

# **Tangy IV Wind Farm**

Volume 1:  
Non-Technical Summary

Section 36 Environmental Impact Assessment Report

**August 2018**



## TABLE OF CONTENTS

<b>OVERVIEW</b>	<b>1</b>
<b>1. INTRODUCTION</b>	<b>3</b>
1.1 Purpose of the Non-Technical Summary	3
<b>2. PROPOSED DEVELOPMENT</b>	<b>4</b>
2.1 Infrastructure	4
2.2 Site Access	4
2.3 Construction	4
2.4 Operation and Management	4
2.5 Residues and Emissions	5
<b>3. SITE SELECTION AND ALTERNATIVES</b>	<b>6</b>
3.1 Site Location and Surroundings	6
3.2 No Development Alternative	6
3.3 Design Evolution	6
<b>4. LIKELY SIGNIFICANT EFFECTS</b>	<b>8</b>
4.1 Landscape and Visual	8
4.2 Ecology and Nature Conservation	8
4.3 Surface Water	9
4.4 Cultural Heritage	10
4.5 Access Traffic and Transport	10
4.6 Land use, Socio-economics and Tourism	11
<b>5. SUMMARY OF OTHER ENVIRONMENTAL EFFECTS</b>	<b>12</b>
5.1 Ornithology	12
5.2 Geology, Soils and Peat	12
5.3 Noise	13
5.4 Shadow Flicker	13
5.5 Aviation	13
<b>6. SUMMARY</b>	<b>15</b>

## OVERVIEW

SSE Generation Limited (the applicant) has applied for consent<sup>1</sup> for the proposed Tangy IV Wind Farm, comprising 16 turbines and associated infrastructure, 3 km north of Kilchenzie, Kintyre, Scotland.

The applicant proposes to repower and extend the existing Tangy I and Tangy II Wind Farms, replacing the existing 22 turbines with a 16 turbine wind farm with a maximum tip height up to, but not exceeding 149.9 m ('the proposed development').

The applicant has provided an Environmental Impact Assessment Report (EIA Report) to accompany the application. The EIA Report comprises the following sections:

- Volume 1: NTS;
- Volume 2: Main Report;
- Volume 3a: Figures;
- Volume 3b: Visualisations; and
- Volume 4: Technical Appendices.

Additional documentation that will be submitted with the EIA Report includes:

- Design and Access Statement;
- Pre-Application Consultation Report; and
- Planning Statement.

The EIA Report and associated documents will be available for viewing on the Scottish Government Energy Consents online portal (<http://www.energyconsents.scot/Default.aspx>) and also at the following locations:

- Argyll and Bute Council, Customer Service Point, 1A Manse Brae, Lochgilphead, PA31 8RD, Mon – Fri from 9am – 12.30 and 1.30 – 4pm;
- Argyll and Bute Council, Burnett Building, Customer Service Point, St. John Street, Campbeltown, PA28 6BJ, Mon – Fri from 9am – 12.30 and 1.30 – 4pm; and
- Tayinloan Post Office, Tayinloan Store, Tayinloan, Tarbert, PA29 6XG, Monday to Friday: 10am to 1pm.

A paper copy of the Non-Technical Summary is available free of charge. A copy of the EIA report is available on DVD at a cost of £10. A printed copy of the EIA Report can be provided upon request (£450). Copies of the documents may be obtained from the applicant by contacting:

Murray West  
SSE  
1 Waterloo Street  
Glasgow  
G2 6AY

Or by email at: [murray.west@sse.com](mailto:murray.west@sse.com)

Further detail on the project is available on the applicant's website: [www.sse.com/tangy-repower](http://www.sse.com/tangy-repower).

Any representations to the application may be submitted via the Energy Consents Unit website at [www.energyconsents.scot/Register.aspx](http://www.energyconsents.scot/Register.aspx); by email to the Scottish Government, Energy Consents Unit mailbox at [representations@gov.scot](mailto:representations@gov.scot); or by post to the Scottish Government, Energy Consents Unit, 4th Floor, 5 Atlantic Quay, 150 Broomielaw, Glasgow, G2 8LU, identifying the proposal and

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<sup>1</sup> An application for consent for the proposed development will be made to the Scottish Ministers under section 36 of the Electricity Act 1989, along with a request for a direction that planning permission be deemed to be granted under section 57(2) of the Town and Country Planning (Scotland) Act 1997 as amended

specifying the grounds for representation. Written or emailed representations should be dated, clearly stating the name (in block capitals), full return email and postal address of those making representations. Only representations sent by email to [representations@gov.scot](mailto:representations@gov.scot) will receive acknowledgement.

All representations should be received not later than 26 October 2018, although Ministers may consider representations received after this date.

Any subsequent additional information which is submitted by the applicant will be subject to further public notice in this manner, and representations to such information will be accepted as per the notice.

## **1. INTRODUCTION**

This Environmental Impact Assessment Report (EIA Report) is submitted by 'the applicant', SSE Generation Ltd (SSEG), holder of a generation licence. The EIA report has been prepared on behalf of the applicant, by SSE Renewables Developments (UK) Limited (SSE Renewables), to accompany an application for consent<sup>2</sup> for the proposed Tangy IV Wind Farm, located on the west coast of the Kintyre Peninsula, Argyll and Bute, Scotland, as shown on Figure 1. The applicant proposes to repower and extend the existing Tangy I and Tangy II Wind Farms, replacing the existing 22 turbines with a 16 turbine wind farm with a maximum tip height up to, but not exceeding 149.9 m ('the proposed development').

### **1.1 Purpose of the Non-Technical Summary**

An EIA Report has been prepared to support the application for planning permission. The purpose of the EIA Report is to document the potential for significant environmental effects as a result of the proposed development, and to specify mitigation to avoid or reduce significant environmental effects. This document provides a Non-Technical Summary (NTS) of the EIA Report.

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

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<sup>2</sup> An application for consent for the proposed development will be made to the Scottish Ministers under section 36 of the Electricity Act 1989, along with a request for a direction that planning permission be deemed to be granted under section 57(2) of the Town and Country Planning (Scotland) Act 1997 as amended

## **2. PROPOSED DEVELOPMENT**

### **2.1 Infrastructure**

The proposed development would include the following key components:

- 16 turbines of up to, but not exceeding, 149.9 m tip height with external transformers;
- hardstanding area at each turbine base with an approximate area of 1,800m<sup>2</sup>;
- three permanent meteorological masts and associated hardstand areas;
- up to two site substations (one new substation and possible retention of the existing Tangy I and Tangy II Wind Farm substation);
- one operations control building with parking and welfare facilities;
- a total 11 km of onsite access tracks with associated watercourse crossings (of which approximately 7.4 km are new access tracks and 3.6 km are upgrades to existing tracks); and
- onsite underground cabling.

The site layout is shown in Figure 2.

### **2.2 Site Access**

The construction and operations access to the site would be from the A83 to the south of the site and connects to Campbeltown and the B842 and B843 roads. It is envisaged that the turbine components would be delivered to the port facilities at Campbeltown and transported to the site via the A83. The B843 provides access to Machrihanish and to CS Wind UK, where turbine towers could be transported to the site.

### **2.3 Construction**

Additional construction key components include:

- temporary construction compound and laydown areas (option for on-site concrete batching);
- temporary meteorological masts;
- temporary telecoms infrastructure;
- forest removal and replanting;
- dismantling of existing turbines and associated reinstatement (turbine bases to ground level and approximately 2.1km of redundant access tracks); and
- up to four borrow pits.

The construction phase of the proposed development is anticipated to be approximately 22 months. It is proposed that construction activities be limited to the working hours of 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 on Saturdays.

A Construction Environmental Management Plan (CEMP), including Waste Management would be implemented during construction to avoid, reduce or control associated adverse environmental effects.

A Traffic Management Plan (TMP) would be developed in consultation with the local roads authority to avoid and reduce effects associated with construction traffic during working hours.

### **2.4 Operation and Management**

It is anticipated that full-time staff will be employed to manage and operate the wind farm.

Routine maintenance and servicing will be carried out on each turbine approximately twice a year, in addition to the initial service three months after commissioning. On average two people will take five days to service each turbine.

At regular periods oil and components will require changing, increasing the service time per machine. Gearbox oil changes are required approximately every 20 months. Blade inspections are carried out as required (normally somewhere between every two and five years). Appropriate maintenance works will be carried out immediately following any unexpected events on site, such as failure of a generator or gearbox. For the purposes of the EIA, it is assumed that the proposed development will be a permanent installation.

Safe access will be maintained all year round with no public vehicular access to the site.

## **2.5 Residues and Emissions**

The EIA has considered the potential for residues and emissions associated with the construction and operation of the proposed development, including consideration of water, air, noise and vibration, light, soil pollution and waste. No significant residues or emissions have been identified.

### **3. SITE SELECTION AND ALTERNATIVES**

#### **3.1 Site Location and Surroundings**

The site is located approximately 9 km north-west of Campbeltown, Kintyre's largest settlement. The closest villages are Bellochantuy, 2 km north-west of the site, and Kilchenzie, 3 km south of the site. The site is a combination of forestry and agricultural land currently used for commercial forestry, grazing and renewable electricity generation. The highest point within the application boundary is Cnocan Gean, north-east of the existing wind farm at a height of 200 m Above Ordnance Datum (AOD). In general, the elevation of the site ranges from about 90 m to 200 m AOD.

- 3.1.1 The site benefits from the presence of an existing local turbine tower manufacturing factory, upgraded harbour facilities. The existing operational Tangy I and Tangy II Wind Farm benefit from an exceptional wind resource and existing infrastructure. There is also the opportunity to increase the efficiency of the current wind farm through replacement of the existing turbines. Turbine technology has significantly advanced since Tangy I and Tangy II became operational, with early turbine models having been superseded by much more efficient machines.

#### **3.2 No Development Alternative**

- 3.2.1 The 'no development' scenario is considered to represent the current baseline situation as described in the individual chapters of this EIA Report. In the 'do nothing' alternative scenario, either the current operational Tangy I and Tangy II Wind Farm would continue generating electricity, or the consent for Tangy III (consented August 2018<sup>3</sup>) would be implemented. In line with the scoping opinion (Scottish Government, 2017) the baseline taken for the purposes of the EIA is the current operational site conditions with Tangy I and Tangy II in operation. In this scenario, the site would not be restored to pre-2004 conditions.

#### **3.3 Design Evolution**

Figures 3a - c summarise the wind farm design evolution first developed for the consented Tangy III wind farm to final design layout for the proposed development.

Over seven different site layouts were assessed, taking account of a range of environmental considerations including input from specialists on:

- the presence of an established bird flight paths (e.g. greenland white-fronted goose to the east of the proposed development);
- turbine scale and geometry in relation to the landscape and visual context;
- visual amenity from sensitive viewpoints;
- the presence of sensitive habitat types;
- the presence of priority peatland habitat;
- avoiding turbines or infrastructure close to watercourses and minimising watercourse crossings;
- avoidance of cultural heritage features; and
- ensuring compliance with acceptable limits for wind turbine operational noise.

The review of alternative layouts also considered technical factors such as:

- distance from Public Roads;
- turbine spacing;
- wind capture; and

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<sup>3</sup> Planning permission for 15 turbines with tip height of 130 m granted in August 2018 by Argyll and Bute Council

- ground conditions (e.g. the presence of peat).

Tangy III Wind Farm was granted planning permission in June 2015 for 15 turbines at 125m tip height. Permission was granted in August 2018 to increase the tip height of the Tangy III Wind Farm turbines by 5 m to 130 m. While the Tangy III ES (2014) assessed a 16 turbine scheme, consent was granted for a 15 turbine scheme (with Turbine 8 removed). The applicant is now seeking to increase the tip height to 149.9 m for a 16 turbine scheme. The proposed post-consent changes include:

- turbine 8 is reintroduced, resulting a total of 16 turbines;
- maximum wind turbine tip height is increased from 130 m to up to, but not exceeding 149.9 m; and
- indicative wind turbine rotor diameter from 105m to circa 130m.

Following further assessment of turbine 8 (T8) and review of previous consultation feedback, it was determined that there was no significant benefit to the removal of T8 with respect to reducing environmental effects, therefore the decision was made to include it in the scope of this EIA Report and application.

## 4. LIKELY SIGNIFICANT EFFECTS

The EIA process is designed to identify any significant effects that the proposed development will have on the environment. The EIA considered the environmental impacts across a range of factors, as required by the Scoping Opinion. The conclusions of the EIA are that significant effects associated with the construction and operation of the proposed development are limited to potential effects on the following topics:

- Landscape and Visual;
- Ecology and Nature Conservation;
- Surface Water;
- Cultural Heritage;
- Access Traffic and Transport; and
- Land use, Socio-economics and Recreation.

### 4.1 Landscape and Visual

The landscape character assessment has identified that the majority of landscape effects in relation to the proposed development would be **not significant. No significant effects are anticipated in relation to landscape designations.**

Potential significant effects have been identified for two of the six landscape character types (LCTs) which make up the 11 km detailed study area: Bay Farmland and Upland Forest-Moor Mosaic. These effects are anticipated to result from the increased appearance of the larger turbines on the southern edge of the forested upland core of Kintyre which forms a context and backdrop to surrounding agricultural fringes, foothills and valleys, and the low-lying landscape of Aros Moss. However, effects are considered to be **Moderate and Significant** as the proposed development is anticipated to be noticeable and **locally intrusive, rather than a dominating feature**. These effects would be limited to a radius of around 8 km from the proposed development and are mostly within a 6 km radius. Beyond this distance all effects are anticipated to be minor or below and would be not significant.

The cumulative landscape character assessment, has found that there would be a potential significant cumulative effect on one designated landscape: West Coast of Kintyre Area of Panoramic Quality (APQ) and parts of two LCTs: Upland Forest Moor Mosaic; and Rocky Mosaic. These effects relate to a potential increase in prominence and frequency of wind farm development when moving through the landscape and potential surrounding effect in some locations, and in the case of Rocky Mosaic which is found in several locations within the detailed study area, would affect only the western, coastal unit of the LCT. The effect in both cases is assessed as moderate and significant. No significant cumulative effect is predicted for any other LCT within the detailed study area.

The visual assessment has identified that, during construction and operation, potential effects would be **significant** for receptors at 16 of the 27 viewpoints, at 3 of the 10 settlements and on 4 of the 17 routes included in the assessment.

The cumulative visual assessment has found that potential effects would be **significant** for receptors at 5 of the 11 viewpoints and on 1 of the 11 routes included in the assessment.

### 4.2 Ecology and Nature Conservation

A full suite of ecology surveys was completed in the summer of 2013, with an update survey undertaken in January 2018 to confirm that conditions on site remain unchanged.

There are no statutory ecological designations present in the ecological study area. Two Sites of Special Scientific Interests (SSSI) are located in close proximity:

- Tangy Loch SSSI: boundary less than 100 m south east of closest turbine, loch is approximately 500 m away; and
- Machrihanish Dunes SSSI: over 2 km south-west from the nearest turbine.

The dominant habitats within the proposed development are coniferous plantation, marshy grassland, improved grassland and wet modified bog. The 2013 surveys identified peatland habitats on site which have been degraded and modified through afforestation and grazing. Ground Water Dependent Terrestrial Ecosystems (GWDTE) are also present. However, the proposed development has been designed to avoid peatland habitats and GWDTE, where possible, thereby minimising impact through turbine location and access track route selection.

Without application of mitigation, there is the potential for significant effects on Tangy Loch SSSI (at national level) in both constructional and operational phases.

The Construction Environmental Management Plan (CEMP) sets out proposed measures to minimise disturbance to ecological features throughout the construction period and is provided as Technical Appendix 5.1: CEMP.

The Habitat Management Plan (HMP) sets out proposed measures for habitat restoration and creation and is provided as Technical Appendix 10.6. Proposed measures include the restoration of 27.7 ha of peatland habitat and the creation of 3.5 ha of native broadleaved woodland.

Following the implementation of the proposed mitigation measures detailed in chapter 10, the residual effects on ecological features are considered to be **not significant**. Following the application of mitigation, no residual effects are predicted.

### 4.3 Surface Water

This assessment has considered the potential for significant effects on surface water quality, fisheries and recreation, flood risk, public water supplies and private water supplies (PWS). The assessment was made with reference to the assessment provided in Chapter 12 of the Tangy III ES (2014) followed by a review of any changes in policy, legislation and guidance and baseline conditions, along with consideration of the significance of effects for the proposed development. Based on this assessment it was concluded that, with the exception of PWS source locations within 250 m of the proposed development, there would be no potential for significant effects. All other non-significant effects have been scoped out.

The assessment of the potential for the proposed development to impact PWS considered 14 PWS source locations within 1 km of the site. Following further baseline characterisation using desk assessment, site survey, questionnaires and local consultations, the potential for impacts on 13 of the 14 PWS source locations was scoped out of further assessment on the basis that they are located outwith the 250 m groundwater protection buffer.

PWS source location 2 was subject to further assessment to consider the potential impacts associated with Borrow Pit C. Based on conceptual site modelling, it was concluded that depending on the hydrogeological connection between PWS2 and Borrow Pit C, there is the potential for either 'no effect' or 'adverse effects' on the quality and quantity of supply.

Following a precautionary approach, it is therefore concluded that there could be the potential for effects of high magnitude. In order to mitigate the potential for significant effects, the applicant proposes to agree contingency plans that would ensure security of supply to the two properties in the unlikely event that there is a significant effect on the quality or quantity of supply. Security of supply would be provided through the use of either temporary or permanent replacement of groundwater supply. Following the application of these proposed mitigation measures, the effect on the supply of water to the residential receptors would be considered **not significant**.

#### 4.4 Cultural Heritage

A desk based study was completed to identify cultural heritage assets within the site. A walkover survey was completed in 2014, with an update survey undertaken in February 2018.

There are no designated assets registered by Historic Environment Scotland (HES) located within the site. However, there are two heritage assets (Sites 13 & 120) deemed to be of 'almost certain National Importance' (C) and 18 assets of 'probable National Importance (V) as recorded on the Non-Statutory Register held by West of Scotland Archaeology Service (WoSAS) within the site. There are 26 non-designated assets within the site and the assets range in date from the prehistoric to the modern period.

The following designated assets within the cultural heritage study areas have been judged to be potentially subject to change in their settings:

- 41 Scheduled Monuments;
- 52 assets from HER Non-Statutory Register of assets of potential National Importance; and
- Three Listed Buildings (one which is Category A Listed).

The proposed development layout and infrastructure have been finalised such as to avoid any direct effects upon known heritage assets within the site. There could still be potential direct effects on unknown buried archaeological remains, in the case of the proposed development, relate to the possibility 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. During operational phase, there is a potential for adverse indirect effects upon the settings or a range of heritage assets within 10 km of the site.

In some areas the proposed felling of forestry would occur in close proximity to known heritage assets. Within these areas the known heritage assets will be surveyed and fenced off under archaeological supervision prior to the commencement of forestry operations. To mitigate the potential for previously unrecorded assets to be impacted during the construction phase, an archaeological watching brief will be maintained on a representative proportion of ground-breaking works across the site. Any remains encountered will either be preserved in situ or will be recorded and removed as appropriate.

It is not possible to mitigate for indirect (setting) effects. Therefore, there would be a Moderate and significant residual operational effect on the setting of two assets: Killocrew Cairn (Site 21) and Tangy Loch Fortified Dwelling (Site 27). In each case the effect, although significant, would not be at a level that would threaten the protection of the asset.

#### 4.5 Access Traffic and Transport

Existing road traffic levels were established by three automatic traffic counts conducted during May 2018 in the following locations:

- A83: South of Kilchenzie;
- A83: South of Low Ballevain; and
- Unnamed Road: South of High Ballevain Farm.

The Access, Traffic and Transport assessment identifies the potential for significant effects on the section of unnamed road between the A83 and the site entrance, in relation to traffic generation and in relation to driver delay. Potential significant effects could also occur at Glenbarr and Rhunahaorine primary schools in relation to pedestrian amenity.

In relation to the identified areas of significant effects, mitigation measures are provided in the Outline Traffic Management Plan (Technical Appendix 15.2), for example, measures to manage driver delay on the road between the A83 and the site entrance, and liaison with local primary schools to ensure pedestrian amenity is maintained. It is anticipated that following

implementation of the specified mitigation the significance of the identified effects will be reduced to low and not significant. All other effects are predicted to be negligible and not significant.

#### **4.6 Land use, Socio-economics and Tourism**

The land within the site application boundary is predominantly managed commercial forest with areas of agricultural grazing land. The southern section of the site is already used for wind power generation (Tangy I and II Wind Farm), with 22 operational turbines. The proposed development will alter the existing land use, with some permanent (approximately 13.74 ha) and some additional temporary (15.98 ha) land take to accommodate the turbines, associated structures and access tracks, however no significant effects are predicted.

The coniferous plantation woodland on the site will be felled to enable the proposed development. Replanting of to a keyhole design will take place following the construction phase.

Renewable energy brings opportunities for economic development within Argyll and Bute. This is particularly important for Campbeltown. The associated potential for direct economic benefit and induced employment creation is expected to create moderate and significant beneficial effects at a local scale in Kintyre.

The potential tourism effects of the proposed development have been considered in detail with reference to the most recent and robust evidence available on the potential impact of wind farms on tourism, including a report by BiGGAR Economics undertaken in 2017. None of this suggests that wind farms are likely to have a significant detrimental effect on tourism.

## 5. SUMMARY OF OTHER ENVIRONMENTAL EFFECTS

The EIA also considered the follow topic issues:

- Ornithology;
- Geology, Soils and Peat;
- Noise;
- Shadow Flicker; and
- Aviation.

No significant effects were identified.

### 5.1 Ornithology

Ornithological surveys were undertaken to understand the existing bird flight activity around the site. In addition to the baseline surveys undertaken for Tangy III (April 2012 to March 2014), further surveys were undertaken between September 2016 and November 2017.

There are no statutory conservation designations within the proposed development but the proposed development is within 20 km of two SPAs:

- Kintyre Goose Roosts SPA (underpinned by Kintyre Goose Roosts Ramsar, Tangy Loch SSSI, Kintyre Goose Lochs SSSI and Rhunahaorine Point SSSI) – various distances to the north, east and south east; and
- Arran Moors SPA (underpinned by Arran Moors SSSI) – 19.4 km to the east.

Bird species present include but are not limited to: Greenland white-fronted goose; little tern; hen harrier; red-throated diver; golden eagle; peregrine falcon and short-eared owl.

No significant effects are predicted during the construction phase through displacement and disruption of breeding/ wintering and foraging birds. No significant effects are predicted during the operation phase through collision risk and displacement of nesting and foraging birds from the proposed development.

There are no significant effects predicted during the decommissioning phase. There are also no significant cumulative and in-combination effects predicted.

Although no significant effects are predicted, given the conservation status of the Greenland white-fronted goose population a number of mitigation measures will also be put in place during the winter period to ensure all reasonable measures are taken to minimise disturbance to commuting flights or roosting birds in the area, including agreeing a schedule of construction work which has the potential to disturb the Greenland white fronted goose population with Argyll and Bute Council in consultation with SNH.

### 5.2 Geology, Soils and Peat

A combined peat survey and ground condition survey was conducted between September 2013 and June 2014. Additional peat probing was undertaken in March 2018 to determine final location of the temporary construction compound and refined access to T8 and T10.

There are no recorded geological designations within the proposed development or within 100 m of the site boundary. The nearest geological designation is Bellochantuy and Tangy Gorges Geological Conservation Review Site (GCR), located approximately 700 m west of the site boundary. Bellochantuy and Tangy Gorges is also a tripartite SSSI site for quaternary geology and geomorphology. The hydrogeological map also suggests that the site is generally underlain by impermeable rocks without groundwater at shallow depth.

The superficial geology of the proposed development are erosional, transported sediments of glacial diamicton, sands and gravels, cobbles and boulders in a matrix of clay and silt. The bedrock geology comprises of the Stonefield Schist Formation on the western area of the site; the Glen Sluan Schist Formation on the east and Loch Tay Limestone Formation in the central region. The SEPA superficial aquifer map and bedrock aquifer maps (2004) indicate that the bedrock and superficial aquifers underling the site are dominated by fracture flow with low productivity.

As a result of the peat probing surveys undertaken, deep peat deposit across the north-eastern part of the study area, in the upland areas of the site and in discrete pockets with groundwater levels shallow were found.

The potential effects on geology and ground conditions are considered to be low or negligible and not significant in the current setting. However, the requirement for further mitigation, including peat management measures, are included as part of the construction process is detailed in TA5.1: CEMP.

### 5.3 Noise

Construction noise has been assessed by a desk-based study of a potential construction programme and by assuming the wind farm is constructed using standard and common methods. Noise levels have been calculated for receiver locations closest to the areas of work and compared with guideline and baseline values. It is concluded that noise generated through construction activities, or related to construction stage traffic movements, will not have a significant effect.

Noise levels from the operation of the turbines have been predicted for those locations closest to the site. Noise surveys have been undertaken over a period of 3 weeks to establish existing baseline background noise levels.

Noise limits have been derived from the data using the measured noise levels, following the method stipulated in national planning guidance.

It is concluded that operational noise levels from the wind farm will be within levels deemed, by national guidance, to be acceptable for wind energy schemes and therefore not significant under the terms of the EIA Regulations.

Though not significant, standard good practice mitigation measures are proposed to reduce potential effects of construction noise and vibration effects of blasting operations.

### 5.4 Shadow Flicker

The shadow flicker assessment has been undertaken for an assessment area of 1,300 m around each turbine. Twelve receptors were found within the area potentially susceptible to shadow flicker.

A site survey was undertaken on 14 March 2018 in order to identify all buildings (located within the study area). The assessment has demonstrated that the 'likely' number of shadow flicker hours taking into account typical sunshine hours for the area would 15.4 hour per year and a maximum of 10 minutes per day. To protect the amenity of local residents, the turbines would be programmed to shut down during periods when shadow flicker could occur, accordingly, the impact from shadow flicker is predicted to be **not significant**.

### 5.5 Aviation

Receptors identified as being sensitive to the proposed development are as follow:

- Campbeltown Aerodrome outer Horizontal Surface;
- Campbeltown Aerodrome Doppler Very High Frequency Omni-Range (DVOR);
- Instrument Flight Procedures;
- NATS Distance Measuring Equipment (DME);

- NATS Lowther Hill Radar;
- NATS Tiree Radar;
- Minimum Sector Altitudes; and
- Military Low Flying.

No significant aviation impacts are predicted and consequently no mitigation is required.

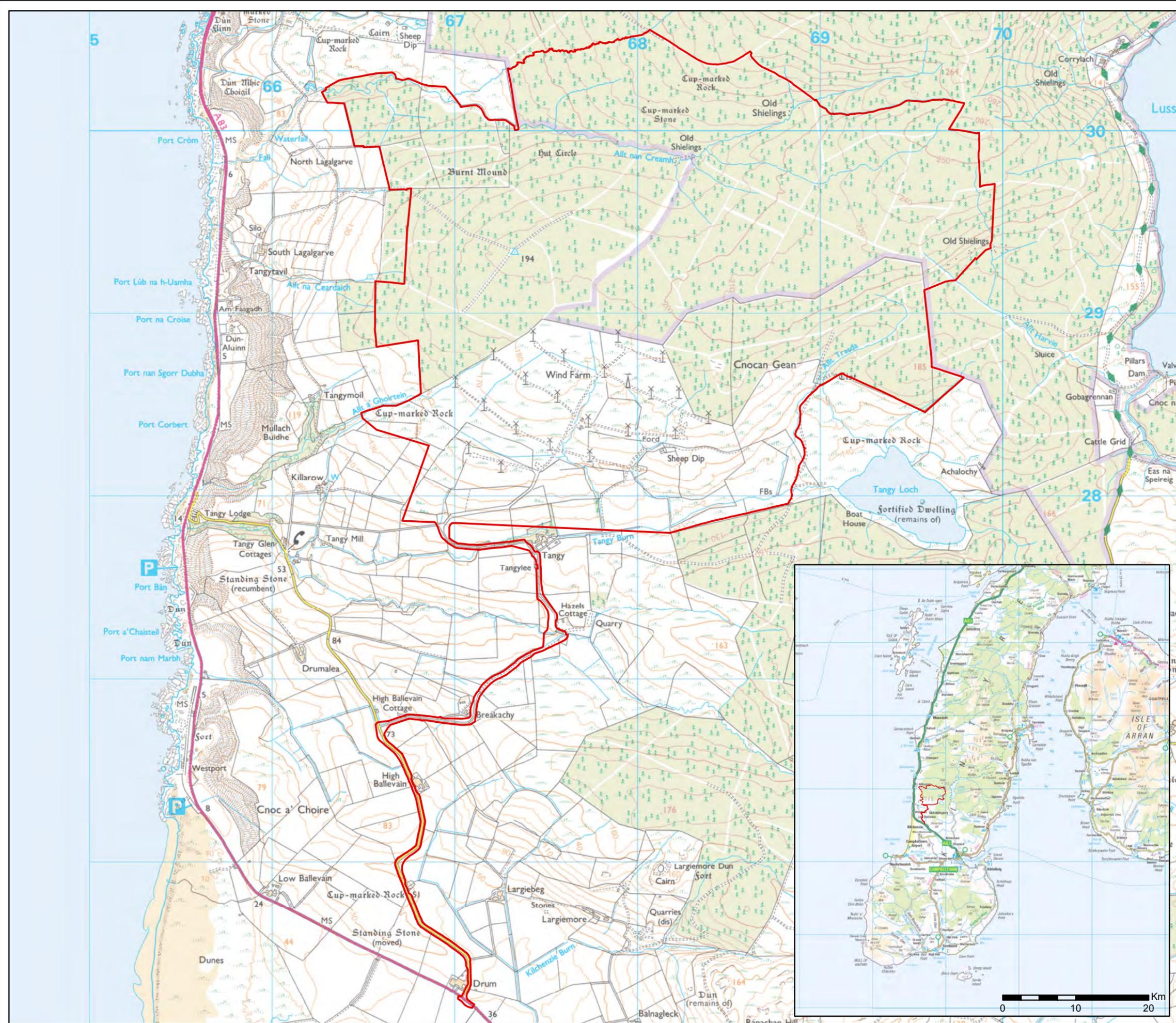
## 6. SUMMARY

Environmental constraints and considerations have been taken into account in the site layout and wind farm design. As a result, the majority of potential significant effects have been avoided or reduced.

The EIA Report on the potential for significant effects under the following headings:

- 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.

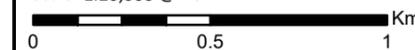
The EIA Report has identified residual significant effects for landscape and visual and cultural heritage receptors. Significant beneficial effects have been identified for the local Kintyre economy. No residual significant effects were identified for ornithology, ecology, geology, soils, peat, surface water, noise, access, traffic and transport, land-use, recreation, shadow flicker or aviation.



**Key**

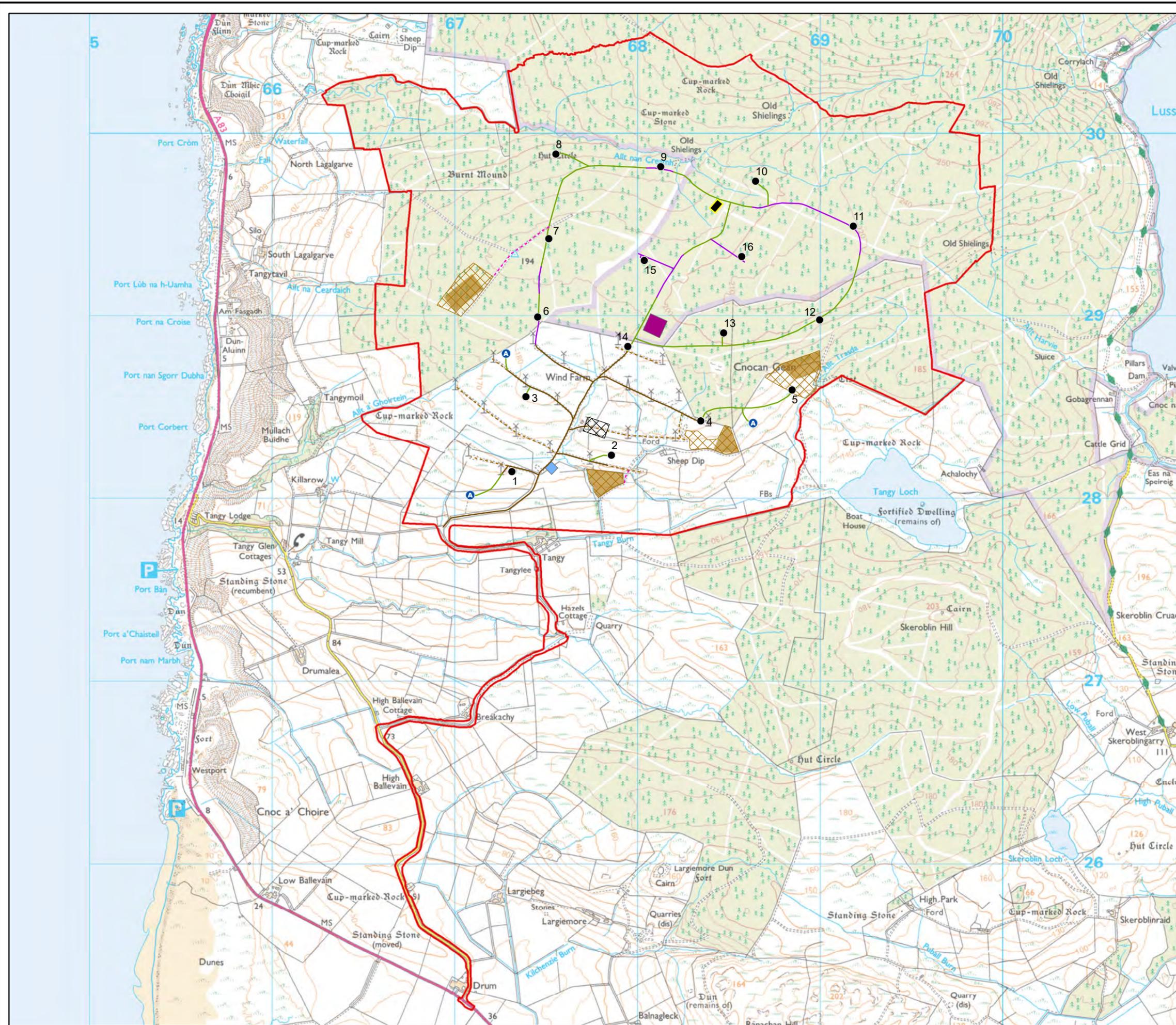
Site Boundary

Scale 1:20,000 @ A3



**Figure 1**  
Site Location

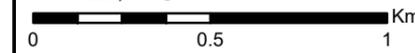
**Tangy IV Wind Farm**  
EIA Report



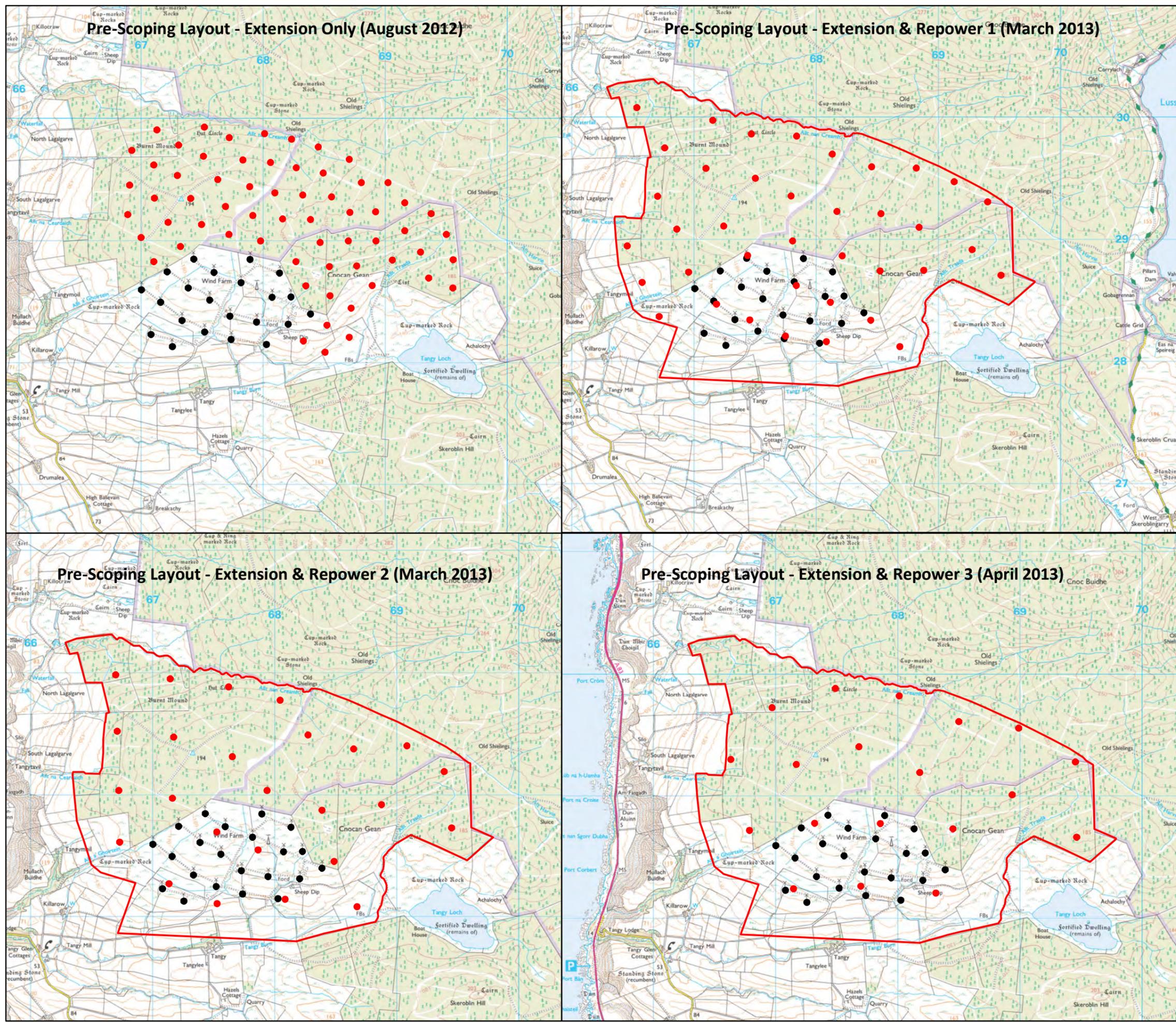
**Key**

- Site Boundary
- Turbine
- A Permanent Met Mast
- New Cut Track
- New Floating Track
- Existing Track to be Reused
- Existing Track for Construction Only
- Existing Track to be Reinstated
- Operations Building
- Substation
- Laydown Area
- Borrow Pit Working Area
- Borrow Pit Search Area
- Construction Compound

Scale 1:20,000 @ A3



**Figure 2**  
**Site Layout**



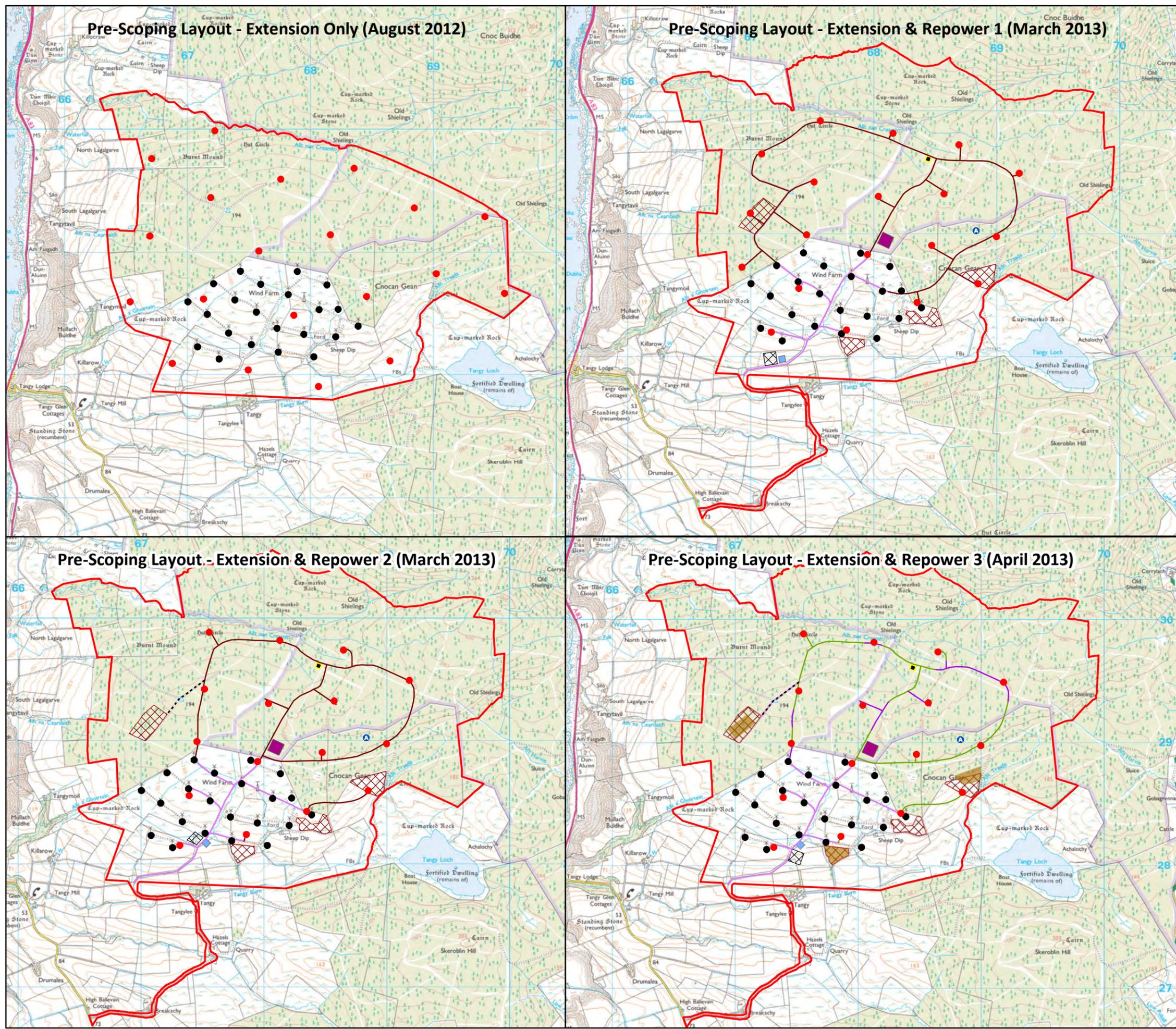
**Key**

- Site Boundary
- Proposed Turbine
- Existing Turbine

Scale 1:30,000 @ A3  
 Km



**Figure 3a**  
**Design Iteration**



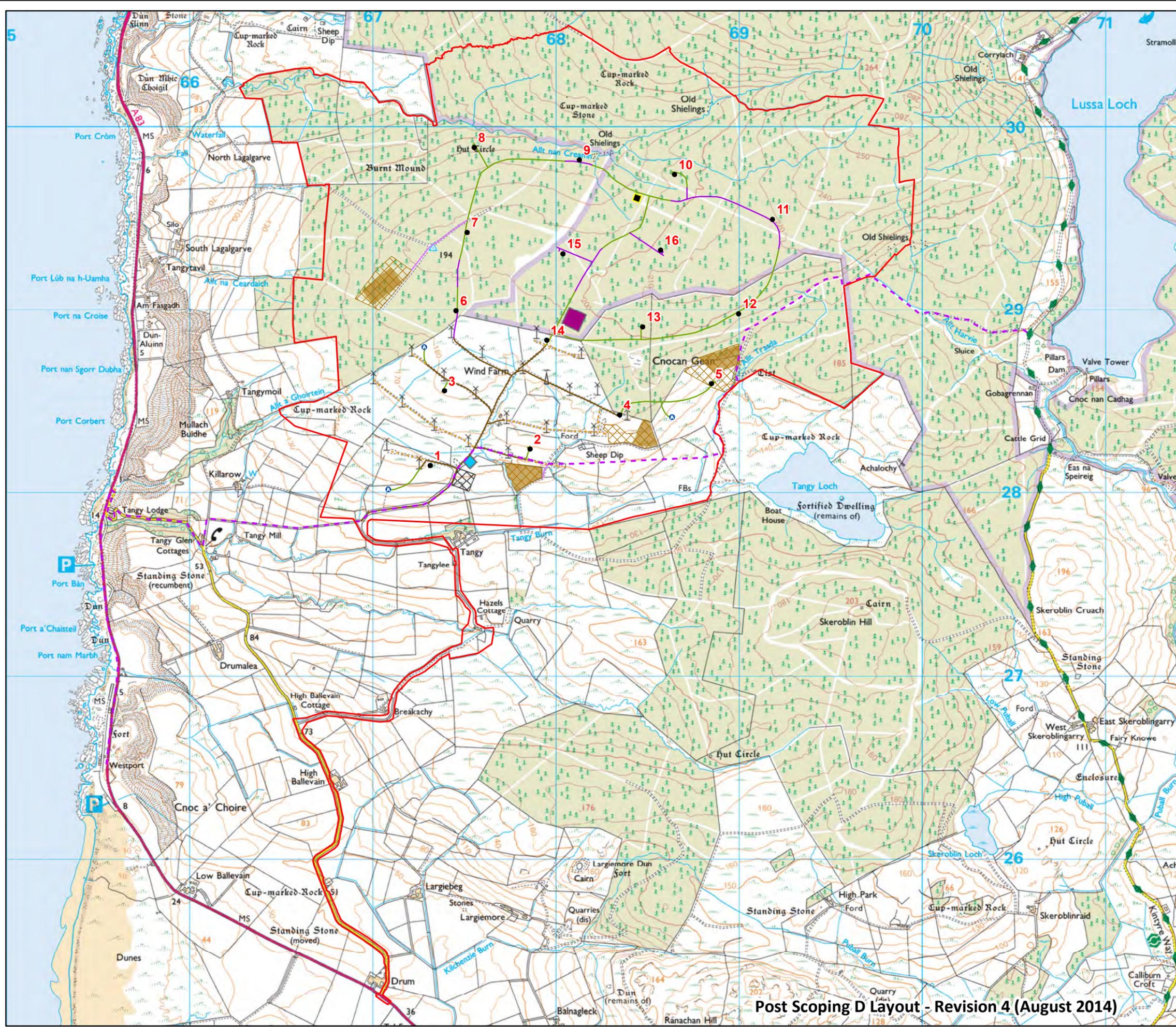
**Key**

- Site Boundary
- Proposed Turbine
- Existing Turbine
- ⊙ Permanent Met Mast
- New Access Tracks
- Existing Forestry Track to BP C
- Existing Access Track
- Cut Access Track
- Floated Access Track
- Proposed Construction Compound
- Proposed Laydown Area
- Proposed Operations Building
- Proposed Substation
- Borrow Pit - Working Area
- Borrow Pit - Search Area

Scale 1:30,000 @ A3  
 Km



**Figure 3b**  
**Design Iteration**  
**Tangy IV Wind Farm**  
**EIA Report**



**Key**

- Site Boundary
- Turbine
- Permanent Met Mast
- Substation
- New Cut Track
- New Float Track
- Existing Track for Construction Only
- Existing Track to be Reinstated
- Existing Track to be Reused
- Potential Re-routing of Kintyre Way
- Borrow Pit - Search Area
- Borrow Pit Working Area
- Proposed Construction Compound
- Proposed Operations Building
- Proposed Laydown Area

Scale 1:20,000 @ A3

N

**Figure 3c**  
Design Iteration

**Tangy IV Wind Farm**  
EIA Report

**Post Scoping D Layout - Revision 4 (August 2014)**

