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# Burn of Whilk Wind Farm

Environmental Statement, Volume 1: Non-Technical Summary

December 2006

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**A Report for**

Mr. Harry Malyon

**npower renewables ltd**


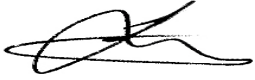

North Range East Lodge  
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# Burn of Whilk Wind Farm

## Environmental Statement

### Volume 1, Non-Technical Summary

December 2006

Responsible for	Function	Name	Date	Signature
Content	Renewable Energy Consultant	Mr. Joseph Kidd	11-12-2006	
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Approved	Responsible Director	Dr. David Bean	14-12-2006	
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## 1. Introduction

Npower Renewables Ltd (NRL) propose to construct and operate a wind farm known as Burn of Whilk between East Clyth and the Loch of Warehouse approximately 11km south west of Wick in Caithness. A site location plan is shown in Figure 1-1.

The wind farm would comprise 13 three-bladed turbines with associated crane pads, access tracks, electrical control building and associated infrastructure. The proposed site layout is shown in Figure 1-2.

The wind farm itself has been designed according to local and national planning policies and has given due consideration to the findings of a detailed environmental impact assessment (EIA).

This document is Volume 1, the Non Technical Summary (NTS), of a three Volume Environmental Statement (ES) reporting on the EIA. The NTS explains the need for the wind farm, describes its location, main components and different stages, as well as summarising the EIA process and key findings.

## 2. Need for the Project

Climate change is occurring worldwide and its effects are already visible on habitats and fauna including, for example, the internationally important populations of upland birds in the UK. In assessing the impact of the wind farm on the environment, it is important to consider what may happen to these species if no attempt is made to lessen the effects of climatic change in order to place the assessment of the project's environmental impacts into context.

The proposed 39MW capacity Burn of Whilk Wind Farm will generate approximately 133 GWh/year which is equivalent to the average domestic electricity supply of approximately 28,555 homes. In generating this electricity from renewable sources the wind farm will in turn make a significant offset of harmful greenhouse gas emissions that will otherwise be generated from fossil fuel electricity generation.

## 3. Existing Environment

The current land use at the proposed Burn of Whilk Wind Farm site is a mixture of improved grassland used for pasture, heather ground overlying peat and forestry land. The proposed site lies within the administrative area of The Highland Council.

The nearest occupied property to the wind farm is located at a distance of approximately 1.5km from the nearest turbine.

The site lies close to Caithness & Sutherland Peatlands SPA, RAMSAR and cSAC, East Caithness Cliffs SPA, and Warehouse Hill and Thrumster Mill SSSI's.

Detailed surveys including bird surveys and ecological assessments were commissioned in 2004.

## 4. The Proposal

NRL propose to build a wind farm at the Burn of Whilk site, the principal components of which are shown on Figure 1-2 Site Layout Plan, and comprise:

- 13 wind turbines each with a maximum capacity of 3MW, measuring 116m to the tip of the blades, and with a 90m rotor diameter;

- Permanent foundations supporting the wind turbines and associated crane hardstandings;
- New access arrangements from the A99(T) for wind farm components;
- Permanent tracks into the site from the public highway and between turbines, including the upgrade of an existing bridge across the Burn of East Clyth and construction of a new bridge over a tributary of the Burn of Whilk;
- Underground cabling within the wind farm site, all cabling to follow the permanent access tracks;
- 1 anemometry mast and associated foundation; and
- An electrical metering and site control building in a formerly derelict steading;

#### **4.1 Construction Stage**

The likely construction period for the development will be about 12 months.

Construction of the wind farm itself initially comprises establishing a site access track from the A99(T) followed by a temporary construction compound, then the area of commercial forestry within the wind farm application boundary needs to be removed (this will be chipped and donated to the Wick District Heating Scheme, subject to agreement). Excavation will be carried out for the wind turbine foundations and the turbine bases will be constructed. Finally the wind turbines themselves will be commissioned and erected. An anemometry mast will also be erected and commissioned.

Construction of access to the wind farm comprises construction of the main site access from the highway, upgrading sections of the existing access track, including replacement of bridge on disused railway line across Burn of East Clyth; and construction of 6km of new access tracks including installation of a new bridge across a Burn of Whilk tributary.

In terms of the grid connection, trenches will be excavated for the cables and an existing steading will be converted into a metering and control building and compound.

On completion of the construction phase the habitats affected by the construction phase will be reinstated.

#### **4.2 Operation Stage**

The wind farm has been designed with a planned operational life of 25 years. On a day to day basis the wind turbines will operate automatically, responding by means of anemometry equipment and control systems to changes in wind speed and direction. The wind farm will be remotely monitored.

The wind turbines would start to generate when the wind speeds at nacelle height reach 3 - 4m/s, attaining their maximum output at around 12m/s. At continuous wind speeds above 25m/s the turbines would automatically shut down for protection reasons. The turbine rotor operates at between approximately 11rpm and 20rpm dependent on wind speed and all turbines would rotate in the same direction.

When operating, the rotational speed of the blades is geared up through the gearbox, which drives the generator. This produces a three-phase power output at 690V, which is transferred from the generator to the transformer via internal low voltage cables. It is stepped up to a higher voltage of 33kV by the transformer for connection to the grid.

Each turbine will have a routine maintenance programme involving a number of checks and changing of consumables, including oil changes. In addition there will be a requirement for unscheduled maintenance, which might vary between resetting alarms to major component changes requiring a crane. Typically maintenance traffic will be four-wheel drive vehicles and

vans. In addition to the turbines, the control building and tracks will also require periodic maintenance.

Initially, daily maintenance visits will be made to the on-site control building. Due to the volume of traffic using the A99(T), this is unlikely to generate any significant increase in the volume of traffic.

### **4.3 Decommissioning Stage**

The anticipated operational life of the wind turbines and for which planning is sought is approximately 25 years.

However at the end of its operational life, the Burn of Whilk Wind Farm will be decommissioned and the land reinstated to its original state. The programme and duration of the decommissioning is expected to be similar to the construction phase of the project. The ultimate decommissioning protocol will be agreed by NRL, SNH and the Highland Council.

An escrow account securing decommissioning funds will be provided for through agreement between NRL and the landowners.

## **5. Planning Policy**

The Burn of Whilk Wind Farm has been designed according to the relevant planning policies in Scotland. These operate at a number of different levels, including at national level, National Planning Policy Guidelines (NPPG's) and more recently the Scottish Planning policies (SPP's) at a regional level, the Highland Structure Plan and at local level, the Caithness Local Plan, the latter two of which form the Development Plan for the region.

The National Policy and Planning Guidance (NPPG) 6 relating to the development of renewable energy provides a clear guidance towards climate change targets and renewable energy policies, stating that 'it is expected that much of the new capacity needed by electricity suppliers to meet the *Renewables Obligation (Scotland)* will come from wind farms.'

Planning Advice Note 45 (Revised 2002) provides a source of information and advice on a number of renewable energy technologies and the significant planning issues likely to arise in the future. It illustrates the range of such developments that have taken place in Scotland and the economic implications for rural areas. The national policy framework provides positive support for renewable energy development.

At regional level, there is a clear commitment in the Highland Council Structure to support renewable energy developments where they are shown to be appropriate and the Structure Plan also supports wind energy proposals provided the impacts are not shown to be significantly detrimental.

The Highland Renewable Energy Strategy and Planning Guidelines supplement the Highland Structure Plan and the existing policies of The Highland Council. One of the key aims of the strategy is to ensure that the advantages of renewable energy developments are realised with minimal effects. The Burn of Whilk site is not located in one of the preferred areas designated in the Highland Strategy. However, the detailed environmental assessment that has been carried out has used a range of experienced professionals and has concluded that the Burn of Whilk site is suitable in line with the constraints and requirements set out in the Strategy and therefore meets the spirit of the constraints methodology employed by the Highlands Strategy Renewable Energy Resource Assessment.

## **6. Environmental Impact Assessment**

Where a proposed development is likely to have significant effects on the environment it falls to the planning system to determine. In these circumstances the assessment of the effects of

certain public and private projects on the environment is covered by the European Council Directive 85/377/EEC. This in turn is provided for in Scottish legislation by the following:

- Environmental Impact Assessment (Scotland) Regulations 1999 (SI 001)
- Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 (SI 320)
- Section 57 of the Town and Country Planning (Scotland) Act 1997

The application for the proposed Burn of Whilk Wind Farm will be determined through the Town and Country Planning (Scotland) Act 1997 which will be administered by the planning authority, Highland Council.

Consultations were undertaken with the planning authority during the scoping phase and the Highland Council requested that an Environmental Statement be prepared under Schedule 2 of the EIA regulations to accompany the planning application, hence the production of this document.

Following an initial feasibility study carried out by npower renewables, a Scoping Report was submitted to the Highland Council on 23rd April 2003.

The Report set out the following key issues that would be addressed in the EIA along with the methods to be used:

- Landscape and visual amenity;
- Noise;
- Ecology;
- Birds;
- Archaeology;
- Geology, Hydrogeology and Hydrology;
- Electro-magnetic interference;
- Traffic; and
- Socio-economic issues.

The key issues and related effects which are detailed in the ES are summarised below:

## **6.1 Landscape and visual amenity**

The landscape and visual amenity assessment examines the potential effects of the proposed Burn of Whilk wind farm on the landscape and visual amenity of the surrounding area. The assessment is based on a study area with a 35km radius and concentrates on the key landscape and visual issues identified during the scoping stage of the assessment. These issues include potential landscape and visual effects on residential areas, main roads and tourist routes; and popular walking routes and recreational areas.

The aim of the landscape and visual impact assessment is to identify, predict and evaluate potential impacts arising from the proposed development. Wherever possible, identified impacts are quantified, but the nature of landscape and visual impact assessment requires interpretation by professional judgement.

The assessment has concluded that the medium scale of the landscapes around the wind farm combined with their generally open, exposed nature, can accommodate the number of wind turbines proposed for the Burn of Whilk site. The layout of the turbines has been optimised taking account of the other environmental and technical constraints to produce a

layout which responds to the sloping landform of the site and produces a reasonably balanced group of turbines when seen from most locations in the vicinity.

There are no statutory landscape designations in the study area, and whilst there are locally designated landscapes including the Flow Country at approximately 11km to the west of the application site, it is not considered that there would be any significant effects on the landscape character of these areas.

There would be no cumulative effects on landscape character at any of the viewpoint locations arising from the Burn of Whilk turbines with the existing wind farms at Buolfrulich, Causeymire and the two turbines at Forss. With the introduction of all of the other proposed wind farms, significant cumulative effects from the Burn of Whilk turbines would occur at some viewpoints in the landscape.

In relation to visual amenity in the study area, significant cumulative effects from the Burn of Whilk turbines with existing and consented wind farms would be limited to two viewpoint locations. If all of the proposed wind farms were built, there would be significant cumulative effects on visual amenity from the Burn of Whilk turbines occurring also for visitors on, and residential properties adjacent to, the A99(T) north of Lybster, and for residential properties at Roster.

Whilst it is recognised that some significant landscape impacts are unavoidable for most wind farm projects, it should be noted that, from a cumulative impact perspective, the scale of the Burn of Whilk Wind Farm can be accommodated into the landscape. Furthermore, the significant impacts only relate to a small proportion of the overall number of viewpoints chosen.

## **6.2 Noise**

Noise can have an effect on the environment and on the quality of life enjoyed by individuals and communities. The impact of noise can therefore be a significant factor in the determination of planning applications.

Noise monitoring was carried out at 4 locations in close proximity to the proposed wind farm to establish the existing noise environment at the site. The noise levels due to construction activities and then the operation of the wind farm were predicted and assessed against the relevant guidance.

For the most part, the likelihood of disturbance due to construction noise will be negligible. There is the possibility of disturbance to properties close to the entrance of the access track but this will be limited to a short period of time. Guidance given in BS 5228 will be used to ensure that best practicable method of minimising noise on the site will be adopted.

The predicted noise levels for the operational stage of the wind farm indicate that noise levels would be within acceptable limits.

## **6.3 Non-Avian Ecology**

The potential effects of the Burn of Whilk Wind Farm proposal were assessed for two types of ecological receptor: habitats (including flora) and protected mammals (fauna). The likely impacts on ecological receptors have been assessed using recognised ecological assessment criteria, with effects quantified using individual habitat and protected mammal receptors that could be affected.

A full habitat survey was undertaken across all areas of the site and adjacent land and a protected mammals survey identified the presence of water vole and potential polecat within discreet areas of the site.

Mitigation consisted of a number of measures including avoidance of sensitive habitats, sensitive construction techniques and habitat re-creation on clear-felled forestry ground that will offset relatively small amounts of other semi-natural habitat loss.

Some habitat areas including conifer plantation, blanket bog, wet heath, dry heath, improved grassland and small amounts of other wetland will be lost due to the development. However, mitigation measures are proposed for all habitat lost. These include:

- Micro-siting of road routes, wind turbines, borrow pits and a temporary compound to minimise the loss, disturbance and change of key habitats or plant species.
- Restoration of semi-natural habitat on road batters and verges.
- Minimising local habitat change using high standards of road verge and batter restoration.
- Felling trees, followed by restoration of blanket bog and heathland habitat in areas currently afforested with conifers.
- Employing high standards in restoration methods and monitoring to ensure that succession on clear-felled ground achieves good-quality wet or dry heath, and perhaps blanket bog habitats.

Mitigation measures for protected mammals result in no predicted significant impacts.

Cumulative impacts were also assessed, including recent afforestation, peat cutting and management for nature conservation. The proposed mitigation measures using deforestation will exceed habitat losses of peatland and heathland from development and will offset a moderate amount of habitat loss to conifer afforestation in eastern Caithness. Cumulative impacts are therefore judged as significant and positive for ground within the wind farm site.

In conclusion, the result of ecological assessment for impacts by the proposed Burn of Whilk Wind Farm on all receptors, under Scottish Executive EIA guidance, is a result of significant and positive. Furthermore, cumulative impact assessment is also judged as significant and positive.

#### **6.4 Birds**

Ornithological field studies were undertaken on and around the site between 2001 and 2005 and included the monitoring of raptors from Vantage Point Surveys (VP), Upland Breeding Bird Surveys (UBBS) and Woodland Point Count Surveys (WPC). The scoping study also highlighted potential impact on Hen Harriers and hence specific monitoring was carried out in 2006.

19 species of conservation concern (including Schedule 1 and sensitive species) were identified during the survey work.

The area affected by the wind farm lies outside SPA and SSSI designations and the significance of the effects of construction were considered to be Low to Medium for all species even prior to mitigation (with the exception of Hen Harrier).

The impact magnitude effects on Hen Harrier were considered to be medium for both construction and operational phases of the development when taking into consideration the changes in forestry habitat and the integrated mitigation procedures.

#### **6.5 Archaeology**

The impact of the Burn of Whilk Wind Farm was assessed in terms of heritage, and cultural value of the landscape. The assessment showed that 195 sites and monuments lie up to 5 km away from the site.

From a heritage perspective, none of these sites would be directly impacted upon by the proposed development the impact and it is considered that the proposed development area is close to optimal for this region. The site itself lies in a fold of the land on the east side of a ridge that separates it visually from the coastal plane to the south. The land to the north is

high and exposed to view from all directions and the land to the east is monument rich and would entail high risks of physical impacts on the heritage of the site. Therefore the potential alternatives can be shown to be more likely to impact adversely on heritage sites and monuments, either physically or visually or both.

From a visual impact perspective, none of the sites were predicted to be significantly impacted by the wind farm. At the majority of the sites, the impact was considered to be negligible. The impact of the visibility of the wind farm from these sites does not impact on a sightline that was designed or built-in to the monument. The ability of the sites and monuments in the surveyed catchment to inform this and future generations is thus not compromised in any way by the proposed development.

In terms of the impact of the development on the cultural value of the landscape itself, wind farms can be viewed as only the most recent in a succession of land uses deemed by contemporaneous societies to be appropriate in marginal areas.

On balance, it is concluded that heritage impacts alone are not sufficient to rule out the development of the proposed wind farm.

## **6.6 Geology, Hydrology, Hydrogeology**

The potential geological, hydrogeological and hydrological impacts of the proposed wind farm development at Burn of Whilk have been assessed, particularly focussing on areas of activity during construction and decommissioning operations, which have the potential to impact upon the hydrology and hydrogeology of the site and overall surface water and groundwater quality.

The assessment carried out on the potential geological, hydrogeological and hydrological impacts showed that no significant effects are anticipated in respect of hydrogeology or soils on the site.

In the design evolution, streams and other areas that may have been affected by hydrology were avoided hence no significant effects on hydrology are anticipated that have not been mitigated against.

## **6.7 Electro-magnetic interference**

There is the potential for wind turbines to have an adverse effect on the performance of electromagnetic waves used in navigation, radio-communication, TV and defence radar and also in the safe operation of aviation.

However, no significant effects through electro-magnetic interference due to the Burn of Whilk Wind Farm are anticipated that have not been mitigated through the design evolution.

## **6.8 Traffic**

The wind farm is situated off the A99(T), the main primary road route between Wick and Latheron. The majority of the existing site is on Forestry Commission land with the rest on private land. There is an existing access track off the A99(T) onto the land holding that part of the wind farm is sited in. It is proposed that this track will be improved and extended northwards to the site.

The turbine components would be delivered to Wick Harbour where the most appropriate route to site would be directly onto the A99(T) and south to the site entrance. No access problems are anticipated in connecting to the primary road network from Wick Harbour. It is proposed that the turbine blades will be loaded onto trucks on River Street, driven onto Station Road, reversed onto the Bridge of Wick and then driven straight across the roundabout onto Cliff Road and the A99(T).

For most of the road network considered there is likely to be no significant impacts due to the construction of the proposed wind farm. The main effects of traffic and transport for the wind

farm are likely to be restricted to certain periods of the construction programme when bulk materials such as fill, concrete and turbine components are being delivered. No significant transport effects from the operational phase of the project or any other significant transport effects are identified.

## **6.9 Socio-economic**

The employment structure of the area is not typical of other remote rural areas in Scotland. The area has a high percentage of employment in advanced manufacturing and business services (driven by the presence of UKAEA) and a high proportion of full time employment.

The unemployment rate has been falling recently, in line with national trends, although long term unemployment in the Caithness region remains a significant problem. This is particularly the case for the Wick area, which has one of the highest long term unemployment rates in Scotland.

It is envisaged that the proposed wind farm would provide employment for the equivalent of 40 people in the construction stage, and the equivalent employment of 50 people through indirect and induced benefits. Once operating, the wind farm will provide full time employment for 2 people.

NRL also intend to set up a Community Benefits Scheme to ensure that the local community should see tangible benefit from the wind farm.

In terms of local tourism, it is not envisaged that the proposed wind farm would have a significant effect as studies have shown the presence of wind farms to often be a positive attraction to tourists rather than a negative issue.

There is right to roam on all land in Scotland and the Forestry Commission encourage the use of their roads and access points for recreational use.

There are no vehicle access rights on the road into the wind farm or on the wind farm site itself during operation. However, the Forestry Commission have a policy of encouraging public access to land in their ownership and, subject to commercial needs, there is a general presumption of access through the forestry for recreation purposes.

Public access on the forestry trails would not be affected by the development of the wind farm, except during construction and decommissioning when it may be necessary to restrict access over some of the forestry tracks for health and safety reasons.

## **7. Mitigation and Benefits**

As a result of the iterative environmental impact assessment process, the wind farm was designed to:

- Avoid known bird flight paths, wetlands, burns, the SSSI/SPA and other areas of habitat value, where this would give rise to significant effects. An adequate buffer zone has been established between the SPA and the wind farm site;
- Avoid disturbing archaeological features on the access to the site and within the site boundary;
- Reduce the potential for noise impacts;
- Arrange the turbines to minimise their visual impact within the other environmental criteria. This includes key design considerations from main viewpoints;
- Avoid the telecommunication microwave links passing through the site;
- Avoid natural watercourses plus buffer zone within the site boundary; and

- Maximise the distance between 2006 Hen Harrier nest and nearest turbine.
- Blanket bog creation on suitable areas of deforested land

The main benefits of the proposed wind farm development are:

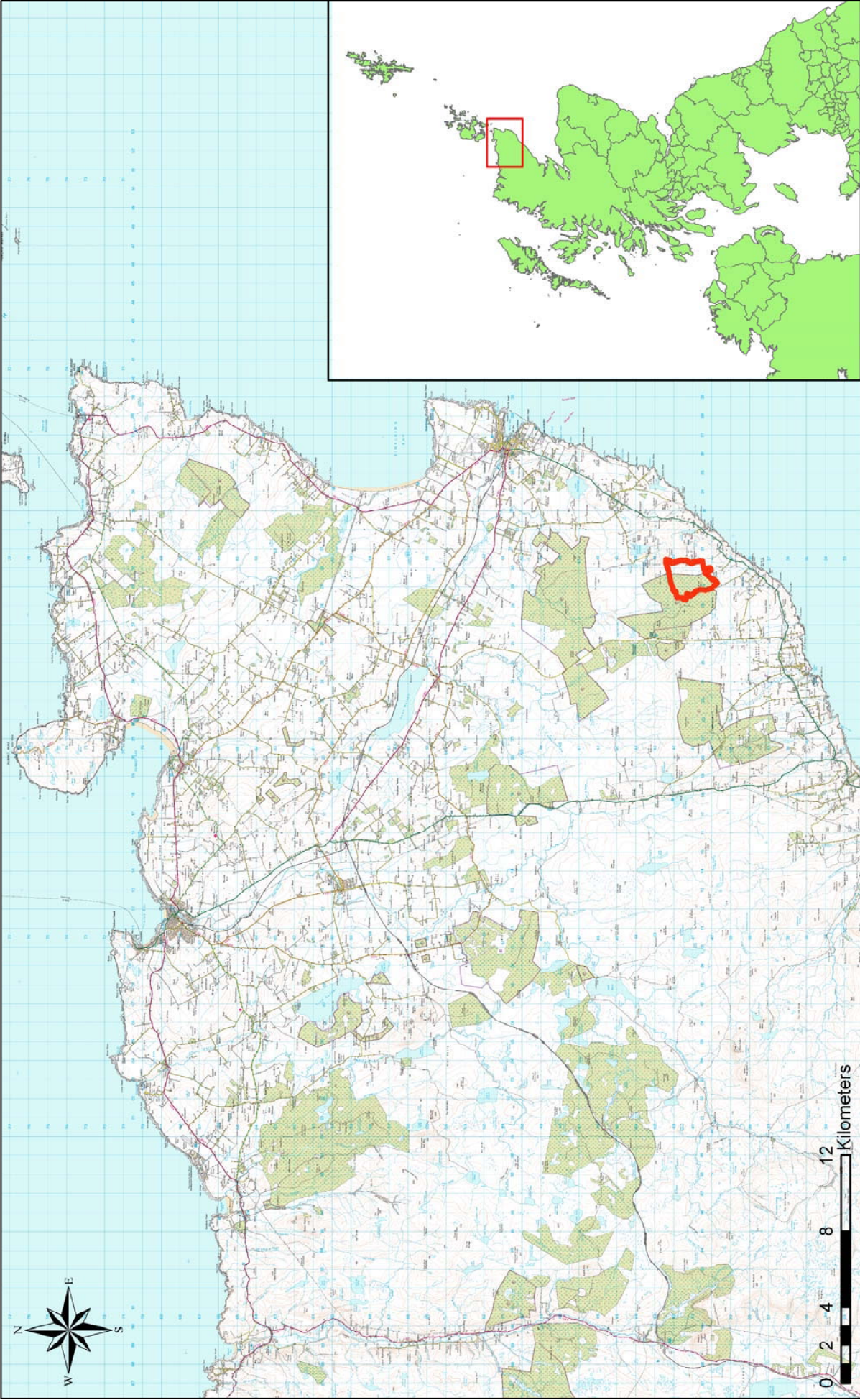
- Contribution towards meeting the national target for energy production from renewable sources, equivalent to average domestic electricity supply of approximately 28,555 homes in the Highlands area, and equivalent offsetting of greenhouse gases if the electricity was produced from traditional fossil fuel power stations.
- Opportunities for local employment during the construction and operation stages and opportunities to local businesses through supply of materials and services during the construction stage.
- Community benefit through the proposed Community Benefit Scheme.

## 8. Conclusion

The development of the Burn of Whilk Wind Farm will play an important role in helping the UK to achieve its targets for renewable energy generation. These targets have been set in order to help tackle climate change and secure energy supplies for the future. The works described in this Environmental Statement provide an important contribution to achieving these objectives.

Npower Renewables Ltd has undertaken a rigorous site selection and project design process in order to minimise the effects that the works will have on the physical, biological and human environment. In particular, careful attention has been given to ecological, archaeological, and landscape impacts in influencing the project design. Technical Reports providing greater detail are available in Appendices to the Environmental Statement.

The Environmental Statement demonstrates how considerations to minimise the net impact of the works have been incorporated throughout the lifecycle of the project, from design to decommissioning. In the course of the assessment impact significance was identified to be High for Hen Harrier and also relating to a number of landscape and visual issues, however key areas for hen harrier nesting and preferential foraging habitat lie to the north of the site and in terms of landscape, the assessment concluded that there was sufficient capacity for the landscape to accommodate the scale of the development. Significant positive benefits are predicted for blanket bog creation on deforested areas of former forestry plantation. No other significant impacts were identified.



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**Figure Title:**  
Regional Site  
Location Figure

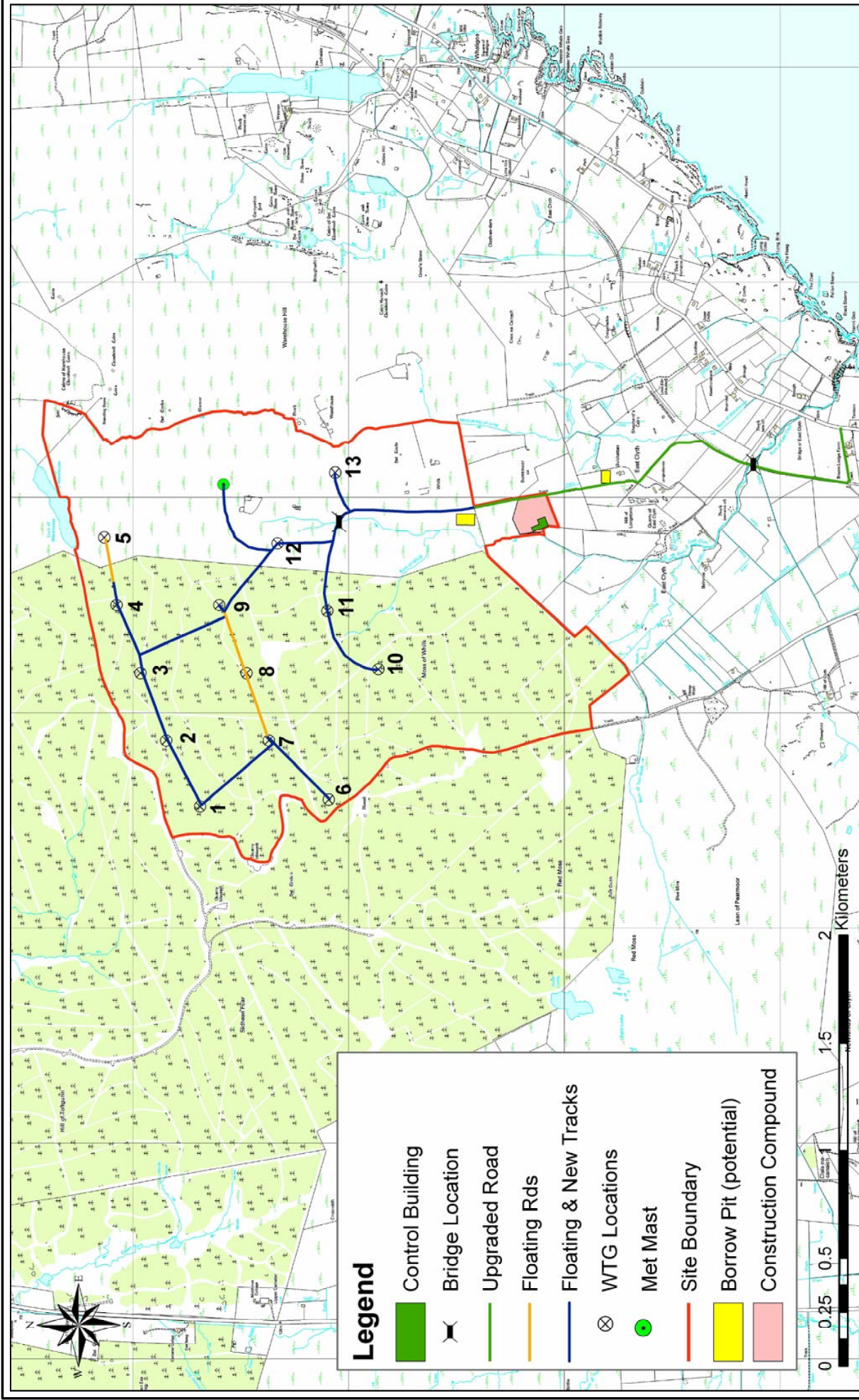
**Client / Project:**  
Npower Renewables Ltd -  
Burn of Whilk Wind Farm

**Figure.1-1**

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Checked By: JM    Revision No: Final





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**Figure Title:**  
Site Layout

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**Figure. 1-2**

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Checked By: JM Revision No: Final

