Gordonbush Extension Wind Farm

Environmental Impact Assessment Report

January 2019

Volume 1: Non-Techincal Summary

NON-TECHNICAL SUMMARY

Figures

* Please note that the visualisation included on the front cover is extracted from Figure 7.15: Viewpoint 8 (Craggie Beg) (Volume 3A of EIA Report) and is for illustrative purposes only.

1. OVERVIEW

1.1 Introduction

1.1.1 On 29th September 2017 consent for the construction and operation of the Gordonbush Wind Farm (15 turbines) was granted by the Scottish Ministers under Section 36 (s.36) of the Electricity Act 1989. The Scottish Ministers also deemed planning permission to be granted under section 57 of the Town and Country Planning (Scotland) Act 1997. SSE Generation Limited ("the Applicant") has applied for a variation[1] of the consent for the proposed Gordonbush Extension Wind Farm on Gordonbush Estate, near Brora, Sutherland (Figure 1: Site Location). The Applicant is also seeking a direction[2] from the Scottish Ministers that the deemed planning permission be varied. Together these form the "variation application".

1.1.2 The main purposes of the variation application are to permit a proposed reduction in the number of turbines from fifteen to a maximum of eleven, and an increase in the tip height of remaining turbines from 130m up to a maximum tip height of 149.9m (and a maximum rotor diameter of up to 136m). Other changes include a reduction in the length of access track given reduced number of turbines, removal of the consented additional operations building, repositioning of temporary batching plant, amendment to indicative borrow pit extraction volumes, removal of permanent operational met mast, repositioning and substitution of the permanent meteorological mast to a LiDAR[3] and associated 4x4 track; and retention of existing operational Gordonbush Wind Farm meteorological mast (southern). No change to the turbine layout of the remaining eleven turbines is proposed. It is anticipated that the capacity of the Proposed Varied Development would exceed 30MW, which combined with the existing Generating Station capacity exceeds 50MW. The proposed changes are hereinafter referred to as "the Proposed Varied Development", and are shown in relation to the consented wind farm, referred to hereinafter as "the Consented Development", on Figure 2: Proposed Variation.

1.2 Needs Case

1.2.1 Since the granting of consent, the turbine and electricity market has changed significantly. Subsidies for onshore wind ended in 2015, and wind turbine technology is continually evolving with more productive and efficient designs coming on to the market place each year. This wind farm would be solely reliant on revenue from electricity generated and sold to the wholesale energy market and optimisation of the site from a generation perspective is essential for the project's economic viability.

1.2.2 Increasing the tip height and rotor diameter of the turbines has the benefit of increasing the turbine energy generation potential and efficiency of the site, which in turn enables a reduction in turbine numbers from fifteen to a maximum of eleven. Increasing the tip height allows the Applicant to take advantage of the most efficient turbines available on the market, with larger blade turbines able to capture more wind energy which increases the output of each turbine.

1.3 Environmental Impact Assessment

1.3.1 The Consented Development was subject to an iterative design and assessment process, considering both technical and environmental constraints. This process is documented within the Gordonbush Extension Wind Farm Environmental Statement (ES) (June, 2015)[4], referred to

[1] Under Section 36C of the Electricity Act 1989 and the Electricity Generating Stations (Applications for Variation of Consent) (Scotland) Regulations 2013.
[2] Under Section 57(2ZA) of the Town and Country Planning (Scotland) Act 1997.
[3] A Light Detection and Ranging (LiDAR) unit to collect meteorological data for the operational life of the wind farm.
[4] The 2015 ES assessed a total of 16 turbines.

hereinafter as the '2015 ES', and the Gordonbush Extension Further Environmental Information (FEI) Report (2016)[5], referred to hereinafter as the '2016 FEI Report'. The Consented Development was therefore designed to avoid or minimise adverse environmental effects where practicable. Where further mitigation measures were required to minimise potential environmental effects, these were set out in the 2015 ES and secured through appropriate Conditions of Consent. No additional mitigation measures were identified within the 2016 FEI Report.

1.3.2 The Applicant has provided a new Environmental Impact Assessment Report ("EIA Report") under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 ("the 2017 EIA Regulations") to accompany the application to vary the relevant section 36 consent. This document provides a Non-Technical Summary ("NTS") of the EIA Report.

1.3.3 The aim of the NTS is to summarise the content and main findings of the EIA Report in a clear and concise manner to assist the public in understanding what the environmental effects of the Proposed Varied Development are likely to be. The full EIA Report provides a more detailed description of the Proposed Varied Development and the findings of the Environmental Impact Assessment (EIA) process.

1.3.4 The EIA Report will comprise six volumes:

- Volume 1 - Non-Technical Summary (NTS);
- Volume 2 – Written Statement;
- Volume 3 – Figures;
- Volume 3a – Landscape and Visual Wirelines and Photomontages (SNH Methodology);
- Volume 3b – Landscape and Visual Wirelines and Photomontages (THC Methodology); and
- Volume 4 - Technical Appendices.

1.3.5 The EIA Report and other documents submitted with the variation application will be available for viewing on the application website at www.sse.com/gordonbushextension.

1.3.6 The full EIA Report will be available for viewing at the following locations:

Brora Library and Culture Centre
Gower Street
Brora
KW9 6PD
(open Mon 1-5pm, 6-8pm
Tue 10-5pm. Thur 2-5pm, 6-8pm
Friday 10am-12.30pm, 1.30-4.30pm)

Planning and building standards office
Sutherland and Easter Ross
Drummuie
Golspie
KW10 6TA
(open during normal office hours)

1.3.7 The EIA Report can also be viewed at the Scottish Government Library at Victoria Quay, Edinburgh, EH6 6QQ and at the following website: www.energyconsents.scot.

1.3.8 Any representations in respect of the application may be submitted via the Energy Consents Unit website at www.energyconsents.scot/Register.aspx; by email to The Scottish Government, Energy Consents Unit mailbox at representations@gov.scot or by post, to The Scottish Government, Energy Consents Unit, 4th Floor, 5 Atlantic Quay, 150 Broomielaw, Glasgow, G2 8LU, identifying the proposal and specifying the grounds of representation.

[5] The 2016 FEI Report assessed a total of 15 turbines (i.e. the Consented Development).

1.3.9 Written or emailed representations should be dated, clearly stating the name of the project (in block capitals), full return email and postal address of those making representations. Only representations sent by email to representations@gov.scot will receive acknowledgement.

1.3.10 All representations should be received not later than the date falling 30 days from the date of the last published notice, although Ministers may consider representations received after this date. Any subsequent additional information which is submitted by the Applicant will be subject to further public notice in this manner, and representations to such information will be accepted as per this notice.

1.3.11 This EIA Report is available in other formats if required. For details, including costs, contact:

SSE Generation
1 Waterloo Street
Glasgow
G2 6AY

2. PROPOSED VARIED DEVELOPMENT

2.1 Project Description

2.1.1 The proposed variations to the Consented Development are summarised below, and shown on Figure 2: Proposed Variations and Figure 3: Proposed Varied Development (see also Chapter 4: Description of Development of the EIA Report):

- Removal of four turbines from the consented layout;
- Increase in the height of the remaining eleven turbines from 130m up to a maximum blade tip height of 149.9m (with a maximum rotor diameter of up to 136m);
- Reduction in length of access track given removal of four turbines;
- Removal of the consented additional operations building;
- Repositioning of temporary batching plant;
- Amendment to indicative Borrow Pit (BP) extraction volumes;
- Removal of Permanent Operational Met Mast;
- Repositioning and substitution of the Permanent Meteorological Mast to a LiDAR and associated 4x4 track; and
- Retention of existing operational Gordonbush Wind Farm meteorological mast (southern).

2.1.2 Table 2.1 provides a comparison between the Consented Development and the Proposed Varied Development.

Table 2.1: Comparison between the Consented Development and the Proposed Varied Development

Description	s.36 Consented Development	s.36C Proposed Varied Development
Number of turbines (WTG)	15	11
Maximum Tip Height (TH)	115m x 3 (WTG)	N/A – These turbines are removed
	130m x 12(WTG)	Up to 19.9m increase @149.9m x 11 (WTG)
Maximum Rotor Diameter (RD)	Max RD 93m (3 WTG @ 115m TH)	N/A – These turbines are removed
	Max RD 105m (12 WTG @ 130m TH)	Up to Max 136m
Turbine Positions	As per Consented layout	No change to remaining eleven turbines
Borrow Pits	BP1 indicative extraction volume= 48,000m³ BP2 indicative extraction volume= 96,000m³ Net indicative extraction volume= 144,000m³	No change to BP search area. Amend the indicative volume of extraction BP1: increase from 48,000m³ to 105,600m³ BP2: decrease from 96,000m³ to 39,600m³. Net indicative extraction volume increased to 145,200m³
Temporary Batching Plant	North of BP2	New location
New Access Tracks	7.96km	5.33km

Description	s.36 Consented Development	s.36C Proposed Varied Development
Operations Building	As per Consented Development layout	No longer required.
Meteorological Mast	Permanent and temporary met mast as per Consented Development layout. Removal of existing operational Gordonbush Wind Farm meteorological mast (southern).	LiDAR proposed, removing requirement for permanent and temporary met masts. Retention of existing operational Gordonbush Wind Farm meteorological mast (southern).

2.1.3 The application boundary would remain unchanged, as would the location of the remaining eleven turbines.

2.1.4 It is anticipated that access to the site would utilise the same delivery route as proposed for the Consented Development (and as used and upgraded for Gordonbush Wind Farm), subject to modifications to accommodate the longer turbine blades.

3. EIA METHODOLOGY

3.1 Baseline

3.1.1 The EIA Report provides an assessment of the likely significant effects of the Proposed Varied Development against the baseline information collected and presented as part of the 2015 ES and 2016 FEI Report with updates where appropriate. In agreement with statutory consultees, previous survey data collected for the 2015 ES and 2016 FEI Report remains valid, subject to updates where this was specifically requested by statutory consultees (e.g. updated otter survey and review of private water supply data).

3.1.2 In accordance with Regulation 5(4) of the EIA Regulations, the EIA Report will aim to avoid duplication of assessment by taking into account the results identified in the 2015 ES and 2016 FEI Report. Electronic copies of both the 2015 ES and 2016 FEI Report are submitted with the Section 36C application for completeness.

3.1.3 The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 require the EIA Report to include a description of 'the main respects in which the developer considers that the likely significant effects on the environment of the proposed varied development would differ from those described in any EIA Report or environmental statement, as the case may be, that was prepared in connection with the relevant section 36 consent.' As such, the EIA Report provides a comparative assessment of how the effects of the Proposed Varied Development would differ from those described for the Consented Development, as assessed within the 2015 ES and 2016 FEI Report. In doing so, the EIA Report provides an assessment of the Proposed Varied Development as a whole and highlights any different effects associated with the proposed variation in comparison with the Consented Development.

3.2 Assessment of Alternatives

3.2.1 The layout of the Consented Development evolved through consideration of a number of technical and environmental factors, such as spacing between turbines, ground conditions, steepness of slope, peat depth, and avoidance where practicable of sensitive habitats, ornithological and cultural heritage constraints. Within these parameters, landscape and visual considerations aimed to achieve a turbine layout that relates to the landform of the site and adjacent areas, whilst achieving a balanced composition with the surrounding landform and skyline in consideration with the operational Gordonbush Wind Farm, as seen from key receptors.

3.2.2 The Proposed Varied Development would remove four turbines and associated access tracks from the Consented Development but there would be no change to the positioning of the remaining turbines and associated access tracks. The four turbines identified for removal were those closest to Strath Brora (WTG's 11, 13, 14 and 16). Design considerations for the Proposed Varied Development focussed on increasing the turbine tip height and rotor diameter, with respect to a number of environmental considerations, principally:

- Landscape and Visual;
- Traffic and Transport;
- Ornithology;
- Noise; and
- The requirements for an aviation lighting scheme.

3.2.3 A range of turbines between 130m and 149.9m tip height were considered for the variation application as these represented the most technically and commercially viable turbines for this site at this time. Following review of potential environmental effects and technical

considerations, and following positive feedback from statutory consultees, a decision was made by the Applicant to progress with the 149.9m tip height.

4. COMPARATIVE ENVIRONMENTAL ASSESSMENT

4.1.1 A summary of the comparative assessment between the Consented Development and Proposed Varied Development, which is provided in Chapter 15 of the EIA Report, is shown in Tables 4.1 and 4.2. Table 4.1 provides a synopsis of the findings from the assessment of the likely significant effects for the receptors considered in Chapters 7 to 14 of the EIA Report. This is provided for both the Consented Development and the Proposed Varied Development, together with the conclusion that has been reached regarding any differences found. Table 4.2 provides a synopsis of the assessment of factors identified in Regulations 4(3), 4(4) and Schedule 4 of the 2017 EIA Regulations.

Table 4.1: Summary Comparison of Effects of the Consented Development Compared to the Proposed Varied Development

Technical Chapter	Consented Development Likely Significant Effects	Proposed Varied Development Likely Significant Effects	Conclusion
Chapter 7: Landscape and Visual	The assessment of effects on landscape character types concluded that there would be some significant direct and indirect effects up to a maximum distance of approximately 6.5km, and considerably less in some directions. Beyond this distance, it was concluded that the Consented Development would be a relatively minor influence in the setting of landscape character types. Some limited parts of the Loch Fleet, Loch Brora and Glen Loth SLA were assessed to receive potentially significant effects, but there were no significant effects predicted on wild land areas (WLA), Gardens and Designed Landscapes (GDL) or National Scenic Areas (NSA). The visual assessment found significant effects on two hilltop viewpoints (Beinn Smeorail and Ben Horn); intermittent significant effects on up to 3km of the minor road from Brora to Rogart travelling eastwards only; intermittent significant effects on approximately 5.6km of core path SU06.02 on the west side of Loch Brora; intermittent significant effects on approximately 100-150m of core path SU06.14 on the east side of Loch Brora; and a significant effect on a part of the access track to Ben Armine Lodge. There were no significant effects predicted on other routes, including the A9, A836, A839, A897, A949, national cycle routes, long distance walking routes and railway lines. The assessment further concluded that the addition of the Consented Development to operational and consented wind farms would result in potentially significant cumulative effects on the landscape character of small parts of Strath Brora, including one very small part of the Loch Fleet, Loch Brora and Glen Loth SLA; the minor road from Brora to Rogart, travelling eastwards only; and on the view from Creag nam Fiadh. The consideration of application stage wind farms did not lead to any additional significant cumulative effects.	The changes proposed would result in a minor decrease in the occurrence of significant effects, including cumulative effects. This is due to the removal of the four southernmost turbines from the Consented Development, which has reduced visibility, particularly from Strath Brora, and reduces the extent of the Proposed Varied Development across views. The following effects which were assessed to be significant for the Consented Development, are now assessed to be not significant: • The area of *Strath (Strath Brora*): eastern section Landscape Character Type (LCT) around Killin Rock; • The area of the Loch Fleet, Loch Brora and Glen Loth Special Landscape Area (SLA) around Killin Rock; • Approximately 1km of the eastbound Brora - Rogart minor road, between Balnacoil and graveyard; • Approximately 1km of Core Path SU06.02 ('Loch Brora - West Track') as it passes the property at Kilbraur; and • Approximately 100-150m of Core Path SU06.14 ('Doll Bridge – Loch Brora'). The assessment also concluded that the following cumulative effects would become not significant: • The cumulative effect at Viewpoint 13. Creag nam Fiadh; and • The cumulative effect on the eastbound Brora - Rogart minor road, other than a stretch of approximately 2km between Sciberscross and Point.	Some significant effects were predicted to arise as a result of the Consented Development, but there are no instances of additional significant effects, or an increase in the extent of significant effects arising as a result of the Proposed Varied Development.
Chapter 8: Ecology	Assessment of effects in the 2015 ES and 2016 FEI Report showed that, after mitigation is taken into account, residual effects of the Consented	The effects on ecological features from the Proposed Varied Development have been assessed, taking into	Overall, the effects of the Proposed Varied

Technical Chapter	Consented Development Likely Significant Effects	Proposed Varied Development Likely Significant Effects	Conclusion
	Development on habitats, protected species and salmonids were not significant. Cumulative effects of the Consented Development were also not considered to be significant, with total combined loss / damage of bog and heath habitat for the Consented Development and Gordonbush Wind Farm amounting to 0.003% and 0.0008% of the national peatland and heath resource respectively. Effects on the Gordonbush Estate HMP management objectives were also assessed as not significant.	account consultation feedback from SNH. At its request, an up-dated otter survey was carried out to inform the assessment. The results confirm that there would be no likely significant effect on this species, allowing the conclusion to be reached that it would have no adverse impact on the integrity of the Caithness and Sutherland Peatlands SAC. There would be no negative effect on implementation of the Gordonbush Habitat Management Plan (HMP).	Development would remain similar to those of the Consented Development.
Chapter 9: Hydrology, Hydrogeology and Geology	One licensed surface water abstraction and six private water supplies were identified within 5km of the site boundary. None of these water supplies were identified as at risk from the Consented Development. A number of potential groundwater dependent terrestrial ecosystems (GWDTE) were identified within the site boundary. The Consented Development was designed to avoid any direct impacts on potential highly dependent GWDTE habitats. Further detailed assessment was undertaken and mitigation measures proposed where appropriate to avoid potential effects on areas of possible GWDTE. With the adoption of the proposed mitigation measures, such as the implementation of a site specific CEMP (see Condition 23), no significant effects to hydrological, hydrogeological or geological receptors as a result of the Consented Development were identified.	The assessment has confirmed, subject to best practice mitigation measures, that the Proposed Varied Development will not have any significant effects on hydrology, hydrogeology and geology. All mitigation measures previously identified within the 2015 ES and 2016 FEI Report are recorded within a Schedule of Mitigation (see EIA Report Appendix 4.2) and are secured through appropriate Conditions of Consent.	Overall, the effects of the Proposed Varied Development would remain similar to those of the Consented Development.
Chapter 10: Ornithology	Surveys to inform the 2015 ES confirmed that the bird species found breeding in the survey area were of Local or Low conservation value, with the exception of skylark, which was considered to have a site population of Regional conservation value. Potential effects of the Consented Development on breeding birds within 500m of the proposed turbine positions were assessed. It was considered that there would be no significant negative effect of the Consented Development on birds through habitat loss or disturbance outside the bird breeding season or collision risk. With the implementation of mitigation measures required through the conditions of consent (see Condition 25), any residual effects from disturbance	It is considered that there would be no likely significant effect of the Proposed Varied Development on birds through habitat loss, disturbance outside the bird breeding season or collision risk. Potential disturbance of nesting birds, if construction is carried out during the bird breeding season, would be mitigated by appropriate deterrence and nest protection measures as outlined in the HMP as required by Condition 25. Consequently, it is considered that there would be no likely significant residual effects on birds through habitat loss, disturbance or collision risk. Furthermore,	Overall, the effects of the Proposed Varied Development would remain similar to those of the Consented Development.

Technical Chapter	Consented Development Likely Significant Effects	Proposed Varied Development Likely Significant Effects	Conclusion
	would be of low magnitude and not significant. Consequently, there would be no adverse effect on the integrity or bird populations of the Caithness and Sutherland Peatlands SPA. There would also be no negative effect on the bird populations of the Gordonbush Habitat Management Plan area.	there would be no adverse effect on the integrity or bird populations of the Caithness and Sutherland Peatlands SPA or on the bird populations of the Gordonbush Habitat Management Plan area.	
Chapter 11: Cultural Heritage	In terms of direct effects, the Consented Development was designed to minimise effects as far as practicable. As a result, only a few minor features of low sensitivity/importance would be directly impacted by the Consented Development. With the mitigation set out in Condition 22 these effects were deemed to be not significant. Significant indirect effects were however predicted at two Scheduled Monuments (Balnacoil Cairn and Duchary Rock Fort). Whilst considered significant, effects were considered to be within an acceptable level given that views from these Scheduled Monuments were seen in the context of the existing Gordonbush Wind Farm. In addition, Duchary Rock Fort and Kilbraur Hut Circle were predicted to receive significant cumulative effects as a result of the Consented Development in combination with other wind farm developments. These were again deemed to be within an acceptable level.	Chapter 11 assessed the likely significance of visual effects on cultural heritage sites within 15km of the Proposed Varied Development. The assessment concludes that there would be a significant visual impact at two SMs (Balnacoil Cairn and Duchary Rock Fort), although the impact is considered to be acceptable in both cases. The visual impact on all other Sites would be Minor or Negligible, and not significant, due principally to screening effects from topography. On potential cumulative effects, the assessment concluded that the Proposed Varied Development would result in significant cumulative effects at two SMs (Kilbraur Hut Circle and Duchary Rock Fort).	No new significant effects have been identified for the Proposed Varied Development that were not already assessed for the Consented Development. Those significant effects that have been identified are therefore considered to be acceptable.
Chapter 12: Traffic and Transport	Based on existing traffic data and the estimated construction vehicle movements, the 2015 ES concluded that no significant detrimental effects were predicted as a result of construction traffic associated with the Consented Development. A cumulative assessment was also undertaken which concluded that no significant cumulative effects were predicted on the local roads network.	The assessment of residual effects has been based on: existing traffic data; the estimated volume of construction traffic; and the implementation of mitigation measures, such as an appropriate traffic management plan and suitable liaison with the relevant authorities. The residual traffic and transport effects are temporary and have been assessed as having no significant effect.	Overall, the effects of the Proposed Varied Development would remain similar to those of the Consented Development.
Chapter 13: Noise	Construction noise, by its very nature, tends to be temporary and highly variable and therefore much less likely to cause adverse effects. Various mitigation methods were suggested to reduce the effects of construction noise, the most important of these being suggested restrictions of hours of working. These were confirmed through Condition 25 of the Conditions	The construction noise assessment has determined that associated levels would be lower than for the Consented Development due to the reduced amount of activities and increased separation distances between construction works and noise sensitive properties.	Noise levels would be lower for the Proposed Varied Development than for the Consented

Technical Chapter	Consented Development Likely Significant Effects	Proposed Varied Development Likely Significant Effects	Conclusion
	of Consent. It was concluded that noise generated through construction activities would have a slight effect and therefore not significant. Noise levels from the operation of the wind turbines were assessed for noise sensitive receptors within the vicinity of the Consented Development. Noise limits were derived from data about the existing noise environment following the method stipulated in national planning guidance. Predicted noise levels took full account of the potential combined effect of the noise from the Consented Development along with the existing Gordonbush Wind Farm, the Kilbraur Wind Farm and its extension. Other, more distant wind farms were not considered in this assessment as they would not make an acoustically relevant contribution to cumulative noise levels. Predicted operational noise levels were compared to the limit values to demonstrate that turbines of the type and size proposed for the Consented Development could operate within the limits so derived as outlined in Condition 25.	Although construction noise could be audible at various times throughout the construction programme, noise levels would remain within acceptable limits such that their temporary effects are considered slight at most and therefore not significant. Various mitigation methods were previously suggested to reduce the effects of construction noise and these remain applicable. The most important of these being restrictions of hours of working which is covered by Condition 25. The predicted wind turbine operational noise levels are within the ETSU-R-97 criteria at all receptors and for all wind conditions, as such, residual operational noise impacts are acceptable according to current guidance and are therefore not significant.	Development due to the reduced amount of activities and increased separation distances between construction works, operational turbines and noise sensitive properties. Overall, the effects of the Proposed Varied Development will remain similar to those of the Consented Development.
Chapter 14: Other Issues	<u>Telecommunications, Television / Radio</u> No disruptions to telecommunications, such as television and radio reception were anticipated as a result of the Consented Development. <u>Aviation (Civil and Military)</u> The Consented Development was not within line of sight to the HIAL Inverness Airport or the RAF Lossiemouth Primary Surveillance Radars (PSRs) and no effects were anticipated. Assessment showed that no radar line of sight exists between the Consented Development and the Perwinnes and Allanshill PSRs or NATS air to ground communications facilities. This indicated that there would be no technical impact on NATS operated aviation navigational facilities. As such, there were no anticipated effects predicted on aviation navigational equipment. The Consented Development lies within an area which is deemed a low flying area by the MOD and by aircraft transiting to and from the Tain Air Weapons Range. The Applicant agreed to review requirements for a suitable aviation lighting scheme with the Ministry of Defence (MOD).	The Proposed Varied Development is not anticipated to result in any change to the potential effects noted in the respect of: • Telecommunications, Television / Radio • Aviation (Civil and Military) • Shadow Flicker • Ice Throw • Air Quality • Carbon Assessment The potential savings in CO_2 emissions due to the Proposed Varied Development replacing other electricity sources over the 25 year lifetime of the wind farm are approximately: • 74,305 tonnes of CO_2 per year over coal-fired electricity; • 22,735 tonnes of CO_2 per year over grid-mix of	Overall, the effects of the Proposed Varied Development will remain similar to those of the Consented Development. Factors considered as new under the 2017 Regulations did not result in any likely significant effects.

Technical Chapter	Consented Development Likely Significant Effects	Proposed Varied Development Likely Significant Effects	Conclusion
	Shadow Flicker There were no potential impacts of shadow flicker predicted as a result of the Consented Development. Ice Throw Following the implementation of proposed mitigation measures, such as making operation crews and members of the public aware of the risks of ice throw, it was considered that the risk of ice throw would be very low. Air Quality With the implementation of mitigation measures to control dust, no significant effects on air quality were predicted. Carbon Assessment A carbon assessment was undertaken to estimate the potential savings in carbon dioxide (CO2) emissions by the Consented Development replacing other electricity sources. This was calculated as approximately 126,564 tonnes of CO2 saved per year (tCO2yr-1) through displacement of coal-fired electricity or 63,282 tonnes CO2yr-1 over grid-mix supply. The CO2 payback time, which is the period of operation of the wind farm required before there is a net saving of CO2 was also been calculated as between 1.3 to 2.6 years (using coal and UK grid supply mix CO2 emission factors, respectively). This is a substantially shorter time period than the 25 year operational period consented.	electricity; or • 37,234 tonnes of CO_2 per year over a fossil fuel mix of electricity. The Proposed Varied Development has an expected payback time of between 0.9 to 2.9 years (using coal and UK grid supply mix CO2 emission factors, respectively). This is a substantially shorter time period than the 25 year operational period applied for. Other factors introduced under the 2017 EIA Regulations, which were not required in the 2015 ES and 2016 FEI Report are also covered in the EIA Report in Chapter 14: Other Issues, and are described further in Table 15.2 of Chapter 15 (and summarised below in Table 4.2).	
Socio Economic and Tourism	Although none of the effects identified were assessed as significant, they would nevertheless likely have a notable positive effect on the local economy and the communities in the immediate vicinity of the site, principally during the construction phase of the project, but also over the longer term during operation. The conclusion of the assessment was that the Consented Development was not expected to have any significant tourism or socio-economic effects. As such it was unnecessary to consider mitigation and no residual effects were identified. The assessment did however conclude that the Consented Development could help to generate a moderate, positive, long-term, cumulative economic effect as a result of its contribution to	It is not anticipated that the Proposed Varied Development would result in any notable change to the assessment findings of the Consented Development. Therefore, a detailed assessment of socio-economics and tourism was scoped out from the EIA Report.	Overall, the effects of the Proposed Varied Development will remain similar to those of the Consented Development.

Technical Chapter	Consented Development Likely Significant Effects	Proposed Varied Development Likely Significant Effects	Conclusion
	the wind farm supply chain in the local area.		

Table 4.2 Assessment of Factors Identified in Regulations 4(3), 4(4) and Schedule 4

Topic	Potential for Significant Effects
Population and Human Health	Potential impacts on population and human health of relevance to the Proposed Varied Development include: • Health and amenity impact associated with construction and operational noise, traffic and transport related effects, shadow flicker and visual amenity; and • Potential for impacts on recreational amenity and/or socioeconomic activity. Noise, shadow flicker, visual amenity and socioeconomic effects are addressed in Table 4.1, with additional detailed assessment provided for in the EIA Report. On this basis, no additional environmental information is required to address the requirements of the 2017 EIA Regulations.
Biodiversity (in Particular Species and Habitats Protected under Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora)	The requirement to consider impacts on biodiversity is addressed in this EIA Report in Chapter 8: Ecology and Chapter 10: Ornithology.
Land and Soil (and Natural Resources Availability)	The potential impacts on geological receptors, peat and groundwater resources are considered in Chapter 9: Hydrology, Hydrogeology, and Geology of this EIA Report.
Water (and Natural Resource Availability)	The potential impacts on the water environment are considered in Chapter 9: Hydrology, Hydrogeology, and Geology of this EIA Report.
Air and Climate	The 2017 EIA Regulations require a consideration of climate change effects, both considering the greenhouse gas emissions, and the climate change vulnerability. The benefits for reducing greenhouse gas emissions associated with the proposed variations are considered in Chapter 14: Other Issues. On this basis, no additional environmental information is required to address the requirement of the 2017 EIA Regulations. The Proposed Varied Development is not considered vulnerable to climate change induced changes to the future baseline because, for example, the wind farm lies outwith the 1 in 200 year flood area boundary (see Chapter 9: Hydrology, Hydrogeology, and Geology), and in any event will be designed to be resilient to extreme weather. No changes are proposed to the locations of the 11 retained turbines. On this basis, no additional environmental information is required to address the requirements of the 2017 EIA Regulations.
Material Assets, Cultural Heritage	Chapter 11: Cultural Heritage, includes an assessment of the potential for significant effects on material assets and cultural heritage

Topic	Potential for Significant Effects
	including architectural and archaeological assets and historic landscape.
Landscape	Chapter 7: Landscape and Visual considers the potential impacts and potential cumulative impacts on landscape and visual receptors. On this basis, no additional environmental information is required to address the requirements of the 2017 EIA Regulations.
Major Accidents and Disasters	Chapter 14: Other Issues, includes an assessment of the potential for major accidents and disasters.
Interaction Between Factors (Cumulative Effects)	The potential for cumulative effects and the potential for interaction between factors is addressed in each of the chapters (Chapter 7 – 14) of this EIA Report. Based on the information provided, no additional environmental information is required to address the requirement of the 2017 EIA Regulations.

5. SUMMARY AND CONCLUSIONS

5.1.1 The EIA Report provides an assessment of the likely significant effects of the Proposed Varied Development against the baseline information collected and presented as part of the 2015 ES and 2016 FEI Report. In agreement with statutory consultees, previous survey data collected for the 2015 ES and 2016 FEI Report remains valid, subject to updates where this was specifically requested by statutory consultees (e.g. updated otter survey and review of private water supply data).

5.1.2 The main potential environmental effects identified for the Consented Development were on landscape and visual and cultural heritage receptors. While significant residual effects were identified for both (see Chapter 7 and 11 of the 2015 ES) these were deemed to be within acceptable levels. All other potentially significant environmental effects were considered to be subject to suitable mitigation, such that there would be no significant residual effects.

5.1.3 The assessment of the Proposed Varied Development confirms that the likely significant effects for the revised scheme would be largely the same as for the Consented Development. There would be some reduction of landscape and visual effects due to the removal of the 4 southernmost turbines. Overall, the differences identified are considered to be negligible or small for the majority of factors and thus does not change the conclusions reached for the Consented Development. No new likely significant effects that had not already been reported upon have been identified.

sse

Key

Site Boundary

Scale 1:250,000@ A3

0 5 10 Km

N

Scale 1:70,000 @ A3

0 1 2 Km

Figure 1
Site Location

Gordonbush Extension Wind Farm
Non-Technical Summary

Key

Consented and Retained

- Site Boundary
- Turbine (Locations Unchanged)
- Access Track
- Operational Access Track to be Reused
- Borrow Pit Search Area
- Construction Compound
- Operational Substation

Consented but Removed

- Turbine
- Permanent Met Mast
- Operations Building
- Access Track

Consented but Repositioned

- Batching Plant (Old Position)
- Batching Plant (Proposed New Position)

Proposed New

- LiDAR
- Access Track

Operational and Retained

- Operational Met Mast

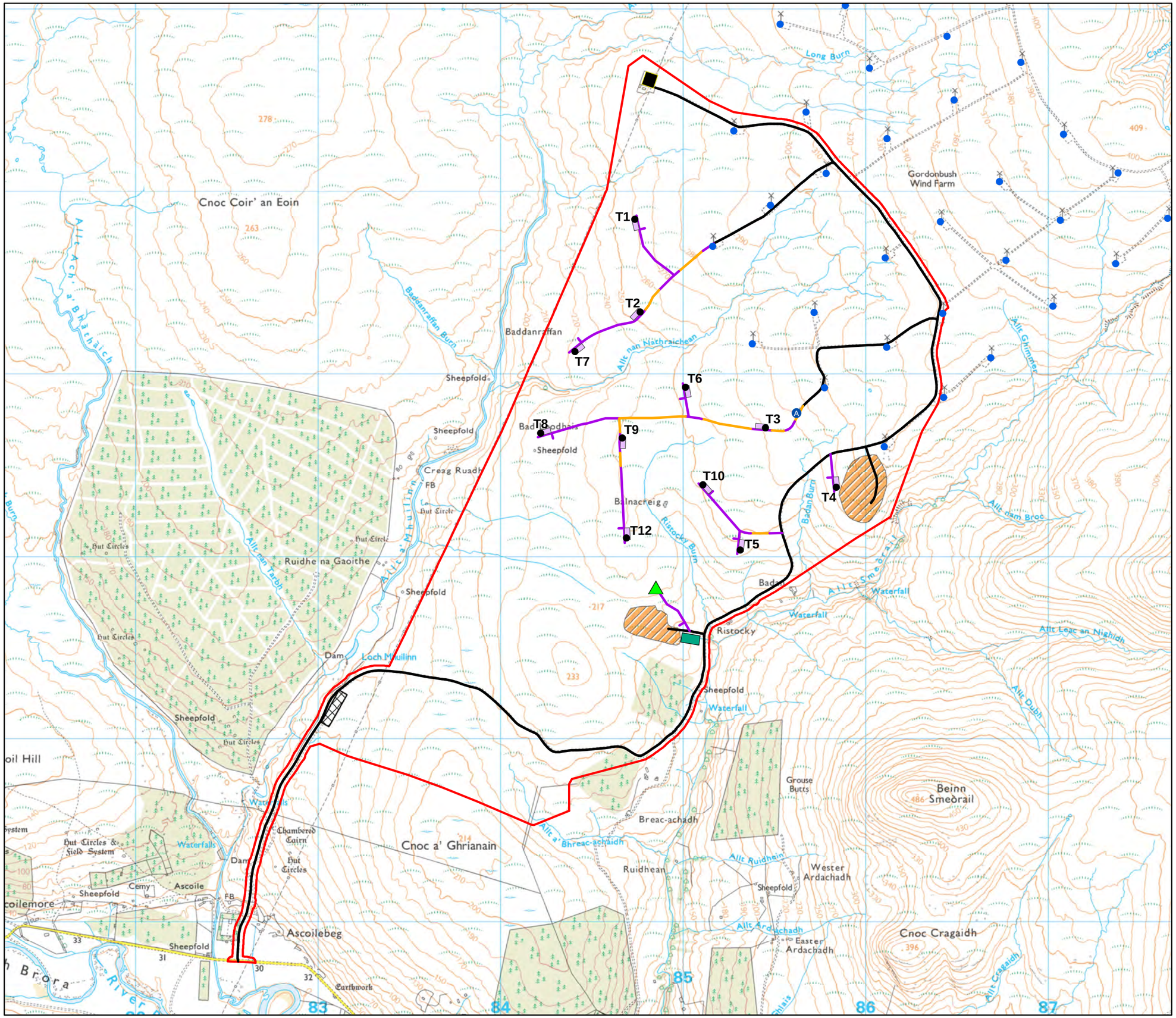
Scale 1:20,000 @ A3

0 0.5 1 Km

N

Figure 2
Proposed Variation

Gordonbush Extension Wind Farm
Non-Technical Summary



Key

- Site Boundary
- Turbine
- Operational Turbine
- Operational Met Mast
- Proposed LiDAR

Access Track

- Existing
- Cut
- Float
- Indicative Hardstanding
- Existing Substation
- Batching Plant
- Borrow Pit Search Area
- Construction Compound

Scale 1:20,000 @ A3

0 0.5 1 Km

N

Figure 3
Proposed Varied Development

Gordonbush Extension Wind Farm
Non-Technical Summary