

CLASHINDARROCH II

WIND FARM

Scoping Report 2018

Prepared for: Vattenfall Wind Power Ltd

Technical Appendix 6.3

Technical Appendix 6.3
SLR Ref: 405.03640.00011
November 2019



CLASHINDARROCH II

Revised Scope of Environmental Impact Assessment Vattenfall

SLR Ref: **405.03640.0011**
Version No: 1
September 2018



BASIS OF REPORT

This document has been prepared by SLR Consulting Limited with reasonable skill, care and diligence, and taking account of the manpower, timescales and resources devoted to it by agreement with Vattenfall (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

SLR shall not be liable for the use of or reliance on any information, advice, recommendations and opinions in this document for any purpose by any person other than the Client. Reliance may be granted to a third party only in the event that SLR and the third party have executed a reliance agreement or collateral warranty.

Information reported herein may be based on the interpretation of public domain data collected by SLR, and/or information supplied by the Client and/or its other advisors and associates. These data have been accepted in good faith as being accurate and valid.

The copyright and intellectual property in all drawings, reports, specifications, bills of quantities, calculations and other information set out in this report remain vested in SLR unless the terms of appointment state otherwise.

This document may contain information of a specialised and/or highly technical nature and the Client is advised to seek clarification on any elements which may be unclear to it.

Information, advice, recommendations and opinions in this document should only be relied upon in the context of the whole document and any documents referenced explicitly herein and should then only be used within the context of the appointment.

CONTENTS

1.0 INTRODUCTION	1
2.0 REVISED SCOPE	2
3.0 CUMULATIVE POSITION	7

DOCUMENT REFERENCES

FIGURES

Figure 1 Revised Site Layout - 042

Figure 2 Blade tip ZTV of the L042 layout with Viewpoints

Figure 3 Comparative blade tip ZTV of L042 and the Clashindarroch layout

Figure 4 Comparative blade tip ZTV of L042 and the previously scoped Clashindarroch II layout

Figure 5 Blade tip ZTV of L042 with Viewpoints and all operational wind farms

Figure 6 Cumulative sites

Figure 7 Noise Sensitive Receptors and Cumulative Noise Contour Plot

APPENDICES

Appendix 01: Scoping Report April 2017

Appendix 02: Scoping Opinion August 2017

Appendix 03: Gate Check Report July 2017

1.0 Introduction

Vattenfall Wind Power Ltd (Vattenfall) propose to submit an application for a wind farm in Aberdeenshire adjacent to the existing Clashindarroch Wind Farm, on land owned by Forestry Commission Scotland (FCS). This would be known as the Clashindarroch II Wind Farm (the proposed development). The proposed development would be located approximately (approx.) 6km to the south-west of Huntly. For the avoidance of doubt, this application for the proposed development under section 36 (s.36) of the Electricity Act 1989 (the 1989 Act) as it would exceed 50 MW.

This document has been prepared by SLR Consulting in response to a request from Local Energy and Consents Unit of the Scottish Government for an updated scope for the proposed Clashindarroch II Wind Farm.

Scoping for the proposed development was originally undertaken during the first part of 2017 and a Scoping Opinion was issued in July 2017. The scoping layout was for 16 turbines with a tip height of up to 149.9m. There was also additional consultation and a gate check process was undertaken in August 2017. A copy of the Scoping Report, Scoping Opinion and Gate Check Report are included as Appendices 1, 2 and 3 of this document.

Since the submission of the Gate Check Report Vattenfall have taken the opportunity to review the project and consider the economic viability of the project and this resulted in the consideration of a number of revised turbine options. This has resulted in a layout of 14 turbines with a tip height of 180m. This layout, referred to as layout 042 is presented as Figure 1.

This document sets out the revisions to scoping which have come about as a result in the revised tip height of the proposed turbines. It is anticipated that the increase in turbine height will mean that the following matters require to be considered and a revised scope agreed:

- Visual impact of aviation lighting;
- Impact of aviation lighting on ecology and ornithology;
- Review of view points;
- Review of Residential Visual Amenity Study (RVAS);
- Review of the impacts on Tap O Noth from a cultural heritage perspective; and
- Swept path for abnormal loads.

This document, in chapter 2, sets out the scopes on which agreement is sought.

2.0 Revised Scope

Table 2-1 sets out the scopes on which agreement is sought with consultees in respect of the revised turbine heights and revised layout being proposed for Clashindarroch II. In the case of all subjects the assessments will be undertaken in accordance with the scope which was presented as part of the Scoping report unless amended by the Scoping Opinion and as set out in the Gate Check report. Table 2-3 sets out those matters which will be addressed as set out in the Scoping Report and Gate Check Report.

Table 2-1
Matters on which Scope is to be agreed

Matter	Proposed Scope
Aviation Lighting	<p>Landscape and Visual Amenity</p> <p>An assessment of the effects of aviation lighting will be carried out as part of the LVIA. This will be based on preparation of night time visualisations for four locations. It is suggested that these should be: Viewpoint 1, Minor Road near Tillathrowie; Viewpoint 3 Haugh of Glass; Viewpoint 10, A96 between Huntly and Keith; and Viewpoint 12 Correen Hills, Old Military Road. The existing night time context at these viewpoints will be described, with the related sensitivity identified and the magnitude of change arising from the aviation lighting of the proposed development will be assessed for these locations. The predicted effects of aviation lighting on landscape character and visual amenity at these viewpoints will be drawn on to provide general comment on the likely effects in the wider study area.</p>
	<p>Ecology and ornithology</p> <p>The requirement for aviation lighting is considered very unlikely, on its own and given the type of lighting proposed, to result in significant impacts on sensitive ecological or ornithological receptors.</p> <p>There is the potential for such lighting to attract songbirds, in particular, in low cloud or foggy conditions during nocturnal migration, theoretically increasing the risk of collision with the turbine blades, tower and nacelle. However, the proposed wind farm is not located in a region known to be used by large concentrations of migrant birds.</p> <p>There is also the potential for the risk of bat mortality to be increased by the presence of lighting, as it may concentrate insect prey close to the turbine blades. However, from the studies that have considered this issue, there is no evidence to date for red aviation lights on turbines causing an increased risk of collision or barotrauma to bats (e.g. Johnson et al. 2003, Arnett et al. 2007, Kunz et al. 2007, Bennett & Hale 2014).</p> <p>It is therefore intended for the effects of the aviation lighting on ecology and ornithology to be scoped out of the assessment following a review of the detailed lighting proposals. This review will include consideration of the number/location of the lights, their brightness and colour (i.e. from spectral power distribution charts),</p>

Matter	Proposed Scope
	whether they are flashing or continuous, their beam angle and shielding.
Increased turbine height	<p>Traffic and Transportation</p> <p>Larger blades will mean that the swept path will require to be undertaken again. The scope will be as per the agreed scope.</p>
	<p>LVIA VPs</p> <p>The previously agreed viewpoints, as included in Appendix 2, have been reviewed on the blade tip ZTV for turbines at 180m. It is considered that these viewpoints remain representative of the main landscape and visual receptors within the 45km radius study area and predicted effects at these locations should be assessed to inform the LVIA, including the cumulative assessment. For reference purposes, a blade tip ZTV of the proposed 180m layout with the viewpoint locations is provided in Figure 2, as well as a comparative blade tip ZTV of the previously scoped Clashindarroch II with the currently proposed development presented in Figure 4. Additionally a blade tip ZTV for the proposed 180m layout showing the location of operational wind farms in the study area is provided in Figure 5.</p>
	<p>RVAS</p> <p>The RVAs will include all residential properties with predicted visibility of the proposed development within 3km with the addition of a review of visual impacts on properties up to a 5km radius, as requested by Aberdeenshire Council in their response to the 2017 Scoping Report.</p>
	<p>Noise</p> <p>Based on the results of an initial noise model, for a 14-turbine layout and candidate turbine model, those residential properties where turbine noise levels may reach 35dB LA90 have been identified (as per the ETSU-R-97 methodology). This has therefore identified where background noise monitoring should be undertaken, and as indicated on Figure 7, this includes the properties at Finglenny and at Corrylair.</p> <p>For those properties at Boganclough, ETSU-derived noise limits are already in place in relation to the existing Clashindarroch wind farm. As such, these limits will be referred to within the noise impact assessment for the proposed development and with respect to the assessment of cumulative noise.</p> <p>It is intended to consult with the Environmental Health department within Aberdeenshire Council, with the aim of discussing and agreeing the methodology for the background noise survey. In this respect, the designated Environmental Health Officer will be invited to the installation of the sound level meters, with the aim of agreeing the exact position at each representative survey location.</p> <p>The measurement of background noise levels at the agreed survey locations will be undertaken for a minimum period of three weeks to cover a range of operational wind speeds and directions, with data excluded for periods of rainfall. An interim analysis of the on-site wind speeds will be undertaken to determine if an extension to the three-week survey period is required.</p> <p>The equipment for background noise monitoring will consist of integrated sound level meters and enhanced outdoor protection kits (which maintain the Class 1 microphone specification when in place). The sound level meters will be calibrated</p>

Matter	Proposed Scope
	<p>on site at the beginning and end of each monitoring period, and following battery change(s) when required.</p> <p>The on-site wind speeds and directions will be measured for the duration of the background noise survey, using an independently validated vertical profiling LiDAR, capable of measuring wind speed and direction at multiple heights between 11m and 200m.</p> <p>Following the completion of the background noise monitoring, detailed analysis of the measured noise and on-site wind speeds will be undertaken.</p> <p>Background noise regression analysis will be undertaken for the Quiet Daytime and Night-time periods. Daytime and night-time noise level criteria, as defined in ETSU-R-97, will be derived from the measured background noise levels (and on-site wind speeds) for use within the assessment of noise impact. The background noise analysis will be provided a series of tables and graphs for inclusion in the assessment, together with the relevant polynomial curve equations.</p>
	<p>Archaeology and Cultural Heritage</p> <p>In general terms, the assessment of the setting of Tap O'Noth will consider the wider landscape, and seek to identify the elements of the views from the fort that make the most significant contribution to its setting and thus its significance. Assessment of the setting and potential impacts on Tap O'Noth fort will include a photomontage of the proposed development from the Tap O Noth. This will be prepared as part of the LVIA work will be referred to in the ACH assessment. The view point photography, photomontages and wirelines will be used to assess the impact of the proposed development on the setting of Tap O Noth, and this will include the setting considered from locations beyond the fort itself. In particular View point 2, Minor road near Backside, will be used in order to assess the potential impact of views towards the asset. Potential impacts on the setting of Tap O'Noth fort as viewed from Mither Tap fort will also be considered. Given the distance between the forts (approximately 21km) and the scale of Tap O'Noth it is possible that this view line will be scoped out, but this will not be done until a wireline model of the views from Mither Tap has been generated and considered.</p> <p>A setting assessment on 'new' assets, Wheedlemont stone circle and the Craw Stane at Rhynie will be undertaken. These were previously excluded from the original assessment as being over 5km from the then proposed turbines, but as a result if the larger turbines will be included. Visibility of the proposed development from both locations will be presented on a wireframe as part of the assessment to get a proper sense of scale, and in the case of Wheedlemont because it is (or was last autumn) screened by a small block of forestry. These wirelines will incorporate the locations of other asset of this pair in order to take into account possible effects on the views between these assets.</p> <p>Both sites have been visited as part of the earlier assessment.</p> <p>Proposed designated heritage assets are tabulated in Table 2-2, together with assets suggested by Historic Environment Scotland that are outside of the current ZTV.</p>

Table 2-2
Assessment of Designated Heritage Assets

Name	Type and Category	Assessment	Notes
Wormy Hillock, henge 690m west north west of Finglenny, SM3278	Scheduled Monument	Yes	
Tap o'Noth, fort, SM63	Scheduled Monument	Yes	Photomontage and wireframes, to include assessment of viewpoints looking towards the asset through the proposed wind farm and from Mither Tap fort.
Coynachie Mill, LB9206	Listed Building, Category B	Yes	
Cnoc Cailliche fort, SM11681	Scheduled Monument	Yes	
Auchindoun Castle, castle and fort, SM90024	Scheduled Monument	No	Outside ZTV
Huntly Castle, SM90165	Scheduled Monument	No	Outside ZTV
Auchindoir, St Mary's Church, Mote Hill and Dovecot, SM90267	Scheduled Monument	No	Outside ZTV
Craw Stane, symbol stone and enclosure 575m E of Mains of Rhynie, SM69	Scheduled Monument	Yes	Include wireframe, envisage focusing on intervisibility with Wheedlemont Stone Circle
Beldorney Castle, LB9164	Listed building, Category A	No	Outside ZTV
Leith Hall, GDL258, LB9183	Inventory Designed Landscape, Listed building, Category A	No	Outside ZTV
Wheedlemont Stone Circle, SM36	Scheduled Monument	Yes	Include wireframe, envisage focusing on intervisibility with Craw Stane

Table 2-3
Matters on which Scope is not revised

Matter	Proposed Scope
Landscape	Other than the revised scopes set out in Table 2-1 in respect of turbine lighting and the revised turbine height there is no proposed change to the LVIA methodology, or the range of landscape and visual receptors to be included in the assessment.
Ecology	Other than the revised scopes set out in Table 2-1 in respect of turbine lighting there is no proposed change to the ecology methodology.
Ornithology	Other than the revised scopes set out in Table 2-1 in respect of turbine lighting there is no proposed change to the ornithology methodology.
Cultural Heritage	Other than the revised scopes set out in Table 2-1 and Table 2-2 as a result of the increased turbine height there is no proposed change to the cultural heritage/archaeology methodology.
Hydrology, Hydrogeology and Geology	There is no change proposed to the hydrology, hydrogeology and geology scope as a result of the revised tip height
Carbon Emissions	There is no change proposed to the carbon emissions scope as a result of the revised tip height. The carbon calculations will be undertaken using the online tool.
Access, Traffic and Transport	Other than the revised scope for swept path set out in Table 2-1 as a result of the increased turbine height there is no proposed change to the traffic and transportation methodology.
Noise	Other than the revised scope set out in Table 2-1 as a result of the increased turbine height there is no proposed change to the noise methodology.
Aviation	A Serco Report was undertaken in respect of the previous design evolution. As a result of the revised tip height this will not be re done.
Socio-Economics, Tourism, Recreation and Land Use	There is no change proposed to the socio economic, tourism, recreation and land use scope as a result of the revised tip height.
Other Issues	There is no change proposed to the other issues scope as a result of the revised tip height.
Schedule of Mitigation	A schedule of mitigation will be provided.

3.0 Cumulative Position

The passage of time means that the cumulative position requires to be updated.

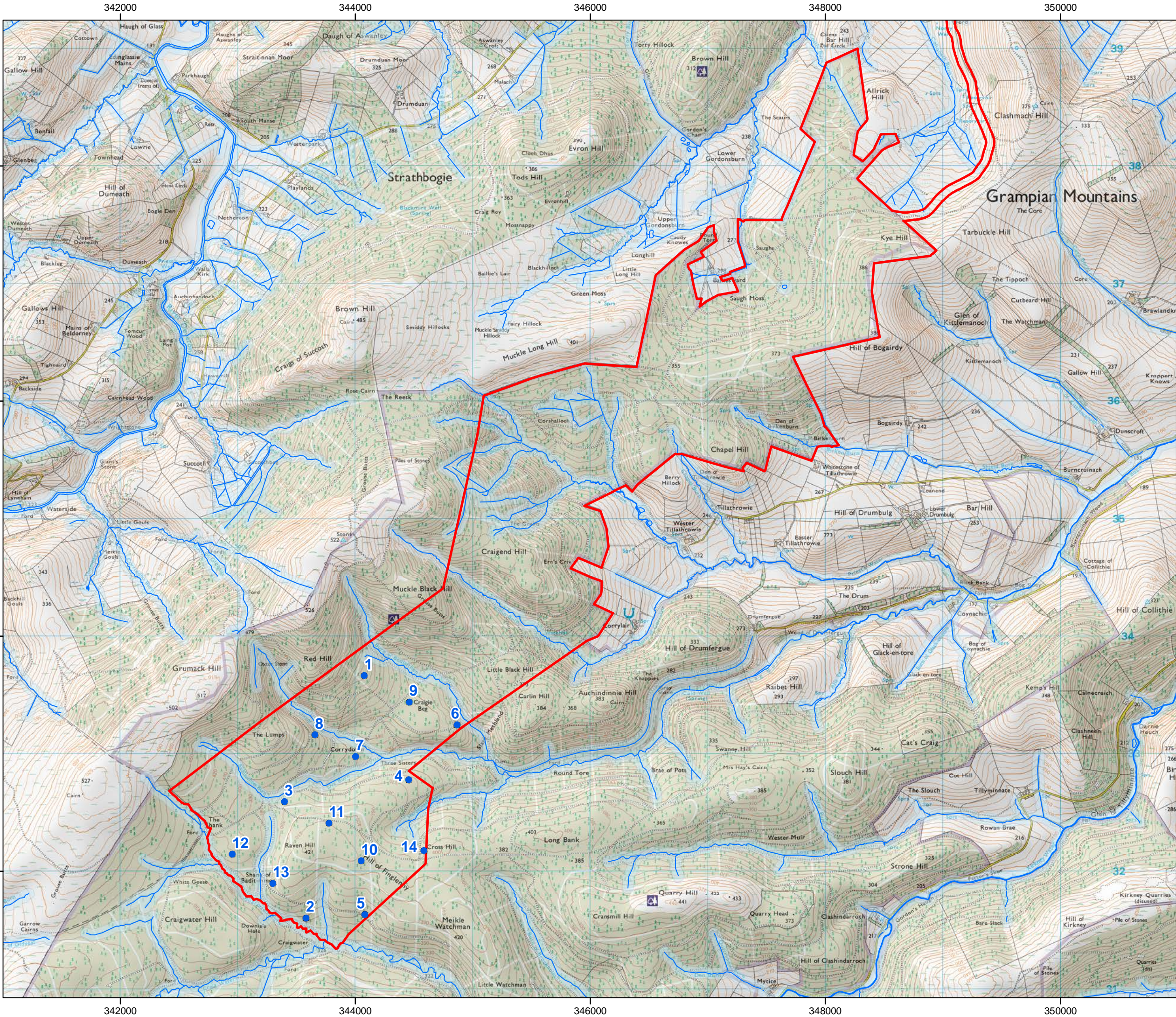
Table 3-1 sets out the position which was agreed in 2017 and the current status as SLR understands it. As part of this consultation exercise we should be grateful if the consultees can confirm of any further updates we should be aware of. The cumulative sites are shown on Figure 6.

Table 3-1
Wind Farm Development within 40km of the Proposed Development Considered in the CLVIA as Agreed in 2017 with Updates

Status	Wind Farm	No of Turbines	Height of Turbines to Blade Tip (m)	Update September 2018
Operational	Balnamoon Crossroads	1	69	No change
	Berry Burn	29	99.5	No change
	Cairnborrow	5	100	No change
	Cairnmore	3	81	No change
	Clashindarroch	18	110	No change
	Dummuie	7	78	No change
	Edintore	6	124	No change
	Followsters	1	77	No change
	Glens of Foudland	20	78	No change
	Hill of Tillymorgan	3	100	No change
	Hill of Towie 1	21	100	No change
	Kildrummy	9	93	No change
	Mains of Balquhain	1	80	No change
	Midtown of Glass	1	79	No change
	Myreton Crossroads	3	79	No change
	Pauls Hill	28	100	No change
	Roths	22	100	No change
	Roths Extension	18	110-125	No change
	Upper Wheedlemont Farm	2	81	No change
U C	Hill of Glaschyle	12	99.5	Now operational
Consented	Aultmore	13	110	No change
	Bailiesward Farm	1	79.6	No change
	Baldyquash Farm	1	86.5	No change
	Cowhill	1	79.6	No change

	Crannabog Farm	1	79	No change
	Dorenell (original)	59	126	Under construction
	Drodland	1	79	No change
	Garellhill Newmill	1	74	No change
	Greenmyres	1	84	No change
	Hill of Burns	1	79.6	No change
	Hill of Towie II	16	125	No change
	Jericho Forest	1	74	No change
	Kellas	4	110	No change
	Mains of Meadaple	1	79	No change
	Meikle Folla	1	79	No change
	Meikle Hill	6	126.5	No change
	Newton of Begshill	1	79.6	No change
	Newton of Edingight Grange	1	77	No change
	Westerton of Folla	1	79	No change
App	Dorenell (Proposed)	60	125-149.9	Withdrawn

FIGURES



- Legend**
- Site Boundary
 - Proposed Turbine Location
 - Watercourse
 - 50m Buffer from Watercourse



4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH
T: +44 (0)131 335 6830
www.slrconsulting.com

1:30,000 @ A3
© Crown Copyright 2018. All rights reserved.
Ordnance Survey Licence 0100031673.
0 0.25 0.5 1 Km



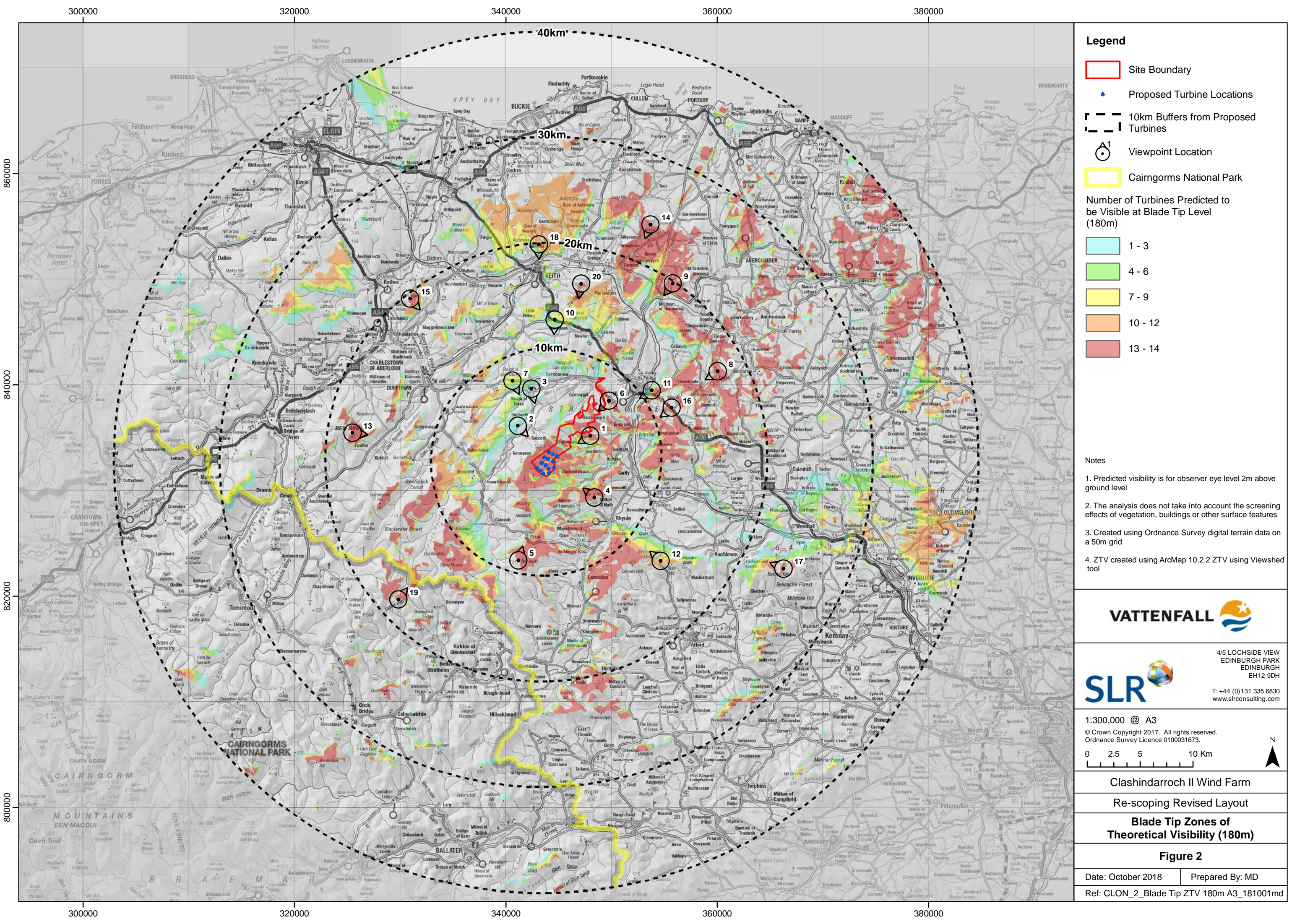
Clashindarroch II Wind Farm

Re-scoping Revised Layout

Revised Site Layout - 042

Figure 1

Date: October 2018	Prepared By: MD
Ref: CLON_1_Revised Site Layout_181001md	



Legend

- Site Boundary
- Proposed Turbine Locations
- 10km Buffers from Proposed Turbines
- Viewpoint Location
- Cairngorms National Park

Number of Turbines Predicted to be Visible at Blade Tip Level (180m)

- 1 - 3
- 4 - 6
- 7 - 9
- 10 - 12
- 13 - 14

Notes

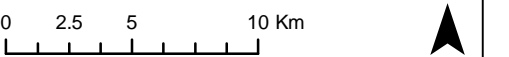
- Predicted visibility is for observer eye level 2m above ground level
- The analysis does not take into account the screening effects of vegetation, buildings or other surface features
- Created using Ordnance Survey digital terrain data on a 50m grid
- ZTV created using ArcMap 10.2.2 ZTV using Viewshed tool



4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH
T: +44 (0)131 335 6830
www.slrconsulting.com

1:300,000 @ A3

© Crown Copyright 2017. All rights reserved.
Ordnance Survey Licence 0100031673.



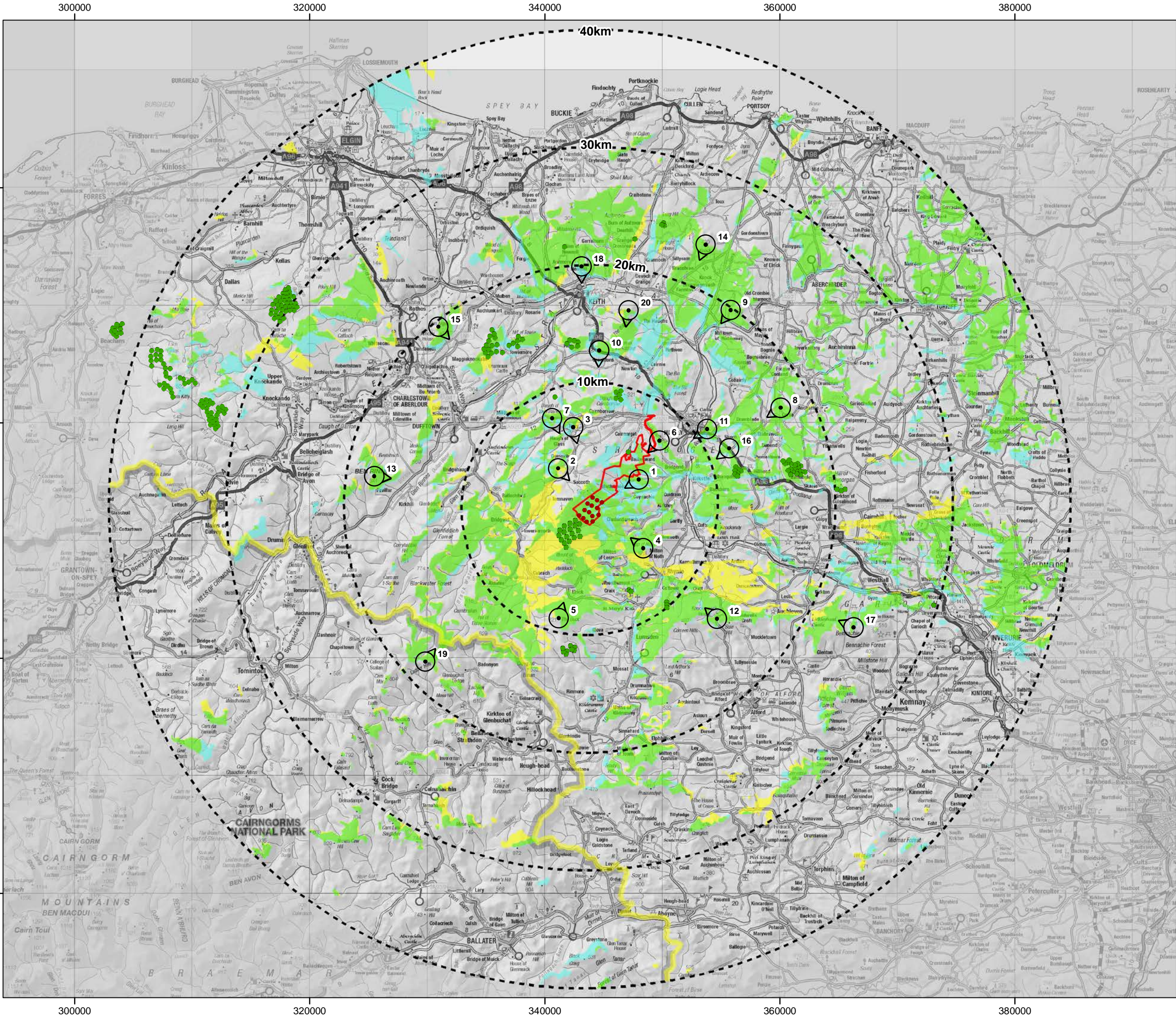
Clashindarroch II Wind Farm

Re-scoping Revised Layout

Blade Tip Zones of
Theoretical Visibility (180m)

Figure 2

Date: October 2018	Prepared By: MD
Ref: CLON_2_Blade Tip ZTV 180m A3_181001md	

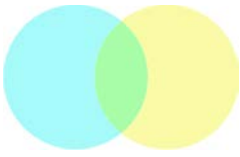


Legend

- Site Boundary
- Proposed Turbine Locations (L042)
- 10km Buffers from Proposed Turbines
- Operational Wind Farm
- Viewpoint Location
- Cairngorms National Park

Zones of Theoretical Visibility

Clashindarroch L042 Blade Tip (180m) Clashindarroch Blade Tip (110m)



Notes

- Predicted visibility is for observer eye level 2m above ground level
- The analysis does not take into account the screening effects of vegetation, buildings or other surface features
- Created using Ordnance Survey digital terrain data on a 50m grid
- ZTV created using ArcMap 10.2.2 ZTV using Viewshed tool



4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH
T: +44 (0)131 335 6830
www.slrconsulting.com

1:300,000 @ A3
© Crown Copyright 2017. All rights reserved.
Ordnance Survey Licence 0100031673.

0 2.5 5 10 Km

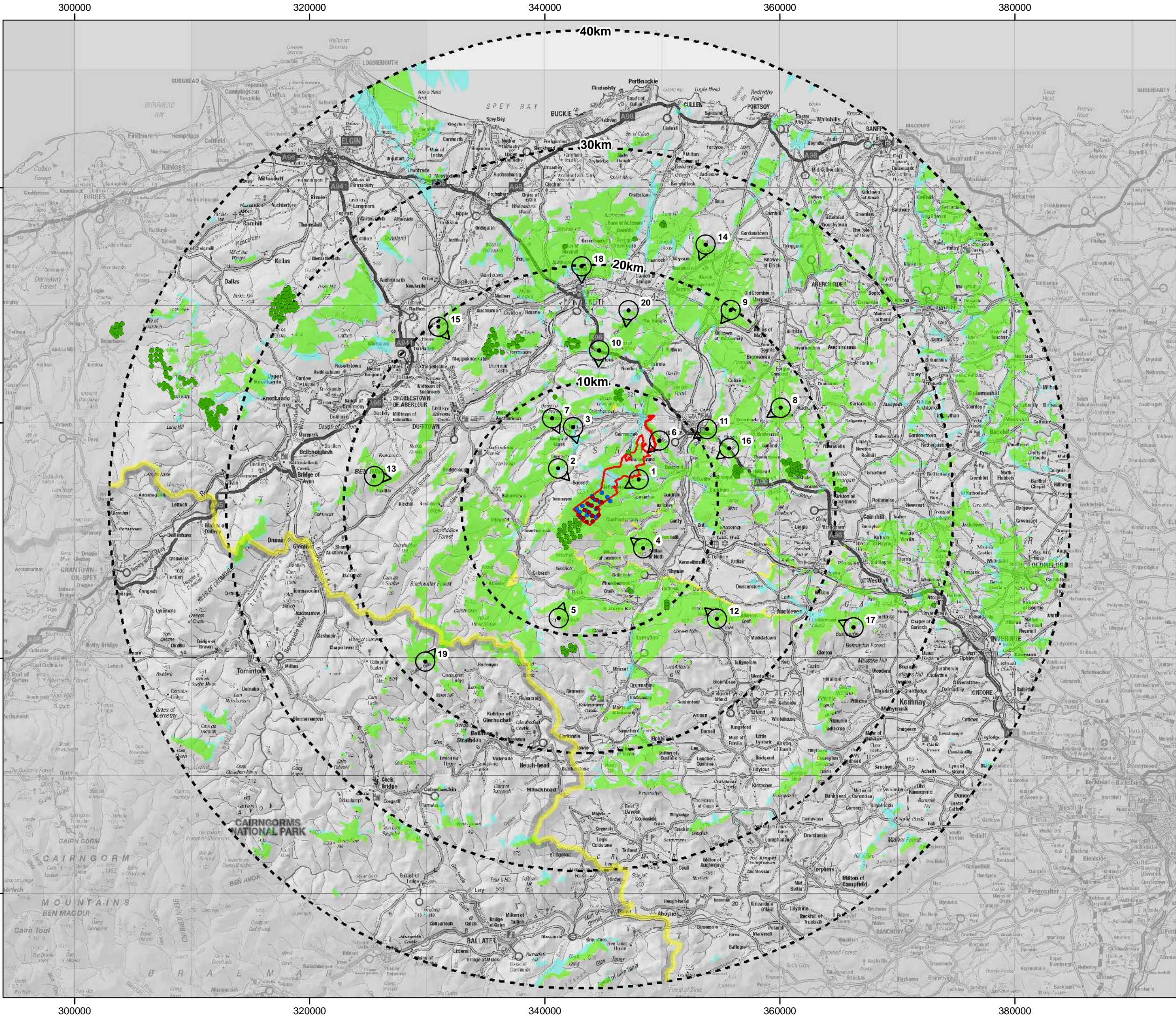
Clashindarroch II Wind Farm

Re-scoping Revised Layout

Cumulative Blade Tip Clashindarroch L042 (180m) & Clashindarroch ZTV

Figure 3

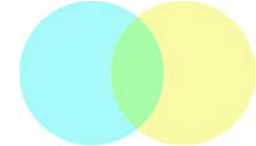
Date: October 2018 Prepared By: MD
Ref: CLON_3_Cumulative A3_180903bphb



Legend

- Site Boundary
- Proposed Turbine Locations (L017)
- Proposed Turbine Locations (L042)
- 10km Buffers from Proposed Turbines
- Operational Wind Farm
- Viewpoint Location
- Cairngorms National Park

Zones of Theoretical Visibility
Clashindarroch L017 Blade Tip (149.9m) Clashindarroch L042 Blade Tip (180m)



Notes

1. Predicted visibility is for observer eye level 2m above ground level
2. The analysis does not take into account the screening effects of vegetation, buildings or other surface features
3. Created using Ordnance Survey digital terrain data on a 50m grid
4. ZTV created using ArcMap 10.2.2 ZTV using Viewshed tool



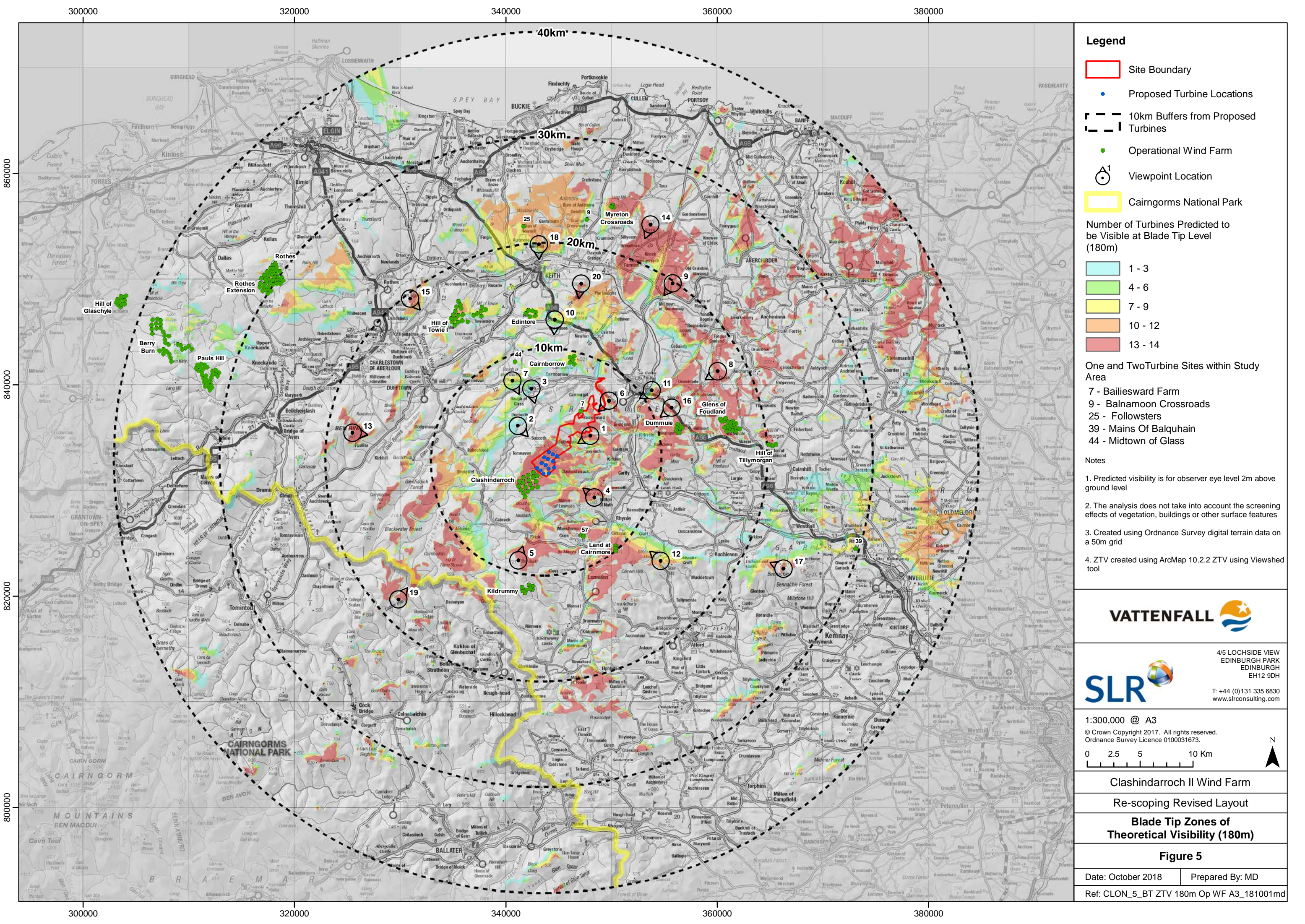
4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH
T: +44 (0)131 335 6830
www.slrconsulting.com

1:300,000 @ A3
© Crown Copyright 2017. All rights reserved.
Ordnance Survey Licence 0100031673.







Clashindarroch II Wind Farm
Re-scoping Revised Layout
Cumulative Blade Tip Clashindarroch L017 & L042 (180m) ZTV

Figure 4






Date: October 2018 Prepared By: MD
Ref: CLON_4_Cumulative Blade Tip ZTV L017 vs L042 180m A3_181001md



Legend

-  Site Boundary
-  Proposed Turbine Locations
-  10km Buffers from Proposed Turbines
-  Operational Wind Farm
-  Viewpoint Location
-  Cairngorms National Park

Number of Turbines Predicted to be Visible at Blade Tip Level (180m)

-  1 - 3
-  4 - 6
-  7 - 9
-  10 - 12
-  13 - 14

One and Two Turbine Sites within Study Area

- 7 - Bailliesward Farm
- 9 - Balnamoon Crossroads
- 25 - Followsters
- 39 - Mains Of Balquhain
- 44 - Midtown of Glass

Notes

1. Predicted visibility is for observer eye level 2m above ground level
2. The analysis does not take into account the screening effects of vegetation, buildings or other surface features
3. Created using Ordnance Survey digital terrain data on a 50m grid
4. ZTV created using ArcMap 10.2.2 ZTV using Viewshed tool



4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH
T: +44 (0)131 335 6830
www.slrconsulting.com



1:300,000 @ A3
© Crown Copyright 2017. All rights reserved.
Ordnance Survey Licence 0100031673.

0 2.5 5 10 Km

Clashindarroch II Wind Farm

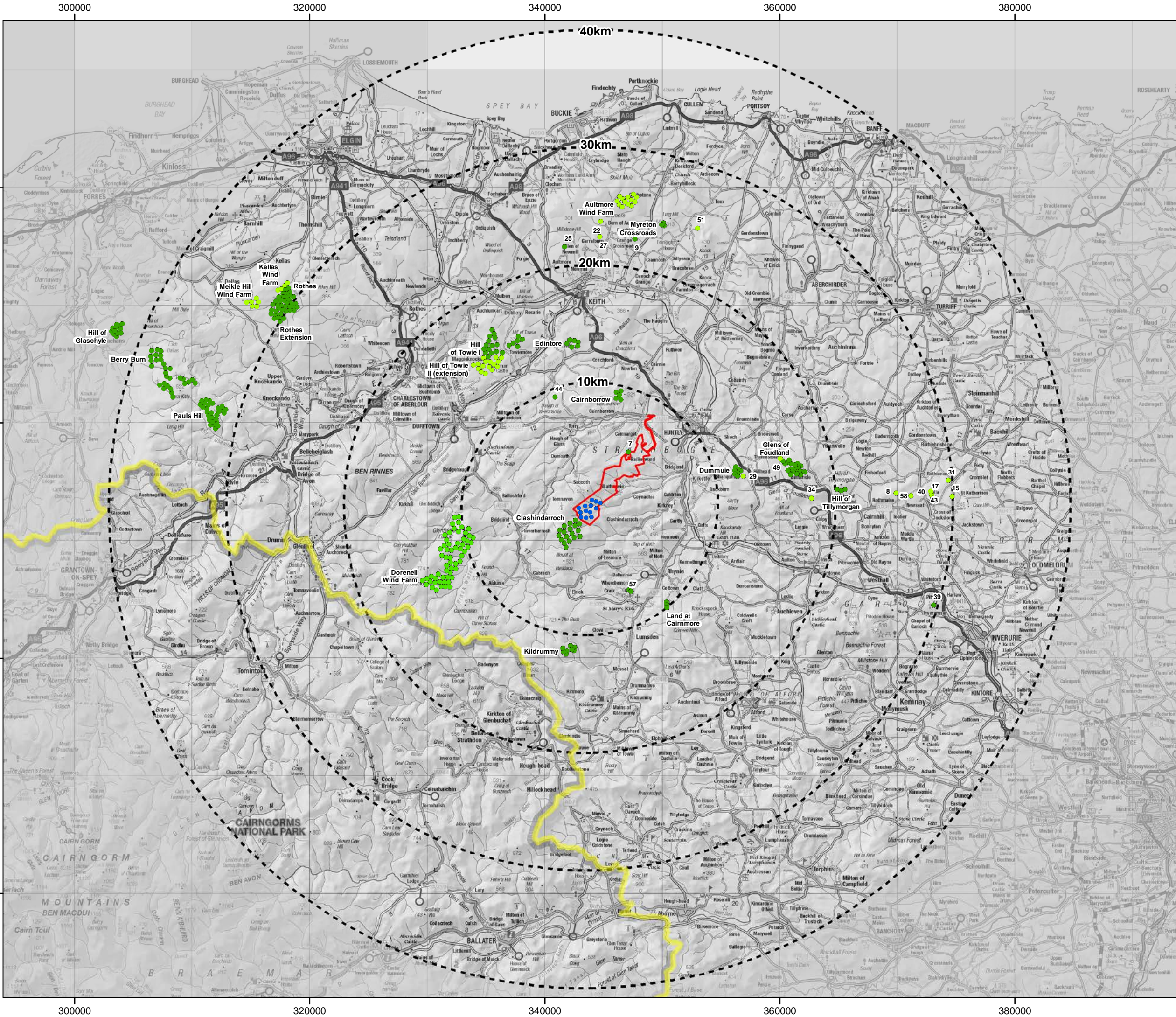
Re-scoping Revised Layout

Blade Tip Zones of Theoretical Visibility (180m)

Figure 5

Date: October 2018 Prepared By: MD

Ref: CLON_5_BT ZTV 180m Op WF A3_181001md



- Legend**
- Site Boundary
 - Proposed Turbine Locations
 - 10km Buffers from Proposed Turbines
 - Cairngorms National Park
- Status of Cumulative Wind Farms**
- Operational
 - Under Construction
 - Consented
 - In Planning

- One and TwoTurbine Sites within Study Area
- 7 - Bailiesward Farm
 - 8 - Baldyquash Farm
 - 9 - Balnamoon Crossroads
 - 15 - Cowhill
 - 17 - Crannabog Farm
 - 22 - Drodland
 - 25 - Followsters
 - 27 - Garrelhill Newmill
 - 29 - Greenmyres
 - 31 - Hill of Burns
 - 34 - Jericho Forest
 - 39 - Mains Of Balquhain
 - 40 - Mains of Meadaple
 - 43 - Meikle Folla
 - 44 - Midtown of Glass
 - 49 - Newton of Begshill
 - 51 - Newton of Edinght Grange

VATTENFALL

SLR

4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH

T: +44 (0)131 335 6830
www.slrconsulting.com

1:300,000 @ A3
© Crown Copyright 2017. All rights reserved.
Ordnance Survey Licence 0100031673.

0 2.5 5 10 Km

N

Clashindarroch II Wind Farm

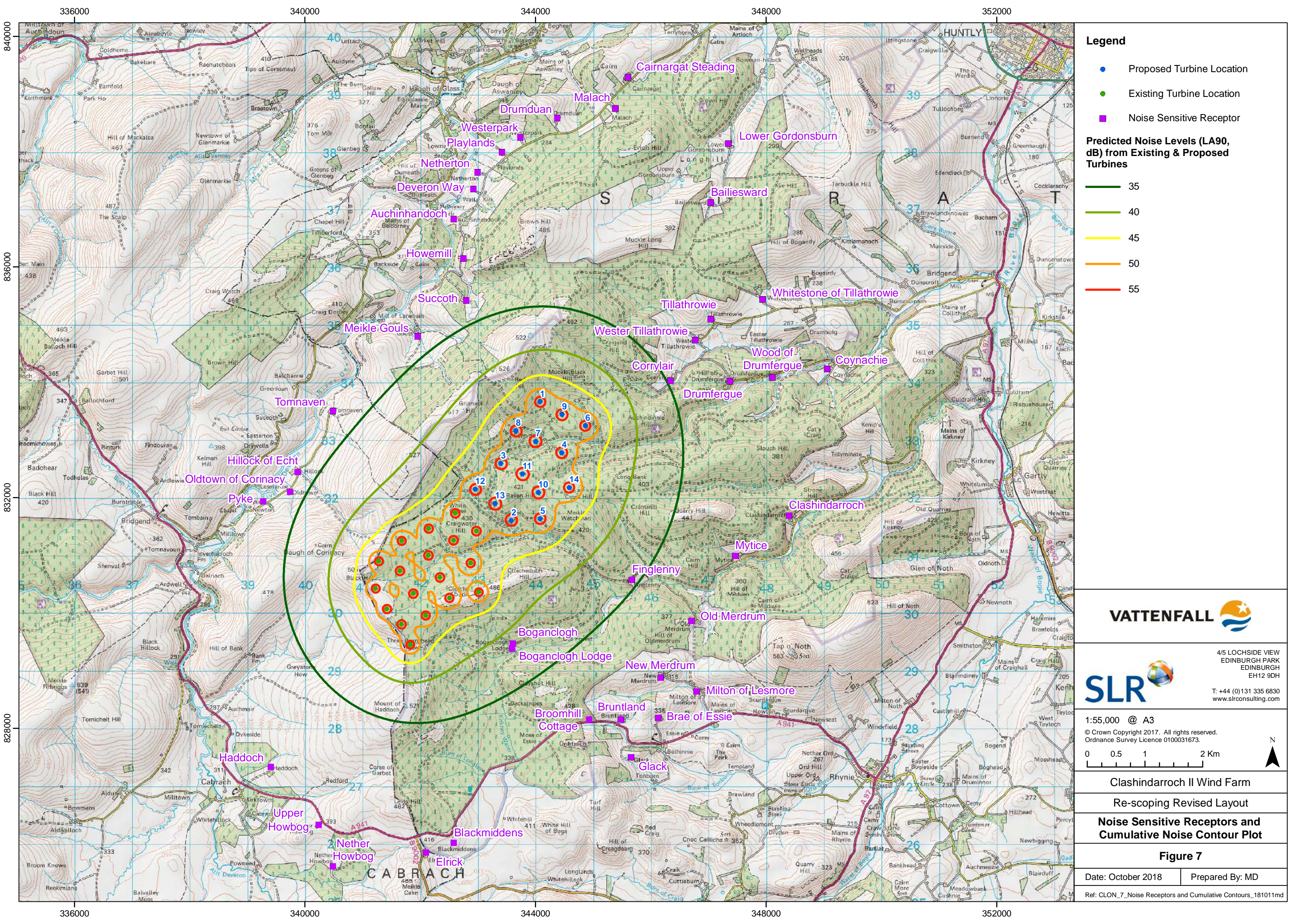
Re-scoping Revised Layout

Cumulative Wind Farm Sites within Assessment

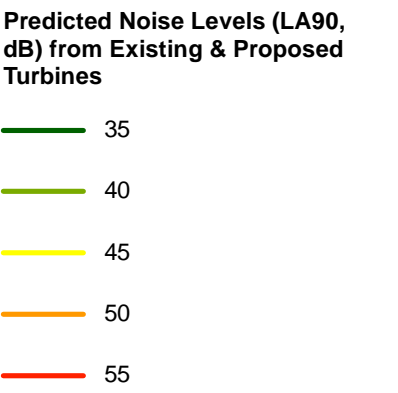
Figure 6

Date: October 2018 Prepared By: MD

Ref: CLON_6_Cumulative Windfarms_181001md



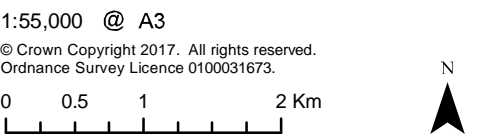
- Legend**
- Proposed Turbine Location
 - Existing Turbine Location
 - Noise Sensitive Receptor



SLR

4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH

T: +44 (0)131 335 6830
www.slrconsulting.com



Clashindarroch II Wind Farm

Re-scoping Revised Layout

Noise Sensitive Receptors and Cumulative Noise Contour Plot

Figure 7

Date: October 2018 Prepared By: MD

Ref: CLON_7_Noise Receptors and Cumulative Contours_181011md

