;
- ◆ Extent of other built development, especially vertical elements.

**TABLE 4.8: DEFINITION OF CRITERIA USED TO DETERMINE NATURE OF RECEPTOR (VISUAL)**

CRITERIA	DEFINITION
NEGLIGIBLE	VIEWS FROM TOWNS, CONURBATIONS AND HEAVILY INDUSTRIALISED AREAS.
LOW	THOSE ENGAGED IN OUTDOOR SPORTS OR RECREATION, OTHER THAN FOR VIEWING; THOSE USING MAJOR ROADS OR MOTORWAYS IN THE REGION; THOSE ENGAGED IN COMMERCIAL ACTIVITY AND TRANSPORT OR IN EDUCATION, WHOSE ATTENTION IS FOCUSED ON THEIR WORK OR ACTIVITY RATHER THAN THE WIDER LANDSCAPE.
MEDIUM	RESIDENTIAL PROPERTIES WITH LESS SIGNIFICANT VIEWS FROM LIVING ROOMS/GARDENS; WALKERS USING LOCAL NETWORK OF FOOTPATHS AND TRACKS; TRANSPORT USERS OF LOCAL ROADS, TRAIN LINES, RIVERS AND CANALS.
HIGH	RESIDENTIAL PROPERTIES WITH PRINCIPLE VIEWS FROM LIVING ROOMS AND GARDENS; IMPORTANT LANDSCAPE FEATURES WITH PHYSICAL, CULTURAL OR HISTORIC ATTRIBUTES; BEAUTY SPOTS, PUBLIC VIEWING AREAS AND PICNIC AREAS; USERS OF STRATEGIC FOOTPATHS, CYCLE ROUTES OR RIGHTS OF WAY, WHERE ATTENTION IS FOCUSED ON THE LANDSCAPE.

The visual assessment additionally takes into account all of the approved and pending wind energy developments within an 8km radius of the proposed turbine. These are listed in Table 4.9 and are illustrated in Appendix 4.11.

**TABLE 4.9: WIND ENERGY DEVELOPMENTS WITHIN 8KM OF PROPOSED TURBINE<sup>26</sup>**

NAME OF SITE/DEVELOPMENT	DISTANCE TO NEAREST TURBINE (KM)	NUMBER OF TURBINES	HEIGHT TO BLADE TIP (M)	STATUS IN PLANNING SYSTEM
WEST MORRISTON FARM	4.6	1	48.3	APPROVED
WHITSLAID FARM	5.6	2	37.5	APPROVED
NETHER HUNTLYWOOD FARM	6.7	2	34.2	PENDING
LARKHILL	7.2	1	27	APPROVED
MUIRCLEUGH FARM	7.4	7	110	PENDING
LONG PARK	7.6	19	100	APPROVED
RENNIESTON EDGE	7.6	1	15	APPROVED

#### 4.5.2 Zone of Theoretical Visibility (ZTV)

The ZTV which illustrates screening from topography only (Appendices 4.1 and 4.2) provides an indication of the undulation of the study area, as the visibility of the proposed turbine is notably limited. Through comparing this ZTV with the one which shows screening from both topography and Semi-natural and Ancient Woodland (Appendices 4.3 and 4.4), the number of small and medium-sized woodlands in the landscape which further reduce available viewpoints becomes apparent.

<sup>26</sup> Data on approved and pending applications gathered on 03.11.14



Appendix 4.3 displays the topographic and woodland ZTV to 5km for a more detailed study of the area closest to the proposed turbine. Crucially, this shows that the turbine will not be visible from the Southern Upland Way, with the exception of a 175m section (maximum) which is explored through Viewpoint 3 below. In addition, the turbine will not be visible from Melrose and the surrounding settlements to the south, or much of the A68.

The most significant areas of theoretical visibility within 5km are at the houses closest to the proposal (to the east) and over the settlement of Earlston. When focussing on Earlston both through desk-based and on-site assessment, it is apparent that much of the village will not be visually impacted by the turbine due to screening from buildings and other vegetation which are not accounted for in the ZTV. This includes a lack of visual impact on the church and its spires which are important features of the village. The visual assessment below therefore focuses on the western boundary of the village, where no other intervening buildings obstruct views towards the proposal.

Between 5 to 15km (Appendix 4.4), the ZTV of the proposal taking into account topography and woodland is even more limited, with patches of visibility to the north, east and on very small areas of high land to the south. No settlements are affected, meaning that the turbine will only be visible from scattered dwellings and to travellers catching occasional glimpses from either roads or walking routes.

#### ***4.5.3 Photomontage Assessment***

Visualisations have been created for this assessment to illustrate the predicted views of the proposed development from a number of significant viewpoints within the study area. Each visualisation illustrates the baseline view; a wireframe diagram clearly presenting and labelling the proposed turbine and any other visible wind energy developments within the 8km cumulative study area; and a photomontage illustrating the altered view with the addition of those turbines in the wireframe.

As referenced in the methodology, despite the use of a woodland ZTV, it was difficult to find the clear, unobstructed views sought for a photomontage in many areas; and in some instances this was not achievable. This was mainly due to the prominent vegetation in the local landscape, and within Earlston the buildings will also screen views of the turbine from many areas. Six of the original seven viewpoints agreed with the SBC Landscape Architect, J. Knight, have been completed for this assessment and are therefore discussed through Tables 4.10 to 4.16 and attached as Appendices 4.5 to 4.10.



**TABLE 4.10: VIEWPOINT 1 - FROM LOCAL ROAD NEAR CLACKMAE FARM COTTAGES**

<b>GRID REFERENCE</b>	E356049; N639325	<b>APPENDIX</b>	4.5
<b>DIRECTION OF VIEW</b>	SOUTHWEST	<b>DISTANCE TO TURBINE</b>	0.9KM
<b>SELECTION CRITERIA:</b> RESIDENTS CLOSEST TO THE PROPOSAL & TRAVELLERS USING THE LOCAL ROAD (MOST LIKELY TO BE NEARBY RESIDENTS).			
<b>NATURE OF RECEPTOR</b>		MEDIUM	
<b>PREDICTED VIEW:</b> THE RESIDENCES ALONG THIS ROAD DO NOT HAVE PRINCIPLE VIEWS TOWARDS THE PROPOSED TURBINE AND AS THE ROAD IS FREQUENTLY LINED BY VEGETATION, MANY SECONDARY AND TERTIARY VIEWS ARE SCREENED. FOR THOSE TRAVELLING ALONG THE ROAD, THIS VEGETATION WILL ALSO FREQUENTLY SCREEN VIEWS OF THE TURBINE. WHERE VISIBLE, THE TURBINE IS A CLEAR FEATURE IN THE FIELD, SITUATED BESIDE THE DAIRY SHED WHICH IS APPARENT TO THE NORTH-NORTHEAST.			
<b>COMBINED CUMULATIVE EFFECTS:</b> NO OTHER TURBINES ARE VISIBLE WITHIN THE SAME FIELD OF VIEW.			
<b>SUCCESSIONAL CUMULATIVE EFFECTS:</b> THE ONLY DEVELOPMENT THEORETICALLY VISIBLE IN 360 <sup>0</sup> IS WHITSLAID FARM (TWO APPROVED TURBINES). HOWEVER, ONLY THE UPPER BLADES ARE VISIBLE IN THE WIREFRAME AND AT A DISTANCE OF 5.4KM THESE WILL NOT BE VISIBLE FROM THE VIEWPOINT DUE TO INTERVENING LANDSCAPE FEATURES.			
<b>NATURE OF EFFECT</b>	MEDIUM	<b>SIGNIFICANCE OF EFFECT</b>	MODERATE

**TABLE 4.11: VIEWPOINT 2 - FROM MILL ROAD TO THE WEST OF EARLSTON**

<b>GRID REFERENCE</b>	E357244; N638419	<b>APPENDIX</b>	4.6
<b>DIRECTION OF VIEW</b>	NORTHWEST	<b>DISTANCE TO TURBINE</b>	1.7KM
<b>SELECTION CRITERIA:</b> RESIDENTS ON THE WESTERN EDGE OF EARLSTON AND RECREATIONAL USERS OF THE SPORTS FIELD.			
<b>NATURE OF RECEPTOR</b>		HIGH	
<b>PREDICTED VIEW:</b> THE PROPOSED TURBINE WILL BE VISIBLE ABOVE THE TREELINE ON THE RIDGE BORDERING THE SPORTS FIELD IN THIS SECTION OF EARLSTON. A NUMBER OF HOUSES BORDER THIS FIELD, SOME VIEWS ARE OBSTRUCTED BY VEGETATION, YET OTHERS WILL HAVE CLEAR VIEWS TOWARDS THE FIELD AND TURBINE. ALTHOUGH VISIBLE, THE TURBINE WILL NOT DOMINATE THIS VIEW DUE TO DISTANCE AND THE NUMBER OF OTHER FEATURES OF INTEREST IN THE AREA.			
<b>COMBINED CUMULATIVE EFFECTS:</b> NO OTHER TURBINES ARE VISIBLE WITHIN THE SAME FIELD OF VIEW.			
<b>SUCCESSIONAL CUMULATIVE EFFECTS:</b> NO OTHER TURBINES ARE VISIBLE WHEN TAKE ACCOUNT OF 360 <sup>0</sup> VIEWS.			
<b>NATURE OF EFFECT</b>	Low	<b>SIGNIFICANCE OF EFFECT</b>	MODERATE

**TABLE 4.12: VIEWPOINT 3 - FROM THE SOUTHERN UPLAND WAY**

<b>GRID REFERENCE</b>	E353867; N639364	<b>APPENDIX</b>	4.7
<b>DIRECTION OF VIEW</b>	EAST-SOUTHEAST	<b>DISTANCE TO TURBINE</b>	1.9KM
<b>SELECTION CRITERIA:</b> POPULAR LONG-DISTANCE WALKING ROUTE.			
<b>NATURE OF RECEPTOR</b>		HIGH	
<p><b>PREDICTED VIEW:</b> THE ZTV (APPENDIX 4.3) SHOWS THAT THE TURBINE IS ONLY THEORETICALLY VISIBLE FROM A VERY SMALL AREA OF THIS ROUTE WITHIN A 5KM RADIUS. DURING THE SITE VISIT, A FEW PHOTOS WERE TAKEN FROM DIFFERENT POINTS WITHIN THIS AREA OF VISIBILITY, WITH THE ONE PRESENTED REPRESENTING THE WORST-CASE SCENARIO.</p> <p>DUE TO THE INTERVENING HILLS AND A SMALL, DENSE AREA OF WOODLAND, ONLY A SMALL SECTION OF THE TURBINE WILL BE VISIBLE AT THIS POINT. THE TURBINE'S PRESENCE WILL NOT INTERFERE WITH THE DISTINCTIVE HILLS VISIBLE IN THE DISTANCE AND NEITHER WILL IT CHALLENGE THE APPARENT SCALE OF THE LANDSCAPE IN THE FOREGROUND, BEING A SMALL FEATURE IN COMPARISON. AS THERE ARE WIDE, OPEN VIEWS ALONG THIS WALKING ROUTE, THIS SMALL AREA OF PARTIAL VISIBILITY WILL NOT HAVE A SIGNIFICANT IMPACT ON THOSE RECEPTORS TRAVELLING ALONG THE PATH.</p>			
<b>COMBINED CUMULATIVE EFFECTS:</b> NO OTHER TURBINES ARE VISIBLE WITHIN THE SAME FIELD OF VIEW.			
<b>SUCCESSIONAL CUMULATIVE EFFECTS:</b> THE BLADE TIPS OF THREE OF THE TURBINES ASSOCIATED WITH LONG PARK WIND FARM ARE THEORETICALLY VISIBLE TO THE WEST-NORTHWEST OF THIS VIEWPOINT; HOWEVER, THE INTERVENING WOODLAND IN THIS DIRECTION SCREENS ANY VIEWS OF THESE VERY SMALL FEATURES.			
<b>NATURE OF EFFECT</b>	LOW	<b>SIGNIFICANCE OF EFFECT</b>	MODERATE

**TABLE 4.13: VIEWPOINT 4 - FROM THE SUMMIT OF BLACK HILL**

<b>GRID REFERENCE</b>	E358550; N637008	<b>APPENDIX</b>	4.8
<b>DIRECTION OF VIEW</b>	NORTHWEST	<b>DISTANCE TO TURBINE</b>	3.6KM
<b>SELECTION CRITERIA:</b> THE ONLY SCENIC VIEWPOINT WITHIN 5KM OF THE PROPOSAL AND THERE IS ALSO A FORT WHICH IS A SCHEDULED ANCIENT MONUMENT. RECEPTORS IN THIS AREA ARE THEREFORE TRAVELLERS AND VISITORS.			
<b>NATURE OF RECEPTOR</b>		HIGH	
<p><b>PREDICTED VIEW:</b> VIEWS FROM THIS HEIGHT ARE WIDE-RANGING IN ALL DIRECTIONS. THE PROPOSED TURBINE WILL BE VISIBLE AS A RELATIVELY SMALL FEATURE ASSOCIATED WITH THE BUILDINGS NEAR CLACKMAE AND THE SETTLEMENT OF EARLSTON WHICH CAN BE SEEN NEARBY, RATHER THAN IN AN AREA WHICH IS LESS AFFECTED BY HUMAN DEVELOPMENT. THE TURBINE WILL NOT SKYLINE OR AFFECT THE SCALE OF ANY HILLS IN THE VIEW.</p>			
<p><b>COMBINED CUMULATIVE EFFECTS:</b> WITHIN THE SAME FIELD OF VIEW, THE EXISTING LONG PARK WIND FARM IS VISIBLE TO THE WEST-NORTHWEST. THIS IS A DISTANT, YET NOTICEABLE FEATURE. THE APPROVED TURBINES AT LARKHILL ARE THEORETICALLY VISIBLE FROM THE WIREFRAME, YET ARE NOT SIGNIFICANT FEATURES DUE TO THEIR SIZE AND THE INTERVENING TOPOGRAPHY.</p> <p>IF THE PENDING WIND FARM AT MUIRCLEUGH FARM IS APPROVED, A FURTHER NOTICEABLE WIND ENERGY FEATURE IS ADDED TO THIS VIEW, WHICH WHILST CLEARLY SEPARATE FROM LONG PARK, WILL INCREASE THE NUMBER OF TURBINES SEEN IN THE DISTANT HORIZON. HOWEVER, THE PROPOSED SINGLE WIND TURBINE AT CLACKMAE IS CLEARLY A SEPARATE, SMALLER DEVELOPMENT WHICH WILL NOT ADVERSELY IMPACT THE WIDE-RANGING VIEWS FROM THIS HILL.</p>			
<p><b>SUCCESSIONAL CUMULATIVE EFFECTS:</b> WITHIN 360<sup>0</sup> VIEWS, FOUR TURBINE DEVELOPMENTS ARE VISIBLE. IN REGARDS TO THE TWO TURBINES AT WHITSLAID FARM AND THE SINGLE TURBINE AT RENNISTON EDGE, THESE ARE VERY SMALL FEATURES IN THE LANDSCAPE THAT ARE UNLIKELY TO BE NOTICEABLE DUE TO INTERVENING LANDSCAPE FEATURES SUCH AS VEGETATION.</p> <p>WEST MORRISTON FARM (ONE TURBINE) AND NETHER HUNTLYWOOD FARM (TWO TURBINES) TO THE NORTH-NORTHEAST, ARE BOTH LARGER FEATURES, YET LIKE CLACKMAE DO NOT SKYLINE OR DOMINATE VIEWS FROM BLACK HILL.</p>			
<b>NATURE OF EFFECT</b>	LOW	<b>SIGNIFICANCE OF EFFECT</b>	MODERATE

**TABLE 4.14: VIEWPOINT 5 - FROM THE TRIG POINT AT SCOTT'S VIEW**

<b>GRID REFERENCE</b>	E359347; N634256	<b>APPENDIX</b>	4.9
<b>DIRECTION OF VIEW</b>	NORTHWEST	<b>DISTANCE TO TURBINE</b>	6.1km
<b>SELECTION CRITERIA: A SCENIC VIEWPOINT CLOSE TO MELROSE.</b>			
<b>NATURE OF RECEPTOR</b>		HIGH	
<b>PREDICTED VIEW:</b> THE WOODLAND IN THE DIRECTION OF THE TURBINE IS TALL AND DENSE AND THE PROPOSED TURBINE AT CLACKMAE IS SCREENED FROM VIEW. EVEN IF VISIBLE, THE WIREFRAME ILLUSTRATES THAT CLACKMAE IS A VERY SMALL FEATURE WHICH DOES NOT CHALLENGE THE SCALE OF THE DOMINANT HILLS FURTHER EAST. IN ADDITION, THE PROPOSAL WILL NOT DIRECTLY AFFECT THE KEY VIEWS WEST TOWARDS THE TWEED VALLEY AND EILDON HILLS.			
<b>COMBINED CUMULATIVE EFFECTS:</b> THE WIND FARMS AT LONG PARK (APPROVED) AND MUIRCLEUGH FARM (PENDING), AND THE SINGLE TURBINE AT LARKHILL (APPROVED) CANNOT BE SEEN CLEARLY DUE TO THE WOODLAND IN THE FOREGROUND SCREENING THE MAJORITY OF THE DISTANT HORIZON.			
<b>SUCCESSIONAL CUMULATIVE EFFECTS:</b> THE ONLY OTHER VISIBLE WIND ENERGY DEVELOPMENT WITHIN THE STUDY AREA IS THE SINGLE TURBINE AT RENNISTON EDGE TO THE SOUTHWEST. HOWEVER THIS IS A SMALL FEATURE WHICH DOES NOT SKYLINE OR CREATE A CLEAR VERTICAL LANDSCAPE ELEMENT FROM THIS VIEWPOINT.			
<b>NATURE OF EFFECT</b>	NEGLECTIBLE	<b>SIGNIFICANCE OF EFFECT</b>	NEUTRAL

**TABLE 4.15: VIEWPOINT 6 - FROM THE SOUTHERN UPLAND WAY NEAR LAUDER**

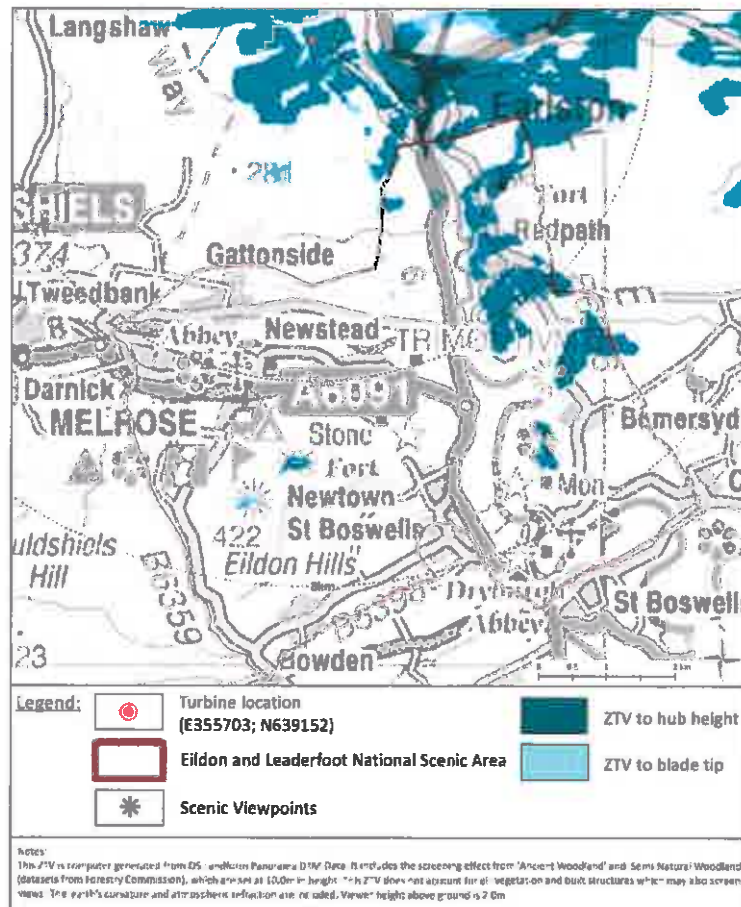
<b>GRID REFERENCE</b>	E354798; E648188	<b>APPENDIX</b>	4.10
<b>DIRECTION OF VIEW</b>	SOUTH	<b>DISTANCE TO TURBINE</b>	9.1km
<b>SELECTION CRITERIA: TO DETERMINE THE VISUAL IMPACT AT THIS DISTANCE ON A SECTION OF THE SOUTHERN UPLAND WAY, A POPULAR LONG-DISTANCE WALKING ROUTE.</b>			
<b>NATURE OF RECEPTOR</b>		HIGH	
<b>PREDICTED VIEW:</b> THE WIREFRAME DIAGRAM ILLUSTRATES THAT THE PROPOSED TURBINE AT CLACKMAE IS A VERY SMALL FEATURE AT THIS DISTANCE. ALTHOUGH IT IS SCREENED FROM VIEW BY WOODLAND AT THE FOREGROUND OF THIS VIEWPOINT, IT IS HIGHLY LIKELY THAT EVEN WITH A CLEARER, MORE OPEN VIEW TO THE SOUTH OF THIS AREA; THE PROPOSED TURBINE WOULD STILL BE SCREENED BY OTHER INTERVENING, MORE DISTANT LANDSCAPE FEATURES DUE TO ITS SMALL SCALE. THE WIREFRAME SHOWS THAT THE PROPOSAL DOES NOT SKYLINE OR CHALLENGE THE SCALE OF THE DISTINCTIVE HILL PEAKS FURTHER SOUTH.			
<b>COMBINED CUMULATIVE EFFECTS:</b> WHITSLAID FARM TO THE SOUTH-SOUTHEAST, ALTHOUGH NOT VISIBLE IN APPENDIX 4.10, WILL BE VISIBLE WITHIN THE SAME FRAME OF VIEW AS THE CLACKMAE TURBINE. THE TWO APPROVED TURBINES ARE NOT LARGE FEATURES FROM THIS AREA, YET WOULD BE NOTICEABLE IF CLEAR VIEWS WERE OBTAINED TOWARDS THEM. HOWEVER, WHEN COMBINED WITH THE PROPOSAL AT CLACKMAE, NO ADDITIONAL VISUAL IMPACT WILL BE CREATED DUE TO THE INSIGNIFICANCE OF THE PROPOSED TURBINE IN THE LANDSCAPE.			
<b>SUCCESSIONAL CUMULATIVE EFFECTS:</b> WITHIN THE 8KM CUMULATIVE STUDY AREA, THREE TURBINE DEVELOPMENTS ARE VISIBLE IN A WESTERLY DIRECTION OF THIS PROPOSAL: LARKHILL, LONG PARK WIND FARM AND THE PROPOSED WIND FARM AT MUIRCLEUGH FARM. THE LATTER TWO ARE LARGE FEATURES AND ALL THREE COULD BE CONFUSED AS ONE MIXED DEVELOPMENT FROM THIS DIRECTION. ALTHOUGH CLEAR, UNOBSTRUCTED VIEWS ARE LIKELY FROM THIS VIEWPOINT TO THE WEST, THE PROPOSED TURBINE AT CLACKMAE TO THE SOUTH WILL ADD NO SIGNIFICANT ADDITIONAL CUMULATIVE IMPACT.			
<b>NATURE OF EFFECT</b>	NEGLECTIBLE	<b>SIGNIFICANCE OF EFFECT</b>	NEUTRAL

#### 4.5.1 National Scenic Areas (NSAs)

NSAs are areas of exceptional landscape designated for their outstanding scenic interest for which special protection measures are required. There is one NSA within the 8km study area approximately 2km to the south of the proposal, called Eildon and Leaderfoot. This was noted by SNH through consultation as an area to consider within the LVIA.<sup>27</sup>

Special qualities of this NSA include the Eildon Hills, views from hill summits, a colourful, richly wooded landscape, an array of historic structures and estates and the iconic River Tweed.<sup>28</sup>

Figure 4.2 illustrates that the proposed turbine will not be visible from much of this valued landscape, with only patches of visibility to the northeast. This visibility includes the two Scenic Viewpoints within the NSA, the visual impact on which have been explored above through Tables 4.13 (Black Hill) and 4.14 (Scott's View).



**FIGURE 4.2: NATIONAL SCENIC AREA AND ZTV**

<sup>27</sup> Consultation with SNH Operations Officer (Southern Scotland), Allison Phillip on 19.12.13.

<sup>28</sup> <http://www.snh.gov.uk/docs/B699718.pdf>

Taking into account cumulative impacts, the assessment above found that the proposed turbine will be a relatively small feature in the landscape that does not skyline or dominate views from the NSA. Due to its closer proximity the Significance of Effect on Black Hill is considered moderate, whereas the significance is neutral from Scott's View due to the minimal impact of the proposal at this distance and the vegetative screening from this particular viewpoint.

In conclusion, the turbine will not affect the scale of the distinctive hills visible from the NSA, nor will it adversely affect the views from these two important hill summits. The other features listed as important to the NSA will also be unaffected by this single turbine development.

#### **4.5.2 Cultural Heritage**

Within the 8km study area, there are five Garden and Designed Landscapes:

1. Carolside and Leadervale 0.5km northeast
2. Abbotsford 5.7km southwest
3. Bemersyde 6.1km south-southeast
4. Mellerstain 6.5km east
5. Dryburgh Abbey 7.1km south-southeast

The ZTV covers small areas within Bemersyde and Mellerstain only; from all others the proposed turbine is unlikely to be visible. This includes Carolside and Leadervale which, despite the proximity to the proposed turbine, is framed by thick belts of woodland that screens the proposal from view. Although the proposal will not visually impact this landscape, further assessment on Carolside and Leadervale can be found in Chapter 5.5 following advice from Historic Scotland.

Bemersyde is located close to Scott's View (Viewpoint 5; see Table 4.14 and Appendix 4.9). There is a possibility that the turbine will be visible from small areas within the eastern half of the landscape, however as the wireframe in Appendix 4.9 indicates, the turbine is a small feature from this distance which will not adversely impact views from, or of, this landscape.

Mellerstain is the largest Garden and Designed Landscape in SBC and there may be patches of visibility to the northwest and southeast of the site. However, no main feature (including Hundy Mundy Folly to the south; southern views of the Cheviots; the mansion, woods or lake; Mellerstain Hill; or Eden Water) will be impacted by the proposed turbine. Therefore, the turbine is unlikely to have a significant impact on the landscape.



### ***4.5.3 Summary of Visual Impacts***

The proposed turbine at Clackmae is situated at the edge of an existing farm track close to a dairy shed and will be associated with this building, the nearby farm and from some viewpoints, the settlement of Earlston. Although it will be visible in combination or succession with some other proposed and approved wind energy developments, it is clearly a stand-alone development at 4.6km from the nearest turbine. The proposed turbine is also an appropriate size for the area and does not affect the apparent scale of the surrounding landscape. The majority of important areas within the study area will not be significantly impacted by the proposal, including the Southern Upland Way, larger settlements such as Melrose, transport corridors such as the A68, and protected areas such as the Eildon and Leaderfoot NSA and local Gardens and Designed Landscapes. Whilst the turbine is visible from the western outskirts of Earlston, it is screened from view in the remainder of the village due to intervening buildings and vegetation, and important features of the settlement such as the church spires are unaffected.

## **4.6 Cumulative Impact**

The combined cumulative impacts of this proposal with the other approved and proposed wind energy developments in the 8km study area were assessed in Chapter 4.5. It was found that the proposed turbine is unlikely to provide an additional adverse cumulative impact to the area due to its suitable size and distance from the nearest wind developments. The sequential cumulative impacts on important routes in the study area are considered below.

Appendices 4.12 and 4.13 have been created to demonstrate the cumulative ZTV of all wind energy developments in the 8km study area. This cumulative assessment is only focussed on the additional impact created by the proposal; therefore Appendix 4.12 illustrates only the cumulative ZTV in areas where the proposed turbine at Clackmae is visible. In order to contrast this for purposes of the sequential assessment, Appendix 4.13 illustrates the full cumulative ZTV of the area.

### ***4.6.1 Sequential Impact: Southern Upland Way***

The Southern Upland Way is approximately 340km in length and at its closest point, is situated 1.8km to the west of the proposed turbine. Within the 8km study area, the route is only visually affected for a maximum length of 175m by the proposed turbine, as indicated through Appendix 4.12. Viewpoint 3 (Table 4.12; Appendix 4.7) analysed the visual impact on this area and found that in addition to a small section of the proposed turbine which will not significantly impact the path, only the tips of a few of the turbines at Long Park Wind Farm were theoretically visible in succession to the west-northwest and these will be screened by intervening woodland.

Appendix 4.13 illustrates that more of the route will be affected by other turbine developments within the 8km study area, especially to the north of Clackmae when the path nears Long Park Wind Farm and the pending wind farm application at Muircleugh Farm.

Nevertheless, within the 8km study area this turbine proposal at Clackmae will add a minimal visual impact to a very small section of the route (175m). Outside this study area, Viewpoint 6 (Table 4.15; Appendix 4.10) illustrates that the proposed turbine will be a very small feature in the landscape which will not be a noticeable and will very likely be screened by intervening landscape features.

The cumulative impact will therefore not be increased significantly by the addition of the proposed turbine in the landscape and will create a minor to neutral Significance of Effect to the Southern Upland Way as a whole.

#### ***4.6.2 Sequential Impact: SBC Core Paths***

There are a small number of SBC Core Paths close to the proposed turbine (including the Southern Upland Way, Core Path 189, investigated above).

##### **Core Path 185**

This is the nearest Core Path, circa 400m east of the turbine at its closest point. It is a circular route leading north from Earlston and running through part of the Carolside and Leadervale Garden and Designed Landscape, as well as the local road near Clackmae farmstead. Appendices 4.12 and 4.13 indicate that the majority of this path is not within the Cumulative ZTV; however sections of the path near Clackmae farmstead and to the north of Earlston may be visually impacted by between one and four wind turbines.

Viewpoints 1 and 2 (Tables 4.10 and 4.11; Appendices 4.5 and 4.6 respectively) are located close to two areas of visibility on the route and indicate that the cumulative impact in this area is not significant, as no other wind turbines are visible from these areas. This suggests that sequential views on the Core Path are not adversely impacted by wind energy developments and whilst occasionally visible, the addition of the proposal at Clackmae will not significantly affect the route.

##### **Core Path 139**

This is located circa 960m south of the proposed turbine. It leads from the A68 near Earlston westwards to the Southern Upland Way. The eastern section of the path is situated in a wooded area at a lower height in the landscape where it will not be visually impacted by any turbine development in 8km.

The western section of the path is more likely to have views of between one to nine turbines including the proposal (Appendix 4.12). There is also a small patch of higher visibility of anything up to seventeen wind turbines which has been investigated through desktop analysis.

Appendix 4.14 presents a wireframe diagram which shows those other turbines in combined visibility with Clackmae. In addition to these there are other developments available in 360° views: In the distance to the northeast the turbine at West Morriston Farm is visible, as well as the two proposed turbines at Nether Huntlywood Farm; and to the northwest the blade tips of two of the turbines at Long Park Wind Farm are just visible above the horizon (although these will be screened by intervening features). The location of the wireframe is at the worst point along the route for cumulative impact and the assessment shows that all other developments are fairly distant features which will not dominate the landscape. The proposal at Clackmae is the largest turbine visible, yet it is clearly separate from the others and does not skyline or dominate the wider landscape view. It will therefore have a moderate Significance of Effect to the Core Path.

#### ***4.6.3 Sequential Impact: A68***

The A68 links Edinburgh to the North East of England. Within the 8km study area, it runs in a north-south direction to the west of Earlston. Appendix 4.12 illustrates that the proposed turbine is not visible from much of the road, with only patches of theoretical visibility near Earlston and further north. In addition to the turbine, up to three other wind turbines in the area may be visible on average. As the proposal is situated to the west of the road, it will not be in direct view of travellers and especially near Earlston, is likely to be at least partly screened by areas of the village and the woodland lining much of the road. The proposed turbine is therefore unlikely to provide a significant addition to the limited cumulative impact.

#### ***4.6.4 Sequential Impact: A6105***

The A6105 is the other main road in the study area which is at least partly in the ZTV of the proposal (the A7 and A6091 to the south will not be visually impacted at all by the proposed turbine). The road runs in a north-easterly direction from Earlston towards Berwick. Appendix 4.12 illustrates that only a small section of this road near Earlston will be impacted by the proposed turbine plus up to three other turbines.

It has already been ascertained in Chapter 4.5 that unobstructed views of the proposed turbine could not be obtained from the A6105 in Earlston due to the surrounding buildings and vegetation within the village: This section of the road will therefore not experience any additional cumulative impact from the turbine at Clackmae, and due to these features is unlikely to be visually impacted by any other turbine development. The church spires, an important visual element of the village when entering on the A6105, are therefore safeguarded.

The proposal may be sporadically in view on approach to Earlston from the A6105 (travelling westwards only); however, as Earlston is not visible until the road enters the village, there are no distant village views from the road which will be impacted by the turbine.

The other turbine developments visible from the road are very likely to be the single approved turbine at West Morriston Farm and the two proposed turbines at Nether Huntlywood Farm.



These developments are located to the north and south of this road respectively to the east of the study area: Travellers are therefore unlikely to see both the proposed turbine at Clackmae and these other turbines at the same time. Instead, when heading westwards the turbines will be experienced at varying times; and when traveling eastwards Clackmae will not be visible except in rear views. As the views of Clackmae will occur only sporadically for a short time on nearing Earlston, the proposal will not add significantly to the sequential impact experienced on the A6105.

#### **4.6.5 Summary of Cumulative Impacts**

Whilst there is the potential for cumulative impacts within the study area, the proposed turbine does not add significantly to these due to its limited visibility in general. Key areas and routes within the study area will experience a minimal to neutral Significance of Effect from the addition of the proposal, including the Southern Upland Way, A68, Galashiels and Melrose. The main area affected will be the eastern section of Core Path 139; however this area of cumulative visibility will be brief and will end when nearing the Southern Upland Way. In addition, no visible wind energy development dominates the wide views available from here. The western edge of Earlston will have a moderate visual impact from the proposed turbine, which will be partly seen above the woodland on a ridge, yet there will be no cumulative impact here and no visual impact from the proposal on the remainder of the village.

#### **4.7 Residual Impacts**

The predicted lifespan of this model of wind turbine is 25 years. As such, the impact of the proposed development is likely to be of medium to long term. Upon completion of the turbine's working life the development will be decommissioned and the site returned to its previous use.

Consequently this development will be fully reversible, with any predicted impacts being reduced to neutral.

#### **4.8 Policy Analysis**

SCOTTISH BORDERS COUNCIL (2013) 'PROPOSED LOCAL DEVELOPMENT PLAN': POLICY ED9 – RENEWABLE ENERGY DEVELOPMENT

*"If turbines are proposed which exceed the turbine heights identified within figs ED9b-e the onus would be on the applicant to demonstrate how the impacts of the proposal on the key constraints and any significant adverse effects can be mitigated in an effort to show a proposal can be supported."*

Those relevant to this proposal are Figures ED9b 'Wind Turbine Development Opportunities and Constraints' and Figure ED9c 'Inherent Landscape Capacity Medium (25m-50m)'. The former recognises the area in which the turbine is situated as having very limited capacity; while the

latter identifies the area as having a low capacity for developments of that size. As the proposed wind energy development is a single turbine with a blade tip height of 34.4m, this application complies with policy. In addition, although it borders an area of no capacity due to the Southern Upland Way, it has been shown through the assessment in this chapter that the turbine has been sited carefully in the landscape in order that there are no significant visual impacts on this important walking route.

- ◆ *“The landscape is capable of accommodating the proposal without significant detrimental impact on landscape character”*

Chapters 4.3 and 4.4 found that the proposed turbine will not adversely impact the landscape character.

- ◆ *“Views of the turbines including associated transmission lines, tracks, plant and buildings should demonstrate minimal effects on sensitive receptors... Assessment must take into account the effects of distance between the developer and the receptor;*
- ◆ *Locations will be preferred where there is surrounding landform which minimises the external visibility of the development and where there is no interference with prominent skylines.”*

This assessment found that there will be no severe or major Significance of Effect from the proposal from any of the sensitive viewpoints selected for this assessment. It was also shown that the turbine will not skyline when considering it from key views.

- ◆ *“Significant coincident cumulative landscape and visual impacts must be avoided where an existing wind farm development is present in an adjoining area and can be viewed together with the proposed development;*
- ◆ *Significant sequential cumulative landscape and visual impacts over a wider area must be avoided where a number of windfarm developments can be viewed in succession on a journey leading to adverse impacts on routes and long distance footpaths.”*

It was found through the assessment on cumulative effects that the proposed turbine will not significantly add to any existing cumulative impact, including sequential impacts on, for example, the Southern Upland Way.

SCOTTISH BORDERS COUNCIL (2013) ‘PROPOSED LOCAL DEVELOPMENT PLAN’: POLICY HD3 – PROTECTION OF RESIDENTIAL AMENITY

*“Development that is judged to have an adverse impact on the amenity of existing or proposed residential areas will not be permitted. To protect the amenity and character of these areas, any developments will be assessed against: ...The level of visual impact.”*

Visual assessments were conducted to represent those residents closest to the proposed turbine to the east (Viewpoint 1; Appendix 4.5) and those to the west of Earlston (Viewpoint 2; Appendix 4.6). The former found that no neighbour will have primary views towards the

turbine, and most will not be able to see the turbine from their property due to intervening vegetation. Where visible, the turbine will be a large feature; however it will not hinder valued landscape views or dominate any surrounding property.

A property to the northwest of the proposed turbine, named Cairney Mount, has not been represented in the visual assessment within this Chapter. This is because the turbine will not be visible from the residence due to intervening woodland, especially that to the immediate east of the property.

From areas to the west of Earlston, some residents will have views of the proposed turbine, although a number of views will be obstructed due to vegetation. Part of the turbine will be visible above woodland on higher land to the west of the village; however it will not have a significant impact due to its distance from the area.

Please note: This policy is the same as Policy H2 ‘*Protection of Residential Amenity*’ of the Scottish Borders (2011) ‘*Consolidated Local Plan*.’

SCOTTISH BORDERS COUNCIL (2013) ‘*PROPOSED LOCAL DEVELOPMENT PLAN*’: POLICY EP4 – NATIONAL SCENIC AREAS

*“Development that may affect a National Scenic Area will only be permitted [in limited circumstances].”*

It was found that there will be no significant impact on the Eildon and Leaderfoot NSA.

Please note: This policy is similar to Policy EP1 ‘*National Scenic Areas*’ of the Scottish Borders (2011) ‘*Consolidated Local Plan*.’

SCOTTISH BORDERS COUNCIL (2013) ‘*PROPOSED LOCAL DEVELOPMENT PLAN*’: POLICY EP10 – GARDENS AND DESIGNED LANDSCAPES

*“The Council will support development that safeguards or enhances the landscape features, character or setting of... Gardens and Designed Landscapes.”*

Analysis in Chapter 4.5 found that the turbine will not adversely impact any of these sites.

SCOTTISH BORDERS COUNCIL (2011) ‘*WIND ENERGY*’

*“The seven identified Strategic Path routes [include]... Southern Upland Way; Borders Abbey Way; St Cuthbert’s Way... Three viewpoints have also been identified as being of strategic importance and are safeguarded with a 7km buffer area around them. [These include] Eildon Hills; Scott’s View.”*

Those listed above are within the 8km study area of the proposal. The turbine will not significantly impact the Southern Upland Way as it is only partly visible for a very short section of the path. In regards to Borders Abbey Way and St Cuthbert’s Way, these are to the south

towards Melrose and as Appendix 4.12 indicates, there will be no visual impact from the proposal on this area.

Viewpoint 5 (Appendix 4.9) illustrates that even where visible, the turbine at Clackmae will have a very minor to neutral visual impact on Scott's View. The Eildon Hills are to the south of the 8km study area, yet will not be visually impacted by the proposal due to the size of the proposal and distance between the hills and turbine.

## 5. HISTORIC ENVIRONMENT

### 5.1 Background

The Historic Environment is a term which encompasses ancient monuments, archaeological sites and landscapes, historic buildings, townscape, parks, gardens and designed landscapes, and our marine heritage. The importance of protecting this historic environment is widely recognised; however this protection is not about preventing change.<sup>29</sup>

Modern wind energy, which has been developed partly to address climate change issues, can both threaten the historical landscape if sited inappropriately, and work towards protecting it in the long-term. This is because the threat of changing weather patterns from climate change, (higher winds, increased rain and other indirect effects), has been recognised as a significant risk to the fabric of the historic built environment.<sup>30</sup> Wind energy therefore has a positive role to play in regards to our cultural heritage and archaeology and is supported by Historic Scotland as long as the character of the historic building or place can be maintained.<sup>31</sup>

The addition of modern developments, including wind turbines, may have an effect on the historic environment, either directly through physical impacts (including shadow flicker and noise) or indirectly, by affecting the setting of the monument. As such, the impacts of renewable energy developments must be assessed thoroughly and, if necessary, be limited.

### 5.2 Historic Setting

The greatest impact from wind turbines on the historic environment is the visual effect they have on their surroundings. The introduction of a modern, moving vertical element into a landscape will affect the historic setting of any monument. Historic setting is a complicated issue and there is no singular definition of the term. Historic Scotland's guidance on setting explains:

*"Setting often extends beyond the property boundary, or 'curtilage', of an individual historic asset into a broader landscape context. Less tangible elements can also be important in understanding the setting. These may include function, sensory perceptions, or the historical, artistic, literary, and scenic associations of places or landscapes."*<sup>32</sup>

Historic Scotland also highlights the importance of viewing monuments as interactive parts of a wider historic landscape. The three key points in the importance of the setting of monuments are:

<sup>29</sup> Historic Scotland 'Scottish Historic Environmental Policy' July 2009

<sup>30</sup> Scottish Planning Policy (SPP) 23: Planning and the Historic Environment, 2008

<sup>31</sup> Historic Scotland, Managing Change in the Historic Environment: Micro-Renewables, 2010

<sup>32</sup> Historic Scotland, Managing Change in the Historic Environment, Setting, October 2010

- ◆ “Setting should be thought of as the way in which the surroundings of a historic asset or place contribute to how it is experienced, understood and appreciated;
- ◆ Monuments, buildings, gardens and settlements were not constructed in isolation. They were often deliberately positioned with reference to the surrounding topography, resources, landscape and other monuments or buildings. These relationships will often have changed through the life of a historic asset or place; and
- ◆ Setting often extends beyond the immediate property boundary of a historic structure into the broader landscape.”<sup>33</sup>

### 5.3 Policy and Guidance

National planning policy and guidance aims to protect, conserve and enhance the historical environment. A number of policy and guidance documents, some geared towards proposed renewable energy developments, indicate how the planning system will achieve this. The documents taken into account within this analysis are listed in Table 5.1.

**TABLE 5.1: RELEVANT GUIDANCE DOCUMENTS**

POLICY/ GUIDANCE	RELEVANT SOURCES OF INFORMATION
<b>POLICY</b>	<ul style="list-style-type: none"> <li>◆ PLANNING (LISTED BUILDINGS AND CONSERVATION AREAS)(SCOTLAND) ACT 1997;</li> <li>◆ HISTORIC ENVIRONMENT (AMENDMENT) (SCOTLAND) ACT 2011;</li> <li>◆ TOWN AND COUNTRY PLANNING (SCOTLAND) ACT 1997;</li> <li>◆ PLANNING ETC. (SCOTLAND) ACT 2006;</li> <li>◆ SCOTTISH PLANNING POLICY (2014) ‘HISTORIC ENVIRONMENT;’ AND</li> <li>◆ HISTORIC SCOTLAND (2008) <i>SCOTTISH ENVIRONMENTAL POLICY (SHEP)</i>.</li> </ul>
<b>GUIDANCE</b>	<ul style="list-style-type: none"> <li>◆ HISTORIC SCOTLAND (2010) ‘<i>MANAGING CHANGE IN THE HISTORIC ENVIRONMENT: MICRO-RENEWABLES;</i>’</li> <li>◆ HISTORIC SCOTLAND (2010) ‘<i>MANAGING CHANGE IN THE HISTORIC ENVIRONMENT: SETTING;</i>’ AND</li> <li>◆ ENGLISH HERITAGE (2012) ‘<i>WIND ENERGY AND THE HISTORIC ENVIRONMENT.</i>’</li> </ul>

Where the character of the historic building or place can be maintained, Historic Scotland support the development of renewable energy. The publication ‘*Managing Change in the Historic Environment: Micro-Renewables*’<sup>34</sup> sets out principles to be taken into consideration when planning a wind turbine development:

- ◆ Establish significance (determine what is important about the historic place and its setting);
- ◆ Identify potential physical and/or visual impacts;

<sup>33</sup> Historic Scotland, *Managing Change in the Historic Environment, Setting*, October 2010

<sup>34</sup> Historic Scotland, *Managing Change in the Historic Environment: Micro-Renewables*, 2010

- ◆ Siting and design of the turbine and its associated infrastructure;
- ◆ Cumulative effects.

## 5.4 Methodology

### 5.4.1 Initial Assessment

A thorough assessment of the historical environment local to the development site at Clackmae has been conducted to determine the potential impacts of the proposed turbine. The aim of this investigation is to identify the direct and indirect impacts of the turbine, cable trench and other infrastructural requirements within a targeted study area around the development.

This assessment was conducted via a desk-based assessment of historic records using a variety of resources: Table 5.2 details the historical designations considered. A map of the local historic environment to the development site is attached as Appendix 5.1. A ZTV overlay has been included to highlight whether there is the potential for views from the monuments or historic features of the proposed turbine.

**TABLE 5.2:** TABLE OF HISTORICAL DESIGNATIONS

DESIGNATION	DESCRIPTION
<b>WORLD HERITAGE SITES (WHS)</b>	THE 1972 UNESCO WORLD HERITAGE CONVENTION WAS RATIFIED BY THE UK IN 1984. THE CONVENTION PROVIDES FOR THE IDENTIFICATION, PROTECTION, CONSERVATION, AND PRESENTATION OF CULTURAL AND NATURAL SITES OF "OUTSTANDING UNIVERSAL VALUE." THE UK CURRENTLY HAS 28 WHS.
<b>SCHEDULED ANCIENT MONUMENTS (SAMs)</b>	MONUMENTS OF NATIONAL IMPORTANCE GIVEN PROTECTION UNDER THE ANCIENT MONUMENTS AND ARCHAEOLOGICAL AREAS ACT 1979 BY SCOTTISH MINISTERS.
<b>LISTED BUILDINGS</b>	LISTED BUILDINGS ARE STRUCTURES OF SPECIAL ARCHITECTURAL OR HISTORIC INTEREST PROTECTED UNDER THE PLANNING (LISTED BUILDINGS AND CONSERVATION AREAS) (SCOTLAND) ACT 1997.
<b>GARDENS AND DESIGNED LANDSCAPES</b>	AN INVENTORY OF GARDENS AND DESIGNED LANDSCAPES CONSIDERED BY SCOTTISH MINISTERS (THROUGH HISTORIC SCOTLAND) TO BE OF NATIONAL IMPORTANCE. MAINTAINING AND ENHANCING THESE LANDSCAPES ARE IMPORTANT FUNCTIONS OF THE PLANNING SYSTEM.
<b>CONSERVATION AREAS</b>	SPECIAL ATTENTION MUST BE PAID TO THE DESIRABILITY OF PRESERVING OR ENHANCING THE CHARACTER AND APPEARANCE THROUGH PLANNING PROCESS. THE PLANNING (LISTED BUILDINGS AND CONSERVATION AREAS) (SCOTLAND) ACT 1997.
<b>MONUMENTS RECORDS</b>	THESE CONTAIN THE NATIONAL COLLECTION OF MATERIAL RELATING TO SCOTTISH ARCHAEOLOGICAL AND ARCHITECTURAL HERITAGE ORGANISED BY THE ROYAL COMMISSION ON THE ANCIENT AND HISTORICAL MONUMENTS OF SCOTLAND (RCAHMS).

The tables below have been designed to assist in measuring how sensitive a historical asset is and how extensive the magnitude of the impact is from the proposed development. These are

not all-encompassing, as they do not take into account all of the principles identified in Chapter 5.3, such as cumulative impact, which must still be assessed separately. Neither can they be used to provide an objective result, as professional judgement is still required;<sup>35</sup> however they remain a useful tool in order to easily take into account a number of important factors.

**TABLE 5.3: SENSITIVITY: BUILT AND CULTURAL HERITAGE ON THE SITE**<sup>36</sup>

SENSITIVITY	DEFINITION
High	<ul style="list-style-type: none"> <li>◆ CATEGORY A AND B LISTED BUILDING;</li> <li>◆ SCHEDULED ANCIENT MONUMENT (SAM);</li> <li>◆ NON-STATUTORY LIST OF SITES LIKELY TO BE OF NATIONAL IMPORTANCE;</li> <li>◆ DESIGNED GARDENS AND LANDSCAPES.</li> </ul>
MEDIUM	<ul style="list-style-type: none"> <li>◆ CATEGORY C(S) LISTED BUILDING;</li> <li>◆ ARCHAEOLOGICAL SITES ON THE SITES AND MONUMENTS RECORD (OF REGIONAL AND LOCAL IMPORTANCE);</li> <li>◆ CONSERVATION AREAS.</li> </ul>
Low	<ul style="list-style-type: none"> <li>◆ ARCHAEOLOGICAL SITES OF LESSER IMPORTANCE;</li> <li>◆ NON-INVENTORY GARDENS AND DESIGNED LANDSCAPES.</li> </ul>

**TABLE 5.4: MAGNITUDE OF BUILT AND CULTURAL HERITAGE EFFECTS**

MAGNITUDE OF IMPACT	DEFINITION
High	<p>ANY NUMBER OF WIND TURBINES AND/OR ANCILLARY DEVELOPMENT THAT WOULD RESULT IN:</p> <ul style="list-style-type: none"> <li>◆ THE REMOVAL OR PARTIAL REMOVAL OF KEY FEATURES, AREAS OR EVIDENCE IMPORTANT TO THE HISTORIC CHARACTER AND INTEGRITY OF THE SITE, WHICH COULD RESULT IN THE SUBSTANTIAL LOSS OF PHYSICAL INTEGRITY; AND/OR</li> <li>◆ A SUBSTANTIAL OBSTRUCTION OF EXISTING VIEW BY THE ADDITION OF UNCHARACTERISTIC ELEMENTS DOMINATING THE VIEW, SIGNIFICANTLY ALTERING THE QUALITY OF THE SETTING OR THE VISUAL AMENITY OF THE SITE BOTH TO AND FROM.</li> </ul> <p>WHERE THE MECHANICAL OR AERODYNAMIC NOISE FROM ANY NUMBER OF WIND TURBINES (OR FROM OTHER NEIGHBOURING WIND ENERGY DEVELOPMENTS) THAT ARE LIKELY TO DETRACT FROM SITE AMENITY OF A POPULAR BUILT OR CULTURAL HERITAGE SITE MANAGED AS A VISITOR ATTRACTION ADJACENT TO A WIND ENERGY DEVELOPMENT.</p>

<sup>35</sup> Historic Scotland (2007) *Environmental Impact Assessment (Scoping): Scoping of wind farm proposal; assessment of impact on the setting of the historic environment resource; some general considerations.*

<sup>36</sup> Use of Wind Energy in Aberdeenshire Guidance for Assessing Wind Energy Developments August 2005



<b>MEDIUM</b>	<p>ANY NUMBER OF WIND TURBINES AND/OR ANCILLARY DEVELOPMENT THAT WOULD RESULT IN:</p> <ul style="list-style-type: none"> <li>◆ THE REMOVAL OF ONE OR MORE KEY FEATURES, PARTS OF THE DESIGNATED SITE, OR EVIDENCE AT THE SECONDARY OR PERIPHERAL LEVEL, BUT ARE NOT FEATURES FUNDAMENTAL TO ITS HISTORIC CHARACTER AND INTEGRITY; AND/OR</li> <li>◆ A PARTIAL OBSTRUCTION OF EXISTING VIEW BY THE ADDITION OF UNCHARACTERISTIC ELEMENTS WHICH, ALTHOUGH NOT AFFECTING THE KEY VISUAL AND PHYSICAL RELATIONSHIPS, COULD BE AN IMPORTANT FEATURE IN THE VIEWS, AND SIGNIFICANTLY ALTER THE QUALITY OF THE SETTING OR VISUAL AMENITY OF THE SITE BOTH TO AND FROM.</li> </ul> <p>WHERE THE NOISE INTRUSION (MECHANICAL OR AERODYNAMIC) FROM ANY NUMBER OF WIND TURBINES (OR FROM OTHER NEIGHBOURING WIND ENERGY DEVELOPMENTS) MAY DETRACT FROM THE AMENITY OF A BUILT OR CULTURAL HERITAGE SITE ADJACENT TO A WIND ENERGY DEVELOPMENT.</p>
<b>Low</b>	<p>ANY NUMBER OF WIND TURBINES OR ANCILLARY DEVELOPMENTS THAT MAY RESULT IN:</p> <ul style="list-style-type: none"> <li>◆ A PARTIAL REMOVAL/MINOR LOSS, AND/OR ALTERATION TO ONE OR MORE PERIPHERAL AND/OR SECONDARY ELEMENTS/FEATURES, BUT NOT SIGNIFICANTLY AFFECTING THE HISTORIC INTEGRITY OF THE SITE OR AFFECT THE KEY FEATURES OF THE SITE; AND/OR</li> <li>◆ AN INTRODUCTION OF ELEMENTS THAT COULD BE INTRUSIVE IN VIEWS, AND COULD ALTER TO A SMALL DEGREE THE QUALITY OF THE SETTING OR VISUAL AMENITY OF THE SITE BOTH TO AND FROM.</li> </ul> <p>WHERE THE NOISE INTRUSION (MECHANICAL OR AERODYNAMIC) FROM ANY NUMBER OF WIND TURBINES (OR FROM OTHER NEIGHBOURING WIND ENERGY DEVELOPMENTS) IS UNLIKELY TO DETRACT FROM THE AMENITY OF A BUILT OR CULTURAL HERITAGE SITE ADJACENT TO A WIND ENERGY DEVELOPMENT.</p>
<b>NEGLECTIBLE</b>	<p>ANY NUMBER OF WIND TURBINES OR ANCILLARY DEVELOPMENTS THAT MAY RESULT IN:</p> <ul style="list-style-type: none"> <li>◆ A RELATIVELY SMALL REMOVAL, AND/OR ALTERATION TO SMALL, PERIPHERAL AND/OR UNIMPORTANT ELEMENTS/FEATURES, BUT NOT AFFECT THE HISTORIC INTEGRITY OF THE SITE OR THE QUALITY OF THE SURVIVING EVIDENCE; AND/OR</li> <li>◆ AN INTRODUCTION OF ELEMENTS THAT COULD BE VISIBLE BUT NOT INTRUSIVE IN VIEWS, AND THE OVERALL QUALITY OF THE SETTING OR VISUAL AMENITY OF THE SITE WOULD NOT BE AFFECTED BOTH TO AND FROM.</li> </ul> <p>WHERE THE NOISE INTRUSION (MECHANICAL OR AERODYNAMIC) FROM ANY NUMBER OF WIND TURBINES (OR FROM OTHER NEIGHBOURING WIND ENERGY DEVELOPMENTS) WOULD NOT HAVE ANY NOTICEABLE EFFECT ON THE AMENITY OF A BUILT OR CULTURAL HERITAGE SITE ADJACENT TO A WIND ENERGY DEVELOPMENT.</p>

#### 5.4.2 Consultation

Feedback on this wind energy proposal was sought from organisations concerned with the protection of the historic environment in the Scottish Borders; those consulted are detailed in the table below.

**TABLE 5.5: CONSULTATION RESPONSES**

CONSULTEE	DATE OF CONSULTATION	DETAIL OF CONSULTATION
<b>SCOTTISH BORDERS COUNCIL – CHRISTOPHER BOWLES, ARCHAEOLOGY OFFICER</b>	16.12.13	<p><i>“THERE ARE POTENTIAL ARCHAEOLOGICAL IMPACTS FROM DEVELOPMENT. THESE INCLUDE POTENTIAL SETTING IMPACTS TO BLACK HILL FORT AS ACKNOWLEDGED IN THE APPLICANTS’ REPORT, AND POTENTIAL DIRECT IMPACTS TO THE LINE OF DERE STREET ROMAN ROAD. A WIREFRAME AND PHOTOMONTAGE FROM BLACK HILL SHOWING THE DEVELOPMENT IN LANDSCAPE WILL AID IN FORMING AN OPINION ON SETTING IMPACTS. POTENTIAL IMPACTS TO THE ROMAN ROAD, WHICH IS PROJECTED TO HAVE RUN NEAR THE DEVELOPMENT AREA, CAN BE DEALT WITH BY CONDITION ON ANY EVENTUAL CONSENT FOR THE SCHEME.”</i></p>
<b>HISTORIC SCOTLAND – ROBIN CAMPBELL, SENIOR HERITAGE MANAGEMENT OFFICER</b>	09.01.14	<p><i>“...THE CLOSEST ASSET WITHIN OUR STATUTORY REMIT TO THE PROPOSAL IS CAROLSIDE AND LEADERVALE INVENTORY GARDEN AND DESIGNED LANDSCAPE...HAVING REVIEWED THE SUBMITTED INFORMATION WE CONSIDER IT UNLIKELY THAT THE PROPOSED DEVELOPMENT SHALL HAVE A SIGNIFICANT ADVERSE IMPACT ON THE SITE OR SETTING... HOWEVER, DUE TO THE PROXIMITY OF ... [THE SITE]... WE WOULD REQUEST THE PROPOSED DEVELOPMENT ALSO TAKES THIS ASSET INTO ACCOUNT AND THAT ANY SUBMITTED PLANNING APPLICATION ALSO INCLUDES AN ASSESSMENT OF POTENTIAL IMPACT ON ITS SETTING.”</i></p>

## 5.5 Designated Historical and Archaeological Sites

Tables 5.6 to 5.10 detail designated historic and archaeological sites within the study area of the proposed turbine.

**TABLE 5.6: SAMs WITHIN 5KM OF THE PROPOSED TURBINE<sup>37</sup>**

INDEX NO.	NAME	DISTANCE (~KM)	SENSITIVITY	MAGNITUDE
4463	BLACK HILL, FORT	3.5	HIGH	LOW
<p><b>DESCRIPTION:</b> A FORT OF THE IRON AGE OCCUPYING THE SUMMIT OF BLACK HILL. IT IS COMPLEX, WITH THE DEFENCES SHOWING AT LEAST THREE PHASES OF CONSTRUCTION.</p> <p><b>IMPACT:</b> AS NOTED IN TABLE 5.5, THE ARCHAEOLOGY OFFICER AT THE COUNCIL REQUESTED THAT THE IMPACT OF THE PROPOSED TURBINE ON THE SETTING OF THIS FORT BE INVESTIGATED. IN ORDER TO DO THIS, VISUALISATION 4 WAS CREATED (APPENDIX 4.8), WHICH IS BASED ON THE SUMMIT OF BLACK HILL.</p> <p>AS SHOWN THROUGH THE VISUALISATION, THERE ARE WIDE VIEWS FROM BLACK HILL OF THE SURROUNDING AREA, WHICH IN THE MODERN DAY COMPRISES MAINLY OF FIELDS, BLOCKS OF TREES, SETTLEMENTS AND SCATTERED FARMSTEADS. THE TURBINE WILL BE AN ADDITIONAL FEATURE IN THIS LANDSCAPE; HOWEVER WILL BE DWARFED BY THE SURROUNDING LANDSCAPE, AS OPPOSED TO BEING PROMINENT. WITH THE SETTING OF THE FORT ENCOMPASSING FAR-RANGING 360° VIEWS, THIS PROPOSAL WILL NOT SIGNIFICANTLY IMPACT THE TURBINE.</p> <p><b>CUMULATIVE IMPACT:</b> IN THE DIRECTION OF CLACKMAE, THE WIND FARM AT LONG PARK IS VISIBLE ON THE HORIZON. THE PROPOSED WIND FARM AT MUIRCLEUGH FARM WILL ALSO BE VISIBLE ON THE HORIZON TO THE NORTHWEST IF APPROVED AND INSTALLED. ALTHOUGH VISIBLE ON THE WIREFRAME DIAGRAM, THE APPROVED TURBINE AT LARKHILL IS NOT A NOTICEABLE FEATURE FROM BLACK HILL DUE TO ITS SMALL SIZE AND THE INTERVENING LANDSCAPE FEATURES.</p> <p>THE TWO WIND FARMS ARE CLEARLY LARGER, SEPARATE FEATURES FROM THE PROPOSED TURBINE AT CLACKMAE. THE PROPOSAL WILL INSTEAD BE ASSOCIATED WITH THE MODERN SETTLEMENT CLOSER TO BLACK HILL DUE TO ITS RELATIVELY SMALL SCALE, AS OPPOSED TO ADDING A FURTHER ELEMENT TO THE LARGE WIND ENERGY DEVELOPMENTS ON THE HILLS IN THE HORIZON. THIS DEVELOPMENT WILL THEREFORE NOT CREATE A SIGNIFICANT ADDITIONAL CUMULATIVE IMPACT TO THE SETTING OF THIS FORT.</p>				
6829	LANGSHAW TOWER AND ASSOCIATED STRUCTURES*	4.0	HIGH	NEGLIGIBLE
<p><b>DESCRIPTION:</b> THE FRAGMENTARY REMAINS OF A 16TH CENTURY L-PLANNED TOWER HOUSE WITH A 17TH CENTURY ADDITION. A LARGE WALLED GARDEN EXTENDS FROM THE WEST SIDE OF THE TOWER, WHILE TO THE EAST AND SOUTHEAST THERE ARE THE TURF-COVERED WALLS OF OUTBUILDINGS. THE MONUMENT IS SITUATED AT THE HEAD OF THE ALLAN OR ELWYN VALLEY.</p>				
2159	EASTER HILL, FORT*	4.1	HIGH	NEGLIGIBLE
<p><b>DESCRIPTION:</b> PREHISTORIC DOMESTIC AND DEFENSIVE.</p>				
6828	COLMSLIE TOWER*	4.4	HIGH	NEGLIGIBLE
<p><b>DESCRIPTION:</b> THE REMAINS OF A TOWER HOUSE OF 16TH CENTURY DATE, SITUATED AT THE EAST END OF THE STEADING OF COLMSLIE FARM.</p>				

<sup>37</sup> Descriptions for monuments in table obtained from Historic Scotland:  
<http://data.historic-scotland.gov.uk/pls/html/db/f?p=2300:30:0>

90214	MELROSE ABBEY & PRECINCT*	4.7	HIGH	NEGLIGIBLE
<b>DESCRIPTION:</b> THE REMAINS OF ONE OF THE FINEST CISTERCIAN MONASTERIES IN SCOTLAND. FOUNDED IN 1136 AS A DAUGHTER HOUSE OF RIEVAULX ABBEY, MELROSE, WHICH WAS THE FIRST CISTERCIAN ABBEY IN SCOTLAND.				
2903	NEWSTEAD, ROMAN FORT, BATH HOUSE, MANSION, WEST ANNEXE ENE OF*	4.7	HIGH	NEGLIGIBLE
<b>DESCRIPTION:</b> THE SITE OF A ROMAN FORT KNOWN AS TRIMONTIUM ROMAN FORT WITH THE SITES OF A BATH HOUSE, MANSION AND WEST ANNEX.				
2845	NEWSTEAD, ROMAN FORT, EAST ANNEXE, SOUTH ANNEX, ROMAN CAMPS E OF*	4.8	HIGH	NEGLIGIBLE
<b>DESCRIPTION:</b> THE SITES OF THE EAST AND SOUTH ANNEXES OF A ROMAN FORT AND THE SITE OF A COMPLEX OF MARCHING CAMPS.				
<i>*THESE SITES DO NOT FALL WITHIN THE ZTV AND ARE THEREFORE WILL NOT BE VISUALLY IMPACTED BY THE PROPOSED DEVELOPMENT DUE TO INTERVENING TOPOGRAPHY AND/OR ANCIENT AND SEMI-NATURAL WOODLAND. NO ARTIFICIAL ELEVATIONS NEED TO BE TAKEN INTO ACCOUNT FOR ANY OF THESE SITES. AS THE PROPOSAL WILL HAVE NO VISUAL IMPACT FROM THESE LOCATIONS, THEY WILL NOT BE DISCUSSED ANY FURTHER WITHIN THIS REPORT.</i>				

**TABLE 5.7: CATEGORY A LISTED BUILDINGS WITHIN 5KM OF THE PROPOSED TURBINE<sup>38</sup>**

HBNUM	NAME	DISTANCE (~KM)	SENSITIVITY	MAGNITUDE
2120	COWDENKNOWES HOUSE*	2.9	HIGH	NEGLIGIBLE
<b>DESCRIPTION:</b> IN THE 16TH CENTURY THIS MANSION-HOUSE CONSISTED OF 3 DISTINCT PARTS: A TOWER; MANSION DATED 1574; AND A SMALL TOWER NOW IN RUINS. ALL WERE ORIGINALLY CONNECTED BY CURTAIN WALLS AND ENCLOSING A COURTYARD NOW OCCUPIED AS OPEN GARDENS. A MODERN WING NOW CONNECTS THE TOWER WITH THE MANSION HOUSE.				
15145	LEADERFOOT VIADUCT*	4.7	HIGH	NEGLIGIBLE
<b>DESCRIPTION:</b> CHARLES JOPP AND WYLIE & PEDDIE (ENGINEERS), 1865. OUTSTANDING FORMER RAILWAY VIADUCT SPANNING THE RIVER TWEED ON 19 TALL, SLENDER ARCHES AT A HEIGHT OF 126FT. RED SANDSTONE PIERS, WALLS AND ABUTMENTS. BRICKWORK ARCHES, EACH OF 43FT SPAN.				
15106	DRYGRANGE, OLD BRIDGE*	4.8	HIGH	NEGLIGIBLE
<b>DESCRIPTION:</b> ALEXANDER STEVENS SNR, 1778-80. LATE 18TH CENTURY ROAD BRIDGE WITH 105FT WIDE CENTRAL SEGMENTAL ARCHWAY FLANKED BY ROUND ARCHES OF 55FT, CROSSING THE RIVER TWEED.				
37811	MELROSE, WAVERLY ROAD, ST HELENS*	4.9	HIGH	NEGLIGIBLE
<b>DESCRIPTION:</b> 1806, 3-BAY, SINGLE STOREY AND BASEMENT. SOUTH FRONT; CENTRE BAY ADVANCED IN SEGMENTAL BOW AND CARRIED UP TO FORM ATTIC STOREY. ENTRANCE AT GROUND FLOOR, WITH FANLIGHT AND SIDELIGHTS IN CENTRE OF TUSCAN PILASTRADE, IS APPROACHED BY STEPS OVER PART-RAISED BASEMENT. 1ST FLOOR ATTIC HAS CENTRE TRIPARTITE WINDOW WITH CAST-IRON BALCONY RUNNING THE WIDTH OF THE BOW.				
<i>*THESE SITES DO NOT FALL WITHIN THE ZTV AND ARE THEREFORE WILL NOT BE VISUALLY IMPACTED BY THE PROPOSED DEVELOPMENT DUE TO INTERVENING TOPOGRAPHY AND/OR ANCIENT AND SEMI-NATURAL WOODLAND. AS THE PROPOSAL WILL HAVE NO VISUAL IMPACT FROM THESE LOCATIONS, THEY WILL NOT BE DISCUSSED ANY FURTHER WITHIN THIS REPORT.</i>				

<sup>38</sup> Details on listed buildings obtained from Historic Scotland: <http://data.historic-scotland.gov.uk/pls/htmlldb/f?p=2200:10:0>

**TABLE 5.8: GARDENS AND DESIGNED LANDSCAPES WITHIN 5KM OF THE PROPOSED TURBINE<sup>39</sup>**

NAME	DISTANCE (~KM)	SENSITIVITY	MAGNITUDE
CAROLSIDE AND LEADERVALE	0.5	HIGH	NEGLIGIBLE
<p><b>DESCRIPTION:</b> CAROLSIDE AND LEADERVALE ARE LINKED PARKLAND POLICIES WHICH ARE CONSIDERED AS MAKING AN OUTSTANDING SCENIC CONTRIBUTION TO THE LEADER VALLEY LANDSCAPE. THE LATE 18<sup>TH</sup> CENTURY TO EARLY 19<sup>TH</sup> CENTURY LANDSCAPE IS WELL-PRESERVED AND COMPRISES TWO MAIN HOUSES, WALLED GARDENS, LODGES AND DRIVES. THE HOUSES ARE SET IN CONTINUOUS PARKLAND FRAMED BY THICK BELTS OF WOODLAND. THIS WOODLAND SHELTERS AND FRAMES THE VALLEY PARKLAND LANDSCAPE AND HOSTS A VARIETY OF WOODLAND WHICH ADDS TEXTURE AND COLOUR TO THE AREA.</p> <p>THE SHORT MAIN DRIVE TO LEADERVALE DESCENDS TOWARDS THE HOUSE FROM THE MINOR ROAD THAT LEADS EAST FROM CLACKMAE. THE ROAD THEN PASSES THROUGH AN AREA OF WOODLAND BEFORE DESCENDING THROUGH PARKLAND TO THE HOUSE.</p>			
<p><b>IMPACT:</b> APPENDIX 5.1 ILLUSTRATES THAT THE PROPOSED TURBINE IS NOT VISIBLE FROM THIS LANDSCAPE WHICH IS PARTLY DUE TO THE TOPOGRAPHY OF THE AREA: THE MIDDLE OF THE SITE IS SITUATED AT THE BOTTOM OF A FAIRLY STEEP VALLEY, WITH THE GARDENS EXTENDING UP EITHER SIDE OF THE EASTERN AND WESTERN SLOPES. THE TURBINE IS ALSO SCREENED BY THE THICK BELTS OF WOODLAND WHICH FRAME THE PARKLAND. THE PROPOSAL WILL THEREFORE HAVE NO VISUAL IMPACT WITHIN THE GARDEN AND DESIGNED LANDSCAPE.</p> <p>AS REFERENCED IN TABLE 5.5, THROUGH CONSULTATION HISTORIC SCOTLAND RECOGNISED THIS NEGLIGIBLE IMPACT, BUT ALSO REQUESTED THAT THE SETTING OF THE LANDSCAPE IS TAKEN INTO ACCOUNT. THE SURROUNDINGS OF THIS SITE COMPRISE MAINLY FARMLAND AND STRIPS OF WOODLAND, WITH EARLSTON SITUATED TO THE SOUTH. FROM OUTWITH THE LANDSCAPE, ONLY THE WOODLAND SURROUNDING CAROLSIDE AND LEADERVALE IS VISIBLE.</p> <p>AS FOUND THROUGH THE LVIA IN CHAPTER 4, THE TURBINE WILL HAVE A MINOR TO NEGLIGIBLE IMPACT ON MOST OF THIS AREA AS IT WILL BE SCREENED FROM MUCH OF THE SURROUNDING LANDSCAPE. HOWEVER, WHERE VISIBLE, FOR EXAMPLE BETWEEN THE TREES LINING THE ROAD NEAR CLACKMAE ON THE EASTERN APPROACH TO THE GARDEN AND DESIGNED LANDSCAPE, IT WILL HAVE A MODERATE IMPACT DUE TO ITS PROXIMITY (SEE VIEWPOINTS 1 AND 2, APPENDICES 4.5 AND 4.6, FOR AN EXAMPLE). NEVERTHELESS, THE RELATIONSHIP OF THE WOODLAND SETTING OF CAROLSIDE AND LEADERVALE WITH THE SURROUNDING LANDSCAPE WILL NOT BE SIGNIFICANTLY IMPACTED BY THE PROPOSAL AND SO THE OVERALL EFFECT ON ITS SETTING WILL BE NEGLIGIBLE.</p>			
<p><b>CUMULATIVE IMPACT:</b> THE CUMULATIVE ZTV (APPENDIX 4.12) INDICATES THAT BETWEEN ONE TO FOUR TURBINES, INCLUDING CLACKMAE, ARE VISIBLE OUTWITH THE GARDEN AND DESIGNED LANDSCAPE TO THE WEST AND SOUTH. AS ESTABLISHED ABOVE, THE ADDITION OF THE TURBINE AT CLACKMAE WILL NOT IMPACT VIEWS FROM WITHIN THE LANDSCAPE AND THEREFORE WILL ALSO NOT CONTRIBUTE TO CUMULATIVE VIEWS OF OTHER WIND ENERGY DEVELOPMENTS. AS THE NEAREST WIND TURBINE TO CAROLSIDE AND LEADERVALE (EXCLUDING THE PROPOSAL AT CLACKMAE) IS THE SINGLE TURBINE AT WEST MORRISTON FARM, WHICH IS 3.4KM NORTHEAST OF THE NEAREST PATCH OF CUMULATIVE ZTV SURROUNDING THE SITE, THE SETTING OF THE LANDSCAPE WILL ALSO HAVE A NEGLIGIBLE CUMULATIVE IMPACT AS ANY OTHER VISIBLE TURBINE DEVELOPMENT WILL APPEAR AS A DISTANT FEATURE.</p>			

<sup>39</sup> Information on Garden and Designed Landscape obtained from Historic Scotland:  
<http://data.historic-scotland.gov.uk/pls/html/db/f?p=2400:15:0::::GARDEN:GDL00088>

**TABLE 5.9: CONSERVATION AREAS WITHIN 5KM OF THE PROPOSED TURBINE<sup>40</sup>**

NAME	DISTANCE (~KM)	SENSITIVITY	MAGNITUDE
GATTONSIDE*	4.1	MEDIUM	NEGLECTIBLE
<b>DESCRIPTION:</b> GATTONSIDE IS A SOUTH SLOPING SETTLEMENT LOOKING OVER THE RIVER TWEED TOWARDS THE EILDON HILLS.			
REDPATH	4.2	MEDIUM	LOW
<b>DESCRIPTION:</b> THIS CONSERVATION AREA HAS A DISTINCT APPEARANCE AND SETTING, WITH PROPERTIES MAINLY BEING SITUATED CLOSE TOGETHER IN A SINGLE ROW ON EITHER SIDE (NORTH AND SOUTH) OF A NARROW ROAD. REDPATH IS LOCATED ON SOUTH FACING SLOPES ABOVE A WOODED DEAN CONNECTED TO THE LEADER WATER.			
<b>IMPACT:</b> THE PROPOSED TURBINE IS ONLY VISIBLE FROM THE WESTERN HALF OF THE CONSERVATION AREA. IN ADDITION, DUE TO THE NATURE OF THE TIGHTLY PACKED RESIDENCIES, IT IS ONLY LIKELY TO BE VISIBLE FROM THE BACK GARDENS OR NORTH-FACING WINDOWS OF THE HOUSES ON THE NORTH-SIDE OF THE ROAD, AS WELL AS FROM A SMALL, OPEN AREA AT THE WESTERN END OF THE ROAD. MANY OF THE GARDENS HAVE ESTABLISHED GARDENS, WHICH WILL SCREEN MANY NORTHERLY VIEWS TOWARDS THE PROPOSAL. AS A RESULT, THE TURBINE AT CLACKMAE WILL HAVE LITTLE IMPACT ON THIS AREA, AND THE INTERVENING DISTANCE AND LANDSCAPE FEATURES MEAN IT WILL NOT DOMINATE LANDSCAPE VIEWS WHEN VISIBLE. THE CHARACTERISTICS AND SETTING OF THE VILLAGE WILL REMAIN UNAFFECTED.			
<b>CUMULATIVE IMPACT:</b> APPENDIX 4.12 INDICATES THAT BETWEEN ONE TO FOUR WIND TURBINES, INCLUDING CLACKMAE, ARE THEORETICALLY VISIBLE IN THE WESTERN END OF THE CONSERVATION AREA: A DESKTOP ASSESSMENT USING RESOFT™ WINDFARM SOFTWARE FOUND THAT ONLY THE PROPOSAL AT CLACKMAE IS VISIBLE FROM THE OPEN AREA OF THE CONSERVATION AREA TO THE WESTERN END OF THE ROAD; THERE WILL THEREFORE BE NO CUMULATIVE IMPACTS.			
MELROSE*	4.7	MEDIUM	NEGLECTIBLE
<b>DESCRIPTION:</b> INCORPORATES THE HISTORIC CORE OF THE SETTLEMENT, INCLUDING THE TOWN'S FAMOUS ABBEY.			
NEWSTEAD*	4.8	MEDIUM	NEGLECTIBLE
<b>DESCRIPTION:</b> LYING ON LAND STEEPLY RISING FROM THE SOUTH BANKS OF THE RIVER TWEED, THE VILLAGE OF NEWSTEAD IS REPORTEDLY THE OLDEST VILLAGE IN SCOTLAND.			
<i>*THESE SITES DO NOT FALL WITHIN THE ZTV AND ARE THEREFORE WILL NOT BE VISUALLY IMPACTED BY THE PROPOSED DEVELOPMENT DUE TO INTERVENING TOPOGRAPHY. AS THE PROPOSAL WILL HAVE NO VISUAL IMPACT FROM THESE LOCATIONS, THEY WILL NOT BE DISCUSSED ANY FURTHER WITHIN THIS REPORT.</i>			

<sup>40</sup> Descriptions of Conservation Areas obtained from SBC: [http://www.scotborders.gov.uk/directory/69/conservation\\_areas](http://www.scotborders.gov.uk/directory/69/conservation_areas)

**TABLE 5.10: MONUMENTS RECORDS WITHIN CLACKMAE LAND BOUNDARY<sup>41</sup>**

CANMORE ID	NAME	DISTANCE (~KM)	SENSITIVITY	MAGNITUDE
55546	CLACKMAE	0.3	MEDIUM	NEGLIGIBLE
<b>DESCRIPTION:</b> TWO STONE BALLS FROM CLACKMAE ARE IN WILTON LODGE MUSEUM, HAWICK.				
<b>IMPACT:</b> THE AREA OF THIS FIND IS TO THE SOUTHEAST OF THE PROPOSAL, ON THE OTHER SIDE OF THE LOCAL ROAD WHICH SEPARATES THE FARMSTEAD OF CLACKMAE FROM THE MAIN AREA OF FARMLAND TO THE WEST OF THE ROAD. DUE TO THIS NOTABLE SEPARATION FEATURE (ROAD), THE USE OF THE EXISTING ACCESS TRACK TO CONSTRUCT AND MAINTAIN THE TURBINE, AND THE DESIGN OF THE CABLE TRENCH WHICH WILL RUN CLOSE TO THE ACCESS TRACK IN A NORTH-WESTERLY DIRECTION OF THE TURBINE TO THE DAIRY SHED, THERE WILL BE NO GROUND DISTURBANCE IN THE AREA OF THE FIND. AS THE STONE BALLS HAVE BEEN REMOVED TO A MUSEUM, VISUAL IMPACT IS NOT A CONCERN.				
55507	CLACKMAE*	0.4	MEDIUM	NEGLIGIBLE
<b>DESCRIPTION:</b> '75 FLINTS, 3 NON FLINT, 50 RETOUCHE' FROM CLACKMAE ARE LISTED AMONG CHIPPED STONE ARTEFACTS IN WILTON LODGE MUSEUM, HAWICK.				
<b>IMPACT:</b> THESE ARE LOCATED NEXT TO CLACKMAE FARM COTTAGES ON THE OPPOSITE SIDE OF THE LOCAL ROAD TO THE PROPOSED TURBINE; THEREFORE FOR THE SAME REASONS AS ABOVE, THE CONSTRUCTION, OPERATION AND MAINTENANCE OF THE TURBINE WILL NOT PHYSICALLY RISK THE FINDSPOT.				
55504	CHESTERLEE, CAIRNEYMOUNT**	0.6	MEDIUM	NEGLIGIBLE
<b>DESCRIPTION:</b> IN 1993 K. CLARK FROM THE NEWSTEAD RESEARCH PROJECT SURVEYED CHESTERLEE, CAIRNEYMOUNT. ALTHOUGH THE SURVEY PRODUCED NO EVIDENCE FOR ARCHAEOLOGICAL FEATURES, THE RESISTIVITY PLOTS SHOW ROUGHLY THE NORTHERN HALF OF A SINGLE DITCHED OVOID ENCLOSURE. NO EVIDENCE FOR AN ENTRANCE OR INTERNAL FEATURES WAS RECOVERED.				
159576	CAIRNEY MOUNT*	0.8	MEDIUM	NEGLIGIBLE
<b>DESCRIPTION:</b> A ROOFLESS BUILDING AND THE FOUNDATIONS OF A SECOND HAVE BEEN RECORDED BY OBLIQUE AERIAL PHOTOGRAPHY (RCAHMSAP 1996) 80M SE OF CAIRNEYMOUNT FARM-STEADING. THEY ARE DEPICTED AS ROOFED ON THE 1ST EDITION OF THE OS 6-INCH MAP AND ONE IS ANNOTATED AS A SMITHY (ROXBURGHSHIRE 1863, SHEET IV), BUT THEY ARE NOT SHOWN ON THE CURRENT EDITION OF THE 1:10 000 MAP SHEET (1983).				
<b>IMPACT:</b> THIS IS WITHIN THE ZTV, YET DUE TO AREAS OF WOODLAND BETWEEN THE RECORD AND TURBINE, ONLY A SMALL UPPER SECTION OF THE TURBINE WILL BE VISIBLE HERE. DUE TO THIS, AND THE LIKELIHOOD THAT ONLY BELOW-GROUND STRUCTURES REMAIN (IF ANY), THE VISUAL IMPACT AND CUMULATIVE VISUAL IMPACT FROM THIS PROPOSAL ARE NOT SIGNIFICANT.				
55503	RIDGEWALLS, CAIRNEYMOUNT**	0.9	MEDIUM	NEGLIGIBLE
<b>DESCRIPTION:</b> CAIRNEYMOUNT IS A PLOUGH-REDUCED EARTHWORK ENCLOSURE, SUB-RECTANGULAR IN PLAN, WITH AN INTERNAL AREA MEASURING 60M BY 45M. ON THE EASTERN SIDE, WHERE THE ENTRANCE LAY, FRAGMENTS OF THE OUTER EARTHWORKS SURVIVE UN-PLOUGHED IN A PLANTATION, WITH BANKS MORE THAN 1M HIGHER THAN THOSE IN THE ADJACENT IMPROVED LAND. EXCAVATIONS WERE CARRIED OUT ON THIS SITE AS PART OF THE NEWSTEAD PROJECT.				
159575	CAIRNEYMOUNT**	0.9	MEDIUM	NEGLIGIBLE
<b>DESCRIPTION:</b> A FARMHOUSE AND FARM-STEADING HAS BEEN RECORDED BY OBLIQUE AERIAL PHOTOGRAPHY (RCAHMSAP 1996). IT HAS A ROOFLESS TWO COMPARTMENT BUILDING, DEPICTED AS ROOFED AND NAMED CAROL SIDE MAINS ON THE 1ST EDITION OF THE OS 6-INCH MAP. THE CROPMARKS OF A SETTLEMENT HAS BEEN RECORDED IMMEDIATELY SE OF THE FARM-STEADING.				

<sup>41</sup> Descriptions of monuments obtained from Canmore: <http://canmore.rcahms.gov.uk/en/search/>



71758	'DERE STREET;' BORDER – NEWSTEAD – ELGINHAUGH*	1.1	MEDIUM	LOW
<p><b>DESCRIPTION:</b> ROMAN ROAD. SUGGESTION THAT DERE STREET CROSSED THE LINE OF THE ROAD THAT NOW RUNS BY CLACKMAE AND KEDSLIE TO STONYFORD BRIDGE, PRESUMABLY SOMEWHERE NEAR KEDSLIE (1956). NO TRACE (1975).</p>				
<p><b>IMPACT:</b> THIS IS SHOWN TO BE LOCATED NORTH OF THE LOCAL ROAD RUNNING IN AN EAST-WEST DIRECTION TO THE NORTH OF THE PROPOSED TURBINE; HOWEVER THERE IS SOME UNCERTAINTY AS TO WHERE IT RAN EXACTLY. THIS WAS RECOGNISED THROUGH CONSULTATION WITH AN ARCHAEOLOGY OFFICER AT SBC (TABLE 5.5), ALTHOUGH IT WAS STATED THAT POTENTIAL IMPACTS CAN BE DEALT WITH THROUGH A PLANNING CONDITION.</p>				
<p><i>*THESE SITES DO NOT FALL WITHIN THE ZTV AND ARE THEREFORE WILL NOT BE VISUALLY IMPACTED BY THE PROPOSED DEVELOPMENT DUE TO INTERVENING TOPOGRAPHY. NO ARTIFICIAL ELEVATIONS NEED TO BE TAKEN INTO ACCOUNT FOR ANY OF THESE SITES. AS THE PROPOSAL WILL HAVE NO VISUAL IMPACT FROM THESE LOCATIONS, THEY WILL NOT BE DISCUSSED ANY FURTHER WITHIN THIS REPORT.</i></p>				
<p><i>*THESE SITES ARE LOCATED TO THE NORTH TO NORTHWEST OF THE PROPOSAL, CLOSE TO A LOCAL ROAD AND THE BUILDINGS ASSOCIATED WITH CAIRNEY MOUNT. THEY ARE SEPARATED FROM THE TURBINE BY CLACKMAE BURN AND WOODLAND. THIS SEPARATION, PLUS THE MINIMAL CONSTRUCTION METHODS PROPOSED FOR TURBINE INSTALLATION, MEANS THAT THERE WILL BE NO PHYSICAL RISK TO THE MONUMENTS RECORDS FROM THE TURBINE.</i></p>				

## 5.6 Physical Impacts

It is unlikely that there will be a direct physical impact on any designated site through construction relating to turbine installation (site access, ground works and drainage), as there does not appear to be any within the footprint of the proposed development. The only designated site in question is the Monument Record, Dere Street, which was a Roman Road which is projected to have run through this area; however the exact route is unclear. The remaining Monuments Records, which are the closest features to the proposed turbine, are all situated near to existing buildings and dwellings in the area (Clackmae farmstead and cottages, and Cairney Mount) and are separated from the proposed turbine by notable features, such as roads, woodland and water bodies.

## 5.7 Overall Impact on Historic Environment

The extent of the visual impact of this turbine proposal at Clackmae is limited due to the topography of the surrounding area, woodland coverage and the appropriate size of the turbine for the landscape. The cumulative impact of this turbine with others in the study area is also limited due to the sizeable distance between it and the nearest turbine at West Morrision Farm (4.6km). This limited visual impact is apparent through Appendices 5.1 and 4.12, and the result is a low to negligible impact on the historic environment.

As per advice from an Archaeology Officer at SBC (Table 5.5), a photomontage was created from a viewpoint on Black Hill, near the fort which is a SAM (Table 5.6). Viewpoint 4 (Appendix 4.8) shows that whilst the turbine will be visible from this area, it will not be a prominent feature and will not skyline. It is also a clearly separate feature from the distant wind farms on the



horizon (Long Park and Muircleugh). The significance of this impact on Black Hill, fort, will therefore be low.

The other two designated sites considered as receiving a low impact are Redpath Conservation Area (Table 5.9) and Dere Street, Roman Road (Table 5.10). There will be views of the turbine from the former, however it will be a distant feature and the character and setting of the Conservation Area will not be affected. There will also be no cumulative impact. The impact on the second is uncertain as the exact location of the Roman Road is unknown.

Overall, the predicted impact of the proposed turbine is very low and the historic environment within 5km will remain largely unaffected by the installation and operation of the development.

### 5.8 Mitigation Measures

The only designation within this study in which impacts are uncertain is Dere Street, a Roman Road which is projected to have run near the site. Nevertheless, as consultation with an Archaeology Officer at SBC confirmed, any potential impacts from this development can be dealt with through a condition of the planning approval. It is likely that an appropriate mitigation measure for this project will be a Watching Brief, where a suitably qualified archaeologist will monitor any site excavations and ground works associated with turbine installation.

It is also important to consider that this development is of a temporary nature and is presumed to only exist in the landscape for 25 years. At this point the turbine will be removed from the site, tracks will be reinstated through the use of topsoil, and underground cables cut.

### 5.9 Policy Analysis

SCOTTISH BORDERS COUNCIL (2013) 'PROPOSED LOCAL DEVELOPMENT PLAN': POLICY ED9 – RENEWABLE ENERGY DEVELOPMENT

*"Renewable energy developments will be approved provided that: ...There are no unacceptable adverse impacts which cannot be fully mitigated on the... archaeological heritage"*

The assessment above found that there will be no adverse impacts on the historic environment which cannot be fully mitigated. The predicted visual and, where relevant, physical impacts of the proposed turbine were considered and there will only be low to negligible impacts on any site or its setting.

Please note: This policy is similar to Policy EP7 'Listed Buildings,' Policy EP8 'Archaeology,' Policy EP9 'Conservation Areas' and Policy EP10 'Gardens and Designed Landscapes' of SBC (2013) 'Proposed Local Development Plan' and Policy BE1 'Listed Buildings,' Policy BE2 'Archaeological Sites and Ancient Monuments' and Policy BE3 'Gardens and Designed Landscapes' of the Scottish Borders (2011) 'Consolidated Local Plan.'

## 6. TOURISM AND RECREATION

### 6.1 Tourism and the Impact of Wind Energy Developments

To date there is no evidence to suggest that wind turbines have an adverse effect on tourism. Wind farms have become increasingly popular, with tourists and locals alike visiting a number of wind farms across the UK.

In April 2012 VisitScotland published research on consumer attitudes to wind farms and their effect on tourism. The report found that 27.5% of respondents strongly disagreed with the notion that wind farms spoil the Scottish countryside, with only 9% strongly agreeing that wind developments ruined it. 83% of respondents said their decision to visit an area would not be affected by the presence of wind farms.

Nevertheless, although there is evidence to suggest the majority of tourists will not be deterred from visiting a site due to nearby wind energy developments, it is important that sensitive destinations are not adversely impacted by a development so as to spoil their amenity. Tourism near the proposal will therefore be explored below.

### 6.2 Tourism and Recreation in the Scottish Borders

The following are key tourist and recreational attractions within 5km of the proposed turbine:

- ◆ Carolside and Leadervale Garden and Designed Landscape

This Garden and Designed Landscape is the closest tourist attraction to the proposal, being situated 0.5km northeast. It was established through Chapters 4 and 5, and illustrated through Appendix 5.1, that there will be no visual impact from the proposed turbine on this attraction due to the screening effects from topography and woodland in the local area. This includes considering the cumulative impacts on the overall setting of the landscape.

- ◆ Southern Upland Way

The landscape of the Borders is considered crucial in attracting tourists due to its hilly nature.<sup>42</sup> One of the main tourist attractions close to the proposed turbine at Clackmae is the long-distance path, the Southern Upland Way (1.8km west). The impact of the turbine on this path was investigated in detail within Chapter 4 and the results found that the proposal will have a very limited visual impact due to it only being partly visible for a very small section of the path. The value of this path as a tourist attraction will therefore be unaffected by the proposal.

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<sup>42</sup> Scottish Borders Council (2011) *'Wind Energy'*

#### Melrose Abbey

One of the key tourist attractions in the Scottish Borders which is within 5km of the proposed turbine is Melrose Abbey. However, as shown through the ZTV (Appendix 4.3), neither Melrose nor the abbey will be visually impacted by the development.

#### Scenic Viewpoint: Black Hill

This is the only SBC Scenic Viewpoint within 5km of the proposal and it is situated within the Eildon and Leaderfoot NSA, circa 3.6km southeast of Clackmae. Viewpoint 4 (Appendix 4.8) of the LVIA (Chapter 4) illustrates the cumulative visual impact of the proposed turbine with other wind energy developments in the same field of view. The proposed turbine is visible, yet does not overshadow the wide-ranging views from this viewpoint. In addition, it is appropriate to the scale of the surrounding landform, as it does not skyline or alter the apparent scale of the distinctive hills in this area, and is clearly separate from the larger developments visible in the distance (namely Long Park Wind Farm and the pending wind farm at Muircleugh Farm). The value of the Scenic Viewpoint as an attraction will therefore not be adversely impacted by the proposed turbine.

### 6.3 Policy Analysis

SCOTTISH BORDERS COUNCIL (2011) 'WIND ENERGY'

*"Wind turbines within [2km]... from selected A and B class roads... and seven identified strategic walking routes will not be supported unless it can be proven they will have no unacceptable adverse impact from these routes.*

Of those listed in the policy, only the A68 and Southern Upland Way are within 2km of the turbine proposal. These routes were analysed in full in Chapter 4 and it was found that the turbine will have no unacceptable impact.

*"The viewpoints from the Eildon Hills, the Carter Bar and Scotts View are considered to be of strategic significance and have a 7km buffer area around them... Applications for turbines within these areas will not be supported unless the applicants can demonstrate such proposals will have no adverse impact from a viewpoint. Iconic viewpoints from identified walking routes have also been identified... as well as selected abbeys, castles, houses and gardens."*

Scott's View and two of the three Eildon Hills are within 7km of Clackmae and in the ZTV of the proposed turbine. However, due to the medium size of the proposal and distance of the development, there will be no adverse impact from the proposal (see Chapter 4). Of those listed abbeys, castles, houses and gardens; the following are within 8km of the proposed turbine, yet not within the ZTV and therefore unaffected by the development: Melrose Abbey, Thirlestane Castle, Smailholm Castle, Gala House and Abbotsford House. Small areas of Mellerstain Garden and Designed Landscape are within the ZTV and so this sensitive site was considered in Chapter 4 where it was found there will be no significant impact from the proposed turbine.

## 7. NOISE ASSESSMENT

This section assesses whether the proposed turbine at Clackmae is likely to cause a noise disturbance at the nearest residential dwellings. The chapter will provide an overview of wind turbine noise, methodology, relevant policy and site context before assessing the extent of wind turbine derived noise at the nearest sensitive receptors.

### 7.1 Wind Turbine Noise Characteristics

Noise levels are normally expressed in decibels (dB). Noise in the environment is measured using the dB(A) scale, which includes a correction for the response of the human ear to noises with different frequency content. Table 7.1 below indicates the subjective effect of change in noise level.

**TABLE 7.1:** SUBJECTIVE EFFECT OF CHANGE IN NOISE LEVEL<sup>43,44</sup>

CHANGE IN LEVEL, dB(A)	SUBJECTIVE EFFECT
3	MINIMUM PERCEPTIBLE CHANGE
5	CLEARLY PERCEPTIBLE
10	TWICE AS LOUD

Noise is generated by wind turbines as they rotate to generate power. This only occurs above the 'cut-in' and below the 'cut-out' wind speeds. Below the cut-in wind speed there is insufficient strength in the wind to generate efficiently and above the cut-out wind speed the turbine is automatically shut down to prevent any malfunctions from occurring. The cut-in speed at turbine hub height is normally between 3 and 5 metres per second (m/s) and the cut out wind speed is normally around 25 m/s.

The principal sources of noise are from the turbine blades rotating in the air (aerodynamic noise), the internal machinery (normally the gearbox) and, to a lesser extent, the generator (mechanical noise). The blades are carefully designed to minimise noise whilst optimising power transfer from the wind. The nacelle at the top of the tower is insulated to minimise noise radiation from the gearbox, generator and other components, which are also isolated from the tower and the blade assembly to prevent structure borne noise.

Wind generated background noise increases with wind speed at a faster rate than wind turbine noise increases with wind speed. The difference between the noise of the wind turbine and background noise is therefore liable to be greatest at low wind speeds. Varying the speed of the turbines in such conditions can, if necessary, reduce the sound output from modern turbines.

<sup>43</sup> Handbook of Noise and Vibration Control, Barber 1992; <http://onlinelibrary.wiley.com/doi/10.1002/9780470209707.fmatter/pdf>

<sup>44</sup> Scottish Government, PAN1/2011: Planning and Noise, <http://www.scotland.gov.uk/Resource/Doc/343210/0114180.pdf>

## 7.2 Relevant Legislation, Policy and Guidance

The documents listed in Table 7.2 were consulted in relation to wind turbine noise and the development:

**TABLE 7.2:** DETAILS OF POLICIES PERTAINING TO NOISE EMISSIONS

POLICY LEVEL	POLICY/GUIDANCE DOCUMENT
NATIONAL	ETSU-R-97 (1997) 'THE ASSESSMENT AND RATING OF NOISE FROM WIND FARMS.'
	INSTITUTE OF ACOUSTICS (IOA; 2013) 'GOOD PRACTISE GUIDE TO THE APPLICATION OF ETSU-R-97 FOR THE ASSESSMENT AND RATING OF WIND TURBINE NOISE.'
	SCOTTISH PLANNING POLICY (2014).
	PAN 1/2011 (2011) 'PLANNING AND NOISE' AND ACCOMPANYING TECHNICAL ADVICE NOTE.
	SCOTTISH GOVERNMENT (2013) PLANNING ADVICE SHEET - 'ONSHORE WIND TURBINES.'
	BSI (2008) BS 5228-1 'CODE OF PRACTICE FOR NOISE AND VIBRATION CONTROL ON CONSTRUCTION AND OPEN SITES – PART 1: NOISE.'
	BSI (2009) BS 5228-2 'CODE OF PRACTICE FOR NOISE AND VIBRATION CONTROL ON CONSTRUCTION AND OPEN SITES – PART 2: VIBRATION.'

Through the use of Government policy such as PAN 1/2011, the planning system is able to limit the adverse effects of noise. In considering the implications of low frequency and wind farm noise, the UK Government refers to the findings of a Salford University report called 'Research into Aerodynamic Modulation of Wind Turbine Noise,' which concludes that there is no evidence of health effects arising from infrasound or low frequency noise generated by wind turbines.

The Scottish Government's online guidance (October 2012) states:

*"The Report 'The Assessment and Rating of Noise from Wind Turbines' (Final Report, Sept 1996, DTI), (ETSU-R-97), describes a framework for the measurement of wind farm noise, which should be followed by applicants and consultees, and used by planning authorities to assess and rate noise from wind energy developments, until such time as an update is available. This gives indicative noise levels thought to offer a reasonable degree of protection to wind farm neighbours, without placing unreasonable burdens on wind farm developers, and suggests appropriate noise conditions."*

ETSU suggests that wind farm noise should be controlled through the application of noise limits at the nearest noise sensitive properties:

- ◆ A fixed limit of 43 dB(A) is recommended for night-time. This is based on a sleep disturbance criteria of 35 dB(A) with an allowance of 10 dB(A) for attenuation through

an open window (free field to internal) and 2 dB(A) subtracted to account for the use of  $L_{A90, 10min}$  rather than  $L_{Aeq, 10min}$ .<sup>45</sup>

- ◆ Noise limits should be applied to external locations and should apply only to those areas frequently used for relaxation or activities for which a quiet environment is highly desirable;
- ◆ Both day- and night-time lower fixed limits can be increased to 45 dB(A) to increase the permissible margin above background where the occupier of the property has some financial interest in the wind farm;
- ◆ In low noise environments the day-time level of the  $L_{A90, 10min}$  of the wind farm noise should be limited to an absolute level within the range of 35-40 dB(A). The actual value chosen within this range should depend upon: The number of dwellings in the neighbourhood of the wind farm; the effect of noise limits on the number of kWh generated; and the duration of the level of exposure;
- ◆ For single turbines or wind farms with very large separation distances between the turbines and the nearest properties, a simplified noise condition may be suitable. If the noise is limited to an  $L_{A90, 10min}$  of 35 dB(A) up to wind speeds of 10m/s at 10m height, then this condition alone would offer sufficient protection of amenity, and background noise surveys would be unnecessary.

Local Planning Authorities will usually consider this simplified noise condition (final bullet point) sufficient to protect neighbouring residents.

Table 7.3 compares typical levels of noise in the environment.

### 7.3 Methodology

Through a desk based survey, the turbine has been positioned at such a distance to create the appropriate separation between the development and any noise sensitive areas. To further demonstrate that any nearby properties will not be impacted by noise, a propagation model analysis has been conducted.

ETSU-R-97 does not prescribe a calculation method for predicting turbine noise emission or calculating propagation. The turbine noise emission<sup>46</sup> is calculated in accordance with ISO 9613-2: 'Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation' and the published agreement between noise consultants working in the field called 'Prediction and Assessment of Wind Turbine Noise' (PAWTN).<sup>47</sup>

<sup>45</sup>  $L_{A90, 10 min}$  is the dB(A) level exceeded 90% of the time over a 10 minute period, as opposed to  $L_{Aeq, 10 min}$ , which is the continuous sound pressure levels over a 10 minute period.

<sup>46</sup> Turbine noise emission level is the noise levels to be experienced at receptor's location

<sup>47</sup> Acoustics Bulletin March/April 2009

**TABLE 7.3: INDICATIVE NOISE LEVELS<sup>48</sup>**

SOURCE/ACTIVITY	INDICATIVE NOISE LEVEL DB(A)
THRESHOLD OF PAIN	140
JET AIRCRAFT AT 250M	105
PNEUMATIC DRILL AT 7M	95
TRUCK AT 30MPH AT 100M	65
BUSY GENERAL OFFICE	60
CAR AT 40MPH AT 100M	55
QUIET BEDROOM	35
RURAL NIGHT-TIME BACKGROUND	20-40
THRESHOLD OF HEARING	0

The ISO 9613-2 propagation model calculates the predicted sound pressure levels at the specified distance by taking the sound power level in octave frequency bands and subtracting or adding a number of factors according to the various losses and gains, including: Atmospheric attenuation; ground absorption or reflection effects; and meteorological conditions.

Assumed input factors for calculation:

- ◆ 10m/s downwind propagation;
- ◆ Ground absorption: G=0.5;
- ◆ Air absorption factor based on a temperature of 10°C and 70% relative humidity;
- ◆ The receptor height is set at 4m above ground level; and
- ◆ Barrier attenuation is not included within the predictions.

According to ISO 9613-2 “the attenuation of sound propagation outdoors between a fixed source and receiver fluctuates due to variations in the meteorological conditions along the propagation path.” Therefore the ISO 9613-2 calculation method allows plus or minus 3dB to moderate downwind propagation and take account of the variety of meteorological conditions that occur over time.

## 7.4 Site Assessment

The proposed development is surrounded by fields which are bordered to the north, west, south and partly to the east by belts of woodland. The closest noise sensitive receptor to the development is 3 Clackmae Farm Cottages, which is 367m northeast. Whilst the applicant owns Clackmae Farm Cottages, these are tenanted and so considered noise sensitive properties. The only property financially involved in the project is the applicant’s dwelling, Clackmae Farmhouse

<sup>48</sup> Adapted from PAN1/2011

(534m northeast). There are a number of other residential properties, mainly to the east, which have been taken into consideration and are detailed in Table 7.4.

## 7.5 Results

Wind turbine operational noise levels at the nearest noise sensitive receptors have been predicted using the noise emission characteristics of the NPS 100/24, which is detailed in the acoustic report attached as Appendix 7.1, in addition to the noise propagation model algorithm outlined in ISO 9613-2. The predicted noise levels were then compared with the ETSU simplified noise condition limits.

Table 7.4 shows the nearest residential dwellings, their distance from the proposed turbine and the predicted noise levels at these properties in relation to  $L_{A90, 10min}$  (which was determined by subtracting 2 dB(A) from  $L_{Aeq, 10min}$ ). A map illustrating the noise sensitive receptors and contours is attached as Appendix 7.2.

**TABLE 7.4:** PROPERTY NAME, DISTANCE FROM TURBINE TO NEAREST NOISE RECEPTORS & NOISE LEVEL

RECEPTOR	ADDRESS	DISTANCE TO WIND TURBINE (M)	PREDICTED DB(A) IN 10M/S WIND ( $L_{A90, 10min}$ )	NOISE LIMIT DB(A)	EXCEEDANCE DB(A)
H1	3-4 CLACKMAE FARM COTTAGES	367	29.40	35	-5.6
H2	1-2 CLACKMAE FARM COTTAGES	396	28.71	35	-6.29
H3	GLENBURNIE FARMHOUSE	490	26.57	35	-8.43
H4	CLACKMAE FARMHOUSE (FI)	534	25.79	45	-19.21
H5	WEST LODGE, CAROLSIDE	641	24.02	35	-10.98
H6	NETHER CAIRNIE	680	23.5	35	-11.5
H7	CAIRNEY MOUNT	918	20.19	35	-14.81

*FI: FINANCIALLY INVOLVED*

### 7.5.1 Assessment Summary

This noise propagation assessment has found that the proposed NPS 100/24 turbine at Clackmae will comply with noise policy and will not be a nuisance to neighbouring noise sensitive receptors.



## 7.6 Construction Noise

During the construction phases of development there will be a number of short-term noise impacts which includes:

- ◆ The transportation of equipment and materials to site will require the use of Heavy Goods Vehicles (HGVs). The majority of the route will be via motorways and other regional roads. The overall impact is therefore unlikely to be significant; and
- ◆ The construction and excavation of the foundations and ancillary structures is likely to have short term noise impacts higher than background levels. In accordance with best practice, this type of construction work will take place during daylight hours to ensure minimal disturbance to nearby residential dwellings.

Given the scale of the proposed development, there will only be a short-term noise impact from construction traffic and turbine components coming to and from site along local roads. These stages are therefore considered to have a negligible overall noise impact.

## 7.7 Policy Analysis

SCOTTISH BORDERS COUNCIL (2013) 'PROPOSED LOCAL DEVELOPMENT PLAN': POLICY ED9 – RENEWABLE ENERGY DEVELOPMENT

*"...proposals for all wind turbine proposals should be judged against the following considerations and will only be approved where the overall impact is judged acceptable by the Council: ... generation of noise..."*

*In all cases developers must demonstrate that they have considered options for minimising the operation impact of a turbine proposal including: ... Turbine specification and technical controls, including consideration of predicted noise levels at specific properties closest to the wind farm at wind speeds corresponding to cut-in, full rated power and maximum operational wind speed, along with background noise levels and wind speeds."*

As demonstrated within this chapter, a noise propagation model was completed for this single, medium-sized turbine proposal and it was found to comply with the noise limits as per ETSU-R-97. The result has meant that there is no need for further detailed background noise testing. If necessary, NPS wind turbines can all be programmed to operate only at certain wind speeds or directions, and can be controlled remotely; however the outcome of the noise propagation has indicated this is unlikely to ever be required on the basis of noise.

Please note: This policy is similar to Policy D4 'Renewable Energy Development' of the Scottish Borders (2011) 'Consolidated Local Plan;' and Policy HD3 'Protection of Residential Amenity' of the SBC (2013) 'Proposed Local Development Plan;' and SBC (2011) 'Wind Energy'

## 8. SHADOW FLICKER

### 8.1 Introduction

This assessment examines the potential effects of shadow flicker produced by the proposed turbine at Clackmae. Shadow flicker is the term used to describe the effect on residential amenity produced by the intermittent casting of shadow upon a particular location by the rotating blades of a wind turbine.

This chapter quantifies the geographical area over which shadow flicker could potentially occur and sets out an assessment of the duration and timing of these effects under the ‘worst case scenario.’ This assessment aims to alleviate concerns among those residing in the local landscape surrounding the development site. It also seeks to identify measures that could be employed to mitigate any impacts, if deemed necessary, as a result of the assessment.

### 8.2 Relevant Legislation, Policy and Guidance

Current Scottish Planning Policy,<sup>49</sup> supplemented by online renewable advice note *Onshore Wind Turbines*,<sup>50</sup> describes shadow flicker as follows:

*“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.’ Shadow flicker 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.”*

The following describes the conditions in the UK where shadow flicker may occur:

- ◆ Only properties within 130 degrees either side of north of the proposed development can be affected at UK latitudes;
- ◆ Shadow flicker is very unlikely to occur at distances greater than ten rotor diameters of the turbine;
- ◆ The frequency of the flickering caused by the rotation of the turbine blades is such that it unlikely to cause any health effects or nuisance<sup>51, 52</sup>

<sup>49</sup> Scottish Planning Policy: <http://www.scotland.gov.uk/Resource/0045/00453827.pdf>

<sup>50</sup> Online renewable advice note, Onshore Wind Turbines, <http://www.scotland.gov.uk/Resource/0040/00405870.pdf>

<sup>51</sup> [http://planningguidance.planningportal.gov.uk/blog/guidance/renewable-and-low-carbon-energy/particular-planning-considerations-for-hydropower-active-solar-technology-solar-farms-and-wind-turbines/#paragraph\\_020](http://planningguidance.planningportal.gov.uk/blog/guidance/renewable-and-low-carbon-energy/particular-planning-considerations-for-hydropower-active-solar-technology-solar-farms-and-wind-turbines/#paragraph_020)

<sup>52</sup> Parsons Brinckerhoff Consultants, for DECC (2010): ‘Update of UK Shadow Flicker Evidence Base: Final Report’

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/48052/1416-update-uk-shadow-flicker-evidence-base.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48052/1416-update-uk-shadow-flicker-evidence-base.pdf)

Furthermore, “mitigation measures which have been employed to operational wind farms, such as turbine shut down strategies, have proved very successful, to the extent that shadow flicker cannot be considered a major issue in the UK.”<sup>53</sup>

### 8.3 Methodology

Planning guidance in the UK requires developers to investigate the impact of shadow flicker upon dwellings situated within ten rotor diameters of the proposed turbine, however no specific methodology is prescribed.

Currently within the UK, only Northern Ireland<sup>54</sup> stipulates legislative requirements for the minimisation of shadow flicker. On this basis, in order to define the significance of effects, this guidance has been adopted for this project. It states that in the worst case scenario shadow flicker should not exceed 30 hours per year or 30 minutes per day.

Any predicted shadow flicker effect that is less than this worst case scenario is deemed to be *negligible* and therefore not significant.

Computer modelling is used for an accurate assessment of shadow flicker, taking into account the dimensions of the development and the movement of the sun throughout the year. Resoft Windfarm<sup>®</sup> software was used for the modelling, with the following parameters:

- ◆ The location and dimensions of the proposed development;
- ◆ The location of properties within the vicinity of the development; and
- ◆ The estimated dimensions and orientations of windows facing the proposed development.

The ‘worst case scenario’ is assumed within this model, which is defined as:

- ◆ Continuous sunshine throughout daylight hours with no cloud cover;
- ◆ Continually rotating turbine blades;
- ◆ No vegetation or other obstacles are screening the receptor; and
- ◆ The wind turbine rotor plane is always perpendicular to the receptor and sun.

### 8.4 Baseline Information

The proposed development has a rotor diameter of 23.6m. There are no properties within the distance of ten rotor diameters (236m) from the proposed site and this turbine is therefore

<sup>53</sup> Parsons Brinckerhoff Consultants, for DECC (2010): ‘Update of UK Shadow Flicker Evidence Base: Final Report’

<sup>54</sup> Best Practice Guidance to Planning Policy Statement 18 ‘Renewable Energy’

[http://www.planningni.gov.uk/index/policy/policy\\_publications/planning\\_statements/planning\\_policy\\_statement\\_18\\_renewable\\_energy\\_best\\_practice\\_guidance.pdf](http://www.planningni.gov.uk/index/policy/policy_publications/planning_statements/planning_policy_statement_18_renewable_energy_best_practice_guidance.pdf)

highly unlikely to adversely affect its nearest receptors through shadow flicker, as per the guidance above.

However, in order to demonstrate that the development will not generate any shadow flicker impact, it has been modelled via Resoft Windfarm<sup>®</sup> software using the parameters detailed in Chapter 8.3.

## 8.5 Results

The assessment found that no properties will be affected by shadow flicker; this is shown through Appendix 8.1.

In practice it is likely that the effects of shadow flicker would occur for considerably less time than the 'worst case scenario' prediction as described, for the following reasons:

- ◆ Approximately 14.3% of total annual hours in the local area are recorded as sunshine;<sup>55</sup> at all other times of the year the shadows cast by the proposed development are unlikely to be sufficiently pronounced to illicit shadow flicker effects;
- ◆ At times when there is insufficient wind to move the turbine, the effects of shadow flicker cannot be produced;
- ◆ Receptors with screening elements (such as a tall fence) would see a further reduction of effects; and
- ◆ At times when the proposed development is not perpendicular to the receptor and sun, the duration of shadow flicker effects would be reduced due to the elliptical shape of the shadow cast.

## 8.6 Policy Analysis

SCOTTISH BORDERS COUNCIL (2013) 'PROPOSED LOCAL DEVELOPMENT PLAN': POLICY ED9 – RENEWABLE ENERGY DEVELOPMENT

*"...proposals for all wind turbine proposals should be judged against the following considerations and will only be approved where the overall impact is judged acceptable by the Council: ... shadow flicker."*

The shadow flicker calculations map (Appendix 8.1) illustrate that no residential property will be affected by shadow flicker from this proposal.

**Please note: This policy is similar to Policy D4 'Renewable Energy Development' of the Scottish Borders (2011) 'Consolidated Local Plan' and Scottish Borders Council (2011) 'Wind Energy.'**

<sup>55</sup> This is calculated from the average total annual sunshine hours recorded at the nearest climate station (Galashiels) by the MET Office between 1981 and 2010. (<http://www.metoffice.gov.uk/public/weather/climate/gcvh617i6>). Total annual hours are 8765.81 (accounting for leap years)

## 9. ECOLOGY

### 9.1 Introduction

The quality of Scotland's natural heritage is recognised internationally and is an important asset to protect. Ultimately, wind turbines have a positive role to play in regards to this, as the purpose of wind energy is to help combat rising carbon emissions which will otherwise increasingly damage the natural environment. Yet in contrast, wind turbines can adversely impact the environment if at an inappropriate scale and location: Development must therefore be designed to prevent this.<sup>56</sup>

Birds and bats are the main classes of fauna perceived to be vulnerable to wind energy developments, through risk of collision with turbine blades.<sup>57</sup> However, whilst further research is required in regards to bat mortality,<sup>58</sup> wind turbines are actually responsible for very few bird deaths caused by human activity (less than 0.01%). Nevertheless, poor turbine design and siting of large wind farms in the 1980s in California still affect the image of the modern wind energy industry today, which has greatly improved standards of design and is subject to far more robust planning control.

### 9.2 Methodology

#### 9.2.1 Scottish Natural Heritage: Policy and Guidance<sup>59</sup>

SNH is a statutory advisor to the Scottish Government and local planning authorities for wind energy planning applications such as this.<sup>60</sup> In 2014, SNH published a guidance document entitled '*Assessing the impact of small-scale wind energy proposals on the natural heritage.*' This document was designed so that planning authorities do not need to consult SNH for a small scale wind energy application (three or fewer turbines) unless a protected area will be affected by a proposal, or an EIA is required. Much of the ecological assessment to follow is structured around this guidance.

Policy pertaining to birds, bats and protected habitats will be explored in more detail below. However, in addition to considering these, it is important to note that SNH require attention to be paid to pathways, an example being pollutants leaving the development site through runoff during construction and entering freshwater sites. Other species must also be taken into consideration, such as the potential for disturbance to Badgers, which are protected by the Protection of Badgers Act 1992, as amended by the Nature Conservation (Scotland) Act 2004.

<sup>56</sup> SNH (2009) Strategic Locational Guidance for Onshore Wind Farms in respect of the Natural Heritage: <http://www.snh.gov.uk/docs/A247182.pdf>

<sup>57</sup> <http://www.snh.gov.uk/planning-and-development/renewable-energy/onshore-wind/>

<sup>58</sup> Research especially needed in UK - Natural England (2014) Bats and Onshore Wind Turbines – Interim Guidance

<sup>59</sup> <http://www.snh.gov.uk/planning-and-development/renewable-energy/onshore-wind/>

<sup>60</sup> SNH (2009) Strategic Locational Guidance for Onshore Wind Farms in respect of the Natural Heritage

## Birds

The EU Birds Directive (2009/147/EC) creates a comprehensive scheme of protection for all wild bird species naturally occurring in the EU.

Great emphasis is placed on the protection of habitats for endangered or migratory species (listed in Annex I) through the establishment of a coherent network of Special Protection Areas (SPAs). Since 1994, all SPAs form an integral part of the EU wide Natura 2000 ecological network.

## Bats

All species of bats are European protected species.<sup>61</sup> Following best practice guidance referred to by SNH and produced by Natural England,<sup>62</sup> a 50m buffer should be maintained between any linear features, (such as trees, walls, hedges, buildings and water bodies), into which no part of the turbine intrudes; in order to reduce the risk to bat populations. The edge of the rotor-swept area (blade tip) therefore needs to be at least 50m from the nearest part of the habitat feature. Figure 8.1 provides an illustration and the formula required to calculate this.

The majority of bat species within the UK are known to use echolocation calls which are only within a useful range of a few meters; they therefore tend to fly close to habitat features such as hedgerows, woodlands, walls, rivers and the tree canopy. UK bat activity has been found to decline at fixed intervals of 50m and varying intervals of 35m from treelines when both commuting and foraging. If the 50m buffer zone for wind turbines is maintained, the majority of UK bat species are unlikely to come into contact with blades.<sup>63</sup>

If a proposed wind turbine does fall within 50m of suitable habitats or within sites designed for bats (Sites of Special Scientific Interest (SSSI) or Special Areas of Conservation (SACs)), a bat survey is automatically required.<sup>64</sup>

## Protected Habitats

The 1992 Habitats Directive (92/43/EEC) affords protection to certain habitats and species identified in the Directive, including those requiring strict protection (European protected species). These areas are known as SAC.

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<sup>61</sup> SNH (2012) Assessing the impact of small-scale wind energy proposals on the natural heritage

<sup>62</sup> As per Natural England Technical Information Note 51 (TIN051): <http://publications.naturalengland.org.uk/publication/35010>

<sup>63</sup> Natural England (2014) Bats and Onshore Wind Turbines – Interim Guidance

<sup>64</sup> Natural England: [www.naturalengland.org.uk](http://www.naturalengland.org.uk)

### 9.2.2 Desk-based Assessment Methodology

A desk-based assessment was conducted to:

- Identify all designated sites listed through Table 9.1 within a 20km radius of the proposed turbine in compliance with SNH guidance.<sup>65</sup> The online information service from SNH (SNHi)<sup>66</sup> was used to gather this; and
- Collect records on the bat species within the 10km grid square in which the turbine is located (NT53) through the NBN Gateway;<sup>67</sup>

**TABLE 9.1:** PROTECTED AREAS TO BE TAKEN INTO CONSIDERATION

NAME	DESCRIPTION
<b>SPECIAL PROTECTION AREAS (SPA)</b>	EUROPEAN DESIGNATED SITES, PROTECTED UNDER THE WILD BIRDS DIRECTIVE (COUNCIL DIRECTIVE 2009/147/EC ON THE CONSERVATION OF WILD BIRDS) [PREVIOUSLY DIRECTIVE 79/409/EEC]. THESE SITES HAVE BEEN IDENTIFIED AS BEING OF INTERNATIONAL IMPORTANCE TO RARE OR VULNERABLE BIRD SPECIES.
<b>SPECIAL AREAS OF CONSERVATION (SAC)</b>	EUROPEAN DESIGNATED SITES, PROTECTED UNDER THE 1992 HABITATS DIRECTIVE (92/43/EEC), WHICH, TOGETHER WITH SPAS, AIM TO FORM A EUROPEAN COMMUNITY-WIDE NETWORK OF PROTECTED AREAS (NATURA 2000) FOR THOSE HABITATS AND SPECIES WHICH ARE ENDANGERED, VULNERABLE, RARE, OR OTHERWISE REQUIRE SPECIAL ATTENTION.
<b>SITES OF SPECIAL SCIENTIFIC INTEREST (SSSI)</b>	AREAS OF LAND THAT REPRESENT A WIDE RANGE OF NATURAL FEATURES, FROM VULNERABLE PLANTS OR ANIMALS, TO HIGH-QUALITY HABITAT EXAMPLES, SUCH AS WETLANDS OR MEADOWS. LEGALLY PROTECTED THROUGH A NUMBER OF ACTS INCLUDING THE COUNTRYSIDE AND RIGHTS OF WAY (CROW) ACT 2000.
<b>OTHER PROTECTED AREAS</b>	INCLUDES: RAMSAR SITES - WETLANDS OF INTERNATIONAL IMPORTANCE DESIGNATED UNDER THE RAMSAR CONVENTION (1971); NATIONAL AND LOCAL NATURE RESERVES (NNRS AND LNRS) - IMPORTANT SITES FOR WILDLIFE, GEOLOGY, EDUCATION OR PUBLIC ENJOYMENT; NATIONAL PARKS; COUNTRY PARKS; AND RSPB RESERVES.

### 9.2.3 Consultation

Feedback on this wind energy proposal was also sought from organisations concerned with the protection of the natural environment in the Scottish Borders and is detailed in the table below. This has influenced the structure of this ecological assessment.

<sup>65</sup> SNH (February 2012): <http://www.snh.gov.uk/docs/A669283.pdf>

<sup>66</sup> <http://www.snh.gov.uk/publications-data-and-research/snhi-information-service/>

<sup>67</sup> NBN Gateway, grid square HU36: <https://data.nbn.org.uk/Reports/Sites/HU36/Groups>

**TABLE 9.2:** CONSULTATION RESPONSES

CONSULTEE	DATE OF CONSULTATION	DETAIL OF CONSULTATION
ALISON PHILLIP, SNH OPERATIONS OFFICER, SOUTHERN SCOTLAND	19.12.13	<p><b>GREENLAW MOOR SPA</b></p> <p>WITHIN THE FORAGING RANGE FOR PINK-FOOTED GEESE AT GREENLAW MOOR SPA "WE KNOW FROM LOCAL STUDIES THAT THE LOCATION OF THE PROPOSED TURBINE IS NOT IN AN AREA KNOWN TO BE REGULARLY USED BY PINK-FOOTED GEESE FOR FEEDING DURING THE AUTUMN AND WINTER MONTHS, AND THAT THE SITE IS NOT LOCATED ALONG THE ROUTE OF REGULAR FLIGHT LINES USED BY GEESE TO ACCESS OTHER FEEDING AREAS. WE THEREFORE CONSIDER IT UNLIKELY THAT A TURBINE AT CLACKMAE FARM WILL HAVE A SIGNIFICANT EFFECT ON THE QUALIFYING INTEREST OF THIS SPA, DIRECTLY OR INDIRECTLY. INFORMATION TO INFORM AN APPROPRIATE ASSESSMENT IS THEREFORE NOT REQUIRED."</p> <p><b>RIVER TWEED SAC &amp; SSSI</b></p> <p>THE TURBINE IS SUFFICIENTLY DISTANT FROM BOTH SITES AND IS UNLIKELY TO HAVE A SIGNIFICANT EFFECT. FURTHER INFORMATION IS NOT REQUIRED.</p> <p><b>OTHER DESIGNATED SITES</b></p> <p>NO CONNECTIVITY BETWEEN PROPOSAL AND OTHER DESIGNATED SITES, NO FURTHER INFORMATION REQUIRED.</p>

## 9.3 Results

### 9.3.1 Designated Sites

All of the designated environmental sites within a 20km radius of the proposed turbine are mapped in Appendix 9.1.

Table 9.3 details the SPAs within the 20km study area and the bird species associated with each area. The table also identifies, where applicable, whether any bird species may have connectivity with the proposed turbine using data provided by SNH.<sup>68</sup>

Other designated environmental sites within 5km are detailed in Table 9.4; with Appendix 9.1 showing all to 20km.

**TABLE 9.3:** SPAs WITHIN 20KM

SITE NAME & DISTANCE FROM TURBINE	QUALIFYING FEATURE	CORE RANGE	TURBINE IN RANGE?
GREENLAW MOOR 17.6KM	AGGREGATIONS OF NON-BREEDING BIRDS: PINK-FOOTED GOOSE ( <i>ANSER BRACHYRHYNCHUS</i> ).	15 TO 20KM	YES

<sup>68</sup> SNH (2013) *Assessing Connectivity with Special Protection Areas (SPAs)*



**TABLE 9.4: OTHER DESIGNATED ENVIRONMENTAL SITES WITHIN 5KM**

SITE NAME & DISTANCE FROM TURBINE (KM)	SITE CATEGORY	QUALIFYING FEATURE
RIVER TWEED 0.8KM	SAC	FISH: RIVER LAMPREY ( <i>LAMPETRA FLUVIATILIS</i> ), BROOK LAMPREY ( <i>LAMPETRA PLANERI</i> ), SEA LAMPREY ( <i>PETROMYZON MARINUS</i> ), ATLANTIC SALMON ( <i>SALMO SALAR</i> ); MAMMALS: OTTER ( <i>LUTRA LUTRA</i> ); RIVERS & STREAMS: RIVERS WITH FLOATING VEGETATION OFTEN DOMINATED BY WATER-CROWFOOT.
CENTRAL BORDERS 1.8KM	ENVIRONMENTALLY SENSITIVE AREA (ESA)	NON-HABITAT PAYMENT, WOODLAND.
GATTONSIDE MOSS 2.5KM	SSSI	FEN, MARSH AND SWAMP (WETLAND): BASIN FEN; OTHER INVERTEBRATES: BEETLE ASSEMBLAGE.
AVENEL HILL & GORGE 3.3KM	SSSI	BROAD-LEAVED, MIXED AND YEW WOODLAND: UPLAND OAK WOODLAND; BUTTERFLIES: GREEN HAIRSTREAK ( <i>COLLOPHRYS RUBI</i> ).
RIVER TWEED 4.2KM	SSSI	FISH: RIVER LAMPREY ( <i>LAMPETRA FLUVIATILIS</i> ), BROOK LAMPREY ( <i>LAMPETRA PLANERI</i> ), SEA LAMPREY ( <i>PETROMYZON MARINUS</i> ), ATLANTIC SALMON ( <i>SALMO SALAR</i> ); MAMMALS: OTTER ( <i>LUTRA LUTRA</i> ); OTHER INVERTEBRATES: FLY ASSEMBLAGE, BEETLE ASSEMBLAGE; RIVERS & STREAMS: TROPIC RANGE RIVER/STREAM; VASCULAR PLANTS: ASSEMBLAGE.
TWEEDWOOD -- GATEHEUGH 4.5KM	SSSI	BROAD-LEAVED, MIXED AND YEW WOODLAND: UPLAND OAK WOODLAND; OTHER INVERTEBRATES: BEETLE ASSEMBLAGE.
THREEPWOOD MOSS 4.7KM	SAC	BOGS (WETLAND): ACTIVE AND DEGRADED RAISED BOG.
	SSSI	BOGS (WETLAND): RAISED BOG.
COLMSLIEHILL JUNIPERS 5.0KM	SSSI	BROAD-LEAVED, MIXED AND YEW WOODLAND (UPLAND): JUNIPER SCRUB.

### 9.3.2 Bat Species

Table 9.5 details the bat species recorded within the 10km grid square in which the proposed turbine is located. It also describes the typical habitat of each species, if individual bats are at risk from wind turbines, and if the species as a whole are at risk.

**TABLE 9.5: RECORDED BAT SPECIES WITHIN 10KM GRID SQUARE (NT53) OF PROPOSAL<sup>69</sup>**

SPECIES	STATUS	HABITAT (SCOTLAND)	LIKELY RISK TO BAT FROM WIND TURBINES	LIKELY THREAT TO POPULATION FROM WIND TURBINES
<b>BROWN LONG-EARED BAT</b> ( <i>PLECOTUS AURITUS</i> )	POPULATION: COMMON/ WIDESPREAD UK STATUS: NOT THREATENED	<b>SUMMER ROOST</b> – LARGE, OLD, OCCUPIED BUILDINGS CLOSE TO WOODLAND; <b>WINTER</b> – POSSIBLY TREE HOLES; <b>FORAGING</b> – MAINLY DECIDUOUS WOODLAND, ALSO MIXED WOODLAND AND EDGE OF CONIFER PLANTATIONS; <b>TRAVEL</b> – USE FLYWAYS (HEDGES, TREELINES).	LOW	LOW
<b>DAUBENTON'S BAT</b> ( <i>MYOTIS DAUBENTONII</i> )	POPULATION: COMMON/ WIDESPREAD UK STATUS: NOT THREATENED	<b>SUMMER ROOST</b> – MAINLY TREES, PREFERRING OAK TO BEECH ON THE EDGE OF WOODLAND, ALWAYS CLOSE TO WATER; <b>WINTER</b> – MAINLY CAVES, MINES; <b>FORAGING</b> – ALMOST EXCLUSIVELY OVER WATER WITH CANOPY TREES ON BANKS; <b>TRAVEL</b> – FLYWAYS (HEDGES, OVERGROWN BURNS), AVOID OPEN SPACE EXCEPT OVER WATER.	LOW	LOW
<b>NATTERER'S BAT</b> ( <i>MYOTIS NATTERERI</i> )	POPULATION: COMMON/ WIDESPREAD UK STATUS: NOT THREATENED	<b>SUMMER ROOST</b> – BUILDINGS OR TREES; <b>WINTER</b> – MINES, LIMESTONE QUARRIES; <b>FORAGING</b> – NUMBER OF LOCATIONS, MOSTLY MEDIUM LENGTH GRASS UNDER WIDELY SPACED CONIFEROUS TREES (E.G. LARCH, SCOTS PINE).	LOW	LOW
<b>COMMON PIPISTRELLE</b> ( <i>PIPISTRELLUS PIPISTRELLUS</i> )	POPULATION: COMMON/ WIDESPREAD UK STATUS: NOT THREATENED	<b>SUMMER ROOST</b> – MOSTLY RIVER VALLEYS, DEPENDENT ON OCCUPIED BUILDINGS; <b>WINTER</b> – PROBABLY BUILDINGS; <b>FORAGING</b> – MAINLY RIPARIAN WOODLAND AND PARKLAND, BUT BROAD PREFERENCES.	MEDIUM	LOW
<b>WHISKERED BAT</b> ( <i>MYOTIS MYSTACINUS</i> )	POPULATION: RARE/ RESTRICTED DISTRIBUTION UK STATUS: VULNERABLE; SCARCE	<b>SUMMER ROOST</b> – USUALLY BUILDINGS, UNDER SLATES OR RIDGE TILES; <b>WINTER</b> – UNDERGROUND SITES <b>FORAGING</b> – MAINLY LIGHTLY WOODED HABITAT, ALONG HEDGEROWS.	LOW	LOW

<sup>69</sup> Table created from 3 documents: Swift (2004) *Bat Species in Scotland: SNH Commissioned Report*: <http://www.snh.gov.uk/docs/C208532.pdf>; Hundt L (2012) *Bat Surveys: Good Practice Guidelines, 2<sup>nd</sup> Edition*, Bat Conservation Trust; Natural England (2014) *Bats and Onshore Wind Turbines – Interim Guidance*

### 9.3.3 Habitat on Proposed Site

The proposed turbine is located within an arable field on Clackmae, used for a rotation of grain and grass. It is sited 108m from a belt of semi-natural woodland to the west, and 175m from a belt of Ancient Woodland to the north. Clackmae Burn runs through this northern belt of woodland, 206m from the turbine at its nearest point. As there is also woodland to the south (360m) and east (305m) of the turbine, the fields in which the turbine is situated are relatively enclosed.

## 9.4 Discussion

### 9.4.1 Designated Sites

As detailed in Table 9.3, there is one SPA 17.6km northeast of the proposed turbine. This is within the range of the Pink-footed goose. Nevertheless, this species roost in estuaries, larger lakes, and reservoirs and usually feed close to their roost sites in large, open areas. Native coastal food plants and agricultural crops are eaten and journeys of up to 20km for foraging are only occasionally taken.<sup>70</sup> Due to the relatively enclosed habitat at Clackmae as described in Chapter 9.3.3, and the distance of the site from the SPA, this species is unlikely to feed at Clackmae and therefore is at low risk from this wind turbine proposal.

This low risk has been confirmed through consultation with SNH (Table 9.2), where it is confirmed this is not an area known to be regularly used by Pink-footed geese for feeding in autumn and winter; further assessment is therefore considered unnecessary.

The other designated sites listed in Table 9.4 have also been established as not being at risk from the proposal through consultation with SNH and therefore no further investigation is required. This is because there is sufficient distance between these protected sites and the turbine and no connectivity through pathways exist. For example, the nearest site is the River Tweed SAC (800m west; the nearest section of which is Leader Water, which runs into the River Tweed 4.5km to the south). However, there are patches of woodland and minor roads separating the river from the turbine. In addition, although the turbine is situated closer to Clackmae Burn (206m north) and a stream to the south (380m), which both run into the SAC, these two smaller watercourses are situated within woodland which will prevent run-off.

### 9.4.2 Bats

The desktop study found records of five bat species within the 10km grid square of Clackmae (NT53) – details on these species were summarised in Table 9.5. It was found that these species have a low risk to wind energy development, with the exception of the Common Pipistrelle. As individuals, these have a medium risk to a turbine, yet there is a low risk to the population as a whole. In addition, the proposed turbine is located 108m from the nearest woodland, in excess

<sup>70</sup> Pink-footed Goose (*Anser brachyrhynchus*) <http://jncc.defra.co.uk>

of the minimum 50m distance from blade tip recommended for the protection of bats. The woodland habitat around Clackmae Burn to the north may be suitable for these pipistrelles; however, the proposed turbine is again situated a suitable distance from this so as to reduce risk to this bat species.

#### **9.4.3 Habitat**

The proposed turbine is situated on arable land which has limited value as habitat. Furthermore, the development will have a minimal footprint as it is situated beside an existing access track on the farm, removing the need for the construction of a new track.

### **9.5 Recommendations**

From the analysis above, it has been found that there is a very small risk to the overall ecology of the surrounding area from this proposed turbine. The mitigation measures required at the site are therefore minimal.

Those measures implemented concern the installation and decommissioning of the turbine with the aim to protect invertebrates such as badgers. This includes covering foundations overnight, capping the end of any pipes and erecting suitable fencing.

### **9.6 Policy Analysis**

SCOTTISH BORDERS COUNCIL (2013) 'PROPOSED LOCAL DEVELOPMENT PLAN': POLICY ED9 – RENEWABLE ENERGY DEVELOPMENT

*"Renewable energy developments will be approved provided that: ... There are no unacceptable adverse impacts which cannot be fully mitigated on the natural heritage including the water environment... [and] biodiversity."*

The analysis presented in this chapter has demonstrated that there will be little risk of impact on the ecology of the surrounding area from this wind turbine.

Please note: This policy is similar to Policy D4 'Renewable Energy Development,' Policy NE1 'International Nature Conservation Sites' and Policy NE2 'National Nature Conservation Sites' of SBC (2011) 'Consolidated Local Plan,' Policy EP1 'International Nature Conservation Sites and Protected Species,' Policy EP2 'National Nature Conservation and Protected Species' and Policy EP3 'Local Biodiversity' of SBC (2013) 'Proposed Local Development Plan,' and SBC (2011) 'Wind Energy.'

## 10. SOIL AND HYDROLOGICAL ASSESSMENT

### 10.1 Introduction

An assessment of the potential effects on soil and hydrology has been carried out through a desk-based assessment. Effects on the soils and hydrology of the site can occur as a result of the various stages of development, namely construction and decommissioning.

### 10.2 Relevant Legislation, Policy and Guidance

Best practice legislation and guidance notes were consulted when conducting the hydrological assessment, including SPP (2014) and Scottish Environmental Protection Agency (SEPA) Policies and Pollution Prevention Guidelines (PPGs).

### 10.3 Consultation Response

Table 10.1 details the feedback received from SEPA through consultation on this development.

**TABLE 10.1:** CONSULTATION RESPONSE

CONSULTEE	DATE OF CONSULTATION	DETAIL OF CONSULTATION
DIARMUID O'CONNOR, SENIOR PLANNING OFFICER, SEPA	17.12.13	SATISFIED THAT INTERESTS CAN BE ADEQUATELY ADDRESSED THROUGH STANDARD GUIDANCE ('SEPA STANDING ADVICE FOR PLANNING AUTHORITIES ON SMALL SCALE LOCAL DEVELOPMENT MANAGEMENT CONSULTATIONS').

### 10.4 Land Capability

As per the Macaulay Land Use Research Institute's Land Capability Map,<sup>71</sup> the development area within Clackmae is categorised as land capable of supporting mixed agriculture. It is categorised as Class 3.2 which is "capable of producing a moderate range of crops with an increasing trend towards grass within the rotation."

The site is therefore not categorised as prime agricultural land (which are classes 1, 2 and 3.1 in the classification system).

<sup>71</sup> The Macaulay Land Use Research Institute: [http://www.macaulay.ac.uk/explorescotland/lca\\_map.pdf](http://www.macaulay.ac.uk/explorescotland/lca_map.pdf)

## 10.5 Hydrology

The nearest water system to the proposed turbine is Clackmae Burn, which is 206m north. This distance is significantly more than the 50m minimum distance recommended for watercourses and so will avoid any risk to the local hydrology. The woodland surrounding Clackmae Burn further reduces any risks, preventing runoff.

## 10.6 Flood Risk

In order to establish whether the site is at risk of flooding, SEPA's online Indicative River and Coastal Flood Map<sup>72</sup> was consulted. Flood risk areas are defined as areas at risk of flooding from rivers, surface water, and/or the sea.

The map shows that the site of the proposed turbine, which is located at 189m AOD, is not at risk from flooding. The closest at risk area is the eastern section of Clackmae Burn, approximately 360m northeast of the turbine.

As there is little risk of flooding at the proposed turbine location, the potential impacts on hydrology in the vicinity of the development are considerably lowered. This is especially significant during the construction phase of the development.

## 10.7 Policy Analysis

SCOTTISH BORDERS COUNCIL (2013) 'PROPOSED LOCAL DEVELOPMENT PLAN': POLICY ED9 – RENEWABLE ENERGY DEVELOPMENT

*"Proposals for all wind turbine proposals should be judged against the following considerations and will only be approved where the overall impact is judged acceptable by the Council: ...protection of carbon rich soils including peat land and protection of prime quality agricultural land."*

The proposed development site is not located on carbon rich soil or prime agricultural land.

Please note: This policy is similar to SBC (2013) 'Proposed Local Development Plan': Policy ED10 'Protection of Prime Quality Agricultural Land and Carbon Rich Soils.'

SCOTTISH BORDERS COUNCIL (2013) 'PROPOSED LOCAL DEVELOPMENT PLAN': POLICY EP15 – DEVELOPMENT AFFECTING THE WATER ENVIRONMENT

*"Where a proposal would result in a significant adverse effect on the water environment through impact on its natural or physical characteristics... it will be refused."*

<sup>72</sup> SEPA, Indicative River & Coastal Flood Map, [http://www.sepa.org.uk/flooding/flood\\_extent\\_maps/view\\_the\\_map.aspx](http://www.sepa.org.uk/flooding/flood_extent_maps/view_the_map.aspx)

This chapter has considered whether the hydrology of the surrounding area will be affected by the installation of the proposed turbine and found that it will provide no risk in regards to runoff or pollution. Flood risk has also been assessed as low.

Please note: This policy is similar to Policy NE5 '*Development Affecting the Water Environment*' of SBC (2011) '*Consolidated Local Plan*' and Policy IS8 '*Flooding*' of SBC (2013) '*Proposed Local Development Plan*.'

## 11. EXISTING INFRASTRUCTURE

### 11.1 Introduction

When designing a new development, it is important to consider the existing infrastructure within the area, including infrastructure related to utilities (such as electricity, gas and water mains), telecommunication facilities and television networks. Construction activities such as excavation have the potential to damage subterranean infrastructure, therefore consultation with relevant authorities is important.

Wind turbines have the potential to interfere with electro-magnetic signals passing above ground or existing infrastructure below ground. Interference can occur with communication networks for civil aviation and radar safeguarding, as well as other types of infrastructure such as seismic monitoring stations. Various types of civilian and military communication that can be affected include microwave and cellular radio communications and various navigational control systems. This study addresses the potential for impact to ensure that the proposed turbine at Clackmae does not generate unwanted 'noise' on existing infrastructure.

### 11.2 Relevant Legislation, Policy and Guidance

Various guidance documents are available for the assessment of the potential impact of turbines on electromagnetic infrastructure and aviation interests. Guidance which has been utilised within this application is outlined in Table 11.1.

**TABLE 11.1:** RELEVANT GUIDANCE

GUIDANCE / LEGISLATION	RELEVANT SOURCES OF INFORMATION
<b>ELECTRO-MAGNETIC INFRASTRUCTURE</b>	SCOTTISH GOVERNMENT (2014) ' <i>ONSHORE WIND TURBINES;</i> ' OFCOM (2009) ' <i>TALL STRUCTURES AND THEIR IMPACT ON BROADCAST AND OTHER WIRELESS SYSTEMS;</i> ' AND BACON (2002) ' <i>FIXED-LINK WIND TURBINE EXCLUSION ZONE METHOD.</i> '
<b>AVIATION ACTIVITIES</b>	SCOTTISH GOVERNMENT (2014) ' <i>ONSHORE WIND TURBINES;</i> ' BWEA (2002) ' <i>WIND ENERGY AND AVIATION INTERESTS, INTERIM GUIDELINES;</i> ' CAA (2013) ' <i>CAP 764: CAA POLICY AND GUIDELINES ON WIND TURBINES;</i> ' CAA (2013) ' <i>CAP 670: AIR TRAFFIC SERVICES SAFETY REQUIREMENTS</i> ' (GEN 01: WIND FARMS); AND CAA (2014) ' <i>CAP 168: LICENSING OF AERODROMES: EDITION 10.</i> '

### 11.3 Electromagnetic Infrastructure

VG Energy aim to ensure that the proposed development at Clackmae does not impact negatively on the electromagnetic infrastructure within the area. Wind turbines can impact



television reception primarily through the ‘scattering’ of signals emitted as a result of the movement of the turbine blades. However, digital signals are less susceptible to these effects and interference from turbines compared to the old, now redundant analogue signals. The impact to properties with satellite television will be negligible, as the transmission to satellite dishes is largely unaffected by wind turbines. Generally, the potential for interference to television reception is predictable, with consultations taking place with the relevant authorities during the planning stage.

### 11.3.1 Consultation Response

Table 11.2 references the feedback which has been received from relevant telecommunication and utilities providers in regards to the proposed development.

**TABLE 11.2:** CONSULTATION RESPONSES

CONSULTEE	DATE OF CONSULTATION	DETAIL OF CONSULTATION
ALESSANDRA LEES, WIND FARM TEAM, JRC	16.10.14	DOES NOT FORESEE ANY POTENTIAL PROBLEMS BASED ON KNOWN INTERFERENCE SCENARIOS.
WINDFARM SUPPORT, ATKINS	05.09.14	NO OBJECTION ON BASIS OF UHF RADIO SCANNING TELEMETRY COMMUNICATIONS.
OFCOM SPECTRUM LICENSING	13.09.14	CONTACT EE, VODAFONE, BT AND AIRWAVE SOLUTIONS (R4TELECOM).
BRIAN JOHNSON, R4TELECOM	24.09.14	NO INFORMATION PROVIDED.
DALE AITKENHEAD, BT	25.09.14	TURBINE SHOULD NOT CAUSE ANY INTERFERENCE.
JOE WILKINSON, VODAFONE	25.09.14	NO OBJECTION TO THE PROPOSED TURBINE.
SIMON MITCHELL, SPECTRUM ASSIGNMENT & COORDINATION TEAM, OFCOM	09.10.14	IF WISHING TO CONTACT EE, TRY: <a href="mailto:TECH.SERVICES-TX@ERICSSON.COM">TECH.SERVICES-TX@ERICSSON.COM</a>
<a href="mailto:TECH.SERVICES-TX@ERICSSON.COM">TECH.SERVICES-TX@ERICSSON.COM</a>	03.11.14	NO RESPONSE.

Based on the information available and the consultation responses listed in Table 11.2, it is unlikely that the proposed turbine will have an adverse effect on television and communication links.

### 11.3.2 Potential Mitigation

Although it is unlikely that objections will be raised during the consultation period for this planning application, if necessary there are a number of measures that can be taken to reduce or overcome any interference with electromagnetic infrastructure. Mitigation measures which could be implemented include, but are not limited to, the following:

- ◆ The re-positioning of the turbine within the applicant's land boundary to eliminate the impact to links;
- ◆ Affected households can be fitted with a more sensitive receiver antenna;
- ◆ Affected antenna can be re-positioned to receive signals from a different transmitter; or
- ◆ An alternative means of transmission, such as a satellite or cable, can be installed.

## **11.4 Aviation, Radar and MOD**

### ***11.4.1 Air Traffic Control Radar***

Wind turbines can at times interfere with Air Traffic Control Radar. The blade movement can cause intermittent detection by radars whilst in operation. This problem occurs when the wind turbine blades are in the line of sight of the radar antenna. Due to their height, they can also impact upon airports and airfields if they project into the safeguarding surface above and around them.

VG Energy has a suite of GIS based maps for MOD, NATS en-route and ATC line of sight. These maps show that the turbine development should not be in the line of sight to any of these installations, although we understand that consultation with the relevant parties will also be required.

### ***11.4.2 Eskdalemuir***

Eskdalemuir is a seismic monitoring site safeguarded by the MOD. It is used to monitor compliance with the Comprehensive Nuclear Test Ban Treaty (CTBT) and the UK is bound not to compromise its detection capabilities.

Wind turbines can produce seismic ground vibrations and as a result there is a 50km Consultation Zone in which the proposed turbine at Clackmae falls within. However, the most recent guidance regarding Eskdalemuir issued on the 22<sup>nd</sup> May 2014 recognises that there is some headroom for further wind farm consents which would not breach the seismic ground vibration threshold.

A new model has been created which calculates the seismic noise from wind turbines using the hub height, rotor diameter and distance from the array. The model only deals with large turbines and so any smaller turbines such as this one at Clackmae (22.6m hub height) are represented as 40m to hub, triple bladed and as utilising upwind technology.

On submission of this planning application to SBC, the Council will advise the MOD; developments are then considered in chronological order as they are notified. It is not possible to determine whether this application will be calculated as complying with the seismic noise threshold before the planning application is submitted.

## 11.5 Other Infrastructure

### 11.5.1 National Grid Gas Pipeline

Consultation with SGN Connections has been undertaken during the design stage of development to ensure no gas mains within the area will be affected by the proposed turbine.<sup>73</sup> It was confirmed through this that there are no gas mains in the area and so there is no risk from the proposed turbine.

### 11.5.2 Electricity Infrastructure

There are no electricity pylons which are at risk from the proposed turbine. The closest is 385m northeast of the proposal.

### 11.5.3 Water Supplies

As discussed in detail in Chapter 10: Soil and Hydrological Assessment, the water supplies surrounding the development site have been taken into account during the design stage of the proposal. Due to careful site design and suitable buffers being adhered to, no water supplies will be adversely affected by the proposed turbine development and associated infrastructure at Clackmae.

## 11.6 Policy Analysis

SCOTTISH BORDERS COUNCIL (2013) 'PROPOSED LOCAL DEVELOPMENT PLAN': POLICY ED9 – RENEWABLE ENERGY DEVELOPMENT

*"Proposals for all wind turbine proposals should be judged against the following considerations and will only be approved where the overall impact is judged acceptable by the Council: ...interference with radio telecommunications and aviation."*

Our analysis in this chapter has shown that the proposed turbine will not interfere with Air Traffic Control radar and is unlikely to impact communications facilities. Until this planning application is submitted and consultation has taken place with the MOD, it is not possible to ascertain whether this application will be calculated as complying with the seismic noise threshold in regards to Eskdalemuir.

Please note: This policy is similar to Policy D4 'Renewable Energy Development' of the Scottish Borders (2011) 'Consolidated Local Plan.'

<sup>73</sup> Consultation with Maureen Smith, SGN Connections, 26.09.14.

## 12. TRAFFIC AND TRANSPORT

### 12.1 Introduction

This chapter addresses the logistical concerns associated with the installation of a single NPS wind turbine at Clackmae. This includes the delivery route, construction program, and development and vehicle specifications.

The proposed development includes the turbine, foundation, crane pad, associated infrastructure, an on-site control unit system, and a meter house. The existing access track on the farm will be used for construction and maintenance, therefore no new track is necessary.

### 12.2 Proposed Route

#### 12.2.1 Delivery of Turbine Components

It is likely that the proposed turbine will be delivered into the Port of Leith. From here, the turbine components will be delivered via the following route:

- ◆ On exiting the Port of Leith, the A199 will be taken in a south-easterly direction out of Leith and past Portobello;
- ◆ Following this, the delivery will continue as the A199 merges into A1;
- ◆ The A720 ramp to Glasgow/Stirling/A90/M8/M9 will then be taken;
- ◆ The delivery will continue on the A720 until the A68 exit towards Jedburgh;
- ◆ The A68 will then be followed until a right turn is taken close to the south of Lauder marked 'Blainslie 2'
- ◆ This local road then runs to Clackmae, where a right turn will be taken onto the existing track leading towards the dairy shed and then turbine location.

From initial inspection, it is not foreseen that the development will require any upgrades to the road network. The final delivery route will be outlined within the Traffic Management Plan composed by the Haulage Company and submitted to the relevant authorities prior to any works taking place.

#### 12.2.2 Access Track

No new access track will be required for this proposal, as the turbine is located next to an existing track on the farm which is suitable for construction and maintenance. As shown through Appendix 12.1, only a small linking section between the existing track and new crane pad will be required. The dimensions of the crane pad are displayed in Table 12.1.

**TABLE 12.1: CRANE PAD DIMENSIONS**

	DEPTH	WIDTH	LENGTH
DIMENSIONS OF CRANE PAD	0.3M	10M	10M
CONSTRUCTION MATERIAL	TYPE 1 AGGREGATE		

A meter house will be required at the base of the wind turbine, on the foundation. The location of the meter house is illustrated in Appendix 12.1 and the specifications are detailed in Table 12.2 and Appendix 12.2.

**TABLE 12.2: METER HOUSE DIMENSIONS**

	HEIGHT	WIDTH	LENGTH
DIMENSIONS OF METER HOUSE	2.5M	2.5M	5M

### 12.2.3 Micro-siting

It is normal practise to allow a small margin for adjustment of the wind turbine and equipment positions to accommodate any unusual ground conditions encountered during excavations. A 5m micro-siting allowance has therefore been added to the application site, as illustrated in Appendix 12.1.

## 12.1 Construction Process

### 12.1.1 Construction Program

The start date for the construction programme will depend on a number of factors including the procurement of components. It is anticipated that on-site construction will take up to one month and be completed in three main phases:

**TABLE 12.3: CONSTRUCTION PROGRAM**

CONSTRUCTION	WORKS CARRIED OUT	APPROXIMATE DURATION
GROUND WORKS	CABLE TRENCHING AND LAYING EXCAVATE AND POUR CONCRETE FOR TURBINE FOUNDATION	2 DAYS ON SITE
WIND TURBINE INSTALLATION	DELIVER TURBINE COMPONENTS (TOWER SECTIONS, NACELLE AND BLADES) EMPLOY CRANES ERECT WIND TURBINE	21 DAYS ON SITE

<b>COMMISSIONING</b>	ELECTRICAL CONNECTIONS COMMISSIONING TURBINE SITE REINSTATEMENT	12 DAYS ON SITE
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### 12.1.2 Working Times

The proposed normal working times of construction activities are 8am to 6pm Monday to Friday and 8am to 1pm on Saturdays. Although unlikely, during the installation of the wind turbine there may be a requirement to extend working hours to take advantage of suitable weather conditions, as some critical elements of installation must be completed once started.

## 12.2 Development Specifications

### 12.2.1 Specifications of Proposal

The weight and dimensions of the NPS components which will be transported to the site are outlined in Table 12.4.

**TABLE 12.4: SIZE AND WEIGHT OF NPS 100/24 COMPONENTS**

TURBINE COMPONENT	LENGTH (M)	WIDTH (M)	HEIGHT (M)	NET WEIGHT (TONNES)
NACELLE, HUB AND 3 BLADES IN CONTAINER	12.2	2.5	2.6	8.8
HUB	12.2	2.5	2.6	16.1

### 12.2.2 Width, Length and Weight Allowances

The length, width and weight allowances for vehicles using the public road network are set out in the Roads and Vehicles (Authorisation of Special Types) (General) Order 2003. The general allowances are outlined in Table 12.5.

**TABLE 12.5: VEHICLE ALLOWANCES**

VEHICLE DIMENSIONS	ALLOWANCE
OVERALL LENGTH	18M (EXCEEDANCE OF 30M REQUIRES A SPECIAL ORDER)
OVERALL WIDTH	3M
OVERALL WEIGHT	44 TONNES

For this proposed development at Clackmae, no vehicles utilised will be in excess of the allowances noted in Table 12.5.

### 12.3 Delivery Vehicles

With the delivery of a single NPS 100/24 turbine and the associated materials required for the construction of the development, a number of vehicular movements will be necessary. The likely specifications of vehicles to be used in conjunction with this project are detailed in Table 12.6. Component delivery schedules will be confirmed in detail a minimum of 5 weeks prior to the date of construction, with the haulage company composing and submitting an agreed Traffic Management Plan.

‘Vehicle Movement’ is a singular movement; from an external point to the development site. The return journey of the vehicle is then considered as an additional movement.

**TABLE 12.6:** VEHICLE INVENTORY FOR DELIVERY OF TURBINE COMPONENTS

COMPONENTS/ REQUIREMENTS	MATERIALS	DELIVERY SPECIFICATIONS	VEHICLE DIMENSIONS	VEHICLE MOVEMENTS
CRANE PAD	STONE (TYPE 1 MOT)	67.5 TONNES DELIVERED BY 20 TONNE LORRIES	6.2M L x 2.5M W x 3.4M H	4
FOUNDATIONS	CONCRETE	95M <sup>3</sup> CONCRETE DELIVERED BY 6M <sup>3</sup> WAGONS	8.2M L x 3.0M W x 3.8M H	32
	REBAR	12 TONNES REBAR DELIVERED BY FLATBED LORRY	17.5M L x 2.5M W x 2.5M H	2
EXCAVATION	EXCAVATOR	DELIVERY ON LOW LOADER	17.5M L x 2.5M W x 3.5M H	2
		DUMP TRUCK	7.5M L x 2.5M W x 2.9M H	2
WORK AND PLANT FOR FOUNDATIONS	TRANSPORTING WORKMEN TO/FROM SITE	TRANSIT VANS	STANDARD	18
	MOBILE WELFARE UNIT	FLATBED	17.5M L x 3.0M W x 4.0M H	2
	ANCILLARY PLANT/MATERIALS	4 x 20 TONNE FLATBEDS	17.5M L x 2.5M W x 3.0M H	4
	STORAGE CONTAINER	FLATBED	17.5M L x 2.5M W x 4.0M H	2
ELECTRICAL WORKS	METER HOUSES/ TRANSFORMERS	20 TONNE LORRY	6.2M L x 2.5M W x 3.4M H	2

	ELECTRICAL CABLING	20 TONNE LORRY	6.2M L x 2.5M W x 3.4M H	2
	EXCAVATOR FOR CABLE TRENCH	FLATBED	17.5M L x 2.5M W x 3.5M H	2
TURBINE ERECTION	100 TONNE CRANE	FLATBED	20M L x 2.6M W x 4.5M H	2
	TOWER SECTION IN CONTAINER	ARTICULATED LORRY	17.5M L x 2.5M W x 4M H (LOADED WEIGHT 19.5 TONNES)	2
	NACELLE, HUB AND 3 BLADES IN CONTAINER	ARTICULATED LORRY	17.5M L x 2.5M W x 4.0M H (LOADED WEIGHT 12.5 TONNES)	2

## 12.4 Decommissioning

The decommissioning of the turbine at the end of its life will follow a reversed construction process. Prior to decommissioning, a further traffic assessment will be carried out and traffic management procedures agreed with the appropriate authorities. The levels of traffic associated with decommissioning are however likely to be lower than those required during construction.

As the disassembled turbine parts can mostly be recycled, they will either be taken to a suitable recycling plant, or another option is for the turbine to be refurbished and sold on the second hand market. At this time the foundation of the turbine will be removed and the area reinstated. The cables, which will be laid inside ducting, can be easily pulled out the ground leaving only the ducting in-situ. Once again, the cabling can be recycled at a suitable recycling plant.

## 12.5 Policy Analysis

SCOTTISH BORDERS COUNCIL (2013) 'PROPOSED LOCAL DEVELOPMENT PLAN': POLICY ED9 – RENEWABLE ENERGY DEVELOPMENT

*"Proposals for all wind turbine proposals should be judged against the following considerations and will only be approved where the overall impact is judged acceptable by the Council: ... Traffic generation, including access during construction"*

As only a single, medium-sized turbine is being proposed at Clackmae, the traffic generated is fairly limited as referenced above.

Please note: This policy is similar to Policy D4 'Renewable Energy Development' of the Scottish Borders (2011) 'Consolidated Local Plan.'



## 13. GENERAL SAFETY

### 13.1 Introduction

A number of health and safety considerations have been taken into account during the design and development of this proposal such as:

- ◆ Health and safety during construction;
- ◆ Public safety and access;
- ◆ General turbine safety; and
- ◆ Extreme weather.

Each of these topics will be explored below.

### 13.2 Health and Safety during Construction

Construction projects have a potential to create hazards for the general public and contractors. For this proposal, the greatest hazards will occur during the construction, repair works and decommissioning of the turbine; however the risks will be minimised by ensuring work complies with the regulations listed in Table 13.1.

**TABLE 13.1:** RELEVANT POLICIES AND GUIDANCE

LEGISLATION / GUIDANCE	RELEVANT SOURCES OF INFORMATION
UK LEGISLATION	HEALTH AND SAFETY AT WORK ACT 1974; THE MANAGEMENT OF HEALTH AND SAFETY AT WORK REGULATIONS 1999; WORK AT HEIGHT REGULATIONS 2005; LIFTING OPERATIONS & LIFTING EQUIPMENT REGULATIONS 1998; CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH REGULATIONS 1999; AND PROVISION AND USE OF WORK EQUIPMENT REGULATIONS 1998.
GUIDANCE	SEPA PUBLICATIONS RELATING TO CONSTRUCTION <sup>74</sup> RENEWABLEUK (2010A) 'HEALTH & SAFETY IN THE WIND INDUSTRY SECTOR.'

RenewableUK has also produced the Wind Turbine Safety Rules (WTSR) for the purpose of formalising a safe system of work for operational wind turbines. When implemented correctly the WTSR will:

- ◆ Represent industry good practice for safeguarding employees from the inherent dangers that exist from installed electrical and mechanical equipment in wind turbines;

<sup>74</sup> Links to many SEPA guidance publications found: [http://www.sepa.org.uk/customer\\_information/construction.aspx](http://www.sepa.org.uk/customer_information/construction.aspx)

- ◆ Assist in the development and application of safe systems of work in a consistent manner; and
- ◆ Provide a robust approach to demonstrating legal compliance with relevant health and safety regulations<sup>75</sup>

If planning is permitted, construction of the proposed turbine will be planned to be completed within normal working hours, as specified Table 13.2; with noise levels limited where possible.

All works will be done by suitably trained and competent staff, to established methodologies which have been risk assessed in advance. During the construction period the site supervisor will ensure that safety is paramount. Public safety and access during construction is detailed in the following sub-chapter.

### 13.3 Public Health, Safety and Access

During the construction and decommissioning phase of the development there will be no access to the public onto the development site. Furthermore, appropriate warning signs will be in place to prevent people entering restricted areas.

Table 13.2 refers to further mitigation measures imposed in order to reduce the impacts of the proposal on the public and ensure their health and safety.

**TABLE 13.2: MITIGATION MEASURES RELATING TO PUBLIC HEALTH AND SAFETY**

CONCERN	MEASURES
NOISE EMITTED DURING CONSTRUCTION	WORKING TIMES WILL FALL WITHIN THE NORMAL WORKING HOURS: MON - FRI: 8AM - 6PM SAT: 8AM - 1PM
ROAD SAFETY	THE CONSTRUCTION OF THE PROPOSED TURBINE WILL RESULT IN A SMALL TEMPORARY INCREASE IN TRAFFIC LEVELS ON THE PUBLIC ROADS USED FOR THE DELIVERY ROUTE; HOWEVER NOT TO LEVELS WHICH WOULD BE TO THE DETRIMENT OF PUBLIC SAFETY.
AIR QUALITY	<ul style="list-style-type: none"> <li>◆ THE CONTRACTOR WILL ENSURE THAT THE NUMBERS OF VEHICLES USED FOR THE CONSTRUCTION OF THIS DEVELOPMENT ARE KEPT TO A MINIMUM;</li> <li>◆ TO ENSURE THAT THE GENERATION OF DUST IS MINIMISED, THE CONTRACTOR WILL IMPLEMENT A DUST CONTROL PROGRAMME TO MAINTAIN A SAFE WORKING ENVIRONMENT, MINIMISING NUISANCE FOR THE SURROUNDING AREA, AND REDUCING IMPACT TO THE NATURAL VEGETATION NEAR THE SITE.</li> </ul>

<sup>75</sup> RenewableUK <http://www.renewableuk.com/en/our-work/health-and-safety/wind-turbine-safety-rules.cfm>

### 13.4 General Turbine Safety

Modern wind turbines are designed to operate to high standards of safety and reliability, and have an excellent safety record. The proposed NPS 100/24 turbine has a certification of safe operation (CE compliant: CEI 0-21).

Furthermore, the NPS 100/24 includes a fully automatic control system that safely operates the turbine in all conditions. The communication interface for the controller is housed in the base of the tower. This system monitors the turbine, ensuring it is working efficiently and safely, with the ability to detect any problems which have arisen.

Each NPS also allows internet communication with supervisory control and data acquisition using Northern Power's SmartView® SCADA system. Any problems which cannot be resolved by the automatic control system are referred to the operator via the computer's modem link and addressed as soon as possible.

Regular maintenance will be required for the turbine to ensure it continues to be a safe feature.

### 13.5 Extreme Weather

#### 13.5.1 Ice Throw

Ice can build up on the turbine blades, nacelle and towers during cold weather conditions. Wind turbines can continue to operate with a very thin accumulation of snow or ice, but will shut down automatically as soon as there is sufficient build up to cause aerodynamic or physical imbalance of the rotor assembly. Potential light icing conditions affecting turbines can be expected over two to seven days per year in Scotland.<sup>76</sup> If these conditions occur it is possible to experience the risk of ice throw. Monitoring systems and protocols are in place to ensure the turbines are stationary during icy conditions and are restarted in a controlled manner to ensure safety. There were no recorded incidences of ice throw injuries at any wind turbine site in the UK in recent winters.

The NPS will automatically safely stop operating if weather conditions are non-standard. Following extended periods of low temperatures, a time allowance for warm-up will also occur. As the NPS turbines were originally developed in Antarctica and the company has tested their technology in harsh conditions in partnership with NASA, the manufacturer has operational experience in icy conditions.

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<sup>76</sup> Wind Energy Production in Cold Climate: <http://cordis.europa.eu/documents/documentlibrary/47698271EN6.pdf>

### ***13.5.2 Lightning Strike***

Wind turbines can be inclined to lightning strikes due to their height, with blades being most vulnerable. Modern wind turbine blades are now protected with an inbuilt lightning protection system (LPS) which means that if struck by lightning, the turbine will automatically shut down.<sup>77</sup> The NPS 100/24 turbine model has lightning receptors in its blades, a nacelle lightning rod and electrical surge protection.

### ***13.5.3 Extreme Wind***

Extreme wind speeds may occur due to severe weather conditions such as storms. Such events can lead to damage or failure of wind turbine components. However, modern turbines are programmed to switch off during high wind speeds in order to prevent damage to the development. The NPS 100/24 generates power at wind speeds between 3m/s (6 miles per hour; mph) and 25m/s (56mph). It can withstand extreme wind speeds of up to 54m/s (120mph). To compare, on average January to March are the windiest months in this area of Scotland, with a mean wind speed between 1981 and 2010 of 11.5mph.<sup>78</sup>

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<sup>77</sup> Supergen Wind:

[http://www.supergen-wind.org.uk/docs/presentations/2010-09-24\\_8\\_1\\_Peesapati\\_Lightning%20Protection%20of%20WT.pdf](http://www.supergen-wind.org.uk/docs/presentations/2010-09-24_8_1_Peesapati_Lightning%20Protection%20of%20WT.pdf)

<sup>78</sup> Average wind speeds are calculated using the Edinburgh/Gogarbank climate station, due to the lack of available wind data from the Galashiels climate station. <http://www.metoffice.gov.uk/public/weather/climate/gcww5vmsn>

## **14. APPENDICES**

<b>Appendix 2.1</b>	<b>Site Layout</b>
<b>Appendix 2.2</b>	<b>Site Constraints</b>
<b>Appendix 2.3</b>	<b>Turbine Elevation</b>
<b>Appendix 4.1</b>	<b>ZTV to 5km</b>
<b>Appendix 4.2</b>	<b>ZTV to 15km</b>
<b>Appendix 4.3</b>	<b>ZTV to 5km (Including Screening from Woodland) and Viewpoints 1 to 4</b>
<b>Appendix 4.4</b>	<b>ZTV to 15km (Including Screening from Woodland) and Viewpoints 5 to 6</b>
<b>Appendix 4.5</b>	<b>Viewpoint 1 - From local road near Clackmae Farm Cottages</b>
<b>Appendix 4.6</b>	<b>Viewpoint 2 - From Mill Road to the west of Earlston</b>
<b>Appendix 4.7</b>	<b>Viewpoint 3 - From the Southern Upland Way</b>
<b>Appendix 4.8</b>	<b>Viewpoint 4 - From the summit of Black Hill</b>
<b>Appendix 4.9</b>	<b>Viewpoint 5 - From the trig point at Scott's View</b>
<b>Appendix 4.10</b>	<b>Viewpoint 6 - From the Southern Upland Way near Lauder</b>
<b>Appendix 4.11</b>	<b>Proposed and Approved Wind Energy Developments to 16km</b>
<b>Appendix 4.12</b>	<b>Cumulative ZTV where the Proposal is Visible to 8km</b>
<b>Appendix 4.13</b>	<b>Cumulative ZTV to 8km</b>
<b>Appendix 4.14</b>	<b>Wireframe Diagram from Core Path 139</b>
<b>Appendix 5.1</b>	<b>Historic Environment</b>
<b>Appendix 7.1</b>	<b>Arcus (2013) Northern Power Systems 100-24 Noise Information</b>
<b>Appendix 7.2</b>	<b>Noise Propagation Map</b>
<b>Appendix 8.1</b>	<b>Shadow Flicker</b>
<b>Appendix 9.1</b>	<b>Designated Environmental Sites within 20km</b>
<b>Appendix 12.1</b>	<b>Detailed Site Drawing</b>
<b>Appendix 12.2</b>	<b>Meter House</b>



Carlos Clarke,  
Development Management,  
Planning and Regulatory Services,  
Scottish Borders Council Headquarters,  
Newton St. Boswells,  
Melrose, TD6 0SA

16/04/2015

Reference: 15/00179/FUL

Dear Carlos Clarke,

I write in response to the queries you emailed to me on 02/04/2015 in regards to the planning application for a single wind turbine at Clackmae. I will address each query in turn below.

#### 1. Visual Impact on Earlston

Following the examination of Viewpoint 2, concerns were raised regarding the proposed turbine's impact on the settlement of Earlston. Viewpoint 2 is a visualisation of the proposal from the west of Earlston (Mill Road). It was selected as this western edge of the village has a clear view of the proposal to the northwest, in contrast to the remainder of the village where views are screened by intervening buildings and vegetation. It therefore represents a worst case visual impact from the settlement.

There are two key aspects to the Council's concerns in relation to Earlston:

***(i) A breach of skyline from the area surrounding Viewpoint 2 which has a number of key receptors***

As identified within Table 4.11 of the Environmental Report, the receptors in this area are residents and recreational users of the sports field. The sequential cumulative impact on the A68 which runs through the west of Earlston close to this location was also considered within the report (page 32).

The turbine will be visible from some of the properties in this area, including primary views; however through the site visit we also found that views from a number of others will be screened by vegetation (for example, bushes within the garden of the property) and/or other buildings. In regards to the receptors involved in outdoor recreation at the sports field close to Viewpoint 2, they are considered less sensitive to change as their activities do not depend on appreciation of the

landscape.<sup>1</sup> This is also the case for travellers on the A68, who will only experience occasional oblique views towards the development as described in the Environmental Report.

Viewpoint 2 illustrates that the upper section of the turbine will be visible above the treeline on a ridge 1.7km northwest. The ridge forms a backdrop to the views in this direction from Earlston, yet as shown there are a number of elements within this view, both in the foreground and background, which create a mixture of foci. Whilst the turbine will be visible from this section of Earlston, it does not overwhelm the skyline and simply adds another feature to the view.

It is therefore not the case that the proposed wind turbine at Clackmae will create a significant adverse effect that will lead to a notable degree of harm on even the most sensitive receptors in this area (residents with primary views). The outlook from some properties will be altered, however due to the distance between the proposal and Earlston, the turbine will not be an overbearing feature on the skyline. It must also be noted that no public objection has yet been received in regards to this planning application.

**(ii) The extent to which the breach of skyline could be visible from other areas within the ZTV**

Firstly, a ZTV indicates theoretical visibility only; localised screening is not taken into account and it represents a worst case scenario. Although one of the two ZTVs attached to the Environmental Report included the screening effects of woodland, this woodland was only that classified as semi-natural or Ancient Woodland by the Forestry Commission and was assumed to have a modest height of 10m. Neither ZTV accounted for vegetation or buildings within Earlston. It is not good practice to assume that all areas within a ZTV will have the same visual impact as Viewpoint 2, which is the impact on the western edge of Earlston closest to the proposal.

Secondly, it was detailed within the Environmental Report that following pre-application discussions with the Planning Service at Scottish Borders Council, other areas of Earlston were investigated. This primarily focussed on the eastern section of the village, where there were theoretical views from the area around High Street of the turbine which would also encompass the distinctive church spires. As stated in the report, it was not possible for us to find a location where this visibility was possible, which led us to consider other areas of the settlement where the same conclusions were drawn. This was primarily due to localised screening (buildings and vegetation).

As best practice dictates that visualisations which show no actual visibility of the proposal should not normally be included in an application,<sup>2</sup> we only submitted a visualisation from Viewpoint 2.

It is noted within your comments emailed on 02.04.2015 that *“your environmental report suggests limited visibility from Earlston and beyond. However, this breach of skyline is a significant concern.”* Our report indeed presented the findings of our site survey and desk-based research which found that the majority of Earlston, including the distinctive skyline of the church spires, would not be impacted by the proposal. Nevertheless, if this concern remains significant, we will provide further visual assessment from any viewpoint selected by the Planning Service.

<sup>1</sup> Paragraph 6.34, page 114 of the Landscape Institute and Institute of Environmental Management & Assessment (2013) *‘Guidelines for Landscape and Visual Impact Assessment: Third edition’* (GLVIA3)

<sup>2</sup> Scottish Natural Heritage (SNH; December 2014) *‘Visual Representation of Wind Farms.’*



Due to the concerns of the Planning Service, it was suggested in your email that the proposed turbine be relocated or reduced in size.

In regards to the former, the Environmental Report includes a constraints map (Appendix 2.2) which clearly shows the restrictions on the site due to woodland, water bodies, noise sensitive receptors and the Southern Upland Way. The only option for relocation further from Earlston would be to move the turbine closer to the Southern Upland Way. This is a less appropriate option, as the receptors on this route are more sensitive to modern elements such as wind turbines than those living within a settlement such as Earlston. The SNH report '*Visual Representation of Wind Farms*' states:

*"It is inappropriate to make design modifications to change the visual effects of the proposed wind farm from a single viewpoint because this may have negative 'knock-on' effects from other viewpoints. A more holistic approach considers the wind farm from a range of viewpoints in relation to the design objectives."*

Relocation based purely on the visual impact of Viewpoint 2 is therefore inappropriate for this proposal, which currently has minimal impact on the Southern Upland Way.

As for reducing the turbine in size, this may be possible, yet it is not believed necessary as the impact on Earlston will not be significant. As well as siting the proposal close to the applicant's dairy shed, the scale of the turbine has been selected carefully so that it meets the applicant's energy requirements. The running of the farm, including milking operations, is an energy-intensive process and a reduction in turbine size will reduce the amount of renewable electricity produced at the site. It is therefore more prudent to install a turbine at Clackmae which balances the energy needs of the farm with the overall impact of the development.

Furthermore, the robotic milkers used in Clackmae are very sensitive to power fluctuations, which are more likely to occur with smaller turbines operating in the more turbulent air found at lower levels. The applicant has done much research into this issue through speaking to other farmers who power their robotic milkers with wind energy and this advice led to the careful selection of this 100kW wind turbine with a blade tip height of 34.4m.

## **2. Questions Regarding Noise Assessment**

Due to its length, our response to the seven questions raised by the Amenity and Pollution Officer, Mary Rose Fitzgerald, is provided separately to this letter.

## **3. Meter House Relocation / Finish**

There was a query as to whether the meter house can be moved from the area immediately beside the turbine to a steading building (approximately 180m northwest). This is possible and we can confirm that there will be no meter house at the base of the turbine.

Although the meter house can be moved and therefore the question on the finish of the cabinet is obsolete, just to note we can finish these in any way specified by the Council in the planning conditions.

Please do not hesitate to contact me if you have any further questions or concerns. This includes requesting further analysis from certain viewpoints or any further visual analysis.

Yours Sincerely,

Siobhan Wolverson

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Mary Rose Fitzgerald,  
Development Management,  
Planning and Regulatory Services,  
Scottish Borders Council Headquarters,  
Newton St. Boswells,  
Melrose, TD6 0SA

16/04/2015

Reference: 15/00179/FUL

Dear Mary Rose Fitzgerald,

Please find a response below to your queries relating to the acoustic assessment for the proposed wind turbine at Clackmae, Earlston.

Some of this information can be found in the two Appendices to Chapter 7: Noise Assessment of the Environmental Report and as such these documents are referenced throughout this response:

- [Appendix 7.1](#) Arcus (2013) Northern Power Systems 100-24 Noise Information
- [Appendix 7.2](#) Noise Propagation Map

**1. Turbine coordinates**

These are provided within Appendix 7.2 and are: E355703; N639152


**2. Receptor coordinates**

RECEPTOR	ADDRESS	COORDINATES (EASTINGS, NORTHINGS)
H1	3-4 CLACKMAE FARM COTTAGES	356061, 639247
H2	1-2 CLACKMAE FARM COTTAGES	356069, 639307
H3	GLENBURNIE FARMHOUSE	356051, 638802
H4	CLACKMAE FARMHOUSE (FI)	356187, 639377
H5	WEST LODGE, CAROLSIDE	355998, 639714
H6	NETHER CAIRNIE	355969, 639764
H7	CAIRNEY MOUNT	354977, 639704

### 3. Turbine sound power levels utilised in the noise predictions

The sound power levels used have been based on the ARCUS report (Appendix 7.1); extract below:

Noise Information  
NPS 100-24 Wind Turbine



**1 INTRODUCTION**

This document has been prepared by Arcus Consultancy Services Ltd (Arcus) on behalf of Northern Power Systems (NPS). It presents a summary of current (December 2013) noise emission data for the Northwind NPS 100-24 wind turbine with a hub height of 36.8 m, and an interpretation of this information for the purposes of supporting UK planning applications.

**2 NOISE MEASUREMENT TEST RESULTS**

Measurements of the noise emissions of the NPS 100-24 wind turbine located at Ft. Yates, North Dakota were carried out in December 2013 by The Cadmus Group Ltd (Cadmus) in accordance with IEC 61400-11. The results of these measurements are summarised in Tables 1 and 2.

**Table 1: Summary of Noise Measurement Test Results, NPS 100-24, 36.8 m hub height**

Standardised 10 m Integer Wind Speed, ms <sup>-1</sup>	6	7	8	9	10
Apparent Sound Power Level, L <sub>WA</sub> , dB	87.9	89.4	90.3	90.9	91.3
Total Uncertainty of Apparent Sound Power Level, dB	0.6	0.6	0.6	0.6	0.5
Tonal Audibility for Tone with Highest Audibility <sup>1</sup> , ΔL <sub>dB</sub> , dB	6.0	5.4	4.1	3.0	1.1
Frequency of Tone, Hz	5024	5024	5024	5024	4976

**Table 2: Worst Case Octave Band Sound Power Spectrum for Wind Speed of 12.5 ms<sup>-1</sup>, 36.8 m hub height**

Octave Band Centre Frequency, Hz	31.5	63	125	250	500	1000	2000	4000	8000
Sound Power Level, L <sub>WA</sub> , dB	55.2	69.5	77.8	83.4	86.3	86.0	82.4	77.3	71.0

The noise propagation has been predicted based on the ISO 9613-2 algorithms with the Resoft™ WindFarm software. The octave band spectra used are shown below:

Wind speed m/s	4.00	5.00	6.00	7.00	8.00	9.00	10.00	12.00
Broadband SPL dB(A)	88.11	88.90	90.40	91.31	91.90	92.10	92.89	93.68
Tonal penalty dB(A)	0.00	4.60	4.10	3.10	2.30	0.00	1.00	0.00

Turbine octave data specified		Check total octave noise							
Hz	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
63	66.30	67.09	68.59	69.50	70.09	70.29	71.08	71.08	71.08
125	74.60	75.39	76.89	77.80	78.39	78.59	79.38	79.38	80.17
250	80.20	80.99	82.49	83.40	83.99	84.19	84.98	84.98	85.77
500	83.10	83.89	85.39	86.30	86.89	87.09	87.88	87.88	88.67
1000	82.60	83.59	85.09	86.00	86.59	86.79	87.58	87.58	88.37
2000	79.20	79.99	81.49	82.40	82.99	83.19	83.98	83.98	84.77
4000	74.10	74.89	76.39	77.30	77.89	78.09	78.88	78.88	79.67
8000	67.80	68.59	70.09	71.00	71.79	71.79	72.58	72.58	73.37

**4. How was uncertainty applied?**

As per Appendix 7.1:

With regards to uncertainty, the GPG states that 'the results of a test made in accordance with the IEC 61400-11 standard, including a reported test uncertainty  $\sigma$ ...with the addition of a margin equal to 1.645  $\sigma$  can be used.' Therefore, in accordance with the GPG, the uncertainties specified in Table 1 have been multiplied by 1.645.

**Table 3: Tonal Penalties and Effective Sound Power Levels**

Standardised 10 m Integer Wind Speed, $\text{ms}^{-1}$	6	7	8	9	10
Apparent Sound Power Level, $L_{WA}$ dB	87.9	89.4	90.3	90.9	91.3
Total Uncertainty, dB, (1.645 $\sigma$ )	1.0	1.0	1.0	1.0	0.8
Tonal Audibility <sup>7</sup> for Tone with Highest Audibility <sup>1</sup> , $\Delta L_{dB}$ dB	6.0	5.4	4.1	3.0	1.1
Applicable Tonal Penalty, dB	4.6	4.1	3.1	2.3	0
Effective Sound Power Level, $L_{WA}$ dB	93.5	94.5	94.4	94.2	92.1

**5. Where was the octave band spectrum obtained from and was it scaled**

The spectra at 10m/s wind speeds were used to assess the noise immissions at the nearest identified noise sensitive receptors. The spectra were scaled based on the worst case octave band (Table 2 shown for question 3 above). The fixed wind shear correction of 1m/s has been accredited by adding 1dB to the 10m/s value in the "tonal penalty" cell.

**6. I note that the hub height of the turbine in the Arcus report is 36.8 and the hub height for the proposed turbine is 22.6m. A correction should be carried out to account for wind shear**

The values have been corrected accordingly; i.e. from the 10m hub height to 22.6m with a fixed 1m/s wind shear correction.

**7. A table of turbine noise immissions (at noise sensitive premises) at integer wind speeds**

The predicted noise immissions at the nearest identified noise sensitive receptors are shown in the following table. The overall values have been rounded to the nearest decibel:

RECEPTOR	ADDRESS (COORDINATES)	4M/s	5M/s	6M/s	7M/s	8M/s	9M/s	10M/s	11M/s	12M/s
H1	3-4 CLACKMAE FARM COTTAGES (356061, 639247)	24	29	30	30	30	28	29	29	29
H2	1-2 CLACKMAE FARM COTTAGES (356069, 639307)	23	28	29	29	29	27	29	29	29
H3	GLENBURNIE FARMHOUSE (356051, 638802)	21	26	27	27	27	25	27	26	26
H4	CLACKMAE FARMHOUSE (FI) (356187, 639377)	20	25	26	26	26	24	26	26	26
H5	WEST LODGE, CAROLSIDE (355998, 639714)	18	24	25	25	24	22	24	24	24
H6	NETHER CAIRNIE (355969, 639764)	18	23	24	24	24	22	24	23	23
H7	CAIRNEY MOUNT (354977, 639704)	15	20	21	21	21	19	20	20	20

FI = FINANCIALLY INVOLVED PROPERTY

The summary of results shown above indicate that the predicted noise immission levels meet the ETSU-R-97 fixed simplified LA90,t 35dB criterion and therefore no further assessment or ambient noise survey is necessary to verify compliance.

Please also find attached a copy of the calculation results entitled: '*Clackmae - accompanying data for Q7 on noise assessment.*'

Please do not hesitate to contact me if you have any further questions.

Yours Sincerely,

Siobhan Wolverson

Senior Environmental and Planning Consultant

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