Chapter 3
Proposed Development

SCOTTISHPOWER RENEWABLES

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3.1 Executive summary

1. SPR intend to construct a renewable energy development comprising advanced renewable technologies. The proposed Development is a Renewable Energy Development that intends to make use of available renewable energy technologies to maximise and optimise the renewable energy potential of the Site. The proposed Development comprises 19 three-bladed horizontal axis wind turbines, 16 up to 149.9 m tip height and 3 up to 135 m tip height, with a combined rated output of around 114 megawatts (MW) and around 20 MW of ground mounted solar arrays producing a combined output of around 134 MW or 360 to 380 GWh of electricity annually. Around 38 MW of battery storage would also be installed to store energy and so provide flexible balance of energy and the delivery of the full potential of energy to meet the demands of the national grid.

2. As highlighted in earlier chapters, the proposed Development supports the very important need of reducing carbon dioxide emissions by replacing forms of power generation which are burning fossil fuels and contributing to global warming. The UK and Scottish governments have made this reduction need a firm commitment by recently making new targets of there being 'net zero' carbon dioxide emissions with the Scottish Government committing to do this by 2045. This proposed Development supports this aim.

3. SPR is making a commitment to operate this proposed Development for a long period of time. It is, therefore, seeking consent for development in perpetuity in response to the ongoing and long term need for renewable energy sources to meet our future energy needs and to meet the carbon dioxide reduction 2050 target of the UK government and the 2045 target of the Scottish government. As there is no proposal to limit the lifetime of the proposed Development, the assessment of all technical areas considers the effects of the operational phase of the proposed Development, without time limitations.

4. The proposed Development would connect to the National Grid and a new overhead or underground power line would be built and connected to a new substation which would be located within the Site. The grid connection may require consent under Section 37 of the Electricity Act 1989 which is the subject of a separate consenting process to this Section 36 application and would be developed and consented by the electricity network operator, Scottish Hydro Electric Transmission PLC.

5. The Site would be accessed from the A83 by one of two potential access points and the existing timber haul road would be used by the proposed Development; however, some new access tracks would be built along with other associated infrastructure. The wind turbines would be delivered in sections with the longest deliveries being up to 65 m long, these components are likely to be delivered to the Site via Campbeltown port with other components and materials being delivered using the existing road network.

6. Solar panels would be installed in two main areas of the site covering an area of around 28.8 ha. The solar panels would be installed on metal frames orientated in a southerly direction. The mounting structures would be anchored to the ground using several possible methods, such as rock anchors, small piles or small concrete foundations.

7. A battery storage facility would be installed adjacent to the substation and a control building for the proposed Development with a storage capacity of around 38 MW. They would be stored within around eight containers, similar to shipping containers, typically measuring around 17 m (length) x 8 m (width) x 4 m (height) each as illustrated in **Figure 3.2** which shows the indicative substation compound. The final design of the battery storage would be based upon the technology available at the time of construction.

8. The construction of the proposed Development would also lead to some other temporary works, such as the development of borrow pits and the felling of some trees. Much of the forestry within the Site is planned for felling under the existing felling plan within the timeframe of the construction, which would take place for around 22 months starting in early 2022. Earthworks and borrow pits would be mostly restored and the felling of trees would be compensated by planting on and off-site if required.

9. In addition to site restoration and compensation planting, SPR has identified opportunities to restore some areas of the Site which have been affected by historical land use (e.g. forestry and land drainage). An area of 84 ha has been identified for habitat management with the aim of damming small ditches to restore water levels in drained peat to encourage the restoration of peat forming vegetation. SPR has used this technique successfully on other windfarms projects to restore peat habitats. This would also reduce runoff from the Site which could benefit the Clachan Burn which can experience periods of flooding.

10. Finally, SPR also intends for the proposed Development to offer opportunities for local communities. A range of site enhancements are incorporated into the plans to enhance the recreation value of the Site, by providing access from the nearby Kintyre Way into the proposed Development giving access to a bird hide, a walker's shelter, stone seating, archaeological features with information boards and a viewing point upon the Site's highest point. The local community would also benefit from a community funding scheme, which would be designed to contribute to important local projects as well as the potential for shared ownership. SPR has previously contributed significant sums to local communities on other projects and SPR has met with local community councils to discuss the type of support that could be available.

3.2 Introduction

11. This Chapter describes the way in which the proposed Development would be constructed including a general description of the proposed renewable energy technologies (i.e. wind turbine and solar array layouts) and their associated infrastructure. It also outlines the anticipated construction activities connected with the proposed Development and a description of the operational elements of the renewable energy technologies.

12. The layout for the proposed Development is shown on **Figure 3.1** including proposed infrastructure. Additional details on construction methods are provided in the outline Construction and Environmental Management Plan (CEMP) included in **Technical Appendix 3.1**. Details on the forestry aspects of the proposed Development are included within **Technical Appendix 3.2**.

3.3 Proposed Development

3.3.1 Development outline

13. The proposed Development is a renewable energy development that intends to make use of available renewable energy technologies to maximise and optimise the renewable energy potential of the Site. For this consent application, SPR intend to construct a blend of renewable energy technologies, including 19 three-bladed horizontal axis wind turbines, 16 up to 149.9 m tip height and 3 up to 135 m tip height (to minimise landscape and amenity impacts), with a combined rated output in the region of around 114 megawatts (MW) and around 20 MW of ground mounted solar arrays producing a combined output of around 134 MW or 360 to 380 GWh of electricity annually. This equates to the annual power consumed by approximately 99,200 average UK households. Around 38 MW of battery storage would also be installed to store energy enabling the flexible balance of energy output to meet the demands of the national grid.

14. The proposed Development would re-use and share existing infrastructure from the existing onsite forestry operations and Cour Windfarm access tracks where possible. This includes sharing much of the timber haul route as an access track, thus maximising efficiency and reducing the cost to the consumer. The proposed Development includes associated infrastructure including:

- wind turbines and ground mounted solar arrays;
- battery storage units;
- crane hardstandings for wind turbine installation;
- transformer/switchgear housings located adjacent to turbines & solar arrays;
- new and upgraded access tracks including watercourse crossings where necessary, passing places and turning heads;

- access off the A83, with a new access located away from an existing access by a cottage being the preferred access point;
- underground electrical cabling;
- compound containing substation, control building and battery storage;
- one site construction and maintenance compound and one laydown area;
- up to two temporary Power Performance Masts;
- health & safety and other directional site signage;
- search areas for up to five borrow pits;
- recreational access paths providing access to the site from the Kintyre Way;
- walker's shelter close to the Kintyre Way;
- signage and access to archaeological features adjacent to the site; and
- bird watchers hide and habitat improvements, including broadleaf tree planting and the re-wetting of peat areas previously drained.

15. The proposed Development would also require forest restructuring works to enable construction and operation of the renewable energy development.

3.3.2 Operational life

16. SPR is making a commitment to operate this proposed Development for a long time period in response to the ongoing and long term need for renewable energy sources to meet our future energy needs and to meet the carbon dioxide reduction 2050 target of the UK government and the 2045 target of the Scottish government. There is no proposal to limit the lifetime of the proposed Development. This means that it is planned to operate the site as per the consent on an ongoing basis even though it is recognised that most renewable energy technology infrastructure taken to site would have a limited operating life. Should there be a failure of any renewable energy technology beyond economic repair or if the technology comes to the end of its viable operating life, SPR would replace the appropriate renewable energy infrastructure with a similar model of the same dimensions and appearance. Such operations would be similar to construction and these effects are examined in this EIA Report. Should consent be granted, it is anticipated that there would be a condition which would deal with the requirement to either remove renewable energy infrastructure if they become non-operational for a defined period of time or to replace the infrastructure like for like. Therefore, the assessment of all technical areas considers the effects of the operational phase of the proposed Development without time limitations.

3.3.3 Grid connection

17. The grid connection point for the proposed Development is subject to confirmation by the network operator/owner.

18. The precise route of the grid connection cabling has not yet been determined and its effects are not identifiable because the grid connection offer has not yet been received from National Grid.

19. The grid connection may require consent under Section 37 of the Electricity Act 1989 which is the subject of a separate consenting process to this Section 36 application. Scottish Hydro Electric Transmission plc who is the network owner in the area of the proposed Development would own the assets beyond the Site substation (**Figure 3.2**).

3.3.4 Wind turbines

20. The proposal includes the installation and operation of 19 three-bladed horizontal axis wind turbines at the Site. The proposed turbine locations are shown on **Figure 3.1** and the coordinates for each are provided in **Table 3.1.**

Turbine No.	OS Easting	OS Northing
1	180708	658743
2	180304	658273
3	179935	657728
4	179735	657058
5	180306	657251
6	180806	657785
7	181417	658330
8	181549	657783
9	181859	657244
10	181005	657274
11	180654	656755
12	181750	656605
13	182147	656219
14	182452	657021
15	183153	657399
16	183620	657004
17	182827	656603
18	182560	655820
19	183251	656198

Table 3.1: Turbine coordinates

21. The wind turbines would have a rating of around 6 MW based on wind turbine technology which is currently available. Sixteen turbines would have a maximum height of 149.9 m to blade tip in an upright position and 3 turbines would have a maximum height of 135 m to blade tip in an upright position, in order to minimise the landscape and amenity effects of the proposed Development. The wind turbines would each incorporate a tapered tubular tower and three blades attached to a nacelle that would house a turbine generator and other operating equipment e.g. a gear box. The turbines would be semi-matt pale grey or a finish agreed with Argyll and Bute Council (A&BC).

22. The exact model of wind turbine to be installed at the proposed Development would be selected through a competitive procurement process. In each assessment in the EIA, a worst-case scenario of the turbine dimensions/characteristics has been used. An indicative turbine for the proposed Development is shown on **Figure 3.3**.

23. Each turbine would be served by an electrical transformer/switchgear unit that would be located externally adjacent to the turbine base. The transformer housing would measure approximately 10 m(l) x 5 m(w) and 4 m(h). The external finishes would typically be metal or glass reinforced or moulded plastic. An indicative external transformer is shown on **Figure 3.4**.

3.3.5 Wind turbine foundations and crane hardstandings

24. Wind turbine foundations would be designed to accommodate the final choice of turbine and to suit site specific conditions. The final design would depend on the findings of detailed ground investigation at each turbine location. An illustration of a typical wind turbine foundation is provided **Figure 3.5**.

25. The turbines would have gravity foundations over an area of 22 m diameter and would be laid using a reinforced concrete. The depth of the excavation would depend on the ground conditions, as a minimum the foundations would be 3 m deep (approximately 1.5 m foundation depth + 1.5 m of minimum fill). The sides of the excavation would be graded back, from the foundation to approximately a 28 m diameter and battered to ensure that they remain stable during construction. The wind turbines would be erected using mobile cranes brought on to the Site for the construction phase.

26. A crane hardstanding would be built adjacent to each wind turbine and is likely to have a footprint of 28 m x 70 m, with the depth dependant on the underlying bearing strata. The depth of crane hardstandings is expected to be about 1 m depending on peat depth. The actual crane pad design and layout would be determined by the wind turbine supplier according to their preferred erection method. An indicative crane hardstanding design has been considered for the purposes of this assessment

and is provided on **Figure 3.6**. The crane hardstanding would include laydown areas for the blade fingers which results in a non-regular foundation footprint with a disturbance area of 80 m by 70 m, plus up to 3 smaller crane pads along the access track typically 15 m by 15 m. These areas would remain *in situ* for the duration of the operational phase of the proposed Development.

27. Soils that are excavated during construction would be set aside for backfilling of foundations and reuse in restoration of disturbed areas around the turbine locations and hardstandings. Further details of soil storage would be developed through the CEMP.

3.3.6 Temporary power performance masts (PPM)

28. Up to two, 90 m temporary Power Performance Masts (PPM) may be erected, dependant on the final turbine selected (**Figure 3.7**). If required, the temporary masts would be erected early in the construction programme and would record data for several months before turbine erection and remaining in place for a period of up to two years following turbine commissioning.

3.3.7 Solar development

29. The solar area is proposed to cover an area of 28.8 ha in total which would be spilt across 2 areas; one area would be located in the north (9.8 ha) and one area in the west (18.9 ha) of the Site. These areas have been selected due to the slope and angle of the land and to avoid environmental constraints, as outlined in **Chapter 2 Site Description and Design Evolution**.

30. The solar areas will comprise rows or arrays of solar panels. Each panel will have a capacity of around 370 watts. The arrays will be formed of solar panels fitted to a metal frame and angled in the direction of the sun. The solar arrays frames will be installed first and depending on the precise ground conditions will either be anchored to rock or pile driven into the ground. Small pre-cast concrete foundations could also be an option (**Figure 3.8**).

31. Solar arrays would be spaced between 5 m and 7 m apart and would be located between 0.5 m to 1 m above the ground. In between the solar arrays, small tracks may need to be installed to enable access for maintenance depending on ground conditions. These tracks would be designed for four-wheel drive vehicles.

32. Low voltage cables buried underground would run from each of the solar arrays to a collector station and then onwards to the site substation.

3.3.8 Battery storage

33. Energy storage, in the form of around eight battery containers would be installed within the compound along with a control building and substation for the proposed Development (**Figure 3.2**). The batteries would have an energy storage capacity of around 38 MW (1/3 turbine capacity). The batteries would store excess power generated by the proposed Development and provide grid support services providing stability to the electricity supply network, the importation of electricity from the national grid and the integration of more renewable energy generation.

34. The battery containers would be of steel construction, very similar to shipping containers in appearance. It is likely that each container would typically measure 17 m (l) x 8 m (w) x 4 m (h) with ancillary equipment such as inverters. The final design of the battery storage would be based upon the technology available at the time of construction. It is likely that a separate switchgear container for the necessary electrical plant to operate the batteries would be required, and this too would be accommodated within the compound.

3.3.9 Substation and control building

35. A substation and control building would be located within a larger compound, measuring 100 m by 75 m, which would also house the battery storage containers, described in the previous section (**Figure 3.2**). The substation would be constructed and owned by the electricity grid network operator which is Scottish Hydro Electric Transmission. The substation and control building for the renewable energy technologies would be able to undertake a range of services for the national grid, including exporting and importing (to the battery facility) power, frequency control, reactive power compensation and re-starting the electrical grid in the event of failure ('black start').

36. The substation would comprise of a range of electrical grid equipment, such as, but not limited to:

- Transformers;
- HVAC Coolers;
- Electrical cabling; and
- Other electrical equipment.

37. The proposed Development would be connected to the substation and electricity network via an onsite control building located at NGR 181123, 657762. An indicative control building compound and elevations are shown on **Figure 3.9**. The control building would be single storey, built on a pre-cast concrete base and would measure approximately 14 m x 24 m and would be 7 m in height. The control building would also host solar panels on the roof to reduce the carbon footprint of the building and will likely include other energy efficient measures, such as rainwater harvesting for flushing of toilets. A small car park will also be located adjacent to the control building.

38. A security fence of around 3 m in height would be installed around the perimeter of the ancillary services compound and the site would be served via a locked access gate. Please see **Figure 3.2**.

3.3.10 Electric cables

39. The proposed Development will comprise buried electric cables which will connect the renewable energy technologies to the substation and control building compound. The majority of the underground power cables would run along the side of the access tracks in trenches to the proposed control building compound. The trenches would be typically 0.45 m wide. Indicative cable trench arrangements are provided on **Figure 3.10**.

3.3.11 Access tracks, passing places and turning heads

40. Approximately 13.6 km of new onsite access tracks and approximately 4.4 km of upgraded track would be required to provide access to the wind turbines, control building compound, solar areas and construction compound (**Figure 3.14**). Indicative track details are shown on **Figure 3.11**.

41. Tracks would have a typical 5 m running width, wider on bends and at junctions. Where not possible to avoid areas of deepest peat, floating tracks would be required to be constructed. It is anticipated that there would be approximately 1.4 km of floating track, where consistent peat depths of between 1-1.5 m or greater are identified along with shallow topography in the area (below 5 %).

42. A total of 4.4 km of the access route would be reused which is currently utilised for the existing forestry operations as a timber haul route, and which was also used to access the Cour Windfarm and which is proposed to be used by the High Constellation windfarm application. The existing access route to site (general access road – from the A83 to the Site) is in good condition, was widened for other windfarms and forestry operations and is generally suitable for very large turbine component deliveries. It is not expected to have to carry out any significant engineering works along this route; however, there may be a couple of sections which require minor upgrades or limited repair works within the existing road corridor.

43. Both access points off the A83 would require some levelling and minor earth works to create the necessary swept paths for the abnormal loads. Some tree removal would also be needed to create adequate entrances and a water main would need to be crossed. The location of both access points are shown on **Figure 3.1** whereas the design details are shown on **Figure 3.12** and **Figure 3.13**.

44. Construction traffic passing places would be placed along the track in addition to passing opportunities at site junction and crane hardstandings. The exact location of these would be determined prior to construction.

45. There would also be thirteen turning heads in addition to turning areas at site junction locations, to be located at turbines 12 & 13, and 15 & 16. These would be 60 m x 5 m, located before the wind turbines on the access track and perpendicular to the track.

3.3.12 Watercourse crossings

46. Watercourse and ditch crossings have been avoided in the design of the access track layout as far as possible; however, there would be eleven watercourse crossings within the Site (coordinates provided in **Table 3.2**). Five of these watercourse crossings are to be new for access to the wind turbine area, one is a new watercourse crossing point for access to the solar development area, and four would be upgraded existing watercourse crossings. The eleventh watercourse crossing would be associated with the track being provided for recreational purposes.

Watercourse crossing	Easting	Northing
WX01	**181089**	**658087**
WX02	**181914**	**657065**
WX03	180092	657012
WX04	**179159**	**656669**
WX05	**182473**	**656129**
WX06	**182794**	**656980**
WX07	**182365**	**656841**
WX08	**181819**	**657071**
WX09	180021	656873
WX10	179434	656358
WX11	179635	658834

Table 3.2: Watercourse crossings
* **Bold** are new; Green are existing crossings for improvement.

3.3.13 Borrow pits

47. Five borrow pit search areas have been identified (**Figure 3.1**), to provide a total of approximately 224,700 m^3 of material to construct the proposed Development (coordinates provided in **Table 3.3** and details presented in **Technical Appendix 10.5 Borrow Pit Assessment**). The use of all of these borrow pits would provide a greater volume of rock than would be needed for the construction of the proposed Development but allows for the current uncertainty of the quality of the rock at these locations. It is likely that only some of the borrow pit search areas would be required. For the purposes of the assessment all five borrow pits have been assessed.

Borrow Pit No.	NGR Reference	Approximate Dimensions (m)	Volume (m^3)
BP01	179744, 658637	100 m x 70 m	56,000 m^3
BP02	180151, 658697	80 m x 80 m	56,320 m^3
BP03	180478, 657583	90 m x 90 m	58,320 m^3
BP04	180167, 657242	106 m x 95 m limited extraction	7,500 m^3
BP05	181766, 657611	100 m x 97 m	46,560 m^3

48. Table 3.3: Borrow Pit Information

49. It is assumed that Type 1 crushed rock for the track and hardstanding surface layers would be won on site from the onsite borrow pits.

50. At least one of these borrow pits would remain open as a borrow pit during the operating period of the proposed Development. This is needed to provide aggregate for any maintenance works. All other borrow pits would be restored and it is anticipated that there would be a consent condition to agree the restoration approach.

3.3.14 Lighting

51. Artificial lighting may be required during the construction phase to ensure safe working conditions, during periods of limited natural light. Examples include vehicle and plant headlights, construction compound lighting, floodlights and mobile lighting units, to be used around specific construction activities. It is intended that the type of lighting would be non-intrusive (e.g. directed down and towards works activity and away from Site boundary), to minimise impact on local properties and any other environmental considerations.

3.3.15 Felling

52. The proposed Development would require 26.03 ha of woodland to be directly felled in order to facilitate wind turbines and associated infrastructure and solar infrastructure. Forestry felling will be required in a 95 m keyholed radius from each turbine location within woodland for to allow for construction, operation and environmental mitigation, including bat habitat standoff distances. Further details are provided in **Technical Appendix 3.2**.

3.3.16 Compensatory planting

53. As a result of the construction of the proposed Development, there would be a net loss of woodland development area. The area available for stocked woodland in the study area would decrease by 50.02 ha. Further details are provided in **Technical Appendix 3.2**.

54. In order to comply with the criteria of the Scottish Government's Control of Woodland Removal Policy, compensation planting would be required. The Applicant is committed to providing appropriate compensatory planting. The extent, location and composition of such planting is to be agreed with Scottish Forestry, taking into account any revision to the felling and restocking plans prior to the commencement of operation of the proposed Development.

3.3.17 Habitat Management Plan

55. As part of the proposed Development, SPR would implement habitat improvement proposals following the identification of opportunities to improve certain parts of the Site. Much of the Site comprises peat, which when undrained provides high quality and important habitats. However, much of the site has been drained for agriculture and forestry. This drainage affects the peat leading to it drying out and also the introduction of poorer quality habitats. SPR and the EIA team have worked together to identify an area in the southern part of the site adjacent to Loch Chorra-riabhaich and the Kintyre Way. This area is 84 ha and compensate and enhance for 41 ha of peat that will be affected by the proposed Development. It is planned to undertake a number of measures in the habitat improvement area, including the damming of ditches using in-situ peat with the aim of raising the water table to rewet surrounding areas of peat and to re-establish peat forming species, such as sphagnum. Details of the habitat management proposals are described in a Habitat Management Plan (HMP) which is provided in **Technical Appendix 8.5**.

3.3.18 Design principles and embedded mitigation

56. A number of design principles and environmental measures, otherwise known as embedded mitigation, have been implemented and incorporated into the proposed Development as standard practice, as described in **Chapter 2 Site Description and Design Evolution**.

57. Throughout the design embedding mitigation has been a feature of the process that has led to the final design of the proposed Development; and this embedded mitigation, therefore, forms part of the proposed Development which has been assessed in this EIA Report.

58. Reference to good practice and standards, guidelines and legislation relied upon in the assessment methodology are referred to within each of the individual specialist topics in **Chapters 7 to 15**. Such environmental measures are also included in the outline CEMP (**Technical Appendix 3.1**).

3.3.19 Micrositing

59. During the construction process there may be a requirement to microsite elements of the proposed Development infrastructure (e.g. due to unsuitable ground conditions, environmental constraints). It is proposed that a 50 m micrositing tolerance of all site infrastructure would be applied to the proposed Development, with the exception of turbine 1, 3, 4, 7 and 11 which would be moved no closer to the nearest residential properties. Within this distance any changes from the consented locations would be subject to approval of the ECoW as required and in consideration of other known constraints. It is anticipated that the agreed micrositing distance may form a planning condition accompanying consent for the proposed Development.

3.3.20 Consents Prior to the Commencement of Development

60. Prior to commencing construction on the Site, it may be necessary for SPR to obtain a number of other statutory authorisations and consents to enable the proposed Development to be implemented. Where relevant these are covered in the technical chapters of this EIA Report.

3.4 Construction

3.4.1 Construction timetable

61. The proposed Development would be constructed over a period of approximately 22 months, anticipated to commence in quarter one of 2022. Construction would include the principal activities listed within the indicative construction programme as provided in **Table 3.4**.

3.4.2 Construction employment

62. The number of people employed during the construction period would vary depending on the stage of construction and the activities ongoing onsite. It is anticipated that the peak workforce requirement would be around 150 construction staff.

3.4.3 Construction hours

63. The construction working hours for the proposed Development would be 7am to 7pm Monday to Friday and 7am to 4pm on weekends, though some activities on weekends would be restricted to reduce disturbance to nearby properties. It should 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 also the lifting of the turbine components, may occur outside the specified hours stated. There will also be a preference for the delivery of abnormal loads (i.e. wind turbine blades) to be at night when traffic flows on roads are much lower to reduce the potential for disturbance to road users subject to approval by Police & Transport Scotland

Indicative Construction Activity	Months																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Forestry felling and export																						
Site establishment																						
Access road improvements																						
Construction of haul road & site access to borrow pits																						
Construction of access tracks, crane pad and building compounds																						
Turbine & Solar foundation construction																						
Substation/storage - civil and electrical works																						
Cable Trenching, Installation and Backfilling																						
Crane delivery																						
Turbine & Solar delivery, erection and commissioning																						
Reinstatement and Restoration Works																						

Table 3.4: Indicative construction programme

3.4.4 Access to the Site

65. It is proposed that the wind turbine components would be delivered to Campbeltown Harbour. A preliminary Route Survey Report has determined that, based on the wind turbine components considered, transport loads will follow a predetermined route which turns right on Hall Street from the quayside before following Kinloch Road. Transport loads would then turn left onto Aquilibrium Avenue then continue onto the A83. The abnormal loads will then continue north on the A83 before reaching the site access junction. The turbine transport loads would be moved from the port of entry (Campbeltown) to the Site under escort.

66. It is expected that wind turbine towers would be sourced from the CS Wind UK manufacturing factory in Machrihanish, transport loads would depart the factory and turn right before continuing east/north east to the junction with the A83. These loads would then travel north on the A83 until they reached the site access junction.

67. For other technologies that will be installed on site, it is likely that they will be delivered using standard articulated lorries utilising the road network between Glasgow and Kintyre.

68. Two access points are currently included in the proposed Development. This comprises an existing access at Glebe cottage and a new access 180 m south of Glebe cottage. This new access is the preferred access as deliveries to the site would be directed away from the cottage avoiding any disturbance and visual intrusion for the residents of the cottage, and also providing better alignment for the delivery of the larger components to enter the Site. However, in the absence of current agreement from A&BC and Transport Scotland, who have verbally agreed to the design of the new access, both accesses are included in the proposed Development and assessed in this EIA Report. **Figure 3.1** illustrates the location of the access points and **Figure 3.12** and **Figure 3.13** illustrate the design of the access points, both of which require works to create an access point suitable for the delivery of turbines to the Site. Should the new access be approved, SPR would not undertake the upgrade improvements needed at Glebe cottage preferring instead to create the new access illustrated in **Figure 3.12** and this could be controlled through a planning condition.

3.4.5 Construction and maintenance compound and laydown area

69. A single construction and maintenance compound would be required for the duration of the construction phase as shown on **Figure 3.1** which is located at NGR 80467, 58478. A small temporary laydown area may also be used at the junction of the existing haul route and the new access route approximately 100 m from the site entrance of the new access (**Figure 3.1**). This would be used only for the temporary laydown of deliveries, plant and construction equipment which may need to be temporarily stored before being transported onto site.

70. The construction and maintenance compound would have a footprint of around 100 m x 75 m (7,500 m^2) and would contain the following:

- temporary modular building(s) to be used as a Site office;
- welfare facilities;
- parking for construction staff and visitors;
- reception area;
- fuelling point or mobile fuel bowser;
- secure storage areas for tools; and
- waste storage facilities.

71. **Figure 3.14** illustrates a typical construction and maintenance compound although the layout may differ depending on site topography and contractor requirements. Crane hardstanding areas, along with the construction and maintenance compound, would be used for laydown during construction.

72. Water would also be required for welfare facilities and to dampen track during dry weather. However, this would be minimal and would likely be collected via rainwater harvesting.

3.4.6 Materials sourcing and waste management

73. For construction, the proposed Development would require a range of materials (e.g. stone for access tracks, the Site compound and the control building compound). Excavated material from the turbine bases and access tracks would be used onsite for restoration/reinstatement. Onsite concrete batching would not take place and concrete will be delivered to site.

74. A Site Waste Management Plan would be developed for implementation during construction, as discussed in the CEMP (Technical **Appendix 3.1**). This outlines details of the materials requirements and waste generation during construction and how SPR intends to consider the management of these aspects.

3.4.7 Temporary peat storage

75. The construction process would both generate peat and use peat. Where possible, “restore-as-you-go” techniques would be used to place excavated peat material in its final destination rather than in temporary stockpiles. However, in some circumstances, there may be a time-delay between these actions. During the interim period, peat would be stored on-site. It is important both for the peat itself and for the surrounding environment that the peat is not allowed to substantially erode or become dry, while it is stored. Procedures to control the hydrology of stored peat would be covered by the CEMP (the outline CEMP is provided in **Technical Appendix 3.1**) and the Peat Management Plan (**Technical Appendix 10.2**). These would include:

- prior to the excavation of relevant infrastructure, vegetation, peat and superficial geology would be removed and stored in overburden stockpiles (or used directly in restoration of other areas; see below);
- care would be taken to segregate peat from other materials, to ensure that turves are kept reasonably intact, and to store turves right-side-up to form a protective layer on top of any deeper peat stockpiles;
- overburden stockpiles will be located adjacent to the infrastructure at least 50 m from watercourses in order to reduce the potential for sediment to be transferred into the wider hydrological system;
- runoff from overburden stockpiles would be directed through the infrastructure SUDS measures (as described in the CEMP), including silt fences and mats, drainage measures and settlement lagoons, as appropriate; and
- peat would not be allowed to dry out in the overburden stockpiles.

76. The catotelm layer would not be used for the dressing of roads and hardstandings. The detail for peat storage areas and dimensions would be determined when site work has commenced and the peat condition and requirements are better understood. Further detail is provided in the Peat Management Plan in **Technical Appendix 10.2.**

3.4.8 Site restoration

77. Soils would be used for reinstatement works associated with access tracks, cable trenches, turbine foundations, crane hardstandings, borrow pits and the temporary construction areas. The upper vegetated turfs would be used to dress infrastructure edges and to reinstate the surface of restoration areas. It is anticipated that most of the soil resources within areas directly affected by construction activities would be able to be stored and reinstated as close as possible to where they were excavated in accordance with good practice; so that the Site would be restored with minimal movement of material from its original location. It is not anticipated that any excavated material would leave Site.

78. Further detail on Site restoration would be provided within the CEMP, an outline of which is provided in (**Technical Appendix 3.1**).

3.4.9 Environmental management and good practice construction

79. The construction of the project would be based on the adoption of good practice, supported by robust project management and the supervision of an Environmental Clerk of Works (ECoW). Details of the good practice and the role of the ECoW is set out in the outline CEMP (**Technical Appendix 3.1**). Good practice includes the adoption of Pollution Prevention Guidelines (PPGs) and replacement Guidance for Pollution Prevention (GPPs). The services of other specialist advisors would be retained as appropriate, such as an Archaeological Advisor, to be called on as required to advise on specific environmental issues. The Principal Contractor (PC) would ensure construction activities are carried out in accordance with the mitigation measures outlined in this EIA Report and any planning conditions, and this would be monitored by SPR and the ECoW.

80. To ensure all mitigation measures outlined within this EIA Report are carried out onsite, contractors would be required to develop a CEMP which would form an overarching document for all site management requirements, including:

- a Traffic Management Plan (TMP);
- a Construction Methodology Statement (CMS)
- a Pollution Prevention Plan (PPP) (including monitoring, as appropriate);
- a Site Waste Management Plan (SWMP); and
- a Water Management Plan (WMP).

3.5 Operation and maintenance

81. As highlighted in Section 3.2.4, the proposed Development would operate in perpetuity as a renewable energy development. Should consent be granted it is anticipated that there would be a condition which would deal with the requirement to remove any part of the proposed Development if they cease to operate for a defined period of time.

3.5.1 Electricity Generation

82. The wind turbines would start to generate electricity at wind speeds of around 3 m/s. Electricity output would increase as the wind speeds increase up to a maximum of around 15 m/s, when the wind turbines would reach their maximum capacity. The turbines would continue to operate at maximum capacity up to wind speeds of around 25 m/s when they would begin to pitch the blades out of the wind and come to a gradual stop as a safety precaution.

83. The solar panels would generate power during the hours of daylight. Battery storage would respond to the need of the national grid and would start operating once connected to the Site substation and grid connection.

3.5.2 Lighting

84. There would be no lighting during the operation of the proposed Development with the exception of security lighting on the control building. This would comprise automatic low intensity lighting.

85. Wind turbines would be less than 150 m to blade tip and, therefore, would not require aviation lighting to comply with CAA requirement in accordance with Article 219 of the Air Navigation Order which comes into effect at 150 m.

86. The proposed Development’s turbines are located within a Ministry of Defence (MOD) “blue” low flying consultation zone. The MOD class such zones as low priority military low flying areas that are less likely to raise concerns. The MOD was consulted during the Site design phase and at the Scoping stage and no objection was raised. It requested that the cardinal turbines are

fitted with MOD accredited 25 candela omni-directional red lighting and infrared combination lighting with an optimised flash pattern of 60 flashes per minute of 200ms to 500ms duration at the highest practicable point. The remaining perimeter turbines should be fitted with 25 candela omni-direction red lighting or infrared lighting to the same specification. However, as highlighted in the Gatecheck Report to the ECU, SPR would be willing to install the infrared lighting on the perimeter turbines but wishes to discuss further with the MOD the need for 25 candela omni-direction red lighting on other turbines. As the area is a low priority low fly area and as the turbines would be mapped on charts, SPR is of the view that the lighting is not needed, especially as Freasdail Windfarm next door does not have any red lighting.

87. It is understood that the MOD has recently agreed that either red lighting or infrared lighting can be installed for the Kennoxhead windfarm and SPR would seek to agree a similar condition for this proposed Development.

3.5.3 Maintenance

88. The proposed Development would be maintained throughout its operational life by a service team comprising up to five full time equivalents made up of operation management, operations technicians and support functions. During periods of scheduled maintenance up to four technicians who may be based in the local area would be required for up to seven weeks per year, whilst additionally the technicians would be required to undertake unscheduled maintenance throughout the year. This team would either be employed directly by the developer or by the turbine and solar panel manufacturers. Management of the proposed Development would typically include wind turbine and solar panel maintenance, health and safety inspections and annual civil maintenance of tracks, drainage and buildings.

89. Maintenance includes the following:

- scheduled routine maintenance and servicing;
- unplanned maintenance or call outs;
- HV and electrical maintenance; and
- Blade and solar array inspections.

3.6 Climate Change, Carbon Considerations & Commitments

90. The proposed Development would generate around 134 MW or between 360 to 380 GWh per year of renewable carbon free energy. As highlighted in **Chapter 2 Site Description and Design Evolution**, this would support the UK and Scotland's targets for cutting carbon dioxide (CO_2) emissions and especially supports the recent commitments to cut CO_2 emissions to net zero by 2045 in Scotland. Carbon dioxide is a greenhouse gas which is contributing to climate change.

91. Whilst the proposed Development would generate renewable energy free from carbon emissions, it is recognised that the project would generate carbon emissions during the construction of the proposed Development. Carbon emissions would result from the component manufacturing, transportation and installation of the proposed Development. There is also the potential for carbon fixers and sinks to be lost through the clearing of trees and vegetation during construction. Trees would be replaced on site as part of a compensation planting scheme which has been previously described in section 3.3.18 of this Chapter. However, it is important to consider the balance between carbon reduction associated with renewable energy development and that which is produced through the manufacturing and construction of the proposed Development.

92. SPR has undertaken an assessment of this carbon balance using a Scottish Government tool specifically design for doing this task for windfarms. Further details, the methodology used, and the results of the carbon balance assessment are presented in **Section 15.6** of **Chapter 15**. In summary, the proposed Development is expected to take around 19 months (1.6 years) to repay the carbon exchange to the atmosphere (the CO_2 debt) through construction of the windfarm; the Site would in effect be in a net gain situation following this time period and can then claim to be contributing to national CO_2 reduction targets.

93. As SPR is applying for consent in perpetuity, the proposed Development and SPR is making a long-term commitment to meeting the requirements for renewable energy generation and reductions of carbon emissions to the atmosphere. SPR would also continue to investigate opportunities for enhancing the renewable energy potential of the Site, subject to further consent application and environmental assessment considerations. However, in summary, the proposed Development as it stands represents a positive contribution to the reduction of CO_2 emissions targets.

3.7 Improved Recreation & Public Access

94. SPR is proposing to enhance several aspects of the site by improving local access and recreation opportunities. The enhancements being proposed are as follows:

- access tracks for users of the Kintyre Way to enter the site with signage for a circular walk which would take visitors to a viewing point upon Cruach nam Fiadh. Stone seating, using locally cut rock from the Site borrow pits, would also be placed at various locations around the Site;
- shelter for walkers close to the entrance to the Site from the Kintyre Way;
- access and information boards to several archaeological features near to the Kintyre Way, which will provide a description of the features and some interesting archaeological context for the Site and the surrounding area. Further details are provided in the following text, in **Chapter 11 Archaeology and Cultural Heritage** and on **Figure 3.1**;
- bird hide, located north west of Lochan Fraoich, and accessible from the Kintyre Way for viewing bird species found within the south western part of the Site; and

95. As highlighted above, the proposed Development would provide information boards at several archaeological features identified on Site. These would comprise information boards for two Sheiling huts located just south of the Kintyre Way between T18 and T19, where there is evidence of a stream diversion and an enclosure, and at the site of a Longhouse (domestic building, byre and enclosure) situated west of the Kintyre Way between T16 and T19. These features are described in more detail in **Chapter 11 Archaeology and Cultural Heritage**. **Figure 3.1** also illustrates the location of these features. The information boards would provide some background information on the features and graphics illustrating what the features may have looked like when in use.

3.8 Socioeconomic Benefit

96. SPR is committed to offering a package of community benefits to local communities that could include the opportunity for community benefit and to invest in the operational development. SPR has already shared initial information with the community about an opportunity to invest and will provided an introductory leaflet which outlines a potential investment structure at a later date.

97. SPR will discuss with local stakeholders to identify which communities would be the appropriate 'Community Organisations' to participate in these benefits. We will keep local communities informed about these benefits as the project progresses and, in line with Scottish Government guidance, will provide information in a timely manner so the communities are able to fully assess the opportunity.

98. SPR is committed to keeping local communities informed as the project progresses and, in line with Scottish Government guidance, will provide information in a timely manner so the communities are able to fully assess the opportunity.

99. It is expected that any proposed income streams from these community benefits could be used to support community projects within the local area. Local communities would have the flexibility to be able to choose how the money is spent and prioritise it for the things which matter most to them. The host community of West Kintyre Community Council has developed a

Community Action Plan for 2017-2023[1] which gives an indication as to the type of initiatives that might be considered important within the West Kintyre Community Council area, including the following:

- creation of all ability tracks & paths, development of the Kintyre Way and development of recreational facilities at Tayinloan playing fields;
- improved broadband and mobile phone services;
- provision of community bus service;
- supporting creation of small businesses and providing bursaries for further training;
- purchase and conversion of unused buildings for community and small business use; and
- improved promotion of West Kintyre as a place to live, work and raise a family.

100. To date, SPR has voluntarily awarded over £1.6 million in community benefit funding to communities in Argyll and Bute. A wide range of local projects and community initiatives have been supported by the funds including:

- 174 community facilities and services projects totalling £339,025.60;
- 47 community or local event projects totalling £39,089.33;
- 16 environmental projects totalling £30,224.45;
- 11 heritage projects totalling £11,036;
- 26 skills and employment projects totalling £26,344.48;
- 73 sport and recreation projects totalling £79,290.17; and
- 129 youth and education projects totalling £102,981.21.

3.9 References

Civil Aviation Authority Statement (June 2017). Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150 m Above Ground Level. Available at: https://publicapps.caa.co.uk/docs/33/DAP01062017_LightingWindTurbinesOnshoreAbove150mAGL.pdf [Accessed 22/10/19]

The Electricity Act 1989

The Air Navigation Order 2016.

[1] West Kintyre Community Council: Community Action Plan 2017-2013

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