4 Description of the Proposed Varied Development

4. Description of the Proposed Varied Development

4.1. Introduction

4.1.1. This Chapter presents a description of the Proposed Varied Development for which consent is being sought, for the purposes of informing the identification and assessment of likely significant environmental effects. This includes the anticipated construction and operation activities connected with the Proposed Varied Development. A brief description of likely decommissioning activities is also provided. The proposed variations to the Consented Development are presented, along with a comparison between the Proposed Varied Development and the Consented Development.

4.1.2. **Chapter 2: Site Description** provides a description of the Proposed Varied Development site (the 'site'), its geographical context, and information on cumulative developments within the wider vicinity.

4.2. Description of the Proposed Varied Development

Overview

4.2.1. The Proposed Varied Development will comprise 11 wind turbines, associated transformers and switchgear at each turbine as well as a battery energy storage system (BESS). The overall maximum installed capacity of the turbines will be approximately 77 megawatts (MW), supported by additional energy storage provision with a maximum output capacity of approximately 50 MW. The associated infrastructure will include:

- turbine foundations;
- crane hardstandings;
- a BESS facility;
- on-site access tracks between turbines and from the point of access to the turbines;
- watercourse crossings;
- on-site substation and maintenance building with welfare facility and associated communications equipment;
- on-site electrical cabling between the turbines and the substation and BESS;
- a temporary construction compound;
- a temporary concrete batching plant;
- two borrow pits to provide aggregate for the construction of the Proposed Varied Development; and

- habitat enhancement areas including forest to bog peatland restoration and native riparian planting.

4.2.2. As outlined in **Chapter 1: Introduction**, the primary purpose of this Section 36C variation is to reduce the number of turbines (and associated hardstandings) of the Consented Development, whilst increasing the height of the remaining turbines. The Consented Development included 17 wind turbines with 15 turbines at a maximum tip height of 149.9 metres (m) and 2 turbines at a maximum tip height of 125 m. The Proposed Varied Development would comprise eleven wind turbines at a maximum tip height of 220 m.

4.2.3. In addition to a reduction in the number of turbines, and an increase in maximum tip height, the Applicant proposes to:

- Increase the size of associated crane hardstandings to accommodate the eleven larger turbines;
- Relocate eight turbines to new locations but within the same pattern of development as the Consented Development;
- Amend parts of the track layout to reflect turbine removal and relocation (as outlined above);
- Change the number and location of required watercourse crossings to accommodate the amended track layout;
- Increase the size and capacity of the associated BESS;
- Relocate the temporary construction compound slightly beyond micrositing allowance;
- Remove the previously proposed permanent anemometer mast; and
- Increase the period of consent from 30 to 40 years.

4.2.4. The Proposed Varied Development is shown on **Figure 4.1** and described in detail throughout this Chapter.

Comparison between the Consented Development and the Proposed Varied Development

4.2.5. A summary of the changes between the Consented Development and the Proposed Varied Development are summarised in **Table 4.1** below.

Table 4.1 – Summary of Key Changes between the Consented Development and the Proposed Varied Development

	Consented Development	Proposed Varied Development	Summary of Key Changes
Maximum Number of Turbines	17	11	Removal of six turbines
Maximum Turbine Tip Height	125 m and 149.9 m	220 m	Increase in maximum tip height up to 95 m
Turbine Foundations	500 m^3 of concrete per turbine	1,440 m^3 of concrete per turbine	Increase of 940 m^3 per turbine
Crane Hardstanding	1,780 m^2 per turbine	3,202 m^2 per turbine	Increase of 1,422 m^2 per turbine
On-site Access Track Length	11 kilometres (km) - 9 km new and 2 km existing	10.3 km – 7.7 km new and 2.6 km existing	Reduction of 0.7 km in total track length and 1.3 km in new track construction.
Temporary Construction Compound	100 m x 50 m	100 m x 50 m	Relocated approximately 65 m south and rotated 90 degrees anti-clockwise.
Substation and BESS Compound	3,480 m^2 Total BESS capacity of 6 MW	10,890 m^2 Total BESS capacity of 50 MW	Increase in area by 7,410 m^2 and increase in BESS capacity of 44 MW
Borrow Pits	2	2	No change.
Watercourse crossings	10	7	Reduction of three watercourse crossings.
Permanent Anemometer mast	1	0	Anemometer mast no longer required.
Micrositing Allowance	50 m	100 m	Increase of 50 m

	Consented Development	Proposed Varied Development	Summary of Key Changes
Operational lifetime	30 years	40 years	Increase of 10 years
Total Generation Output	70.2 MW	77 MW	Increase of 6.8 MW
Total Maximum Output	76.2 MW	84.6 MW*	Increase of 8.4 MW
Estimated Energy Yield (P50)	158.00 GWh/year	241.34 GWh/year	Increase of approximately 53%

***It should be noted that although the Proposed Varied Development comprises 127 MW of renewable energy, no more than 84.6 MW will be exported to the grid at any one time. This is limited by grid connection capacity.**

4.2.6. **Table 4.2** below provides a comparison between the Consented Development and the Proposed Varied Development's turbines, including grid reference and tip height. Three of the Proposed Varied Development's turbine locations remain unchanged or within the micrositing allowance for the Consented Development. Locations of four turbines are within 200 m of a consented turbine position, whilst the remaining four turbines are over 200 m from a consented turbine position but located within the same pattern of development. No turbine is proposed further than 500 m from a consented location.

Table 4.2 – Overview of the Consented Development Turbines and the Proposed Varied Development Turbines

Consented Development Turbine ID	Easting	Northing	Tip Height (m)	Proposed Varied Development Turbine ID	Easting	Northing	Tip Height (m)	Summary of Key Change**
1	261952	595637	125	1	262208	595979	220	Turbine relocated ~429 m north-east.
2	262221	595349	149.9	2	262752	595635	220	Turbine relocated ~601 m north-east.
3	262915	595224	125	-	-	-	-	Turbine has been removed from layout.
4	261734	595199	149.9	3	261917	595432	220	Turbine relocated ~297 m north-east.
5	262475	594930	149.9	4	262752	595076	220	Turbine relocated ~310 m north-east.
6	261915	594785	149.9	5	261921	594770	220	Turbine microsited ~15 m south-east.
8*	262100	594427	149.9	-	-	-	-	Turbine has been removed from layout.
9	262404	594135	149.9	-	-	-	-	Turbine has been removed from layout.
10	261985	593849	149.9	6	261969	593817	220	Turbine microsited ~35 m south.
12*	262325	593596	149.9	-	-	-		Turbine has been removed from layout.

Consented Development Turbine ID	Easting	Northing	Tip Height (m)	Proposed Varied Development Turbine ID	Easting	Northing	Tip Height (m)	Summary of Key Change**
13	261738	593413	149.9	8	261654	593306	220	Turbine relocated ~134 m south-west.
14	262667	593305	149.9	7	262685	593323	220	Turbine microsited ~26 m north-east.
15	262123	593084	149.9	-	-	-	-	Turbine has been removed from layout.
16	261438	592997	149.9	-	-	-	-	Turbine has been removed from layout.
17	262482	592799	149.9	9	262467	592647	220	Turbine relocated ~149 m south.
18	261690	592707	149.9	10	261496	592707	220	Turbine relocated ~193 m west.
19	262045	592402	149.9	11	261878	592202	220	Turbine relocated ~259 m south-west.

* Turbines 7 and 11 removed from the Consented Development design as detailed in AEI (Infinergy, 2019).

**Although some Proposed Varied Development turbines are more than 500 m from the consented turbine with the same identification number, each proposed turbine is located within 500 m of a previously consented turbine position. The revised layout therefore remains within the same established pattern of development and does not introduce turbines into substantially new areas of the site.

4.2.7. **Figure 4.2** further illustrates the difference between the proposed turbine locations of the Proposed Varied Development in comparison to the Consented Development.

4.2.8. Much of the associated infrastructure remains in the same or very similar location as that of the Consented Development, including the substation compound and borrow pits. The main infrastructure differences between the two schemes are that the temporary construction compound has been relocated slightly beyond micrositing allowance for the Consented Development (and rotated approximately 90 degrees anticlockwise) to reduce earthworks requirements and to avoid areas of deepest peat, and the overall footprint of the BESS has increased to accommodate its increased capacity. The associated infrastructure is located at the following approximate locations:

- The temporary construction compound at (easting) 262410 (northing) 591239;
- The substation, BESS and control building compound at (easting) 262202 and (northing) 594056; and
- Two borrow pits at (easting) 261871 and (northing) 592555 and (easting) 262109 and (northing) 595388.

4.2.9. Further information on the associated infrastructure and how it may vary from the Consented Development is provided below.

Micrositing

4.2.10. Whilst the location of the infrastructure described above has been determined through an iterative environmental based design process, there is the potential for these exact locations to be altered through micrositing allowances prior to construction. A micrositing allowance of up to 100 m in all directions is being sought in respect of each turbine and its associated infrastructure in order to address any potential difficulties which may arise in the event that pre-construction surveys identify unsuitable ground conditions or environmental constraints that could be avoided by relocation. This is an increase of 50 m from the Consented Development, to allow for greater flexibility in siting the larger infrastructure. No micrositing will be undertaken that results in an increase in the significance of adverse effects. It is proposed that the micrositing of all infrastructure will be subject to an appropriately worded planning condition.

4.2.11. The assessments within this Environmental Impact Assessment (EIA) Report have included the considerations of this 100 m micrositing and it does not alter the conclusions formed as to worst case effects.

Turbines and Turbine Foundations

4.2.12. The Proposed Varied Development will comprise eleven turbines up to 220 m tip height when vertical. The indicative combined generation capacity of the turbines is anticipated to be in the region of 77 MW. The specific turbine manufacturer and model has not yet been selected as this will be subject to a pre-commencement tendering exercise and will

be confirmed post consent. Therefore, for the purposes of the EIA, maximum turbine dimensions and operational attributes have been established as the development scenario.

4.2.13. The turbine parameters for the Proposed Varied Development will be eleven turbines based on the Nordex N163 with a maximum overall height (to blade tip) of 220 m and an indicative hub height of 138.5 m. The rotor diameter of this candidate turbine is 163 m for all turbines.

4.2.14. These dimensions are indicative and final turbine dimensions will be determined based upon turbine availability and procurement prior to construction. The tip height of the chosen turbine will not exceed a blade tip height of 220 m. Given this committed maximum tip height, and the range of turbine models likely to be available and suitable for the local wind conditions, there is considered to be negligible potential for the significance of environmental effects to be different than as assessed based on the candidate turbine model. It is anticipated that confirmation of the final selected turbine dimensions will be required by a suitably worded planning condition.

4.2.15. The proposed final locations of the turbines have been defined in order to enable the EIA Report to describe fully the Proposed Varied Development for which permission is being sought. The British National Grid coordinates denoting where each of the turbines are proposed to be located are listed in **Table 4.2**.

4.2.16. Each of the wind turbines will comprise the following components:

- three blades;
- tower;
- nacelle;
- hub; and
- transformer and switchgear.

4.2.17. Each wind turbine will have a nacelle mounted on a tapered tubular steel tower. The nacelle will contain the gearbox or direct drive, the generator, the transformer, and other associated equipment. The hub and rotor assembly, including three blades, will be attached to the nacelle.

4.2.18. An elevation drawing of a typical wind turbine is illustrated in **Figure 4.3**. The wind turbines will be of a typical modern, three-blade, horizontal axis design in semi-matt white or light grey with no external advertising or lettering except for statutory notices.

4.2.19. The switchgear will be sited either within the base of each tower or externally sited, on the ground inside its own enclosure, a few metres away from the tower. For the purpose of the EIA it has been assumed that the switchgear will be contained within each tower base.

4.2.20. The proposed increase in turbine size will result in an increased turbine foundation in comparison to the Consented Development. The turbine foundations are expected to comprise a mix of pile and gravity bases. Until detailed ground investigations have been undertaken, the exact size and depth of foundations required cannot be determined. Therefore, for the purposes of this EIA Report, the following approximate dimensions have been used:

- a round reinforced concrete slab approximately 1440 m^3;
- approximate slab diameter up to 25 m; and
- depth of the foundations approximately 3.5 m.

4.2.21. The increase in turbine size has resulted in an increase of approximately 940 m^3 of concrete required per turbine foundation when compared to the Consented Development. An illustration of a typical wind turbine foundation is provided in **Figure 4.4**. The actual foundation design will be specific to the site conditions as verified during detailed pre-construction site investigations. In the unlikely event that ground conditions are unsuitable for the standard foundation design as described above, an alternative foundation design may be required, although it is not expected that this would materially affect the conclusions of the EIA.

Crane Hardstandings

4.2.22. To enable the construction of the turbines, a crane hardstanding area and turning area at each turbine location will be required to accommodate assembly cranes and construction vehicles. As with the turbine foundations, the proposed increase in turbine size will require the associated crane hardstandings to increase. This will comprise a crushed stone hardstanding area measuring approximately 3202 m^2. The actual dimensions will be subject to the specifications required by the selected turbine manufacturer and crane operator and following detailed site investigations prior to construction commencing.

4.2.23. Each turbine will have a permanent hardstand area of approximately 843 m^2 and a temporary hardstand area of approximately 2359 m^2, as illustrated on **Figure 4.5**. Each hardstand area has increased by 1422 m^2 in comparison to the Consented Development to account for the larger turbines. After turbine erection is completed, the temporary hardstand areas would be reinstated. The permanent crane hardstanding areas will remain in place during the lifetime of the Proposed Varied Development to facilitate maintenance work.

4.2.24. Indicative crane hardstandings are illustrated in **Figure 4.5.** Detailed construction drawings with final dimensions will be provided prior to commencement once the final turbine model has been selected.

Site Access Tracks and Site Traffic

4.2.25. The proposed site access point remains the same as the Consented Development and would be from a new access junction between Muirdrochwood and Smittons on the B729,

entering the site from the south. An indicative drawing of the Abnormal Indivisible Load (AIL) access junction is shown in **Figure 4.6**.

4.2.26. The total length of on-site access tracks to be constructed for the Proposed Varied Development will be decreased to approximately 10.3 km. This is a total difference of 0.7 km in comparison to the Consented Development, amended to accommodate the proposed turbine relocations and removals. The length of newly constructed access track will reduce from approximately 9 km to 7.7 km, representing a reduction of 1.3 km, due to increased utilisation of existing forestry tracks.

4.2.27. The Proposed Varied Development will include approximately 7.7 km of new access tracks and 2.6 km of existing tracks which will be upgraded. All new access tracks have been designed to avoid sensitive environmental receptors. They will be formed largely of locally sourced stone and from the on-site borrow pits (see 'Borrow Pits' section below) and will have a typical running width of 6 m, wider on bends and at junctions, plus drainage provision in verges. An indicative access track cross section is shown in **Figure 4.7**.

4.2.28. Where proposed access tracks cross areas of deep peat, floated track construction is proposed, to avoid the requirement for excavation of peat. It is proposed that approximately 0.2 km of the new access track would be floated over deep peat if, following detailed site investigations, deep peat cannot be avoided by micro-siting. Floated track construction would involve placing of a geotextile membrane on existing topsoil and vegetation followed by aggregate layers. Floating roads would be designed to ensure suitability for site traffic during construction and operation.

4.2.29. The total length of roads for the Proposed Varied Development is approximately 10.3 km and can be sub-divided into the categories detailed in **Table 4.3**. New, floated and existing access tracks are shown in **Figure 4.8**.

Table 4.3 – Access Track Composition

Type	Approximate Length	Percentage of Total
Existing track, to be upgraded / widened where necessary	2.6 km	25%
New cut track	7.5 km	73%
New floated track	0.2 km	2%

4.2.30. The proposed alignment of access tracks, developed from the Consented Development's track design and refined through an iterative process based on the digital terrain model and site surveys, has sought to:

- minimise the overall track length;
- minimise the variation of the vertical alignment of the tracks;
- minimise the number of dead ends within the layout; and
- avoid or minimise incursion into identified constraints, such as watercourses, areas of deeper and potentially unstable peat, priority habitats, and steep slopes.

4.2.31. A Transport Assessment (**Appendix 15.1**) has been undertaken in support of the Section 36C Application for the Proposed Varied Development, and this provides detail on access routes to the site for construction vehicles and provides an estimate of trip generation during construction. The Transport Assessment includes a review of the proposed route, construction traffic impacts, and an abnormal load route review. Traffic and transport effects are discussed further in **Chapter 15: Traffic and Transport**.

4.2.32. As with the Consented Development, a number of roadworks on the B729 are required to facilitate turbine delivery for the Proposed Varied Development. An assessment of the B729 offsite roadworks is included within **Appendix 15.2**, based on the Abnormal Load Route Assessment (ALRA) presented within **Chapter 15**.

4.2.33. Prior to construction, any required improvements to public roads will be undertaken and appropriate highway safety measures will be agreed with Dumfries and Galloway Council (DGC) and Transport Scotland, with necessary signage or traffic control measures implemented throughout the construction phase on the agreed basis.

Watercourse Crossings

4.2.34. Whilst attempts have been made to avoid watercourse crossings, it has been necessary for the on-site access tracks to cross local watercourses to reach the proposed wind turbine locations. Seven watercourse crossings have been included in the project design, a decrease of three from the Consented Development. Two of these crossings are existing forestry access track watercourse crossings and five are new proposed watercourses crossings.

4.2.35. In addition to the requirement for new watercourse crossings, one of the existing watercourse crossings at the entrance to the site is to be removed to allow diversion of the minor watercourse around the proposed access junction. A new watercourse crossing under the B729 public road is proposed to allow the continuation of the water drainage.

4.2.36. **Table 4.4** below summarises the new watercourse crossings that will be required in support of the Proposed Varied Development, and these are shown on **Figure 13.2a-b**. Further details of the water crossings (existing and proposed) are included in **Appendix 13.2** and discussed within **Chapter 13: Hydrology and Hydrogeology**.

4.2.37. It is likely that three types of watercourse crossing will be utilised for the Proposed Varied Development: bridges, box culverts and pipe culverts. The use of these types of

watercourse crossings will be determined individually based on site-specific assessment. Typical culvert details are illustrated on **Figure 4.9**, and a typical bridge plan is provided as **Figure 4.10**.

4.2.38. All watercourse crossings would be designed in accordance with the Scottish Environment Protection Agency (SEPA) Good Practice Guide for the Construction of River Crossings, and where culverts are required, they would be designed in accordance with the CIRIA Culvert Design and Operation Guide (C689). All river crossings will be designed to accommodate a 1-in-200-year flood event and will be tailored to meet the specific requirements and constraints of each location.

4.2.39. It is proposed that the final detailed design for all watercourse crossings, including any potential upgrades or amendments required to existing crossings, will be addressed through an appropriately worded condition and in accordance with the requirements of the Environmental Authorisations (Scotland) Regulations 2018.

Table 4.4 Proposed Watercourse Crossing ID., Location and Type

ID	Easting	Northing	Watercourse	Proposed Crossing Type
WC1	262550	591183	Unnamed watercourse	Existing Crossing to be removed
WC2	262568	591223	Unnamed watercourse	New crossing for diversion and to replace WC1
WC3	262393	591782	Dry Burn Tributary	Existing culvert crossing
WC4	262523	592253	Dry Burn	Existing crossing
WC5	262207	594347	Craigengillan Burn tributary	New crossing
WC6	262119	594494	Craigengillan Burn Tributary	New crossing
WC7	262233	594497	Craigengillan Burn	New crossing
WC8	262583	594874	Goat Strand	New crossing

Temporary Construction Compound

4.2.40. One secure construction and material storage compound will be required during the construction period. The location of this compound is shown in **Figure 4.1**. The compound will comprise the same area as that of the Consented Development at approximately 100 m x 50 m (5,000 m^2) and remains in a very similar location (moved approximately 65 m south and rotated 90 degrees anticlockwise). An indicative layout of a typical construction compound is provided in **Figure 4.11**.

4.2.41. The compound area will house temporary portable cabin structures to be used as the main site office and welfare facilities, including toilets, clothes drying and kitchen, with the provision for sealed waste storage and removal. The compound will also be used for the storage and assembly of wind turbine components, parking for vehicles, containerised storage for tools and small parts, and storage for cables, oil and fuel as required.

4.2.42. A concrete batching plant will be located within or adjoining the construction compound and will comprise aggregate and cement hoppers, water bowsers/tanks, a mixer and a control cubicle. Aggregates and sand would be stockpiled and contained adjacent to the plant. An indicative batching plant compound is shown in **Figure 4.12**.

4.2.43. The proposed location of the compound is on firm ground and avoids habitats of highest sensitivity. Prior to commencing construction work, a detailed appraisal of the area will be required, including an assessment by the project ecologist and also trial pits and/or boreholes to confirm the nature of the sub-strata.

4.2.44. The detailed location, size and engineering properties of the construction compound will be confirmed prior to the start of construction, after the turbine supplier and model have been confirmed.

4.2.45. On completion of construction works, it is proposed that all temporary structures be removed, and the compound area be restored.

Substation, BESS and Cabling

4.2.46. The electricity substation and BESS compound would comprise an 'L' shaped, fenced hardstanding area with a maximum footprint of approximately 10,890 $m^{2.}$ This compound would house electrical equipment (including 33 kilovolts [kV] / 132 kV step-up transformers and ancillary equipment suitable for a transmission connection to the electricity grid system), the BESS facility and three single storey control buildings. These include one ScottishPower Control Building measuring approximately 19 m x 13 m x 4.7 m and a Wind Farm Operator's Control Building measuring approximately 16 m x 11 m x 6.3 m (unchanged from the Consented Development). A Battery Storage Control Building measuring approximately 5.7 m x 20.6 m x 5 m has also been incorporated into the revised design of the BESS facility. The control buildings would house switchgear, metering, protection and control equipment as well as welfare facilities.

4.2.47. The BESS facility will efficiently store electricity generated from the wind turbines for future use when the National Grid requires it. The BESS would have an approximate maximum electricity storage capacity of 50 MW, an increase of 44 MW when compared to the Consented Development. The location of the proposed BESS facility remains the same as the Consented Development, however the overall footprint has increased to approximately 8,100 m^2 (an increase of 6,900 m^2 compared to the Consented Development's BESS facility), to accommodate the proposed larger capacity. The BESS facility will include containerised battery units, switchgear and transformers units, storage containers and a water storage tank. The indicative height of the battery units themselves would be approximately 5 m, unchanged from the Consented Development.

4.2.48. **Figures 4.13a-b** show the indicative layout and elevation of the substation compound, BESS facility and control buildings. The proposed location of the compound control building and main site compound is shown in **Figure 4.1**. **Figures 4.14 – 4.17** show the indicative elevations of the control buildings and BESS facility.

4.2.49. The substation and BESS compound will include access tracks and car parking (refer to **Figure 4.13**) and will be surrounded by a security fence up to 2.5 m in height and CCTV will be deployed as a security measure (as detailed in **Figure 4.18**). The CCTV will be mounted on posts each measuring up to 4.5 m in height.

4.2.50. Technology continues to develop in the field of energy storage, therefore details of the final design of all components of the substation and BESS compound are proposed to be secured through an appropriately worded condition. The design would conform with relevant safety standards and requirements for the selected technology.

4.2.51. Wind turbines typically produce electricity at 690 volts (V), which is normally stepped-up to 33 kV via the turbine transformers. The electrical power produced by the individual turbines will be fed to the on-site substation and BESS facility via underground cables. The design of the substation and control room building is relatively flexible and where appropriate may be clad in local materials to match in with the surroundings.

4.2.52. The wind farm array cables on-site will be laid in trenches, typically up to 1.5 m deep and up to 1.2 m wide, laid on a sand bed and backfilled using suitably graded material. The trenches will also carry earthing and communication cables for the operation of the Proposed Varied Development. Cabling will mainly be located adjacent to the access tracks within the wind farm itself. An indicative cable trench is shown in **Figure 4.19.**

Borrow Pits

4.2.53. To minimise the volume of imported material brought onto the site and any associated environmental impact, borrow pits located within the site will be used to source stone for access track and compound construction. A borrow pit is an area where material has been excavated for use at another location.

4.2.54. Two borrow pit search areas have been identified within the Proposed Varied Development boundary and remain the same as that for the Consented Development (refer to **Figure 4.1**). These search areas were identified as part of the Consented Development's design iteration as areas anticipated to have suitable bedrock geology (based on British Geological Survey mapping), shallow peat depth and suitable topography, sited to minimise visual, hydrological and ecological impacts (refer to the 2018 EIA Report for further detail). Proposed borrow working drawings are shown in **Figures 4.20 - 4.21**.

4.2.55. Detailed site investigations prior to construction will be carried out to further confirm the rock type, rock characteristics and suitability, as well as potential volumes to be extracted from the search area. The final borrow pit(s) identified during the geotechnical evaluation will be defined within the Construction Environmental Management Plan (CEMP) (refer to

Appendix 4.1 Outline CEMP). The pollution control measures to be implemented during usage of the borrow pit(s) and its reinstatement will also be covered within this document.

4.2.56. The borrow pits will require the use of plant to both win and crush the resulting rock to the required grading. It is anticipated that rock will be extracted by breakers and other relevant methods that may be required. Noise associated with stone extraction is discussed further in **Chapter 14: Noise**.

4.2.57. Environmental considerations have influenced the location of the borrow pit search areas to minimise the effect on ecology, hydrology and landscape, and to allow successful reinstatement measures to be put in place as appropriate. Following construction, the borrow pit(s) will be restored and reinstated to agreed profiles.

Anemometer Mast

4.2.58. The Consented Development included for an operational phase met mast located within the north-western part of the site. There is no longer a requirement for an anemometer mast as part of the Proposed Varied Development and as such a variation is being sought to remove this from the associated infrastructure.

4.3. Grid Connection

4.3.1. The proposed grid connection remains unchanged from the Consented Development. It is likely that the Proposed Varied Development would connect to the national transmission system in the vicinity of Holm Hill, near the A713 approximately 7 km north-west of the site, via a new trident wood-pole mounted 132 kV overhead line operated by ScottishPower Energy Networks (SPEN) to connect Lorg Wind Farm.

4.3.2. The Lorg Wind Farm Grid Connection extends approximately 17.5 km between Lorg Wind Farm and the proposed Holm Hill substation, intersecting the central part of the Proposed Varied Development site. A Section 37 application seeking consent for the new 132 kV line was submitted to the Energy Consents Unit (ECU) in November 2025 (ECU Ref: ECU00001789) by SPEN. The EIA undertaken in support of the application concludes that, following mitigation, likely significant residual effects are limited to Landscape and Visual effects only. These comprise temporary significant landscape and visual effects during construction, with a single significant operational visual effect at Craigengillan; all other landscape and visual effects are non-significant post-construction. The assessment also identifies significant cumulative landscape and visual effects, arising from the Lorg Wind Farm Grid Connection in combination with other committed developments (including the Consented Development). This application is currently under determination at the time of writing (May 2026).

4.3.3. A short underground connection of approximately 200 m would link the Proposed Varied Development substation to the Lorg Wind Farm Grid Connection. This connection would be subject to a separate consenting process by SPEN. A proportionate assessment of the likely significant environmental effects resulting from this connection in combination with

the Proposed Varied Development are assessed in **Appendix 4.2**. The final routing and design of this connection would be determined by SPEN.

4.3.4. The potential for cumulative effects arising from the Proposed Varied Development and the Lorg Wind Farm Grid Connection (the latter which is subject to a live Section 37 application as described above) has been considered, where relevant, within each technical assessment chapter (**Chapters 7–18**).

4.3.5. The Proposed Varied Development presently has an anticipated grid connection date of 2030.

4.4. Construction

4.4.1. It is anticipated that the Proposed Varied Development's construction phase will last approximately 21 months which allows for the commencement of off-site access remedial works at the start of the programme and a commissioning and testing period at the end of the programme. The main construction phase which will be the most onerous in terms of construction activities will last approximately 16 months, to commence in 2028. Construction would include the same principal activities as set out for the Consented Development:

- construction of access junction;
- site clearance works including tree felling;
- construction of borrow workings and sourcing of rock;
- formation of site compound(s) including hardstanding and temporary site office facilities;
- construction of new access tracks and passing places (as required), interlinking the turbine locations and substation compound;
- construction and upgrade of culverts under roads to facilitate drainage and maintain existing hydrology;
- construction of bridges where required;
- construction of crane hardstanding areas;
- construction of turbine foundations;
- construction of site control building and associated substation;
- construction and installation of battery storage facility;
- excavation of trenches and cable laying adjacent to site roads;
- connection of on-site distribution and signal cables;

- remedial works to the public highway to accommodate turbine deliveries;
- delivery and erection of wind turbines;
- commissioning of site equipment;
- site restoration; and
- habitat restoration, enhancement and management works (which will continue into the operational period).

4.4.2. An indicative construction programme outlining key stages is provided in **Table 4.5** below.

Table 4.5 – Indicative Construction Programme

Task	Year 1 (quarters)				Year 2 (quarters)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Mobilisation, Felling and Remedial Works								
Access & Site Tracks								
Foundations								
On-site Cabling								
Substation & BESS								
Crane Hardstanding								
Turbine Delivery								
Turbine Erection								
Commissioning & Testing								
Site Reinstatement								

4.4.3. Normal construction hours will be between 07:00 and 19:00 Monday to Friday and 07:00 and 13:00 on Saturdays. These times have been chosen to minimise disturbance to local residents. It must, however, be noted that out of necessity due to weather conditions and health and safety requirements, some generally quiet activities, for example abnormal load deliveries (which are controlled by Police Scotland) and the lifting of the turbine components, may occur outside the specified hours stated. Any construction outwith these hours will be in line with the noise limits as assessed in **Chapter 14** and advance warning of any works outwith the agreed working hours will be provided to DGC and local residents.

Summary of Development Area

4.4.4. **Table 4.6** below summarises the approximate areas for which aggregate material will be required for each of the main infrastructure elements described in **Section 4.2**. The transport assessment in **Chapter 15** has been prepared on a "worst-case" basis that all construction aggregate will be imported to site. However, if base materials (at least) are won on-site this would result in a reduction in delivery volumes and traffic. Further detail on traffic volumes associated with the importation of construction materials is provided in **Chapter 15**.

Table 4.6 – Proposed Varied Development Areas

Infrastructure	Area (m^2)
Site Tracks	51,500 m^2
Crane Hardstanding	35,222 m^2
Construction Compound	5,000 m^2
Substation and BESS Compound	10,890 m^2

4.4.5. The total development land take (footprint) for all infrastructure elements of the Proposed Varied Development (excluding earthworks) is 229,466 m^2. In comparison, the Consented Development's footprint (excluding earthworks) is 158,300 m^2. The total infrastructure footprint of the Proposed Varied Development, including associated earthworks, is outlined in detail within the outline Peat Management Plan included as **Appendix 12.2**.

Construction Materials

4.4.6. The main materials likely to be required for the construction of the access tracks, turbine and substation foundations, and hardstanding areas, include:

- crushed stone;
- geotextile;

- cement;
- sand;
- concrete;
- steel reinforcement; and
- electrical cable.

4.4.7. The construction areas will be subject to excavations, initially by stripping back the soil from the area to be excavated. This soil will typically be stored separately either in a mound adjacent to the excavation area for backfill, if required, or stored at a designated area on-site for further use or reinstatement of temporary works areas. The handling of soils will be undertaken in accordance with best practice techniques, with particular consideration given to appropriate handling and storage of peat soils (refer to outline Peat Management Plan presented in **Appendix 12.2**).

4.4.8. For the purposes of the transport assessment, it has been assumed that concrete will be batched on-site within the identified concrete batching areas and materials will be delivered to site on a spread programme.

4.4.9. Should surface water run-off or groundwater enter the excavation during construction of the turbine foundations, appropriate pumping measures away from watercourses will be implemented to ensure the works are safely carried out and the excavation is sufficiently dry to allow concrete placement. Once the concrete is cast, the excavated material will be used for backfill and compacted to the required design density. Once this backfill is completed, the crane hardstanding areas will be constructed.

4.4.10. The turbines will be erected using a large mobile crane or crawler crane, positioned on the hardstanding adjacent to the turbine base. A smaller tail crane will be positioned adjacent to the delivery position of the turbine components. The two cranes will lift the tower sections and blades into their assembly positions, and the main crane will lift the tower sections, nacelle and blades into their operational positions.

4.4.11. As soon as practical, once installation is complete, the immediate construction area will be restored to its original profile, although the crane hardstandings will be retained for future maintenance. The soils will be replaced and reseeded where appropriate and as advised by the on-site Environmental Clerk of Works (ECoW). Any surplus soils will be used to restore track edges after construction. This progressive reinstatement has been found to assist with re-establishment of the local habitats as it minimises the time soils are in storage.

4.5. Environmental Management

Construction Environmental Management Plan (CEMP)

4.5.1. As part of the construction contract, the contractor responsible for undertaking the construction and/or decommissioning works (the Contractor) shall sign up to produce, and adhere to, a CEMP. The CEMP shall be developed in accordance with 'Good Practice During Wind Farm Construction' (NatureScot et al., 2024).

4.5.2. The CEMP shall describe how the Applicant will ensure suitable management of the following environmental issues during construction of the Proposed Varied Development:

- noise and vibration;
- dust and air pollution;
- surface and ground water;
- ecology (including protection of habitats and species);
- agriculture (including protection of livestock and land);
- cultural heritage;
- waste (construction and domestic);
- pollution incidence response (for both land and water); and
- site operations (including maintenance of the construction compound, working hours and safety of the public).

4.5.3. The CEMP is anticipated to include or cross-reference to, the following documentation:

- Construction Methodology Statement (CMS);
- Traffic Management Plan (TMP);
- Pollution Prevention Plan (PPP);
- Site Waste Management Plan (SWMP);
- Drainage Management Plan (DMP);
- Peat Management Plan (PMP) (refer to an outline plan in **Appendix 12.2**); and
- Habitat Enhancement and Management Plan (HEMP) (refer to an outline plan in **Appendix 9.8**).

4.5.4. The Contractor and/or Applicant shall consult with DGC, SEPA, NatureScot and Historic Environment Scotland (HES) on relevant aspects of the CEMP. The Contractor shall amend and improve the CEMP as required throughout the construction and decommissioning period.

4.5.5. The CEMP shall contain details of all environmental mitigation required during construction and details on how the Contractor will implement and monitor this mitigation. The CEMP will also contain details on how the Contractor will liaise with the public and landowners and how queries or complaints will be responded to.

4.5.6. Specific requirements of the CEMP for each of the environmental topics assessed within the EIA are provided in the relevant EIA Report chapters and an outline CEMP is provided in **Appendix 4.1**.

Drainage

4.5.7. The need for drainage on the access track network would be considered for all parts of the track network separately, since slope and wetness vary considerably across the site. Drainage methods will adapt to different track construction types, ensuring minimal environmental impact and maintaining natural drainage paths. In flat areas, drainage is generally unnecessary as rainfall can infiltrate the ground. On slopes, lateral drainage is installed on the upslope side to prevent pooling and rapid runoff, with cross-drains allowing water to pass across the track and re-infiltrate downslope. Excavated tracks will require drainage ditches to manage water flow and prevent sediment and pollutants from entering watercourses, using filters and silt traps. Check dams in ditches help trap silt and direct water into cross drains.

4.5.8. A detailed drainage design will be undertaken and agreed with the planning authority, in consultation with SEPA, for approval prior to construction.

Pollution Prevention & Health and Safety

4.5.9. Prior to commencement of construction activities, a pollution prevention strategy, contained within a CEMP, will be agreed with the SEPA to ensure that appropriate measures are put in place to protect watercourses and the surrounding environment.

4.5.10. As with any development, during the construction stage there is the potential for threats to the quality of the water environment in waterbodies, watercourses and local ditches. These mostly arise from poor site practice so careful attention will be paid to the appropriate guidance and policies to reduce the potential for these to occur.

4.5.11. Any fuel or oil held on-site will only be of an amount sufficient for the plant required. This will be stored in a bunded area to prevent pollution in the event of a spillage. There will be no long-term storage of lubricants or petrochemical products on-site at the Proposed Varied Development.

4.5.12. High standards of health and safety will be established and maintained. At all times, all activities will be undertaken in a manner compliant with applicable health and safety legislation and with relevant good practice, as defined under applicable statutory approved codes of practice and guidance.

4.5.13. Further details of site-specific storage and management of fuel and oil and protection of watercourses during construction are presented in **Chapter 13** of this EIA Report.

Traffic & Transportation

4.5.14. A detailed Transport Assessment has been undertaken which provides details regarding transport and access to the site (refer to **Chapter 15**).

4.5.15. Traffic associated with the construction and maintenance of the Proposed Varied Development falls into two main categories, namely Abnormal Indivisible Loads (AIL) and Construction / Maintenance Loads. The abnormal loads are those that will require an escort, either by private contractor or by police escort. Construction / maintenance loads are those that do not require any special escort or permissions and are only influenced by normal traffic regulations.

4.5.16. The Applicant will ensure that the vehicles will be routed as agreed with DGC, Transport Scotland and Police Scotland, to minimise disruption and disturbance to local residents and road users. Further details regarding transport and access can be found in **Chapter 15** of this EIA Report.

Pre-construction Surveys

4.5.17. Detailed surveys have informed the design process of the Proposed Varied Development. However, certain design elements are dependent on turbine model and manufacturer, therefore detailed construction details will be decided once the turbine has been selected.

4.5.18. Pre-construction surveys will be undertaken to update the ecological and ornithological baseline and to perform detailed geotechnical ground surveys, further details of these are provided in the relevant technical chapters.

4.5.19. The Applicant will engage an ECoW on-site during the construction phase. The ECoW will be responsible for pre-construction ecology surveys and will monitor the construction process on-site to provide advice and ensure that the measures within the CEMP are followed.

4.6. Operation and Maintenance

4.6.1. The lifetime of the Proposed Varied Development is envisaged to be 40 years from the final commissioning to commencement of decommissioning. This is a proposed increase of ten years from that of the Consented Development.

4.6.2. The Proposed Varied Development would be maintained throughout its operational life by a service team. The service team would comprise operation management, operations technicians and support functions undertaking the scheduled and unscheduled maintenance throughout the year. This team would either be employed directly by the developer or by the turbine manufacturer. Management of the wind farm would typically

include turbine maintenance, health and safety inspections and civil maintenance of tracks, drainage and buildings. Turbine maintenance includes the following:

- Civil maintenance of tracks and drainage;
- Scheduled routine maintenance and servicing;
- Unplanned maintenance or call outs;
- High Voltage (HV) and electrical maintenance; and
- Blade inspections.

4.6.3. In the unlikely event that a major turbine component requires replacement, vehicles will use the new access tracks and crane pads, which will be retained during the operational phase to allow access.

4.6.4. Health and safety will be controlled as set out in the construction phase.

Operation Environmental Management Plan

4.6.5. The Applicant will implement an Operation Environmental Management Plan (OEMP). Similar to the CEMP, the OEMP will set out the mitigation measures described in the EIA Report, and how the Applicant will manage and monitor environmental effects throughout the operation of the Proposed Varied Development. The OEMP will also be developed in consultation with DGC, SEPA, NatureScot and HES where relevant.

Aviation Lighting

4.6.6. As the turbine structures are over 150 m high, there is a statutory requirement to install visible aviation lighting on the turbines. A proposed lighting scheme has been agreed with the Civil Aviation Authority (CAA) and Ministry of Defence (MoD). The specification of the lighting proposed is provided in **Chapter 16: Aviation,** and **Appendix 16.1.**

4.6.7. Six of the 11 turbines will be installed with medium intensity lights (minimum 2000 candela). These are turbines T1, T4, T5, T6, T7 and T11. A second back up light would be installed which would only function in the case of failure of the operating light. The lights will be switched on between the start of Evening Civil Twilight and the end of Morning Civil Twilight in accordance with the UK Almanac.

4.6.8. The Applicant has agreed with the CAA that there is no requirement for low intensity lights on the turbine towers and these would not be installed.

4.6.9. Although the lights could have an intensity of 2000 candela at horizontal and slightly above, the lights will be at reduced intensity at different angles above and below the horizontal. The reduction in intensity at different elevation angles will be substantial, for

example, according to the applicable guidance[1], at an angle of -1 degree the minimum intensity reduces to 750 candela and at -10 degrees the recommended maximum intensity is only 75 candela. Perceived light intensity also diminishes with distance.

4.6.10. In addition, CAA guidance[3] allows lights to operate in a lower intensity mode *"if the horizontal meteorological visibility in all directions from every wind turbine generator in a group is more than 5km."* In these conditions the 2000 candela lights could be operated at *"not less than 10% of the minimum peak intensity specified for a light of this type"* (i.e. 200 candela). Visibility meters would be installed on T1, T6 and T11 to measure the prevailing atmospheric conditions and visibility range.

4.7. Decommissioning

4.7.1. Consent is being sought for an operational lifespan of 40 years from the date of commissioning the turbines. This is an increase of ten years in comparison to the Consented Development. For the purpose of the EIA Report, it is assumed that the Proposed Varied Development will be decommissioned unless further consents to extend operational life are sought.

4.7.2. It is expected that decommissioning will take approximately eight months. The environmental effects of decommissioning are considered to be similar to those during construction, excluding the loss of habitat which will have already occurred under construction. Decommissioning is anticipated to be a much shorter process than the approximate 21 month construction period.

4.7.3. Prior to decommissioning, a Decommissioning Environmental Management Plan (DEMP) will be produced to reflect then current legislation and policy and will be agreed with the relevant statutory authorities.

4.7.4. During decommissioning vehicles will access the site by the same route used for delivery and construction of the Proposed Varied Development.

4.7.5. It is anticipated that certain components of the turbines will be dismantled and removed from site for disposal and/or recycling as appropriate and in accordance with regulations in place at the time. It is proposed to leave the buried portion of the foundations of the turbines in situ on decommissioning. This is considered to have less impact on the hydrological system which will have established itself during the lifetime of the wind farm than complete removal of the foundations.

4.8. Climate Change and Carbon Considerations

4.8.1. Increasing atmospheric concentrations of greenhouse gases (GHGs), including carbon dioxide (CO_2) (also referred to as carbon emissions) are resulting in climate change. A

[1] International Civil Aviation Organisation (ICAO) Annex 14 Table 6.3 Medium Intensity Lighting Specifications.

major contributor to this increase in GHG emissions is the burning of fossil fuels. With concern growing over climate change, reducing its cause is of utmost importance. The replacement of traditional fossil fuel power generation with renewable energy sources provides high potential for the reduction of GHG emissions. This is reflected in UK and Scottish Government climate change and renewable energy policy and commitments. The relevant aspects of such policies are summarised in **Chapter 5: Planning and Energy Policy Context**.

Energy Generation

4.8.2. Whilst the Proposed Varied Development will reduce carbon emissions by replacing the need to burn fossil fuels for power, carbon emissions will result from the component manufacturing, transportation and installation processes associated with the Proposed Varied Development. There is also the potential for carbon fixers and sinks to be lost through the clearing of vegetation and excavation of peat during construction. There must, therefore, be a sufficient balance between the carbon reduction associated with renewable energy development and that which is produced through construction and fabrication processes and lost through site preparation (see Carbon Calculator in **Chapter 18: Climate Change and Carbon Balance**).

4.8.3. The combined electrical installed capacity from the wind turbine generators within the Proposed Varied Development is currently estimated to be approximately 77 MW, with the exact capacity depending on the model and type of turbine selected. Based on the Proposed Varied Development's location and estimated capacity factor, the Applicant has calculated the Estimated Energy Yield (P50) of annual indicative total electricity wind turbine output for the site, which would be approximately 241,340 megawatt-hours (MWh), per annum. The Proposed Varied Development would generate enough power to supply approximately 76,860 average Scottish households[2].

Carbon Emission Savings

4.8.4. Whilst the wind turbines will reduce carbon emissions by replacing the need to burn fossil fuels for power, there is the potential for carbon fixers and sinks to be lost through the clearing of vegetation and peat for construction. There must therefore be a sufficient balance between the carbon reduced and that which is produced and lost through associated processes.

4.8.5. The Scottish Government's online Carbon Calculator Tool V1.8.1 has been completed for the Proposed Varied Development. Input parameters are based on the proposed site design, infrastructure dimensions, results from peat depth surveys and laboratory testing of peat, and other information gained from site survey work, desk study and, where applicable, assumptions relating to groundwater, drainage, and habitat regeneration. See **Chapter 18.**

[2] Based on average annual Scottish household electricity consumption of 3.140 kWh (DESNZ, 2025).

4.8.6. The output from the Carbon Calculator indicates the expected total carbon dioxide loss for the Proposed Varied Development (from manufacture of turbines, construction, decommissioning, and carbon sink losses, also taking account of gains due to restoration of borrow bits) is nearly 180,000 tonnes of carbon dioxide (tCO_2 eq). Input and output parameters are detailed in **Chapter 18**.

4.8.7. Scottish Government guidance on wind farm carbon savings (Scottish Government, 2018), states: *"carbon emission savings from wind farms should be calculated using the fossil fuel sourced grid mix as the counterfactual, rather than the grid mix."* Taking account of the expected total CO_2 loss from the Carbon Calculator result, the Proposed Varied Development would be expected to result in a saving of approximately 113,017 tonnes of carbon dioxide (tCO_2) per annum, meaning a total of over 4.5 million tonnes over the 40-year operational lifetime of the Proposed Varied Development, through displacement of carbon-emitting generation.

4.8.8. The expected carbon payback time of the Proposed Varied Development is 1.5 years. This is the period of time for which a wind farm needs to be in operation before it has, by displacing generation from fossil-fuelled power stations, avoided as much carbon dioxide as was released in its lifecycle.

4.8.9. As recommended in current guidance estimated savings are for replacement of fossil fuel electricity generation but, while this could be the case in the short term, it is not the most probable scenario in the longer-term. The grid-mix of electricity generation represents the overall carbon emissions from the grid per unit of electricity and includes nuclear and renewables as well as fossil fuels. Based on the grid-mix results, the Proposed Varied Development is expected to result in a minimum saving of approximately 44,652 tCO_2 per annum with an expected carbon payback time of 3.7 years.

4.9. Public Access

4.9.1. Access to the site is to be taken from a newly provided junction off the B729. There are no core paths within the site boundary, however members of the public have wider statutory rights of responsible access on and over most land under the provisions of the Land Reform (Scotland) Act 2003.

4.9.2. The Applicant is committed to keeping any impacts on on-site access tracks/paths to a minimum as detailed in Section 8 of the NatureScot guidance document Good Practice During Windfarm Construction (NatureScot, 2024), which suggests that during construction there should be a proportionate approach taken to site management. Access restrictions will therefore be kept to the minimum area and minimum duration possible and focussed on where the actual risks are present. There will be no proposed closures or diversions of any of the existing paths during the construction periods of the Proposed Varied Development. However, access rights to certain areas of the site may be temporarily restricted where construction work is being carried out, in accordance with the Land Reform (Scotland) Act 2003.

4.9.3. There are several core paths and heritage trails in the vicinity of the site, the closest of which is the Southern Upland Way, approximately 740 m from the site boundary at its closest point. Further core paths and heritage trails in the vicinity include Stroanfreggan Heritage Trail, Dundeugh Hill, Forest Lodge Forest Walks, and Garryhorn Mine Paths. Access will not be restricted to any of these paths during construction or operation.

4.10. Community Benefit

4.10.1. Based on a total installed wind energy capacity of 77 MW and a community benefit contribution of £5,000 per MW of installed wind energy capacity, the Proposed Varied Development could generate up to £385,000 per annum to support local groups and projects in the areas surrounding the site. This marks an increase of £34,000 per annum from the Consented Development. With the proposed increase of operational lifetime of the Proposed Varied Development from 30 to 40 years, this would equate to an additional £4.87 million over the Proposed Varied Development's lifetime compared to the Consented Development.

4.10.2. Further information on the Proposed Varied Development's socio-economic benefits can be found in the standalone Socio-economic Impact Assessment Report.

4.11. Biodiversity Enhancement

4.11.1. A HEMP will be implemented during the life of the Proposed Varied Development which will offer opportunities for interrelated environmental enhancements at the site with respect to peat, biodiversity and forestry. Key features of this plan include restoring degraded blanket bog habitat by removing conifer plantations and implementing measures such as furrow blocking and ground smoothing, creating and managing dry heath and acid grassland habitats, establishing native broadleaved woodland, enhancing riparian zones to improve connectivity, and installing fencing to protect young trees.

4.11.2. An outline HEMP is included as **Appendix 9.8** which provides further detail on these proposed management measures. This represents a significant increase in proposed biodiversity enhancement measures compared to that associated with the Consented Development.

4.12. Forestry

4.12.1. As detailed in **Chapter 2**, the site largely consists of commercial sitka spruce plantation, with some smaller areas of native broadleaf planting, and the remaining elements comprising open un-plantable land beyond the woodland edge.

4.12.2. As with the Consented Development, areas of forestry would require to be cleared for the construction and operation of the Proposed Varied Development. Forestry proposals have been developed to identify areas of forest to be removed, including habitat management works, and identify those areas which may or may not be planted as part of the Proposed Varied Development (refer to **Chapter 7: Forestry**).

4.12.3. The Proposed Varied Development's Felling Plan (**Figure 7.4**) shows which parts of the forest would be felled as a result of the Proposed Varied Development and when this felling would take place. In this case considering technical and environmental constraints a 2 ha (85 m radius) keyhole was adopted around each turbine location within woodland for construction, operation and environmental mitigation, with 10 m buffers for other infrastructure and 30 m corridor for road lines. No additional felling would be required for wind yield or turbine performance purposes.

4.12.4. All felling for the Proposed Varied Development would take place during the construction period, there would be no further development felling during the operational period. In total 226.1 ha would be felled due to the construction of the Proposed Varied Development. Where possible timber crops would be felled to produce timber for the markets. Forestry waste arising from the felling would be treated in a manner which produces the best environmental outcome taking into account the guidance and conditions prevailing at the time of the crop clearance.

4.12.5. The Proposed Varied Development Restocking Plan (**Figure 7.5**) shows which woodlands would be restocked and with which species. No replanting would be carried out on the areas to be felled for the Proposed Varied Development's permanent infrastructure or for habitat management (refer to **Appendix 9.8**), forest management or forest design purposes. As a result, there would be a net loss of woodland area of 119.9 ha (66.6 ha of this loss comprising forest to bog restoration). In order to comply with the criteria of the Scottish Government's Control of Woodland Removal Policy, off-site compensation planting would be required.

4.13. Land Management

4.13.1. It is anticipated that long term land management practices would continue unaffected by the Proposed Varied Development with normal forestry practices continuing unimpeded. On-site access tracks could be utilised by transport vehicles, and re-planting can commence soon after turbine construction.

4.14. Summary

4.14.1. This Chapter provides details of the Proposed Varied Development and a summary of the associated infrastructure alongside a comparison of the Consented Development. A description of the likely activities to occur during the construction, operation and decommissioning phases is also provided.

References

NatureScot et al. (2024). Good Practice During Wind Farm Construction.
Available at: https://www.nature.scot/doc/good-practice-during-wind-farm-construction

Scottish Government. (2018.) The Environmental Authorisations (Scotland) Regulations 2018.
Available at: https://www.legislation.gov.uk/ssi/2018/219/contents/made

Abbreviations

Abbreviations	Definition
AIL	Abnormal Indivisible Loads
CAA	Civil Aviation Authority
CEMP	Construction Environmental Management Plan
CO_2	Carbon Dioxide
DEMP	Decommissioning Environmental Management Plan
DGC	Dumfries & Galloway Council
DMP	Drainage Management Plan
EIA	Environmental Impact Assessment
ECoW	Environmental Clerk of Works
GHGs	Greenhouse Gases
HES	Historic Environment Scotland
HEMP	Habitat Enhancement and Management Plan
HV	High Voltage
kV	kilovolts
MOD	Ministry of Defence
MW	Megawatt
MWh	Megawatt hour
OEMP	Operation Environmental Management Plan
PPP	Pollution Prevention Plan
SEPA	Scottish Environmental Protection Agency

SWMP	Site Waste Management Plan
TMP	Traffic Management Plan