19. SUMMARY OF IMPACTS AND SCHEDULE OF MITIGATION

19.1 Introduction

19.1.1 The purpose of this chapter is to summarise the mitigation measures proposed in each of the chapters to avoid, reduce, or offset impacts which would otherwise give rise to significant residual environmental effects.

19.1.2 The main aim of the design process was to 'design out' potential for environmental effects as far as possible. This chapter does not summarise 'mitigation by design'.

19.1.3 The majority of the pre-construction and construction phase mitigation would be delivered through the proposed Construction Environmental Management Plan (CEMP). The outline content of the proposed CEMP is provided in Appendix 5.1: Construction Environmental Management Plan. Further detail on specific mitigation measures to be included in the CEMP is contained in each of the technical chapters, where relevant.

19.2 Summary of Mitigation and Residual Effects

19.2.1 The predicted effects and mitigation measures have been compiled into Table 19.1. They are presented in the order in which they appear within this EIA Report.

- Landscape and Visual;
- Ornithology;
- Ecology and Nature Conservation;
- Geology, Soil and Peat;
- Surface Water;
- Cultural Heritage;
- Noise;
- Access Traffic and Transport;
- Land-use, Socio-economics and Recreation;
- Shadow Flicker; and
- Aviation.

Table 19.1: Summary of Mitigation and Residual Effects					
Topic	**Potential likely Significant Effect (without mitigation)**	**Mitigation Measures**	**Effect**	**Timing**	**Residual Effect**
Landscape and Visual (Chapter 8)	**Construction and Operation:** The assessment confirms that potential significant and cumulative effects are limited to two of the six Landscape Character Types (LCTs) and to an area within 8 km of the proposed development. The majority of the study area would not experience significant landscape effects. Potential significant visual effects have been identified for 16 of the 27 viewpoints, at three of the 10 settlements and four of the 17 routes, however it is noted that significant effects would be unlikely to affect receptors in the Settlements which are not currently affected by the existing Tangy I and II Wind Farm. Similarly, receptors on the affected routes are similar to those affected by the existing Tangy I and II Wind Farm. The majority of the study area would not experience significant effects on visual amenity.	Advice on landscape and visual issues has been core to the design process including turbine scale, geometry, turbine and site layouts and reinstatement measures. Because of this, there is no additional landscape and visual mitigation proposed.	Not applicable.	Not applicable.	Potential significant and cumulative effects have been identified for two of the six Landscape Character Types (LCTs). Potential significant visual effects for 16 of the 27 viewpoints, at 3 of the 10 settlements and 4 of the 17 routes. Potential significant cumulative visual effects at 5 of the 11 viewpoints and on 1 of the 11 routes. It is noted that significant effects would be unlikely to affect receptors in the Settlements or on assessed route which are not currently affected by the existing Tangy I and II Wind Farm. Overall the majority of the study area would not experience significant effects on landscape character or visual amenity.
Ornithology (Chapter 9)	No potential significant effects identified and no potential for an adverse effect on the integrity of the Kintyre Goose Roosts SPA.	**Construction:** Although no significant effects are predicted, a number of mitigation measures will be put in place during the winter period to ensure all reasonable	Reduction and/or avoidance of non-significant effects.	Pre-Construction, Construction, Post-Construction and Operation.	No significant effects.

Table 19.1: Summary of Mitigation and Residual Effects					
		measures are taken to avoid disturbance to commuting flights of, or roosting, Greenland white-fronted geese in the area: • Prior to the commencement of works an agreed timetable for construction, which takes account of the need to protect geese using Tangy Loch or Lussa Loch from disturbance during building works, shall be submitted and approved by Argyll and Bute Council in consultation with SNH. The duly approved timetable shall be adhered to by contractors for the duration of the construction period; • Any construction works, vehicular traffic, or other activity shall be confined to the period 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 on Saturdays. Turbine deliveries would only take place outside these times with the prior consent of the local authority and police. Those activities that are unlikely to give rise to noise audible at the site boundary may continue outside of the stated hours; and • Any blasting shall be confined to Monday to Friday, between the hours of 10:00 and 16:00. Blasting on Saturday mornings shall be a matter for negotiation between contractor and the local authority. The ECoW will oversee the implementation of the above mitigation measures.			

Table 19.1: Summary of Mitigation and Residual Effects					
		Operation: Operational monitoring should be undertaken of Greenland white-fronted goose roosting activity (and flight paths) at Tangy Loch and Lussa Loch. It is recommended these surveys be carried out in years 1, 2, 5, 10 and 15 during the operational period.			
Ecology and Nature Conservation (Chapter 10)	**Construction:** Permanent and temporary (reversible) adverse impacts on habitats. Direct impact on habitats and indirect impacts on species from accidental pollution. Adverse effect at the local level of habitat loss and/or modification. **Operation:** Accidental spillage during maintenance works could lead to potential habitat loss or degradation.	**Construction:** Mitigation through development design was implemented, where possible, to avoid those habitats of highest ecological value and highest sensitivity to effects. Peat slide risks on Tangy Loch SSSI and the required mitigation measures are discussed in Appendix 11.1: Peat Stability Risk Assessment and embedded in Appendix 5.1: CEMP. Other relevant good construction practice measures are included in Appendix 5.1: CEMP. A protected species survey would be completed within eight months prior to the start of construction. A suitably qualified ecologist would be appointed to survey areas where reptiles may be found. Any reptiles discovered during the survey would be moved to suitable areas outwith the construction area. If the work is undertaken outwith the active months for reptiles, the ecologist would search for suitable hibernation sites for relocation. All such work would be undertaken in	Reduction and/or avoidance of significant effects.	Pre-Construction, Construction, Post-Construction, Operation and Decommissioning.	No likely residual significant effects anticipated.

Table 19.1: Summary of Mitigation and Residual Effects					
		accordance with approved method statements. Prior to work in the area of the known active badger sett (which is expected to comprise forestry clearance due to the volume of windthrow in this area), the measures described in Appendix 10.5: Badger Protection Plan would be followed to allow forestry clearance within 20 m of the active sett. A further survey of the single entrance sett prior to construction would determine if it is active, in which case the same protection measures would be applied. If found inactive, no protection measures would be required for this sett. **Operation:** The risk of pollution from surface runoff to watercourses and aquatic habitats, such as Tangy Loch SSSI, would be prevented by ensuring that runoff control measures, such as interceptor drains and silt traps to assist in maintaining water quality, are in place. Additionally, interceptor drains would be used to control the flow of any runoff from operation activities. **Decommissioning:** Areas of wind farm infrastructure such as turbines and tracks to be removed as part of the decommissioning of the existing Tangy I and II Wind Farms would be reinstated. Where tracks would not be upgraded to be used in the proposed development, they would be reinstated to			

Table 19.1: Summary of Mitigation and Residual Effects					
		allow recolonisation of natural habitats. It is likely that recolonisation would include M23 rush pasture and M23/M25 mire habitats as they are the habitats found around the sections of track to be removed. More details on the proposed approach to decommissioning and reinstatement are set out in Appendix 5.1: CEMP. Habitat restoration, woodland replanting and bat carcass searches would be completed in accordance with Appendix 10.6: Habitat Management Plan.			
Geology, Soil and Peat (Chapter 11)	No potential significant effects identified	Though not significant, requirement for further mitigation, as part of the construction phase for managing peat slide risk and peat handling/reinstatement are described in Appendix 11.1 and Appendix 11.3 respectively. The good practice mitigation measures described therein would be implemented through Appendix 5.1: CEMP.	Not applicable.	Not applicable.	No significant effects.
Surface Water (Chapter 12)	**Construction:** Potential effects of high magnitude on PWS2 relating to both quality and quantity of PWS during the use of borrow pit C. **Operation:** Potential effects of high magnitude on PWS2 relating to quantity of PWS should the direction of groundwater flow be altered.	The mitigation measures below are proposed in addition to the good practice water quality protection measures included within the CEMP (Appendix 5.1). The applicant intends to identify a long-term sustainable solution for the PWS2 water supply and will seek to establish the PWS users' current needs regarding water use and quantities, post-consent. The applicant will seek the PWS users' input and support for any protection or	Reduction and/or avoidance of significant effects.	Pre-Construction, Construction, Post-Construction and Operation.	No likely residual significant effects anticipated.

Table 19.1: Summary of Mitigation and Residual Effects					
		mitigation measures relating to the PWS' infrastructure and will strive to maintain, if not improve, the current PWS water quality and quantity. The applicant accepts that the protection of the PWS to the satisfaction of SEPA and the PWS users will be required as part of the consent/pre-commencement Planning Condition. As part of good practice within the CEMP and in line with LUPS-31 on-going monitoring of the PWS2 groundwater supply will be undertaken to demonstrate whether the quality of groundwater and/or hydrological connectivity is being maintained taking cognizance of SEPA Technical Guidance Note 1: The Monitoring of Infrastructure with Excavations Less than 1m Deep within 100m of Sensitive Receptors (Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystem). Monitoring will take place before, during and after construction; with timescales to be agreed with SEPA. If required and as agreed with the PWS user, temporary water supply will be made available for use from the outset and throughout the construction period, should PWS2 be temporarily adversely affected.			
Cultural Heritage (Chapter 13)	**Construction:** Potential direct effects on known or unknown buried archaeological remains, in the case of the proposed development, relate to the possibility	**Construction and Operation:** Mitigation through development design was implemented to avoid or minimise potential significant cultural heritage effects.	Reduction and/or avoidance of significant effects.	Pre-Construction, Construction, Post-Construction and Operation.	Predicted residual significant effect is predicted for Killocraw Cairn (Site 21) and Tangy Loch Fortified Dwelling (Site 27). Although significant,

Table 19.1: Summary of Mitigation and Residual Effects					
	of disturbing, removing or destroying in situ remains and artefacts during ground breaking works (including excavation, construction and other works associated with the proposed development) on this site. **Operation:** During the operational phase there is a potential for adverse indirect effects upon the settings of a range of heritage assets within 10 km of the site	No Significant direct effects are predicted and consequently no mitigation is required. It is recognised that there is a potential for inadvertent damage to both known and unknown archaeological remains. In order to prevent inadvertent damage to heritage assets within the coniferous plantation woodland during clearance operations, all visible remains will be photographed, surveyed and fenced off under archaeological supervision, in advance of forestry operations. All areas of peat >1 m and proposed borrow pit locations, all of which are located in close proximity to known heritage assets (Sites 14, 15 and 16), will be subject to archaeological monitoring. The purpose of such monitoring will be to identify any hitherto unknown archaeological remains threatened by the proposed development, to assess their value and to mitigate any impact upon them either through avoidance or, if preservation in situ is not feasible, through preservation by record. No direct mitigation is possible for operational (setting) effects. Potential offset measures are considered in Chapter 13.			the effect would not be at a level that could threaten the protection of the asset.
Noise (Chapter 14)	No potential significant effects identified	**Construction:** Though not significant, mitigation measures are proposed to reduce potential effects of construction noise and	Reduction and/or avoidance of non-significant effects.	Pre-Construction, Construction,	No likely residual significant effects anticipated.

Table 19.1: Summary of Mitigation and Residual Effects					
		potential noise and vibration effects of blasting operations. Those activities that may give rise to audible noise at the surrounding properties and heavy goods vehicle deliveries to the site would be limited to the hours 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 on Saturdays. Turbine deliveries would only take place outside these times with the prior consent of the local authority and the Police. Those activities that are unlikely to give rise to audible noise at the site boundary may continue outside of the stated hours. All construction activities shall adhere to good practice as set out in BS 5228. All equipment will be maintained in good working order and any associated noise attenuation such as engine casing and exhaust silencers shall remain fitted at all times. Where flexibility exists, activities will be separated from residential neighbours by the maximum possible distances. A site management regime will be developed to control the movement of vehicles to and from the proposed development site. Construction plant capable of generating significant noise and vibration levels will be operated in a manner to restrict the duration of the higher magnitude levels.		Post-Construction and Operation.	

Table 19.1: Summary of Mitigation and Residual Effects					
		The potential noise and vibration effects of blasting operations will be reduced according to the guidance set out in the relevant British Standards PAN50 Annex D and discussed below: • Blasting should take place under strictly controlled conditions with the agreement of the relevant authorities, at regular times within the working week, that is, Monday to Friday, between the hours of 10.00 and 16.00. Blasting on Saturday mornings shall be a matter for negotiation between the contractor and the local authorities; • Vibration levels at the nearest sensitive properties are best controlled through on site testing processes carried out in consultation with the Local Authorities. This site testing based process would include the use of progressively increased minor charges to gauge ground conditions both in terms of propagation characteristics and the level of charge needed to release the requisite material. The use of onsite monitoring at neighbouring sensitive locations during the course of this preliminary testing can then be used to define upper final charge values that will ensure vibration levels remain within the criteria set out previously, as described in BS 5228 2 and BS 6472 2 2008;			

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		• Blasting operations shall adhere to good practice as set out in BS 5228 2 and in PAN50, Annex D, Paragraph 95, in order to control air overpressure. **Operation:** The selection of the final turbine to be installed at the site would be made on the basis of enabling the relevant noise limits to be achieved at the surrounding properties. Satisfactory control of cumulative noise immission levels would be achieved through enforcement of individual consent limits for each of the individual wind farms.			
Access Traffic and Transport (Chapter 15)	**Construction:** Major adverse effect on receptors as a result of increased traffic for the duration of construction of the proposed development. Potential for driver delay on the unnamed road between the A83 and the site entrance. Moderate effect on pedestrian amenity at the primary schools. **Operation:** None predicted.	**Construction:** An outline Traffic Management Plan (TMP, Appendix 15.2) has been prepared to provide detailed mitigation measures to address each of the identified significant effects, and general operation practices and polices relating to transport. Mitigation measures proposed in TMP include, but are not limited to: • The applicant and the appointed contractor will provide written notice to schools affected (Glenbarr and Rhunahaorine Primary School) in advance of concrete pouring days and indicate that there is a potential for an effect on pedestrian amenity. • The applicant and their appointed contractor shall consult with these schools to identify any specific	Reduction and/or avoidance of significant effects.	Pre-Construction, Construction and Post-Construction.	No likely residual significant effects anticipated.

Table 19.1: Summary of Mitigation and Residual Effects					
		mitigation measures which might be adopted on concrete pouring days. • Given the location of each of these schools on the A83, and their small size, it is reasonably possible that no staff or students walk to school. If is established that this is the case then no mitigation measures are likely to be required.			
Land-use, Socio-economics and Recreation (Chapter 16)	**Construction:** Moderate beneficial and significant socio-economic (employment) effects in Kintyre. Minor beneficial tourism (accommodation) effects in Campbeltown, the west coast and east coast. **Operation:** None predicted.	**Construction:** • liaison with landowners regarding the timing of works to minimise disruption to any activities on private land where possible; • restriction of construction plant and personnel to working areas to reduce disturbance and vegetation damage; • liaison with local community and local authority to inform traffic management measures to maintain access to the A83 and minimise disruption to the local road network; • regularly update the community of plans implemented to ensure they are informed of the anticipated construction movements and its potential effects; • information provided for local users regarding construction or decommissioning activity to reduce effects experienced; and	Reduction and/or avoidance of non-significant adverse effects. Enhancement of significant beneficial effects.	Pre-Construction, Construction, Post-Construction and Operation.	Moderate beneficial and significant socio-economic (employment) effects in Kintyre. Minor beneficial tourism (accommodation) effects in Campbeltown, the west coast and east coast.

Table 19.1: Summary of Mitigation and Residual Effects					
		• Measures to enhance the socio-economic effect of the proposed development. **Operation:** • land not required for the operation of the proposed development, will be returned to the landowner for uses compatible with operational activities; and • Measures to enhance the socio-economic effect of the proposed development			
Shadow Flicker (Chapter 17)	No potential significant effects identified	Mitigation measures are available to counteract shadow flicker occurrence to reduce the possibility of nuisance. One of the most effective mitigation strategies is shutting down selected turbines using turbine control systems during periods when shadow flicker could theoretically occur and during certain weather conditions. Therefore, in order to protect the amenity of local residents, the turbines would be programmed to shut down during periods when shadow flicker could occur.	Reduction and/or avoidance of non-significant effects.	Operation.	No likely residual significant effects anticipated.
Aviation (Chapter 18)	No potential significant effects identified	Not applicable	Not applicable.	Not applicable.	No significant effects.