Appendix 4.1c EIA Consultation Responses

East Ayrshire Council

Energy Consents Unit – Meeting Minutes

Glasgow Airport

Glasgow Prestwick Airport

Historic Environment Scotland

NATS Safeguarding

Scottish Natural Heritage

Scottish Environment Protection Agency

South Lanarkshire Council – Roads and Transportation Services

South Lanarkshire Council – Planning Department

SYSTRA Ltd

West of Scotland Archaeology Service

3R Energy Solutions Limited,
Lanark Auction Market, Hyndford Road, Lanark ML11 9AX.
T 01555 660244 **E** info@3renergy.co.uk **W** www.3renergy.co.uk

Designed & produced by

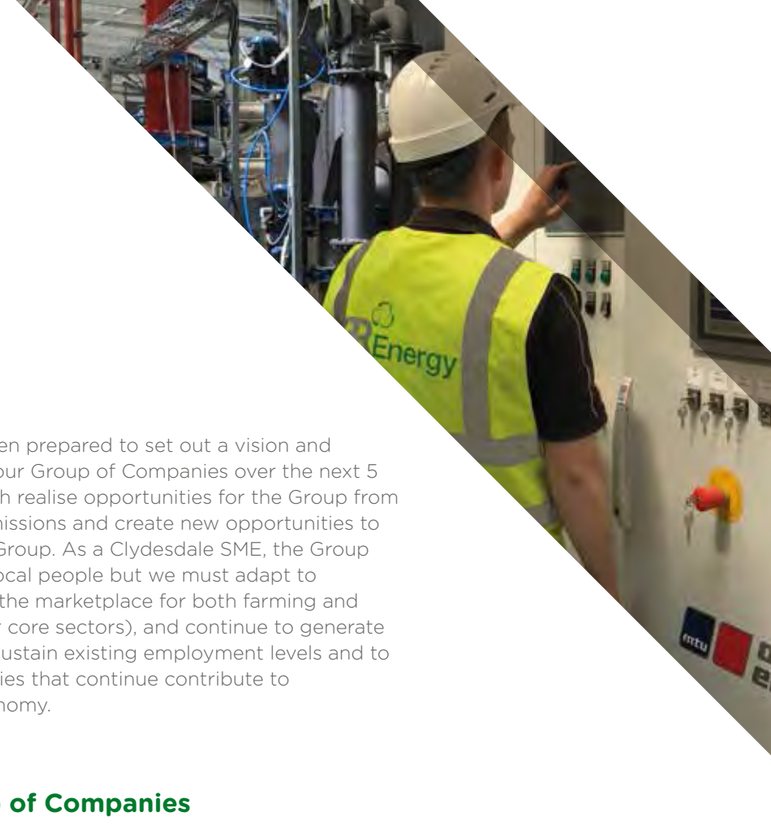
DBD ImageWorks

21 Hyndford Road, Lanark, Scotland ML11 9AE.
Telephone: 01555 665493
Web: www.dbdcreative.com

3R Energy
CHP • Wind • Biomass

Forward Strategy

April 2018



1. Purpose

This document has been prepared to set out a vision and Forward Strategy for our Group of Companies over the next 5 years, designed to both realise opportunities for the Group from existing planning permissions and create new opportunities to sustain and grow the Group. As a Clydesdale SME, the Group currently employs 18 local people but we must adapt to significant changes in the marketplace for both farming and renewable energy (our core sectors), and continue to generate new opportunities to sustain existing employment levels and to create new opportunities that continue contribute to Clydesdale's local economy.

2. The Group of Companies

Our core Group of Companies is made up of the following associated businesses:

- **3R Energy Solutions Ltd (3R Energy)**
- **Holz Energie UK Ltd**
- **William Mitchell & Sons Ltd**
- **Mitchell Farming Partnerships LLP**

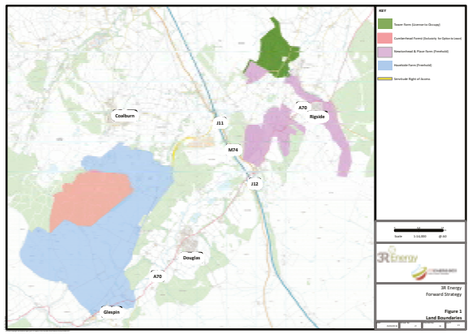
3R Energy is our renewable energy and development company based in Lanark. Holz Energie UK, sister company of 3R Energy and also based in Lanark, is our wholly owned UK import franchise of the successful German wood-gas CHP manufacturer, Holz Energie Wegsheid. Mitchell Farming Partnerships and William Mitchell & Sons Ltd, based at Newtonhead Farm Rigside and Hazelside Farm Douglas respectively, manage the farming assets of the Group.

Together, the Group:

- has farmed the land for over 120 years
- generates a combined annual turnover of £6m
- employs 18 people on a full and part time basis
- owns and manages 3,500 acres of land in the Douglas Valley

3. Our Landholding

We own and manage over 3,500 acres of land in the Douglas Valley in South Lanarkshire, all as shown on Figure 1. The landholding has a productive history ranging from traditional farming to opencast coal mining to Scotland's first wind farm to one of Scotland's largest Wood-Gas CHP Plants.



3.1 History & Investment to Date

3.1.1 Farming

The Mitchell Family have farmed at Hazelside for over 120 years. The land is mainly hill grazing for sheep and cattle, with a small amount of arable and organic farming undertaken on the better fields at lower altitude. We currently have 2,000 breeding ewes and 600 head of cattle.

3.1.2 Energy - Coal

The northernmost area of the landholding was mined for coal as part of the former Dalquhandy Opencast Coal Site which operated between ca.1988 and 2004. As a result, our landholding to the west of the M74 motorway can now be accessed directly from Junction 11 of the M74 via a dual-width, tarmac surfaced, road that was installed to serve the former Opencast Operations.

The landholding not only benefits from direct access to the M74 motorway but also from a large area of concrete hardstanding that remains on the site from the Opencast era which has now (in part) been re-used as the foundation for a new CHP-powered Wood Fuel Drying Facility.

We own and manage over 3,500 acres of land in the Douglas Valley in South Lanarkshire

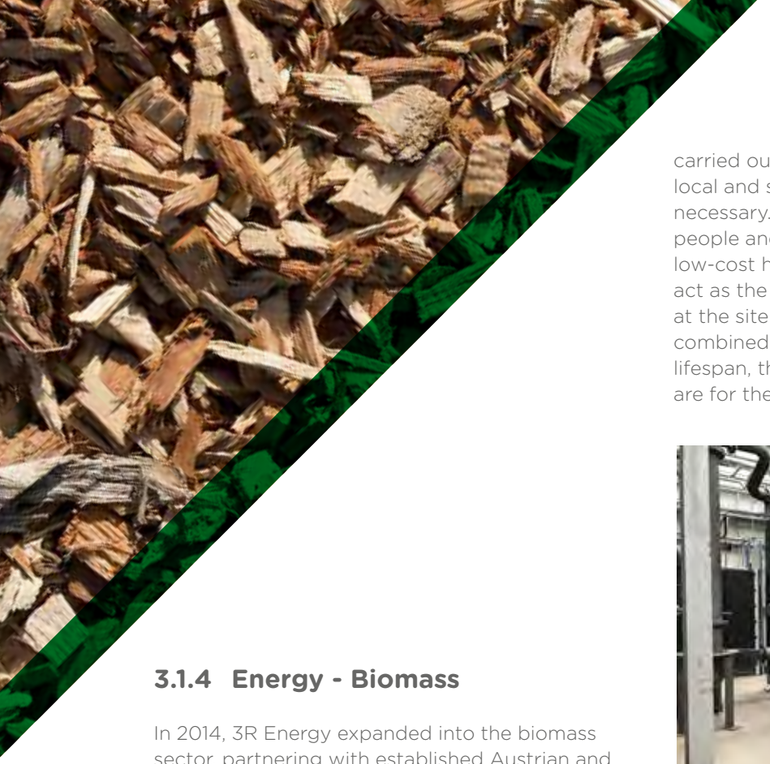
3.1.3 Energy – Wind

In 1995 the landholding saw the commissioning of Scotland's first wind farm on the top of Hagshaw Hill (488m AOD). To this day, the twenty six Bonus 600kW machines on Hagshaw Hill continue to produce around 16MW of electricity which supplies the local distribution network in the area. Hagshaw Hill Wind Farm was extended in 2007 by a further twenty 1.3 MW machines, resulting in a total combined generating capacity of 42MW. The original Wind Farm and Extension are operated by ScottishPower Renewables under a lease from William Mitchell & Sons Ltd.

Hagshaw Hill was at the forefront of the renewable energy revolution in Scotland, and with the onset of the UK Government's Feed-in Tariff programme in 2009, so sparked our own interest in developing onshore wind projects for other farms and rural businesses across Scotland. That same year saw the launch of 3R Energy, our first venture in developing onshore wind projects.

By 2010 3R Energy had partnered with American turbine manufacturer, Northern Power Systems, and went on to become the UK's leading installer of NPS turbines, with over 55 separate projects now successfully completed.

In 2015, 3R Energy embarked on its first commercial scale wind farm project on part of the landholding at Douglas West. In 2016, we obtained planning permission and a grid connection offer for the Douglas West project (45MW), comprising 15 wind turbines of up to 131m in height. Due to recent UK Government changes in support mechanisms for onshore wind, we sought to amend this permission to reduce the number of turbines to 13 but increase their height to 150m and increase the total export capacity to 49MW in order to make the project financially viable in a susbsidy-free market. This application was approved by the SLC Planning Committee in February 2018 and awaits the conclusion of a Legal Agreement.



3.1.4 Energy - Biomass

In 2014, 3R Energy expanded into the biomass sector, partnering with established Austrian and German boiler manufacturers ETA and Heizomat. We have now installed over 70 biomass systems for farms and commercial customers across Scotland and northern England, and continue to seek new opportunities in this sector.

3.1.5 Energy – CHP

In 2016, we commissioned a combined 1.5MW project on the landholding at Hazelside that included a 500kW Enercon E48 wind turbine and a 1MW Wood-Gas CHP project which share a single smart-grid connection. Together, the two projects constituted a £6.5m capital investment in the landholding, with all works carried out by our in-house team supported by local and specialist contractors where necessary. The CHP plant now employs 6 local people and generates a significant amount of low-cost heat and power which we hope will act as the catalyst for further inward investment at the site (See Property section below). The combined project will have at least a 20 year lifespan, therefore, the new jobs created here are for the long-term.

3.1.6 Property

In 2017, we obtained planning permission for 28ha of industrial development land around our new CHP Plant which is accessed directly from J11 of the M74. The site is capable of delivering up to 1.5m ft2 of industrial floorspace and creating up to 1,800 new jobs for the local area (dependent upon make-up of end users). The site has planning permission in principle for a mix of Class 4 (Business), Class 5 (General Industrial) and Class 6 (Storage & Distribution) development and is shortly to be marketed by national agents.

3.1.7 Job Creation

The Group currently employs 18 local people but we must adapt to changes in the marketplace for both farming and renewable energy, and continue to generate new opportunities to sustain existing employment levels and to create new opportunities. This document seeks to set out our vision and Forward Strategy for the next 5 years to realise opportunities for the Group from existing planning permissions and establish new opportunities.

3.1.8 Community Benefit

Through the Hazelside E48 project, we have established the Hazelside Micro Grant Scheme which provides funding for local groups and projects. To date, the Micro Grant Scheme has provided funding towards hanging baskets in Douglas, the Douglas Pensioners Christmas Party, and leaflets to promote walking routes around Douglas.

Hazelside
Micro Grant Scheme

Our business also provides direct sponsorship to many other local groups and events, such as the Douglasdale Folk Festival, Douglasdale REAL Group's 'Gig in The Grounds', Douglasdale Players Panto Club, Local Young Farmers Groups, Abington Show, Lanark Rugby Club, Lanark Tennis Club, and Lanark Golf Club, to name some examples.

SPR operate the Hagshaw Wind Farm Trust which currently disburses community benefit funding to local communities from the Hagshaw Hill Wind Farm and Extension.

Once operational, our Douglas West Wind Farm will deliver £6.1 million (based on a total installed capacity of 49 MW) of community funding for local groups and projects in Douglas, Coalburn and surrounds over the life of the wind farm, comprising financial contributions of £245,000 per annum.

Hagshaw Hill
Windfarm Trust

Once operational, our Douglas West Wind Farm will deliver £6.1 million of community funding

4. Energy, Economic & Policy Context

The need for renewable energy development and the transition to a low carbon economy supplied by indigenous sources is strongly supported by national legislation, energy and planning policy.

The need to develop renewable energy to fight climate change has never been greater, with the switch to the use of electric cars over the coming years, the demand for electricity is set to soar, and this needs to come from clean sources. In parallel, there is an increasing drive to protect Scotland's precious landscape, minimising the impact on nationally important locations and areas of 'wild land'. Finding viable projects that fit within these often conflicting requirements is always a compromise, and we consider that the renewable energy opportunities identified below represent a good compromise where the level of impact is acceptable for the benefit they will create.

With subsidies having been removed for onshore wind, it is necessary for new projects to maximise the available wind resource, drive down costs, and use the most modern and efficient turbines. With significant advances in turbine design, onshore wind has become the UK's cheapest source of new build power . With new taller and more efficient turbines, new wind farms can produce more electricity from fewer turbines, and at lower cost to the consumer. The Scottish Government has recognised that larger turbines are necessary to unlock cost reductions and ensure new projects are viable subsidy-free. In this regard, the recently published Draft Scottish Energy Strategy (January 2017) highlights this need for greater efficiencies and welcomes work which has already been done by the industry to identify cost reduction measures.

The Scottish Energy Strategy also contains unambiguous policy support for the further development of onshore wind as the technology that has an important role in helping to deliver the Government's energy strategy for the period out to 2050.

Likewise, in an address to industry the Head of the Scottish Government Energy Consents Unit Frances Pacitti said "We will acknowledge the need for us to be much more realistic in where the onshore wind industry is as a market and how to attract investment into Scotland". She said that the Scottish Government will work towards "normalcy" around higher tip heights. "The dialogue to date has been capped at 132 metres but it's time to move that on. The discussion is 150 metres-plus for most applications going forward".

At a local level, South Lanarkshire Council has recently issued draft Capacity and Siting Guidance for Taller Turbines which directs new wind energy projects to locations which are most suitable for subsidy-free projects.

Against this backdrop, we have identified two onshore wind opportunities that we would like to develop to maximise renewable generation from both our existing Douglas West and Hagshaw Hill sites, to ensure we make the most of the available wind resource in this area and deliver more electricity from fewer turbines, and at lower cost to the consumer. Neither project would increase the lateral spread of turbines beyond those already consented or constructed on the north side of the Douglas Valley, and would be capable of delivering a range of benefits to the local area as set out below.

In an industrial context, the Scottish Government and South Lanarkshire Council's continued commitment to sustainable economic development and job creation is a supportive framework within which we aim to develop our industrial opportunities at J11 of the M74 over the next 5 years, with the target of bringing significant inward investment and jobs to the local area.

Food production and tourism are also key sectors of the Scottish economy which are supported in various Government policy documents. We will therefore also seek to develop our business opportunities in these areas over the next 5 years, as highlighted below.

5. Future Opportunities & Forward Strategy

5.1 Context

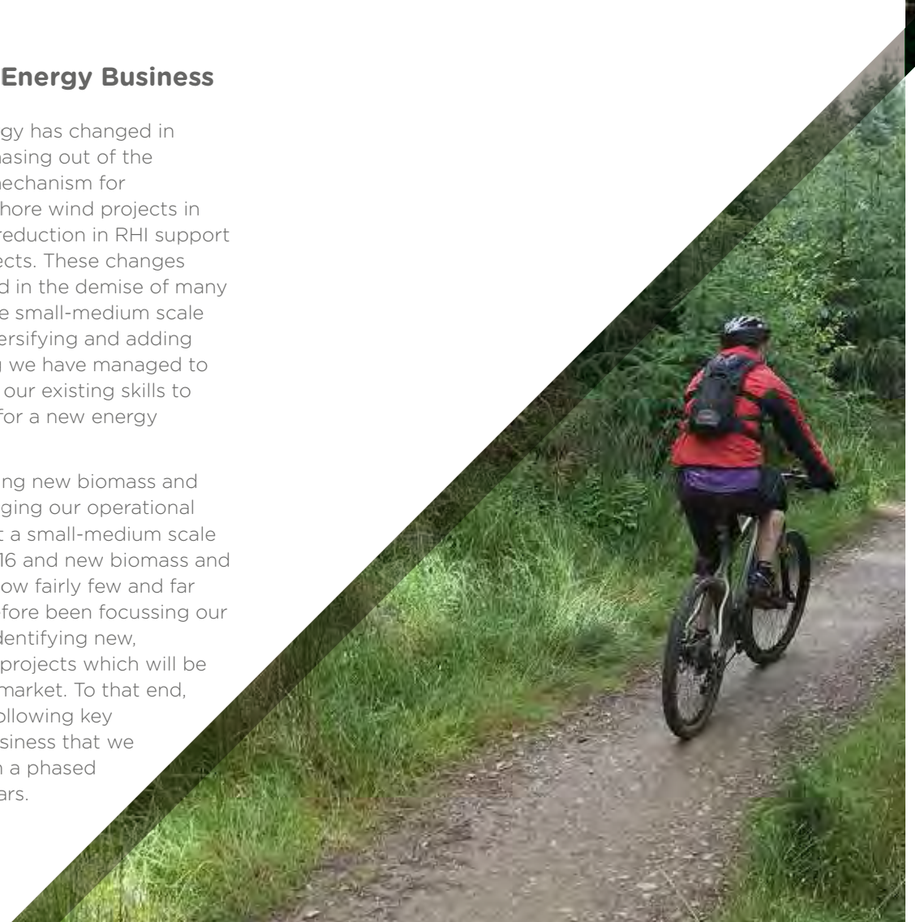
Against the backdrop of the impending exit from the EU, the future for hill farming on marginal land in Scotland looks uncertain. The UK Government has already indicated that, following our exit from the EU, support for farming marginal land in the UK will be diverted from production support to the delivery of 'public goods' such as access to the countryside and planting meadows from 2022 onwards. This allied to the UK Government's removal of financial support for renewable energy technologies creates an uncertain future for the core business of the Group.

These factors are beyond our control, but serve to sharpen our focus to look at other ways to diversify our landholding to ensure its economic viability for future generations and to help sustain our renewable energy and development businesses going forward. To that end, we have identified the following opportunities which we would like to pursue over the next 5 year period.

5.2 Renewable Energy Business

Our business at 3R Energy has changed in recent years with the phasing out of the Feed-in Tariff support mechanism for small-medium scale onshore wind projects in the UK, and the steady reduction in RHI support for renewable heat projects. These changes have regrettably resulted in the demise of many of our competitors in the small-medium scale market, but through diversifying and adding value to our landholding we have managed to retain our team and use our existing skills to reposition the business for a new energy market.

Whilst still actively seeking new biomass and CHP projects, and managing our operational assets, we have not built a small-medium scale turbine project since 2016 and new biomass and CHP opportunities are now fairly few and far between. We have therefore been focussing our development team on identifying new, commercial-scale, wind projects which will be viable in a subsidy-free market. To that end, we have identified the following key opportunities for the business that we would like to develop on a phased basis over the next 5 years.



5.3 Wind Energy Opportunities

5.3.1 Background and Context

As landowners of Scotland's first wind farm at Hagshaw Hill, we have been approached by a number of developers, including the current lease-holders, about the potential to repower the original wind farm. As neighbouring landowners to Cumberhead Forest, we also have recently been contacted by a number of developers seeking to secure access over our land to develop an 'infill' wind energy scheme on the eastern part of Cumberhead Forest as an extension to our consented Douglas West Wind Farm.

These opportunities are clearly of interest to other developers and large outside investors, which in many ways confirms their commercial viability. However, following careful consideration we feel there are many benefits in 3R Energy taking these projects forward, as a local business, helping to sustain our existing employment levels, maximise local benefits, and ensure a more coordinated approach to the future development of the Douglas West and Hagshaw Hill sites.

The benefits from a physical perspective include the ability to develop a coordinated layout, phasing, access, grid connection and landscape strategy which takes account of future plans for the adjoining Hagshaw Hill and Douglas West Wind Farm schemes. A coordinated strategy for the development of the Hagshaw Hill Repowering and Douglas West Extension schemes would allow for:

- delivery of an outcome which is better designed in landscape terms, more strategically efficient and cost-effective;
- better coordinated habitat management proposals;
- a more efficient use of existing grid assets and local grid improvements;
- consideration of energy storage options;
- better public access delivery across multiple sites; and,
- a significant Community Benefit package which would generate a 30-year income stream to fund a Community-Led Investement Strategy for the Douglas Valley post-mining.

Together the two projects would represent a £100m investment in the Scottish and South Lanarkshire economies, producing enough electricity to power over 70,000 homes and displace 120,000 tonnes of CO2 each year.

In line with the Scottish Government's Onshore Wind Policy Statement (2017), our aim would be to minimise the impacts of both schemes on the environment and local residents, while obtaining the greatest amount of renewable generation and community benefit from two existing wind farm sites.

5.3.2 Hagshaw Hill Wind Farm Repowering

As noted in the Scottish Government's Onshore Wind Policy Statement (2017), many established onshore wind sites will be coming to the end of their consented life during the coming decade and beyond. As the need and demand for renewable power increases, the Scottish Government expects developers to review the potential for "repowering" at existing sites. This could be in the form of measures designed to extend the life of components and turbines at such sites, or replacing and replanting existing turbines with new turbines.

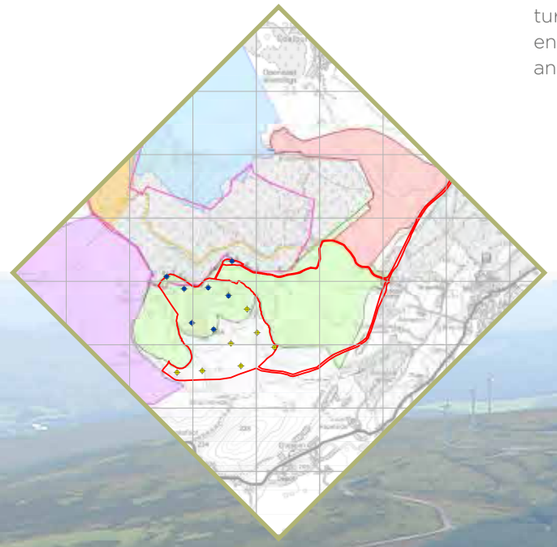
The Scottish Government's position remains one of clear support in principle for repowering at existing sites. This is on the grounds of its potential to make the best use of existing sites, and – through the continued use of established infrastructure, grid connections and strong wind resource provide a cost effective option to deliver our renewable and decarbonisation targets.

The two projects would represent a £100m investment in the Scottish and South Lanarkshire economies.

Scotland's first wind farm at Hagshaw Hill is one such site that is now nearing the end of its useful life, and the opportunity to repower the wind farm with the new generation of turbines presents itself. As landowners of Hagshaw Hill we propose to repower the existing wind farm as part of a phased programme over the next 5 years which aims to replace the aged machines in the existing wind farm with new modern and more efficient machines which will maximise the strong wind resource available at this site and ensure its viability going forward.

Wind turbine technology has developed greatly since Scotland's first wind farm was built at Hagshaw Hill in 1995. The much shorter separation distances between the smaller machines that were erected at that time mean that the existing lease area for the original wind farm is not of a sufficient size to accommodate the wake separation distances for the modern, larger turbines that would be required to ensure the site's continued viability in a subsidy-free market. It is therefore proposed that the existing lease area which Hagshaw 1 occupies be extended to the south to take in an area of the hill that is flanked on either side by the later Hagshaw Hill Extension area (see Figure 2, P23). This will ensure sufficient land is available to repower the site with new, modern machines to maximise the renewable generation potential of the site. We propose to remove the 26 original turbines and replace them with 14 new modern machines. The revised repowering site has the potential to deliver more than double the amount of power and community funding from just over half the number of turbines.

It is intended to commence development in the first phase, to the south of the existing lease area, in advance of, or in parallel with, the decommissioning of the existing Bonus 600kW turbines on the current Hagshaw 1 site. This will enable us to phase the grid connection capacity and finance of the project to ensure it is viable in the wholesale market, without any Government support. A 30 year operational lifespan will be sought.

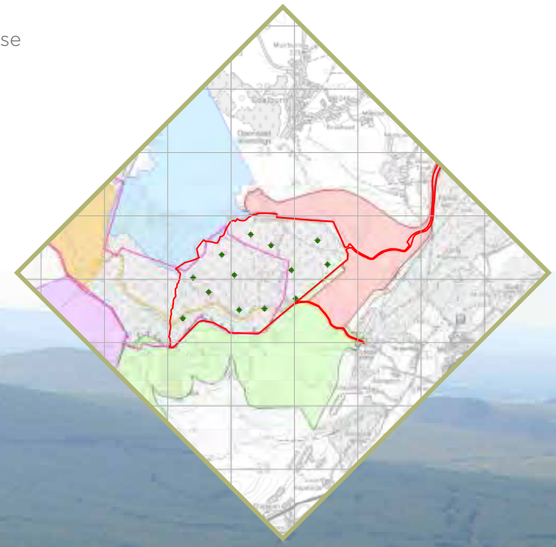


5.3.3 Douglas West Wind Farm Extension

As noted above, an opportunity also exists to extend the permitted Douglas West Wind Farm onto the adjoining eastern block of Cumberhead Forest to 'infill' the remaining gap between Douglas West, Hagshaw Hill and a number of other consented or constructed wind farms on the north side of the Douglas Valley. The proposed extension area scores well in SLC's new guidance for taller turbines and would be a viable project in the subsidy-free world.

Initial environmental screening work has been carried out which has not identified any environmental issues that could not be overcome through careful site design or the use of mitigation measures. The project does not increase the lateral spread of turbines in the Douglas Valley, but rather infills a blank spot in the centre of the turbine cluster on the north side of the Valley. There is logic in this infill project being taken forward as an extension to our consented Douglas West Wind Farm.

Initial wind yield assessment work has demonstrated a viable site comprising of 13 machines generating up to 49MW of power. An indicative site layout has been prepared which ensures consistent turbine spacing with adjoining schemes (including Douglas West and Hagshaw Hill Repowering) and is shown in Figure 3 (P23). A 30 year operational lifespan will be sought.



5.3.4 Wind Farm Design

We are currently considering turbines of up to 200m for both projects and have recently been appointed landscape consultants, Pegasus Group, to undertake a combined landscape and visual design iteration exercise in relation to both the proposed Douglas West Extension and the proposed Hagshaw Hill Repowering projects.

The existing Hagshaw Hill Wind Farm would be repowered in two phases. The first phase would be constructed prior to the decommissioning of the existing 26no. Hagshaw Hill turbines, and the new turbines would therefore be required to be accommodated alongside the existing turbines for a short period of time. The second phase would then be constructed, following the removal of the existing turbines.

The existing Hagshaw Hill Extension turbines (20 turbines in two groups - 9no. to the west of the site on Avemarks Hill and 11no. to the east of the site near Burnt Rig) would not be included as part of the repowering and any schemes would be required to work with these turbines continuing in situ.

Using a number of key viewpoints in the surrounding landscape, taken from the consented Douglas West LVIA (VPs 1-4 and 14), the review will begin by considering the layout options shown in Figures 2 and 3, as follows:

- **Douglas West Extension: 13no. turbines**
- **Hagshaw Hill Repowering Phase 1: 7no. turbines**
- **Hagshaw Hill Repowering Phase 2: 7no. turbines**

The review will firstly consider turbines of 200m to blade tip for each of the layouts. Following this, if it is not considered that turbines of 200m would appear to relate well to the landscape, or to the existing context of the Hagshaw Hill extension turbines, alternative turbine heights and/or layout arrangements will be tested and illustrated as alternatives for consideration. It is noted that alternative turbine heights with a small rotor diameter may enable an increased number of turbines to be included within the layouts, as the spacing requirements between turbines would be less.

The output of the exercise will be the production of wireframe and photomontage visualisations from each of the five viewpoints, for both the 200m turbine option and any other layout options suggested by Pegasus following the review. This exercise will inform pre-application discussions with South Lanarkshire Council, SNH and the local community.

5.3.5 Local Grid Improvements and Storage Opportunity

Global energy markets are rapidly turning away from fossil fuels towards wind and other competitively priced renewable sources. As renewables' role in power generation expands, technology becomes an important enabler. Renewable energy storage solutions are developing fast and have significant potential to provide the efficiency and flexibility needed to accelerate the global transition to a renewables-led energy mix. As part of the local grid improvements to be facilitated through these projects, as discussed below, we propose to include battery storage provision on the landholding as part of a coordinated strategy for delivery of both Douglas West Extension and Hagshaw Hill Repowering in a subsidy-free world.

On the grid connection proposals, we have been working with ScottishPower Distribution on an innovative solution to connect the above projects to the local distribution network on our landholding. In order to facilitate this connection, local grid upgrades will be required. Working closely with ScottishPower, we have together developed a solution that creates both opportunities to connect our projects and delivers much needed upgrades to the local electricity network through the creation of a new Grid Supply Point (GSP) on land we have secured at Auldton (B7078), to be known as the Lesmahagow GSP. The new GSP will relieve load and pressure on the existing Linmill GSP at Kirkfieldbank which has no spare capacity, and increase stability and future opportunities on this part of the network.

Energy storage provision and a new GSP will play a huge role in unlocking the future renewable energy potential of these sites as part of this area's contribution to our transition to a flexible, smart low carbon economy.

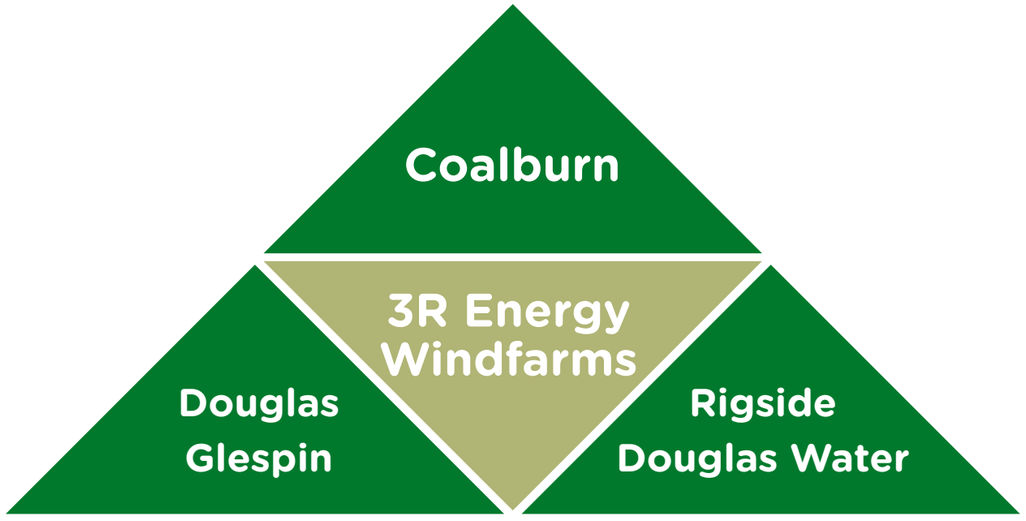
5.3.6 Community Benefit, as part of a Community-Led Investment Strategy

We would like to consult on community benefit opportunities from both our project at Douglas West Extension and Hagshaw Hill Repowering. In this regard we intend to engage with the local community in Douglas, Glespin, Coalburn, Rigside and Douglas Water to explore the potential to establish a Douglas Valley Development Trust which would receive income from both projects (in addition to the traditional REF community benefit arrangements) which would yield the financial resources to deliver a Community-Led Investment Strategy for each village. The Strategy would seek to deliver on the aims of the Coalburn, Douglas and Glespin Community Action Plan (August 2016) and the Rigside and Douglas Water Community Action Plan (2018 – 2023) in the first instance.

The communities in each of these villages have prepared Action Plans for how they would like to see their communities develop over the coming years and we would very much like our future projects to provide a dedicated stream of funding to deliver on the objectives of each Action Plan, and any other future projects identified. The overarching objective of the Development Trust would be to deliver real improvement to the physical and recreational environment of Douglas, Glespin, Coalburn, Rigside and Douglas Water.

In order to achieve this, we propose that the Douglas West Extension and Hagshaw Hill Repowering projects would fund a full-time Local Development Officer who would be dedicated to the task of developing and delivering the Community-Led Investment Strategy for the area. This would include seeking out, developing and submitting grant applications on behalf of local groups for specific improvement projects in the above villages that would fulfil the objectives of each Community Action Plan. Each village would have a dedicated 'pot' of money ring fenced for their community by the Development Trust on an annual basis. It is proposed that this funding could be used as 100% finance for one-off projects, or as part of match-funding arrangements for larger schemes. Revenue funding could also be considered for the right projects/facilities. It is initially proposed that the Local Development Officer would be based in 3R Energy's office in Lanark and would work closely with the South Lanarkshire Council Economic Development & Regeneration Team, and all local groups and third sector agencies in the Douglas Valley Communities.

The Development Trust would be established, formally constituted, and proposed to comprise of representatives of each local community, 3R Energy and South Lanarkshire Council who would all be appointed as Trustees. The Trustees would assess and decide on all funding applications put forward by the Local Development Officer, and each Trustee would serve for time-limited period only before re-election would take place. To ensure good governance, the Trust would be independently audited on an annual basis by an agreed firm of Chartered Accountants with a Year-End Report prepared and made publicly available.



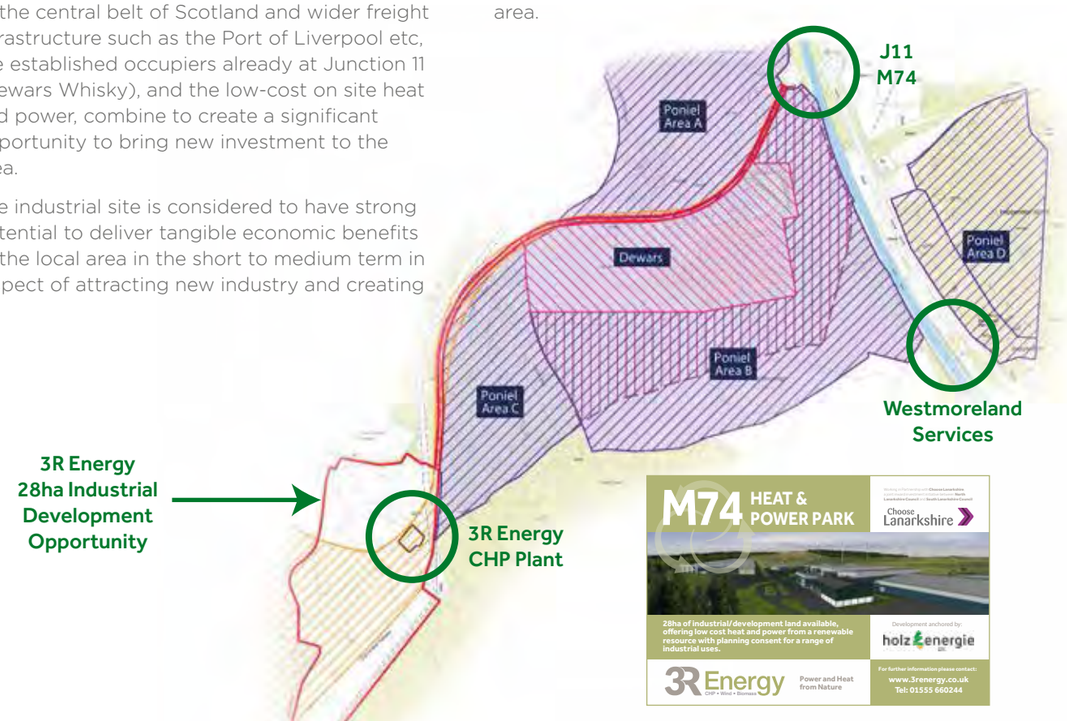
5.4 Industrial Development Opportunities

In addition to the renewable energy strategy outlined above, it is equally important to the future of the business, and wider local regeneration strategies, that we build on the opportunity created through the construction of our Wood Gas CHP plant on the former opencast part of the landholding at J11 of the M74 by actively marketing our consented industrial area adjacent. We have now appointed national agents to market the site and various enquiries are now starting to emerge.

The location of the site on a key transport axis in central Scotland, the excellent infrastructure connecting the site to the M74 motorway, accessible drive times for logistics businesses to the central belt of Scotland and wider freight infrastructure such as the Port of Liverpool etc, the established occupiers already at Junction 11 (Dewars Whisky), and the low-cost on site heat and power, combine to create a significant opportunity to bring new investment to the area.

The industrial site is considered to have strong potential to deliver tangible economic benefits to the local area in the short to medium term in respect of attracting new industry and creating new jobs. Specifically, the site has the potential to deliver up to 1.5m ft2 of industrial/logistics floorspace and creating up to 1,800 new jobs for the local area (dependent upon make-up of end users) which would act as a major catalyst in the regeneration of the local area post-mining.

There is a clear opportunity for businesses to recruit a local workforce from the Douglas Valley, where there is currently a general shortage of employment opportunities following the demise of significant local industries and employers. Support for training and employability programmes also exists through SLC and partner organisations which will be helpful in attracting new industry to the area.



5.4 Farm Diversification Opportunities

5.4.1 Fruit Growing Clyde Valley Fruits

The Clyde Valley has a strong history and pedigree in fruit growing and was at one time one of the major fruit producing regions in Scotland. Commercial fruit growing in the Clyde Valley dates back at least to the early 17th century. It is estimated that by the end of the 18th century, over 300 acres of Lanarkshire were devoted to horticulture with around 75% of this on the banks for the Clyde and its tributaries. Production continued to grow over the next century with fruits including apples, pears, gooseberries, plums, strawberries and tomatoes all grown here.

As the population and industry increased in Glasgow and the Central Belt there was a growing demand for local fruit. Between the mid-19th century and the early 20th century the Clyde Valley was probably the largest commercial orchard area in Scotland. From around 1920, the fruit industry went into decline. This was mainly due to competition from global markets and the gradual expansion of supermarkets that provided cheaper and readily available foreign fruits.

At Dalquhandy we have the land, and we have an abundance of heat from the CHP plant, to create the optimum conditions for fruit growing on a commercial scale. With people now much more conscious of food miles and recognising the benefits of local provenance, we see an opportunity to establish a business that heralds a return to commercial fruit growing in the Clyde Valley, initially focussing on commercial crops of tomatoes and soft fruits.

It is our intention to explore the potential to utilise an area of land adjacent to the CHP plant (within the industrial area consent) for the erection of a network of polytunnels to house the crops. The polytunnels will be heated by the warm, moist, CO2-rich air from the adjoining CHP plant to create optimum growing conditions, at low cost. Adjacent to the polytunnels we propose to construct a processing and warehouse building to accommodate a cold store (also powered by the CHP Plant) to hold the fruit once picked, packaged and ready for market.

This venture has the potential to create a small number of local jobs in the management and operation of the new business, but is dependent on the outcome of a detailed Business Plan and Feasibility Study exercise which is currently underway.

5.4.2 Happendon Wood Holiday Lodges

With the Westmorland Group recently taking over the Cairn Lodge Service Station, and in the process of delivering a £3m upgrade of the Services to bring it to the same standard as the other flagship motorway destinations in the Westmorland Family, we see a great opportunity to develop a high quality woodland holiday lodge accommodation on our land on the opposite side of the B7078. Such a development would complement the Westmoreland project (which includes a farm shop), and encourage more overnight visitors to this part of South Lanarkshire.

Nestled in Happendon Wood, looking south over the Douglas Water and our farmland beyond, would be a great location for people to holiday that is in easy reach of Glasgow, Edinburgh, the Ayrshire Coast, New Lanark and the many other attractions that South Lanarkshire has to offer.

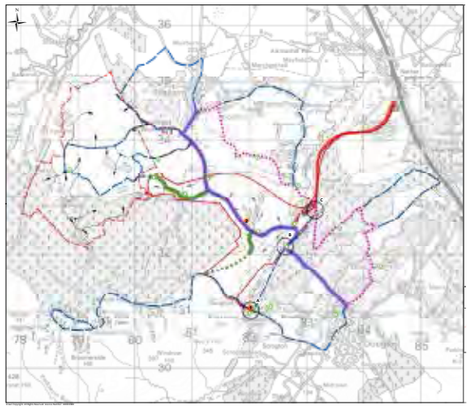
Such an opportunity has the potential to create a small number of additional local jobs in the managing, running, cleaning, maintaining and servicing of the lodges, as well as indirect work for local contractors and trades. Again, an initial Feasibility Study and Business Plan exercise is being commenced to assess the scale and nature of the opportunity.

5.4.3 General Farm Diversification

Over the course of the next 5 years we will also seek to identify and deliver a range of other farm diversification opportunities such as steading conversions, commercial tree planting and farm-scale renewable energy technologies.

5.5 Public Access & Outdoor Recreation Opportunities

A range of public access and outdoor recreation opportunities also exist on the landholding that we are keen to deliver as part of the wind energy opportunities highlighted above, including:



- Developing and enhancing the Public Access Strategy and Heritage Trail commitments that form part of the existing planning permission for the Douglas West Wind Farm.
- Creating a Visitor Welcome Area, car parking, and some (initially) basic visitor facilities adjacent to our existing CHP Plant which is accessed direct from the M74 motorway.
- Design and implement a range of mountain bike trails across the landholding incorporating Hagshaw Hill and adjoining areas which can be accessed direct from the new Visitor Welcome Area.
- A range of waymarked walking routes that take in the new Heritage Trail around Douglas and Coalburn that can also can be accessed directly from the new Visitor Welcome Area.

- Signposting and visitor information about local cafes in Douglas and Coalburn that are achievable as part of a walking circuit from the Visitor Welcome Area.
- Plans for promoting the walking and mountain bike offering around Douglas and Coalburn more widely throughout the local area, primarily within the revamped Cairn Lodge Services, and beyond, to increase visitor potential.
- Advertising local overnight accommodation options within the Visitor Welcome Area to encourage visitors to consider staying overnight in the area when they come to use the mountain bike and walking trails (following the model of Glentress and the spin-off benefits now enjoyed by Peebles and Innerleithen).

6 Summary and Next Steps

During the course of 2018, 3R Energy will embark on a programme of community consultation into the main components of this Forward Strategy to ensure that the local community are aware of our emerging plans for the business and landholding going forward, and to ensure that we obtain comments and feedback from the local community on our proposals.

We will also engage closely with South Lanarkshire Council, Scottish Enterprise, our Agents, and others with a commercial interest in J11 of the M74 to "brand" the junction as a destination for industry/logistics and to formally market our offering.

We will progress the preparation of the Business Plans for both the Fruit Growing Enterprise and the Happendon Wood Holiday Lodges to better understand the economics and market conditions to develop each proposal.

We will engage a consultant to explore the potential to develop a network of mountain biking trails and some (initially) basic visitor facilities adjacent to our existing CHP Plant which is accessed direct from the M74 motorway.

We intend to consult on and develop plans for the Development Trust and overall Community Benefit Strategy outlined above which aims to create a mechanism that will provide the funding to deliver the objectives of the Community Action Plans prepared for the villages Douglas, Glespin, Coalburn, Rigside and Douglas Water.

As local landowners, we plan to continue living and working in the local area for many years and generations to come, and we wish to develop future plans for the landholding that will help the area prosper as well as developing and sustaining our own businesses and employees. We look forward to working with all local partners in developing plans for the future that are mutually beneficial and create a positive and lasting legacy from renewable energy in the local area.

As local landowners, we plan to continue living and working in the Douglas Valley for many years and generations to come.

7 Plans and Figures

Figure 1

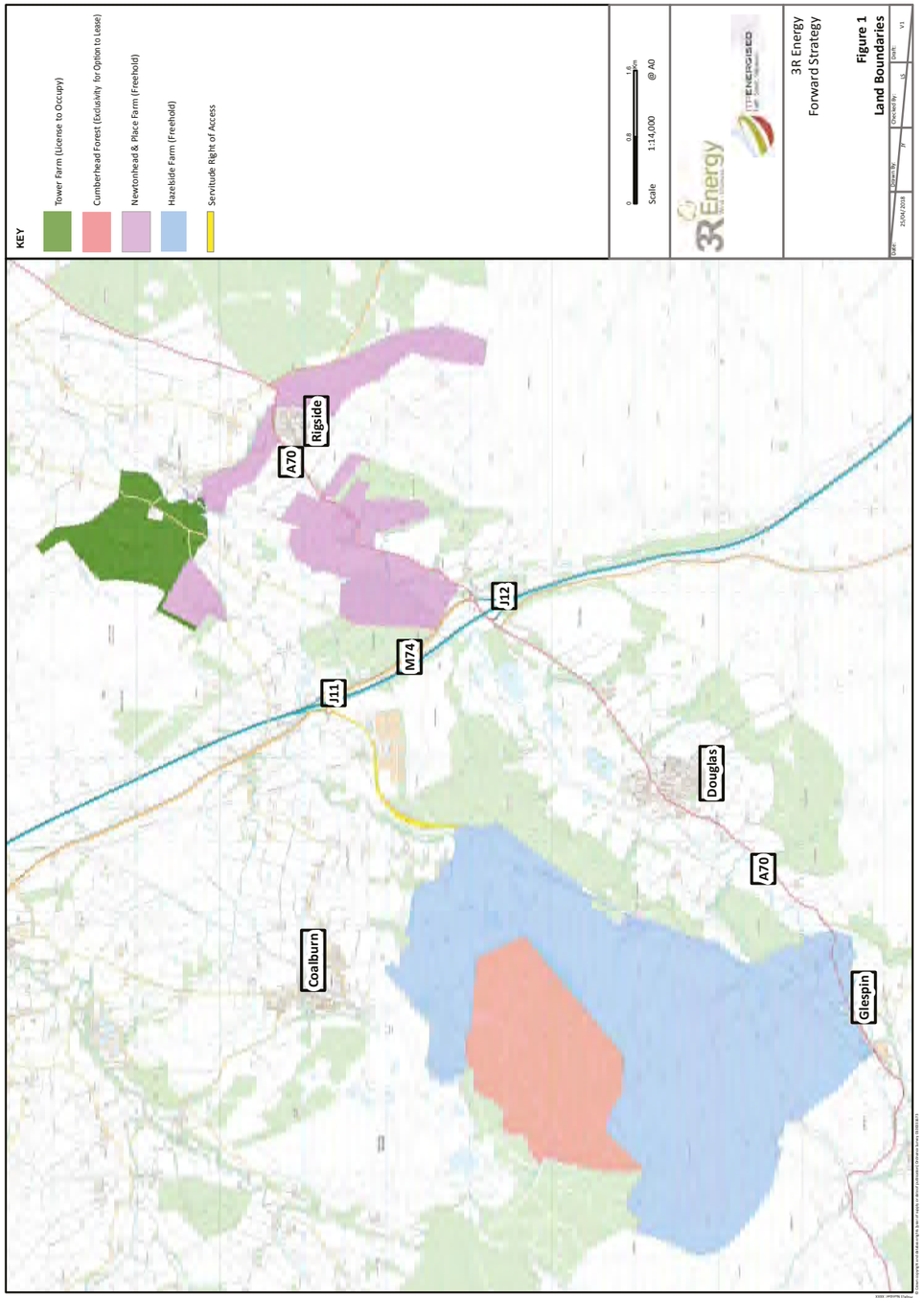


Figure 2

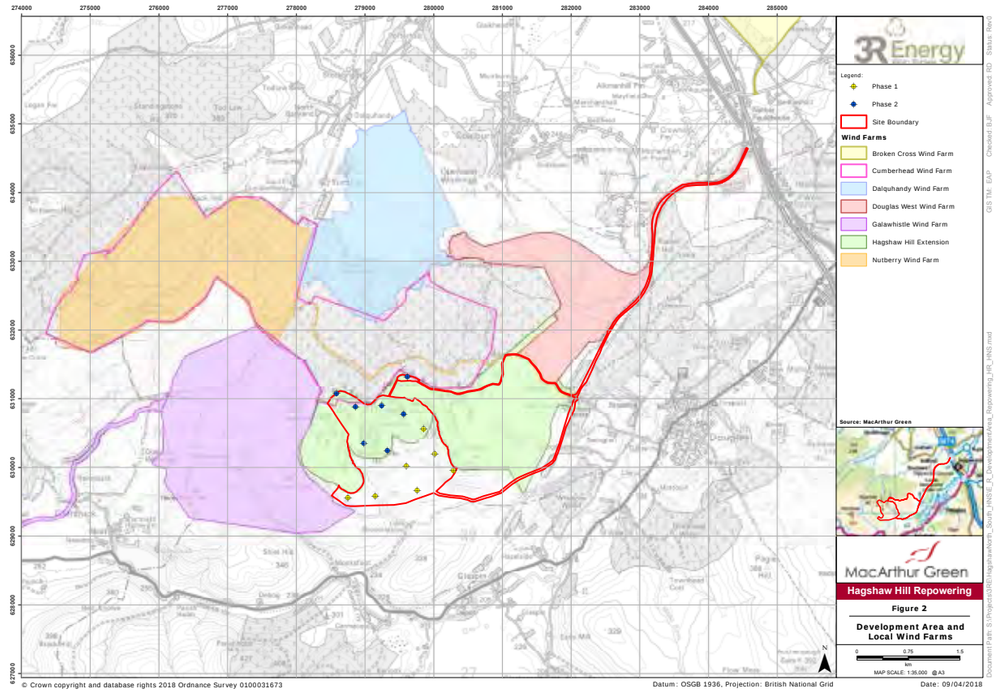
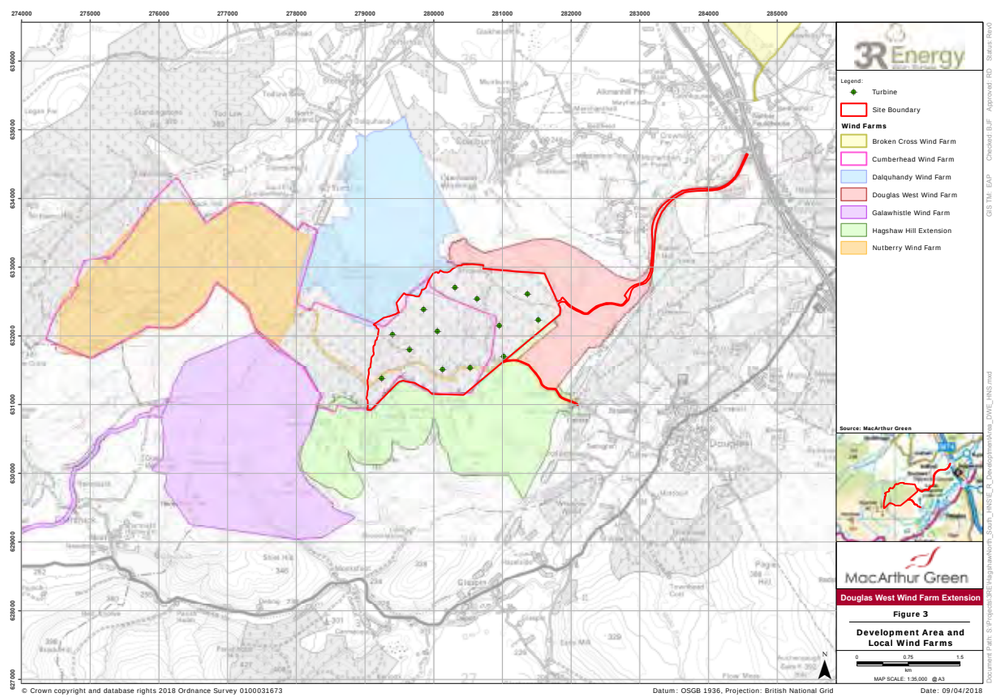


Figure 3



From: Graeme Walker [redacted]
Sent: 13 July 2018 14:51
To: David MacArthur
Subject: RE: Hagshaw Hill Repowering and - Ecology and Ornithology Scoping

Hi David

Thanks for the reminder, sorry it is taking so long to get through these things.

I hope you find these comments helpful.

1 Ornithology:- I note that you intend to follow the 2014 guidelines. Overall the approach that you have set out will deliver sufficient information for a full assessment. Re flight activity, I agree that the presence of the existing turbines is problematic but the solution you suggest is a sensible pragmatic approach. I think that the long run of annual monitoring data from the existing site will help give a more stable baseline.

2 Ecology:-

Habitats:-
The NVC habitat survey work will provide an updated baseline and as you say an indication of peat distribution across the site. Is it safe to assume that a peat depth survey will be carried out to support the soils assessment and help locate roads and turbine bases?

Protected Species:-
The outlined approach will provide sufficient detail for assessment. It is recommended that an otter contingency plan is built into the construction management plan.

Great Crested Newts:
The outlined approach will provide sufficient detail for assessment.

Bats:-
I note the post construction monitoring and mitigation regime that is proposed. This is very helpful, however, the presence of the Nyctalus (high risk) in the area around Hagshaw Hill points to the need for a degree of confidence when relying on data collected for surrounding sites. The proposals for additional survey will help provide this information it would be helpful if some of the additional survey time could be targeted at the high flying behaviour of the Nyctalus species. Recording high levels of Nyctalus activity would endorse the need for the suggested mitigation regime.

Fish:-
The outlined approach will provide sufficient detail for assessment.

Please feel free to come back to me if further clarification is needed.

Graeme

Graeme Walker | Operations Area Officer

Scottish Natural Heritage | 31 Miller Road | Ayr | KA7 2AX | **t:** [redacted]
nature.scot – Connecting People and Nature in Scotland - @nature_scot

From: David MacArthur [redacted]
Sent: 13 July 2018 11:20
To: Graeme Walker
Cc: Rafe Dewar
Subject: Hagshaw Hill Repowering and - Ecology and Ornithology Scoping

Hi Graeme,

Just a quick email to ask if you have had a chance to review these reports? I'm particularly keen to get your thoughts on our approach to bat surveys given the season is marching on.

Many thanks
David

From: David MacArthur
Sent: 25 June 2018 11:38
To: graeme.walker@snh.gov.uk
Subject: Hagshaw Hill Repowering - Ecology and Ornithology Scoping

Hi Graeme,

Good to speak to you just there.

Please find attached the Ornithology and Ecology Scoping reports for Hagshaw Hill Repowering.

As mentioned on the call, we were not able to discuss the proposed approach with SNH at the same time as Douglas West Ext due to finalisation of commercial terms relating to the site. As you'll see from the attached though, the approach is very similar to that proposed at Douglas West Extension.

Similar to Douglas West Extension, this site is surrounded by many operational wind farms and so the existing baseline data will be of considerable benefit to informing the ornithology and ecology impact assessments. The site is also part of the same agricultural unit (and in the same land ownership) as the neighbouring Douglas West. One obvious difference to Douglas West Ext however is the presence of Hagshaw Hill wind farm. We have taken into account these factors, along with the recommendations in the existing SNH guidance, in the proposed methods for the site.

I would be grateful if SNH could confirm that the proposed surveys are acceptable.

Many thanks and please call if you would like to discuss the scoping report further.

David

David H MacArthur, MCIEEM
Director

MacArthur Green
95 South Woodside Road, Glasgow, G20 6NT
Office: [redacted]
Mobile: [redacted]
Web: www.macarthurgreen.com

MacArthur Green

Hagshaw Hill Wind Farm Repowering:

Ecology Scoping Report

Prepared by: Rafe Dewar
Reviewed by: David H. MacArthur

Date: 30 April 2018

Tel: 0141 342 5404
Email: rafe.dewar@macarthurgreen.com
Web: www.macarthurgreen.com
Address: 95 South Woodside Road | Glasgow | G20 6NT

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1.0	Draft	Rafe Dewar	09/04/2018
1.0	Draft	David MacArthur	10/04/2018
1.1	Update	Rafe Dewar	30/04/2018

CONTENTS

1. INTRODUCTION

This report sets out the planned ecology surveys requirements for the proposed Hagshaw Hill Wind Farm Repowering project (the "proposed development").

As noted in the Scottish Government's Onshore Wind Policy Statement (2017), many established onshore wind sites will be coming to the end of their consented life during the coming decade and beyond. As the need and demand for renewable power increases, the Scottish Government expects developers to review the potential for "repowering" at existing sites. This could be in the form of measures designed to extend the life of components and turbines at such sites, or replacing and replanting existing turbines with new turbines.

The Scottish Government's position remains one of clear support in principle for repowering at existing sites. This is on the grounds of its potential to make the best use of existing sites, and – through the continued use of established infrastructure, grid connections and strong wind resource provide a cost effective option to deliver our renewable and decarbonisation targets.

Scotland's first wind farm at Hagshaw Hill is one such site that is now nearing the end of its useful life, and the opportunity to repower the wind farm with the new generation of turbines presents itself. As landowners of Hagshaw Hill, our clients 3R Energy, propose to repower the existing wind farm with new modern and more efficient machines in order to maximise the strong wind resource available at this site going forward.

The proposed development therefore involves a repowering of the operational Hagshaw Hill Wind Farm, by replacing the existing 26 turbine wind farm with 14 modern, larger turbines. Of these 14 turbines, seven will be within the existing Hagshaw Hill Wind Farm site boundary, with the other seven within an area of land adjacent to the south (Figure 1) required in order to accommodate the wake separation distances for modern, larger turbines that are necessary to maximise site efficiency and ensure the site's future viability in a subsidy-free market. The repowering of Hagshaw Hill Wind Farm has the potential to deliver more than double the amount of power and community funding from just over half the number of turbines.

It is intended to commence development in the first phase, to the south of the existing lease area, in advance of, or in parallel with, the decommissioning of the existing Bonus 600kW turbines on the current Hagshaw 1 site. This will enable 3R Energy to phase the grid connection capacity and finance of the project to ensure it is viable in the wholesale market, without any Government support.

Ecological surveys have regularly taken place for wind farm projects in the immediate vicinity of the proposed development over the last 15 years (Table 1). It is therefore considered to be the case that the ecological baseline conditions within the local area are well known.

This report therefore summarises the existing information available for the proposed development site and surrounding area, and outlines which surveys are considered, and are not considered, necessary to allow a robust environmental impact assessment.

2. METHODOLOGY

The baseline conditions within the proposed development and surrounding area will be assessed in the environmental impact assessment via a combination of a desk study and field surveys.

2.1 Desk Based Study

The desk study will gather ecological information from a variety of online sources and consultation with conservation organisations, such as those listed below:

- National Biodiversity Network NBN Gateway (http://data.nbn.org.uk/);
- Scottish Natural Heritage, including Sitelink (http://gateway.snh.gov.uk/sitelink/index.jsp); and
- South Lanarkshire Council.

In addition, ecological information available in the public domain relating to applications of the following local wind farm projects (see Figure 1) will be referred to:

- Douglas West & Dalquhandy DP Renewable Energy Project (DW);
- Douglas West Community Wind Farm (DWCW);
- Dalquhandy Wind Farm (DQ);
- Hagshaw Hill Extension Wind Farm (HH);
- Galawhistle Wind Farm (GA);
- Nutberry Wind Farm (NU); and
- Cumberhead (Nutberry Extension) Wind Farm (CU).

This information includes scoping reports, environmental statements and consultation responses from relevant stakeholders.

A timeline of baseline surveys carried out for the above wind farm projects is presented below in Table 1, with specific ecology survey dates shown in Table 2. Results of these surveys are summarised in Appendix 1.

Table 1. Timeline of baseline ecological surveys carried out at nearby wind farm sites

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
HH	■													
NU		■												
GA					■	■								
DWCW						■	■		■					
DQ								■	■					
CU										■	■	■		
DW									■		■	■		■

Table 2. Timing of various ecological surveys carried out at nearby wind farm sites

Survey	HH	NU	GA	DWCW	DQ	CU	DW
Phase 1	2004	2005	2008-09	2010	2011	2013	2014
NVC	-	2005	2009	2012	2012	2014	2014
Protected Species	2004	2005	2008-09	2009-10	2011-12	2014	2014, 2017
Bats	2004	2005	2008-09	2010	2011-12	2014	2014-15
Great-crested Newts	-	-	-	2012	2011-12	2014	2014-15
Fish	-	-	2009	2010	-	2014	2012

2.2 Designated Sites

Table 3 below details the designated sites located within 5 km of the proposed development that have ecological interests.

Table 3. Designated sites within 5km of Douglas West Wind Farm Extension

Name	Distance	Qualifying interests	Status
Coalburn Moss SAC and SSSI	2.7km	Active raised bog Degraded raised bog	Favourable Maintained Unfavourable Recovering
Muirkirk Uplands SSSI	3.7km	Blanket bog Upland assemblage	Unfavourable No change Favourable Maintained
Miller's Wood SSSI	5km	Upland birch woodland	Unfavourable Declining

In SNH's scoping opinion in response to the Douglas West & Dalquhandy DP Renewable Energy Project scoping report (SNH letter, dated 16 October 2015) it was stated that, "*We confirm that we do not anticipate any direct or indirect effects on nationally or internationally important natural heritage sites.*"

As the Hagshaw Hill Wind Farm lies adjacent to, and on the same agricultural unit as, the Douglas West & Dalquhandy DP Renewable Energy Project site, it can be reasonably concluded that the proposed development will not have a significant effect on the SAC & SSSIs, or indeed any other designated site. As such, it is not anticipated that an assessment under the Habitats Regulations Appraisal process is required, as no likely significant effects are predicted.

2.3 Field Survey Requirements

Based on the information presented above, and the survey data available from the various sources shown, the following ecology surveys are planned for the proposed development site in 2018:

- **Habitats:** habitat surveys have been undertaken on the site as part of the earlier Hagshaw Hill Wind Farm Extension planning application. An updated NVC Habitat survey will be carried out within up to a 300m buffer of planned infrastructure (both phases) to allow for assessment of indirect effects on any peat habitats and Ground Water Dependent Terrestrial Ecosystems and micrositing.
- **Protected species:** within up to 250m of buffer of planned infrastructure (both phases), targeted towards terrestrial mammal species likely to be present, based on results from other local wind farm projects (see Appendix 1 - likely to be badger and otter). The surveys will also include checks for any suitable bat roost structures.
- **Great crested newts**: Habitat Suitability Index surveys will be undertaken at any suitable locations within 500m of the proposed development site. If there are any new suitable waterbodies not previously surveyed, or if previously surveyed waterbodies have increased in suitability then further surveys will be undertaken. Otherwise, based on the apparent absence of the species from the local area (see Appendix 1) no further surveys are deemed necessary.
- **Bats**: Appendix 1 shows that the same bat species were consistently recorded across local wind farm project sites. Based on the availability of results of roost risk assessments and activity surveys carried out at local wind farm project sites, plus a roost check during protected species surveys for this project, it is concluded that sufficient information will exist to be able to robustly assess potential effects on bats. If roost sites are confirmed then further activity surveys will be undertaken monthly between May and September, using detectors deployed over 10 night periods each month. Otherwise no activity surveys are planned.

  Given that high risk bat species are likely to be using the proposed development site (based on the results from DW) it is likely that mitigation will have to include a curtailment condition similar to that requested by SNH on other recent projects. This condition is detailed below:

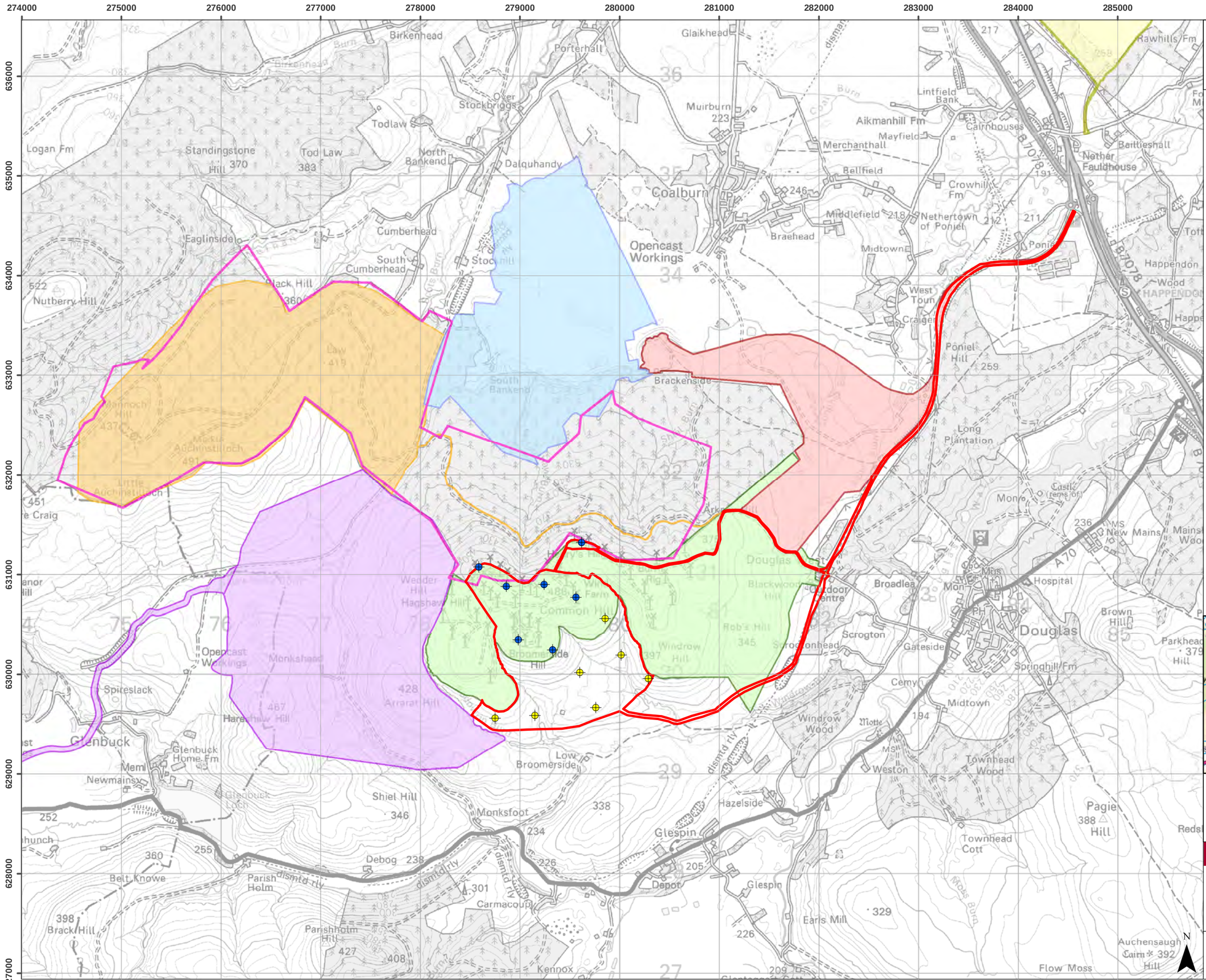
  - 'One year of pre-construction monitoring would allow a comparison of bat activity pre and post construction to be made. This will require an identical acoustic monitoring methodology to be employed as that to be used during post-construction monitoring.
  - The programme of post-construction bat monitoring should span a minimum of 3 years. Carcass searches and acoustic monitoring will be required, along with simultaneous monitoring of key weather parameters (wind speed and temperature). If repeated casualties are detected during operation, a trial curtailment regime informed by bat activity, temperature and wind speed data should be implemented – the SCADA system on the turbines can be programmed to switch the turbines to be feathered during periods of high risk (high bat activity), i.e. at above the normal cut-in speed and up to the appropriate wind speed above which bat activity drops off. '

- **Fish:** based on the information available from other local wind farm projects (primarily Galawhistle which shares the same catchment of watercourses) it is considered that sufficient information exists to be able to robustly assess potential effects on fish, with brown trout likely to be the only species present. No further surveys are planned.

APPENDIX 1: ECOLOGICAL ACTIVITY AT OTHER LOCAL SITES

A summary of the ecological findings for other local wind farm projects is presented below. The location of these projects is shown in Figure 1.

Species	DWCW	Douglas West	Dalquhandy	Hagshaw Hill Extension	Galawhistle	Nutberry	Cumberhead
Badger	Present	Present	Present	No evidence	Present	Present	Present
Otter	Present	Present	Present	No evidence	Present	No evidence	Present
Water Vole	No evidence	No evidence	No evidence	No evidence	No evidence	No evidence	No evidence
Pine Marten	Not surveyed	No evidence	Not surveyed	Not surveyed	Not surveyed	Not surveyed	No evidence
Red Squirrel	No evidence	No evidence	No evidence	No evidence	No evidence	No evidence	No evidence
Great crested Newt	No evidence	No evidence	No evidence	Not surveyed	Not surveyed	Not surveyed	No evidence
Common Pipistrelle	Present	Present	Present	Not surveyed	Present	Not surveyed	Present
Soprano Pipistrelle	Present	Present	Present	Not surveyed	Present	Not surveyed	Present
Myotis sp.	Present	Present	Present	Not surveyed	Present	Not surveyed	Present
Nyctalus sp.	Present	Present	Present	Not surveyed	No evidence	Not surveyed	Present
Brown Long-eared bat	No evidence	Present	No evidence	Not surveyed	Present	Not surveyed	Present
Brown Trout	Present	Present	Not surveyed	Present	Present	Present	Present
Atlantic Salmon	No evidence	No evidence	Not surveyed	No evidence	No evidence	Present	No evidence
European Eel	No evidence	No evidence	Not surveyed	No evidence	No evidence	No evidence	No evidence



3R Energy
Wind • Biomass

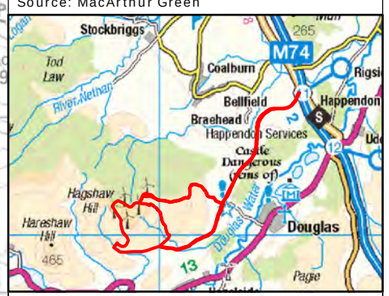
Legend:

- Phase 1
- Phase 2
- Site Boundary

Wind Farms

- Broken Cross Wind Farm
- Cumberhead Wind Farm
- Dalquhandy Wind Farm
- Douglas West Wind Farm
- Galawhistle Wind Farm
- Hagshaw Hill Extension
- Nutberry Wind Farm

Source: MacArthur Green



MacArthur Green

Hagshaw Hill Repowering

Figure 1

Development Area and Local Wind Farms

0 0.75 1.5 km

MAP SCALE: 1:35,000 @ A3

Status: Rev0 Approved: RD Checked: BJF GIS TM: EAP

Document Path: S:\Projects\3RE\HagshawNorth_South_HNSE_R_DevelopmentArea_Repowering_HR_HNS.mxd

Datum: OSGB 1936, Projection: British National Grid

Date: 09/04/2018

Hagshaw Hill Wind Farm Repowering:

Ornithology Scoping Report

Prepared by: Rafe Dewar
Reviewed by: David H. MacArthur

Date: 28 March 2018

Tel: 0141 342 5404
Email: rafe.dewar@macarthurgreen.com
Web: www.macarthurgreen.com
Address: 95 South Woodside Road | Glasgow | G20 6NT

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1.0	Draft	Rafe Dewar	13/03/2018
1.1	Reviewed	David H. MacArthur	14/03/2018
1.2	Updated	Rafe Dewar	23/03/2018

CONTENTS

1. INTRODUCTION

This report sets out the proposed ornithology survey requirements for the proposed Hagshaw Hill Wind Farm Repowering project (the "proposed development").

As noted in the Scottish Government's Onshore Wind Policy Statement (2017), many established onshore wind sites will be coming to the end of their consented life during the coming decade and beyond. As the need and demand for renewable power increases, the Scottish Government expects developers to review the potential for "repowering" at existing sites. This could be in the form of measures designed to extend the life of components and turbines at such sites, or replacing and replanting existing turbines with new turbines.

The Scottish Government's position remains one of clear support in principle for repowering at existing sites. This is on the grounds of its potential to make the best use of existing sites, and – through the continued use of established infrastructure, grid connections and strong wind resource provide a cost effective option to deliver our renewable and decarbonisation targets.

Scotland's first wind farm at Hagshaw Hill is one such site that is now nearing the end of its useful life, and the opportunity to repower the wind farm with the new generation of turbines presents itself. As landowners of Hagshaw Hill, our clients 3R Energy, propose to repower the existing wind farm with new modern and more efficient machines in order to maximise the strong wind resource available at this site going forward.

The proposed development therefore involves a repowering of the operational Hagshaw Hill Wind Farm, by replacing the existing 26 turbine wind farm with 14 modern, larger turbines. Of these 14 turbines, seven will be within the existing Hagshaw Hill Wind Farm site boundary, with the other seven within an area of land adjacent to the south (Figure 1) required in order to accommodate the wake separation distances for modern, larger turbines that are necessary to maximise site efficiency and ensure the site's future viability in a subsidy-free market. The repowering of Hagshaw Hill Wind Farm has the potential to deliver more than double the amount of power from just over half the number of turbines.

It is intended to commence development in the first phase, to the south of the existing lease area, in advance of, or in parallel with, the decommissioning of the existing Bonus 600kW turbines on the current Hagshaw 1 site. This will enable the Applicant to phase the grid connection capacity and finance of the project to ensure it is viable in the wholesale market, without any Government support.

Ornithological surveys have regularly taken place for wind farm projects in the immediate vicinity of the proposed development over the last 15 years (Figure 1), as well as ongoing monitoring for the Hagshaw Hill Extension Wind Farm. As a result a number of adjacent sites' survey areas have at least in part overlapped spatially with the proposed development site. It is therefore considered that the ornithological baseline conditions within the development site are well known.

This report summarises the existing information available for the proposed development site and surrounding area, and outlines which surveys are considered necessary to allow a robust environmental impact assessment.

3. METHODOLOGY

The baseline conditions within the proposed development site and surrounding area will be assessed in the environmental impact assessment via a combination of a desk study and field surveys. The requirements of ornithology surveys have been informed by SNH (2014a and 2014b) guidance.

3.1 Desk Based Study

The desk study will gather ornithological information from a variety of online sources and consultation with conservation organisations, such as those listed below:

- National Biodiversity Network NBN Gateway (http://data.nbn.org.uk/);
- Scottish Natural Heritage, including Sitelink (http://gateway.snh.gov.uk/sitelink/index.jsp);
- South Lanarkshire Council;
- The Royal Society for the Protection of Birds (RSPB); and
- South Strathclyde Raptor Study Group.

In addition, ornithological information available in the public domain relating to applications of the following local wind farm projects (see Figure 1) will be referred to:

- Hagshaw Hill Extension Wind Farm (HH);
- Douglas West & Dalquhandy DP Renewable Energy Project (DW);
- Douglas West Community Wind Farm (DWCW);
- Dalquhandy Wind Farm (DQ);
- Galawhistle Wind Farm (GA);
- Nutberry Wind Farm (NU); and
- Cumberhead (Nutberry Extension) Wind Farm (CU).

This information includes scoping reports, environmental statements and consultation responses from relevant stakeholders.

A timeline of baseline surveys carried out for the above wind farm projects is presented below in Table 1:

Table 1. Timeline of baseline surveys carried out at nearby wind farm sites

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
HH							Operational Monitoring								
NU															
GA															
DWCW															
DQ															
CU															
DW															

Table 2 below details the designated sites located within 20 km of the proposed development that have ornithological interests. It should be noted that the two Sites of Special Scientific Interest (SSSIs) are coincidental in extent with the Muirkirk and North Lowther Uplands Special Protection Area (SPA).

Table 2. Designated sites within 20km of Hagshaw Hill North Wind Farm

Name	Distance	Qualifying interests	Status
Muirkirk and North Lowther Uplands SPA	5km	Hen harrier (*Circus cyaneus*)	Unfavourable Declining
		Short-eared owl (*Asio flammeus*)	Favourable Maintained
		Peregrine (*Falco peregrinus*)	Unfavourable No Change
		Golden plover (*Pluvialis apricaria*)	Favourable Maintained
		Merlin (*Falco columbarius*)	Unfavourable No Change
		Hen harrier (*Circus cyaneus*)	Unfavourable Declining
North Lowther Uplands SSSI	5km	Hen harrier (*Circus cyaneus*)	Unfavourable No Change
		Breeding bird assemblage	Unfavourable Declining
Muirkirk Uplands SSSI	6km	Hen harrier (*Circus cyaneus*)	Favourable Maintained
		Short-eared owl (*Asio flammeus*)	Favourable Maintained
		Hen harrier (*Circus cyaneus*), non-breeding	Unfavourable Declining
		Breeding bird assemblage	Favourable Maintained

In SNH's scoping opinion in response to the Douglas West & Dalquhandy DP Renewable Energy Project scoping report (SNH letter, dated 16 October 2015), for which MacArthur Green was the Ecological and Ornithological Advisor, it was concluded that, "*The Muirkirk and North Lowther Special Protection Area (SPA) is located over 6km to the west of the development site. We advise that any of the birds recorded on the development site are not directly connected to this or other specially protected sites in the area. We confirm that we do not anticipate any direct or indirect effects on nationally or internationally important natural heritage sites.*"

As the proposed development site is in close proximity to the Douglas West & Dalquhandy DP Renewable Energy Project site boundary, it can be reasonably concluded that the proposed development will not have a significant effect on the SPA & SSSIs, or indeed any other designated site. As such, it is not anticipated that any specific surveys relating to the distribution of SPA birds are required, nor will an assessment under the Habitats Regulations Appraisal process, as no likely significant effects are predicted.

3.2 Field Survey Methodologies

SNH (2014b) guidance states that "*as operational wind farms are likely to have a reduced bird interest compared with similar sites pre-development, only one year of fresh surveys will be required*". These surveys will take place in 2018.

Breeding Bird Surveys

SNH (2014b) guidance suggests that distribution and abundance surveys should be carried out following SNH (2014a) guidance. The following ornithology surveys are therefore planned for the proposed development site in 2018:

- Breeding bird surveys for upland waders following the methods described in Brown & Shepherd (1993), from April to July. This will cover areas of suitable habitat within the existing Hagshaw Hill Wind Farm site and the area of proposed turbine extension to the south.

- Scarce Breeding Bird Surveys (raptors, owls and black grouse): 2018 breeding season within the proposed development site and up to 2km buffer, following the methods described in Hardey *et al.* (2013) and Gilbert *et al.* (1998).

As per SNH (2014b) guidance it is considered that the above one year of survey effort is sufficient to allow a robust characterisation of the baseline ornithological assemblage and usage of the proposed development site and surrounding area, when used in combination with the substantial information collated for other nearby projects. A summary of this information is provided in Appendix 1.

Flight Activity Surveys

SNH (2014b) guidance states that "*flight activity surveys should not be carried out over operational wind farms for the purpose of quantifying collision risk*". It is also acknowledged that the guidance also states that "*any extension to the spatial extent (or 'footprint') of development should be treated as a new site and considered for survey accordingly*". Although the proposed development site includes an area where turbines were previously not located, it is considered that flight activity (vantage point) surveys are not required because considerable information exists from previous surveys for nearby wind farm projects, which have survey areas that either overlap with the proposed development site, or are close by. It is also noted that the proposed expansion of the original Hagshaw site boundary is onto land that is flanked on either side by turbines from the Hagshaw Hill Extension and Galawhistle Wind Farms.

Instead an estimation of collision risk will be carried out by a combination of at least two of the methods outlined in SNH (2014b), using available information in lieu of specific flight activity surveys.

The following wind farm projects have carried out flight activity surveys where viewsheds have at least in part overlapped with the proposed development site:

- **Hagshaw Hill Extension Wind Farm** (2003-04)
- **Galawhistle Wind Farm** (2007-09): from Avermarks Hill (NS 78457 30142) and Shiel Hill (NS 77655 28594).

Table 1 above shows that baseline data for the local area that are available over a long-term period (2003 to 2015), and over that time, the species assemblage has remained relatively similar between years, as well as across different sites. Table A.1 in Appendix 1 shows that there is a high degree of consistency in assemblage between different projects. In general, the local area including the proposed development site is of limited importance for target species, with few breeding records of raptors (e.g. no hen harrier or merlin breeding evidence), and low levels of site usage by foraging raptors. A similar variety of wader species do breed within each site. Whooper swan, pink-footed goose and greylag goose were the only target wildfowl species regularly recorded, mainly in flight, and birds utilise the waterbody within the Dalquhandy Wind Farm site as a roosting location. Black grouse has been monitored as part of the Hagshaw Hill Wind Farm Extension monitoring plan, and so local distribution of this species is well known.

The overlapping baseline surveys will provide additional supporting information to surveys carried out in 2018 to determine the level of significance of any effects due to the proposed development.

4. REFERENCES

Brown, A.F. & Shepherd, K.B. (1993) A Method for Censusing Upland Breeding Waders. Bird Study, 40(3): 189-195.

Gilbert, G., Gibbons, D.W. & Evans, J. (1998) Bird Monitoring Methods. A Manual of Techniques for Key UK Species. RSPB, BTO, WWT, JNCC, ITE & The Seabird Group: Sandy.

Hardey, J. Crick, H., Wernham, C., Riley, H., Etheridge, B. & Thompson, D. (2013) Raptors: A Field Guide for Surveys and Monitoring Raptors. Stationery Office: Edinburgh (3rd edition).

Scottish Natural Heritage (2014a). Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms. May 2014.

Scottish Natural Heritage (2014b). Repowering onshore wind farms: bird survey requirements. Guidance, November 2014.

APPENDIX 1: ORNITHOLOGICAL ACTIVITY AT OTHER LOCAL SITES

A summary of the ornithological findings for other local wind farm projects is presented below. The location of these projects is shown in Figure 1.

Douglas West Community Wind Farm

Status: Scoping
Baseline Data: One full year of surveys completed in 2009/10. Scoping Report issued in 2012.

Various ornithological surveys were carried out between 2009 and 2010, and a scoping report was produced in March 2012 for this proposed 15 turbine project.

Although baseline surveys were completed prior to the production of the scoping report, no summary of results was contained in that document, and survey data were not made available in the public domain as no planning submission was made. Data were however summarised as part of the Douglas West & Dalquhandy DP Renewable Energy Project's EIA.

Douglas West & Dalquhandy DP Renewable Energy Project

Status: Consented
Baseline Data: One year of surveys from September 2014 to September 2015. ES and SEI issued in 2015 with non-material variation in 2016 and revised ES in 2017.

Work comprised the following surveys out to a 2km buffer of the site:

- Flight activity (Vantage Point) surveys. Fieldwork carried out from September 2014 to mid-March 2014 (non-breeding season), and from mid-March to August 2015 (breeding season) inclusive;
- Moorland Breeding Birds Surveys. Fieldwork carried out in spring-summer 2015;
- Breeding raptor surveys. Fieldwork carried out in spring-summer 2015;
- Barn owl surveys. Fieldwork carried out in spring-summer 2015; and
- Black grouse lek surveys. Fieldwork carried out in spring 2015.

Raptors: No target raptor species recorded breeding within the site and 2 km buffer. The following target species were recorded during baseline surveys - hen harrier, merlin, peregrine, barn owl and short-eared owl.

Wildfowl: Whooper swan, pink-footed goose and greylag goose overflying the site.

Waders: Seven species of waders were recorded breeding: oystercatcher (3 pairs), ringed plover (2 pairs), lapwing (7 pairs), snipe (13 pairs), curlew (5 pairs), common Sandpiper (5 pairs) and redshank (4 pairs).

Black grouse: Lek of up to two males recorded within Hagshaw Hill Extension site.

Dalquhandy Wind Farm

Status: Consented
Baseline Data: One year of surveys from September 2011 to November 2012 inclusive.

The following bird surveys were carried out within the site boundary and up to a 2km buffer zone:

- Vantage point surveys;
- 3 x Common Bird Census (CBC) surveys (adapted);
- 3 x Brown and Shepherd (1993) surveys;
- 3 x Woodland Point Count surveys;
- 2 x Black Grouse surveys;
- 4 x Breeding raptor surveys;
- 4 x Breeding owl surveys;
- 2 x Wintering bird surveys; and
- 7 x Wintering wildfowl counts.

Raptors: The following target species were recorded during baseline surveys - hen harrier, osprey, merlin, peregrine and short-eared owl. No evidence of breeding or roosting was recorded within the study area.

Wildfowl: Whooper swan (up to 15 using site), pink-footed goose (up to 1,361 birds roosting within study area), greylag goose (up to 185 birds roosting within study area).

Waders: Seven species of waders were recorded breeding: oystercatcher (3 pairs), ringed plover (6 pairs), lapwing (10 pairs), snipe (8 pairs), curlew (4 pairs), common Sandpiper (11 pairs) and redshank (3 pairs). Up to 138 golden plover during winter surveys.

Black grouse: none recorded.

Hagshaw Hill Extension Wind Farm

Status: Operational
Baseline Data: One year of surveys from April 2003 to July 2004 inclusive.

The following bird surveys were carried out within the site boundary and up to a 2km buffer zone:

- Vantage point surveys;
- Breeding bird survey;
- Black grouse survey; and
- Winter walkover survey.

Raptors: The following target species were recorded during baseline surveys - hen harrier, merlin, peregrine and barn owl. No evidence of breeding or roosting was recorded within the study area.

Black grouse: 4-6 males were recorded lekking at up to 4 lek sites within the study area.

Waders: 5 pairs of curlew bred within the study area. Golden plover present on migration.

Galawhistle Wind Farm

Status: Operational
Baseline Data: Two years of surveys from 2007 to 2009.

The following bird surveys were carried out within the site boundary and up to a 2km buffer zone:

- Vantage point surveys;
- Breeding bird surveys;
- Breeding raptor surveys;
- Winter walkover surveys; and
- Black grouse surveys.

Wildfowl: Whooper swan, pink-footed goose and greylag goose recorded during vantage point surveys, but no usage of site.

Raptors: Peregrine and barn owl recorded breeding within the study area. Hen harrier, merlin, red kite, osprey and short-eared owl present on occasion, but no breeding or roosting evidence.

Waders: Seven breeding species within study area – curlew (14 pairs), lapwing (2 pairs), ringed plover (4 pairs), snipe (6 pairs), common sandpiper (7 pairs), oystercatcher (11 pairs), with golden plover present.

Black grouse: Active at three locations within study area.

Nutberry Wind Farm

Status: Operational
Baseline Data: April 2004 to March 2006 (original and revised applications).

The following bird surveys were carried out within the site boundary and up to a 2km buffer zone:

- Vantage point surveys from 2004 to 2006;
- Moorland breeding bird surveys in 2004 and 2005;
- Raptor breeding survey in 2005 and 2006;
- Black grouse surveys in 2004 and 2005;
- Forest point count surveys in the 2004 breeding and 2004/05 nonbreeding seasons;
- Winter walkover survey in 2004/05;
- Monitoring of clear-fell areas to assess how birds might use deforested areas in the future (2005 and 2006); and
- Golden plover field searches in 2006.

Raptors: Hen harrier recorded foraging, with occasional merlin, peregrine, short-eared owl, osprey and red kite. Peregrine recorded breeding within the study area, and goshawk considered likely to be breeding within site.

Wildfowl: No regular migratory movements, but greylag goose and pink-footed goose flight activity recorded.

Waders: Breeding curlew and snipe within study area. Surrounding fields showed usage by golden plover in winter.

Black grouse: Two leks located within wider study area in 2004, but none in 2005.

Cumberhead Wind Farm

Status: Consented
Baseline Data: Surveys from April 2013 to August 2014.

The following bird surveys were carried out within the site boundary and up to a 2km buffer zone:

- Vantage point surveys from May 2013 to August 2014;
- Black grouse surveys in 2013 and 2014;
- Breeding bird surveys in 2013 and 2014;
- Breeding raptor surveys in 2013 and 2014; and
- Winter walkover surveys in 2013-14.

Raptors: Hen harrier recorded foraging, with occasional merlin, peregrine and short-eared owl. Goshawk considered likely to be breeding within survey area.

Wildfowl: No regular migratory movements, but greylag goose and pink-footed goose flight activity recorded.

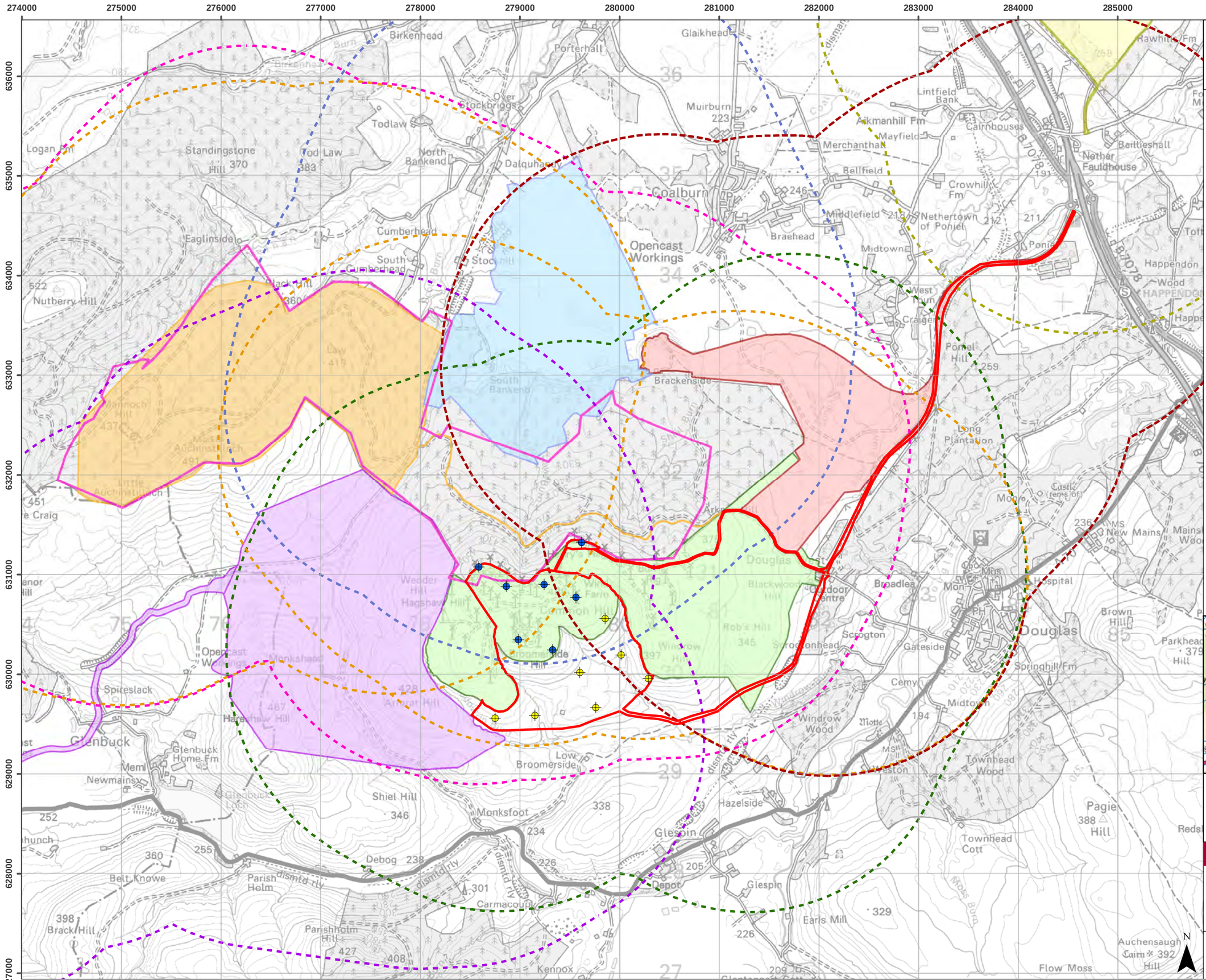
Waders: Breeding curlew within study area. Some usage by golden plover in winter.

Black grouse: single male but no lek sites recorded.

Table A.1. Noted presence of target species during baseline surveys at local wind farm projects

Site	HH	ML	PE	SE	KT	GI	OP	BO	BK	WS	PG	GJ	CU	OC	SN	CS	L.	RP	GP	RK
Douglas West & Dalquhandy	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DWCW	✓	✓	✓				✓			✓	✓	✓	✓	✓	✓		✓		✓	
Dalquhandy	✓	✓	✓	✓			✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Hagshaw Hill	✓	✓	✓					✓	✓				✓						✓	
Galawhistle	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Nutberry	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓		✓				✓	
Cumberhead	✓	✓	✓	✓		✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

HH = hen harrier; ML = merlin; PE = peregrine; SE = short-eared owl; KT = red kite; GI = goshawk; OP = osprey; BO = barn owl; BK = black grouse; WS = whooper swan; PG = pink-footed goose; GJ = greylag goose; CU = curlew; OC = oystercatcher; SN = snipe; CS = common sandpiper; L. = lapwing; RP = ringed plover; GP = golden plover; RK = redshank.



Datum: OSGB 1936, Projection: British National Grid

Date: 28/03/2018

HISTORIC ENVIRONMENT SCOTLAND | ÀRAINNEACHD EACHDRAIDHEIL ALBA

By email to: Ross.Cameron@mottmac.com

Mr Ross Cameron
Senior Heritage Consultant
Mott MacDonald (Glasgow)
St Vincent Plaza
319 St Vincent Street
Glasgow
G2 5LD

Longmore House
Salisbury Place
Edinburgh
EH9 1SH

Enquiry Line: 0131-668-8716
HMConsultations@hes.scot

Our ref: AMN/16/SR
Our case ID: 300030427

23 August 2018

Dear Mr Cameron

Hagshaw Wind Farm, Near Douglas, South Lanarkshire
Proposed Repowering of Wind Farm

Thank you for your pre-application consultation which we received on 30 July 2018 seeking our comments on the proposed repowering of Hagshaw Wind Farm.

Our comments here focus on heritage assets that fall within our remit, namely scheduled monuments and their setting, category A-listed buildings and their setting, Inventory gardens and designed landscapes and Inventory battlefields.

We would recommend that you also seek advice from South Lanarkshire Council's archaeology and conservation advisors in relation to the above assets, as well as sites that are outside our remit including unscheduled archaeology or category B and C listed buildings.

The proposed development
We understand that the proposed development comprises the replacement of the existing Hagshaw Wind Farm, which consists of 26 turbines of 55m blade tip height, with 14 turbines of an increased blade tip height of 200m. We note that the site boundary has changed to incorporate the flatter land to the south.

Our advice
We have reviewed the information contained in the consultation email which specifically relates to the cultural heritage assessment to be carried out for this development.
We note the proposal to assess this repowering scheme as a new development on a restored greenfield site. We are content with this approach as we agree that the baseline for EIA should be the expected restored state of the site, excluding the existing turbines. This is also in line with Scottish Natural Heritage's recommended methodology with

regards to the baseline, contained in their draft guidance for 'Assessing the impact of repowered wind farms on nature'. This guidance can be found here:
SNH guidance.

We note the proposed study areas to be used for the cultural heritage assessment are:

- Inner Study (an area extending up to 1km)-covering sites within our remit
- Middle Study (an area extending up to 10km) -covering sites within our remit
- Outer Study (an area extending up to 20km)-covering sites within our remit

We understand that the proposal's potential impacts on nationally important heritage assets located up to 20km from the site will be assessed, where these assets fall within the Zone of Theoretical Visibility. However, no detailed information concerning the actual methodology to be applied to the assessment within the three study areas has been provided. We therefore are unable to comment on it at this stage.

In addition, we acknowledge the intention to use wireframes for key sites. We are content with this proposal. However, while we recommend that visualisations for this scheme should exclude the existing wind farm, it would also be helpful to prepare separate visualisations comparing the existing and the proposed development from the same key viewpoints.

Further information
Detailed guidance on the application of national policy is set out in our 'Managing Change in the Historic Environment' series available online at www.historicenvironment.scot/advice-and-support/planning-and-guidance/legislation-and-guidance/managing-change-in-the-historic-environment-guidance-notes/. Technical advice is available through our Technical Conservation website at www.engineshed.org.

We look forward to receiving your statutory consultation if an application comes forward.

We hope this is helpful. Please contact us if you have any questions about this response. The officer managing this case is Urszula Szupszynska and they can be contacted by phone on 0131 668 8653 or by email on Urszula.Szupszynska@hes.scot.

Yours sincerely

Historic Environment Scotland

From: Szupszynska U (Urszula) [redacted]>
Sent: 13 August 2018 16:00
To: Cameron, Ross D <[redacted]>
Subject: RE: Hagshaw Hill - Consultation

Hi Ross,
Many thanks for this. I've been able to open the shapefiles without any problems. I will respond to you ASAP, hopefully before next Friday. In the meantime, I can provisionally confirm that the approach you intend to undertake appears reasonable for sites within our remit (nationally important heritage assets).
Regards
Urszula

Urszula Szupszynska | Senior Casework Officer | Heritage Directorate

Historic Environment Scotland | Àrainneachd Eachdraidheil Alba
Longmore House, Salisbury Place, Edinburgh, EH9 1SH
T [redacted]
M [redacted]
E: [redacted]

https://www.historicenvironment.scot/

Historic Environment Scotland - Scottish Charity No. SC045925
Registered Address: Longmore House, Salisbury Place, Edinburgh, EH9 1SH

Read Our Operating Plan for 2018-2019

From: Cameron, Ross D [redacted]]
Sent: 13 August 2018 15:40
To: Szupszynska U (Urszula) <[redacted]
Subject: RE: Hagshaw Hill - Consultation

Hi Urszula,

Apologies about that. Hopefully the attached works better. Let me know if this continues to cause issues.

However, to circumvent this if the shapefiles continue to cause issues, I also attach two pdf showing the site outline as well as an excel sheet outlining the locations of the turbines.

The proposals are being considered as a new development on a restored greenfield site. We propose to address the heritage concerns through three Study Areas:

- Inner Study area covering up to 1km around the Proposed Development: This will cover all heritage assets designated or otherwise identified by the DBA;
- Middle Study Area up to 10km: Nationally and Regionally Significant heritage assets within this area including SMR sites identified as such by WoSAS. Predominantly assessed using ZTV.
- Outer Study Area up to 20km: National and internationally significant sites as identified by ZTV and likely to include New Lanark.

I anticipate using wireframes for key sites, but would happily accept some steer from yourselves on these.

The timescales for this project are very tight, so I would appreciate as prompt a response as possible.

Let me know if you receive the shapefiles ok and if there is anything else you require.

Kind regards,

Ross

Ross Cameron
MLitt, MA (Hons)
Senior Heritage Consultant

Please note, I do not generally work Fridays

[redacted]

MOTT MACDONALD

Mott MacDonald
St Vincent Plaza
319 St Vincent Street
Glasgow G2 5LD
United Kingdom

Website | Twitter | LinkedIn | Facebook | YouTube

From: Szupszynska U (Urszula) <[redacted]
Sent: 13 August 2018 15:22

To: Cameron, Ross D <[redacted]
Subject: RE: Hagshaw Hill - Consultation

Dear Ross,
Many thanks for your email. I can confirm that HES will endeavour to respond to your enquiry by Friday, 24 August. In the meantime, it would be helpful to receive any information you might have about the proposed approach in relation to the cultural heritage study for this repowering proposal. Also, we are unable to open the GIS shapefiles that we received. Would you be able to send them in a different format?
Kind regards
Urszula

Urszula Szupszynska | Senior Casework Officer | Heritage Directorate

Historic Environment Scotland | Àrainneachd Eachdraidheil Alba
Longmore House, Salisbury Place, Edinburgh, EH9 1SH
T [redacted]
M: [redacted]
E: [redacted]

https://www.historicenvironment.scot/

From: Cameron, Ross D [mailto:Ross.Cameron@mottmac.com]
Sent: 30 July 2018 11:41

To: HM - Consultations <HMConsultations@hes.scot>
Subject: Hagshaw Hill - Consultation

Dear Sir/Madam,

Mott MacDonald have been commissioned to provide Cultural Heritage services as part of the proposed repowering of Hagshaw Hill Wind Farm, near Douglas in South Lanarkshire (centred on NS 79109 30591).

This development will involve replacement of the existing 26 turbines each with 600kw capacity with 14 turbines of 5mw capacity. The total generation will be increased from 15.6 mw to 70 mw. The new turbines will have a maximum tip height of 200m compared to 55m previously. The site boundary has also changed to incorporate the flatter land to the south, around Broomerside.

The client intends to complete an EIA and submit an S36 application. I attach a pdf showing the red line boundary as well as a couple of shapefiles showing the turbine locations and the site boundary. Due to the tight timeframes of the project, the client made the decision not to proceed with scoping and asked me to contact you directly.

I would appreciate if you were able to provide a consultation response by return, or indicate a timeframe for provision of this.

Any questions, or if there is anything else you require from me, please let me know.

Kind regards,

Ross

Ross Cameron
MLitt, MA (Hons)
Senior Heritage Consultant

Please note, I do not generally work Fridays

[redacted]

MOTT MACDONALD

Mott MacDonald
St Vincent Plaza
319 St Vincent Street
Glasgow G2 5LD
United Kingdom

Website | **Twitter** | **LinkedIn** | **Facebook** | **YouTube**

From: O'Hare, Martin (DRS) <Martin.OHare@glasgow.gov.uk> **On Behalf Of** Wosas Enquiries (DRS)
Sent: 14 August 2018 15:55

To: Cameron, Ross D <Ross.Cameron@mottmac.com>
Subject: RE: Hagshaw Hill - Consultation & SMR data

Hello Ross,

Attached is a zip folder containing an HER extract in relation to Hagshaw Hill. The only shapefile that I could open was the point layer showing the location of the proposed new turbines, but I was able to import the PDF showing the boundary of the proposed development, so I digitised that (excluding the access tracks). I used this to create a 10km buffer equating to the middle study area, though you should be aware that the southern end of this search boundary extents outside the area that we cover – the extent of the area covered by the extract is shown in the 'boundary' shapefile, so you can decide whether it's worth asking Dumfries and Galloway for data for the small section of ground that's in their area.

The extract picks up all sites recorded in the HER from within 10km of the boundary of the windfarm. I know that you only asked for nationally- and regionally-important sites from between 1km and 10km from the site, but this would have meant creating two extracts. I generally think it's better that you have the full range of sites anyway, as not all sites have been assessed for regional significance – we basically make use of the coding that was done as part of the process of preparing the old non-statutory register (NSR), but sites added to the HER after the completion of that project won't have an NSR code. However, it should not be assumed that this automatically means that they would not be of regional significance, it's simply that they were not assessed at the time that the NSR was compiled. Providing the full dataset out to 10km means that you can conduct any filtering at your end, rather than only looking at a sub-set of sites that were included in the HER when the NSR was being produced.

Looking at the position of the proposed new turbines, it appears that hardly any of them coincide with those already in place, though it does appear that some could make use of existing access tracks. It does appear, however, that the scheme as a whole will require substantial amounts of additional new ground disturbance, in addition to having a potentially much greater impact on the setting of sites beyond the boundary of the development area. Although identified as the re-powering of an existing wind-farm, therefore, it'd almost be easier to start from scratch when assessing both the direct and indirect impacts of the proposal.

Regards,

Martin

Martin O'Hare
Historic Environment Records Officer
West of Scotland Archaeology Service
231 George Street, Glasgow, G1 1RX
Tel: [redacted]
email: [redacted]

HISTORY HERITAGE & ARCHAEOLOGY • 2017 •

From: Cameron, Ross D [redacted]
Sent: 13 August 2018 16:04

To: Wosas Enquiries (DRS) <[redacted]
Subject: RE: Hagshaw Hill - Consultation & SMR data

Hi Martin,

Quick follow up email for the Hagshaw Hill Wind Farm SMR data and Consultation (below).
I also attach shapefiles here, as I am assured these will work if the others I sent did not open.
I have increased my Middle Study Area to 10km.

I'd appreciate if you were able to provide the SMR data by return, or indicate when this will be issued. As discussed, there is a very tight timeframe on this, so I am keen to keep the client up to date with my schedule.

Kind regards,
Ross

From: Cameron, Ross D
Sent: 06 August 2018 10:43
To: 'Wosas Enquiries (DRS)' <[redacted]>
Subject: RE: Hagshaw Hill - Consultation & SMR data

Hi Martin,

Many thanks for this. I would like you to go ahead and produce the SMR data.

My proposed methodology was for:

- All sites within and up to 1km of site boundary;
- Middle Study are of 5km showing all Nationally and regionally significant sites (including your non statutory sites);
- Outer Study Area of up to 20km showing national and international sites affected (this to include New Lanark).

As everything has moved so fast, I am yet to receive the ZTV. However, if you feel the Middle Study Area could/should be extended then I'd be grateful if the SMR extract can include up to 10km for non-statutory SMR sites considered Regionally and Nationally important. This should allow me to assess this in more detail when I have the ZTV.

I am a bit of a GIS luddite. I thought I had sent you the .shp files, but clearly did something wrong. I have tried again, but also attached an excel sheet with the co-ordinates on it. I have also attached a pdf. Turbine 4 has moved slightly (15m) following production of this, as have the crane pads etc, but you can see the general layout and check these with the excel co-ordinates on GIS.

As you can see, there is a fair bit of virgin ground being broken.

Hopefully this all you need. Anything else or if you want to chat it through, then let me know.

Kind regards,
Ross

From: O'Hare, Martin (DRS) [redacted]> **On Behalf Of** Wosas Enquiries (DRS)
Sent: 02 August 2018 12:12

To: Cameron, Ross D [redacted]>
Subject: RE: Hagshaw Hill - Consultation & SMR data

Hello Ross,

The cost for providing an HER extract would be £100 plus VAT. Let me know if you want me to go ahead and produce this.

In terms of the proposal itself, I've not looked at it in detail, but I'd think that one of the major issues would be the potentially sizable increase in the ZTV that would result from replacing 55m high turbines with ones 200m tall. I think that you'd need to look in detail at the impact this may have on the visibility of the wind farm on the setting of distant sites, potentially beyond the 5km study area mentioned in your email. This is because the larger turbines would likely be visible from sites that currently have no view of them, or would be more visually intrusive in the setting of sites where only a small portion of the existing wind-farm can currently be seen. It's likely to be complicated by the fact that other turbines are already present in the immediate vicinity (though outside the red-line boundary shown on the map that accompanied your email), so you'd really need to consider the extent of change to the cumulative impact of these turbines as a whole, rather than just considering the existing turbines in isolation.

I'm afraid that I was unable to open the two .shp files that accompanied your email – when I tried to import them into our GIS, it just returned an error message which said 'error opening feature class'. I don't know what sort of software was used to produce them, but typically when we produce a shapefile in ArcMap, it includes a number of different files, with a range of extensions (.cpg, .dbf, .sbn, .sbx, .shp and .shx), so I presume that I can't open the files that you sent through because some or all of these files are missing. As a result, I don't have any information on the positions of the proposed new turbines within the site boundary. If the new turbines would be positioned on the same sites as the existing ones, this would obviously reduce the potential direct impact of the proposal on archaeological material within the site boundary, as they'd be located on ground that would have been disturbed already. However, the fact that you said that the site boundary has been changed to incorporate flatter land around Broomerside suggests that this may not be the case, and that the new turbines may need new bases etc on currently undisturbed ground.

Regards,

Martin

Martin O'Hare
Historic Environment Records Officer
West of Scotland Archaeology Service
231 George Street, Glasgow, G1 1RX
Tel [redacted]
email: [redacted]

HISTOR
HERITAGE
ARCHAEOLO
• 2017

From: Cameron, Ross D [redacted]
Sent: 30 July 2018 11:35

To: Wosas Enquiries (DRS) <[redacted]>
Subject: Hagshaw Hill - Consultation & SMR data

Hugh, Martin, Paul,

I hope you are all well and things aren't too busy.

Mott MacDonald have been commissioned to provide Cultural Heritage services as part of the proposed repowering of Hagshaw Hill Wind Farm. This will involve replacement of the existing 26 turbines of 600kw capacity with 14 turbines of 5mw capacity. The new turbines will have a maximum tip height of 200m compared to 55m previously. The site boundary has also changed to incorporate the flatter land to the south, around Broomerside.

To refresh your memory, Hagshaw is just west of Douglas centred on NS 79109 30591 (roughly).

This has been proposed for a few months, but has only been given the go ahead today. The client intends to complete an EIA and submit an S36 application. I attach a pdf showing the red line boundary as well as a couple of shapefiles showing the turbine locations and the site boundary. Due to the tight timeframes of the project, the client made the decision not to proceed with scoping and asked me to contact you directly.

I would appreciate if you were able to provide a consultation response by return, or indicate a timeframe for provision of this.

In addition, I would like to request SMR data for the area. I'd appreciate records of all sites within the red line boundary (inner study area), as well as up to 1km from the edge of the site boundary. Given the extent of existing development, I felt this would be sufficient, but I am happy to hear you thoughts on this. I'd also appreciate records of any non-statutory sites you consider nationally or regionally important within 5km of the site boundary. In addition, any other information you feel may be beneficial, including reports for previous work associated with Hagshaw Hill wind farm would be greatly appreciated.

For any costs incurred by the SMR search, we would appreciate if you reference our project: 398334 Hagshaw Hill.

Please could you send any invoice to both the Croydon head office as listed below (registered office) and us (Mott MacDonald Ltd here in Glasgow.

Mott MacDonald House
8-10 Sydenham Road
Croydon
CR0 2EE
UK

Mott MacDonald
St Vincent Plaza
319 St Vincent Street
Glasgow
G2 5LD

I'd also appreciate if you could confirm what the cost for this will be.

Any questions, or if there is anything else you require from me, please let me know.

Kind regards,

Ross

Ross Cameron
MLitt, MA (Hons)
Senior Heritage Consultant

Please note, I do not generally work Fridays

[redacted]

MOTT MACDONALD

Mott MacDonald
St Vincent Plaza
319 St Vincent Street
Glasgow G2 5LD
United Kingdom

Website | Twitter | LinkedIn | Facebook | YouTube

From: Jenny Hazzard
Sent: 29 October 2018 11:21
To: Wright, James <[redacted]>
Subject: PWS consultation for Hagshaw Repowering

Hi again James –
I'm hoping you can help with a query on private water supplies and whether there are any recorded in the vicinity of the proposed Hagshaw Repowering project.
I have attached here a figure showing the proposed Hagshaw Hill Repowering infrastructure and a buffer which is 500m around the proposed turbines and borrow pit search area, and 250m around the proposed new track.
Are you able to let me know please if the Council has any recorded PWS in this buffer area? Or point me in the direction of who I should be asking, if it is not you?
If you need any further info to be able to answer this query, please let me know.
Best regards,
Jenny

Jenny Hazzard | Director | ITPEnergised
Office: [redacted] | Mobile: [redacted]
7 Dundas Street, Edinburgh EH3 6QG
www.itpenergised.com

From: Jenny Hazzard
Sent: 15 November 2018 10:12
To: 'brian.fotheringham [redacted]>
Cc: Theo Philip [redacted]>
Subject: Hagshaw Hill Wind Farm Repowering

Dear Mr Fotheringham,
I am getting in touch with respect to the proposed repowering of Hagshaw Hill Wind Farm, being proposed by 3R Energy.

The proposed development comprises the replacement of the existing 26 turbines of the original Hagshaw Hill development, with 14 larger turbines occupying the original development area plus additional land to the south, delivering approximately 84MW of generation and around 20MW storage capacity. A proposed site layout plan is attached (note it is shown over three pages due to the length of the access track).

A formal Scoping process has not been undertaken, rather we have engaged and are engaging in direct consultation with the Energy Consents Unit and relevant regulatory consultees.

As part of the EIA process and assessment work undertaken to date, we have followed relevant guidance and best practice with respect to the water environment and geology (including peat). Below we have briefly set out the scope of survey and assessment work undertaken, and preliminary conclusions drawn, and would be grateful for SEPA's feedback including any concerns or queries, or further information required.

Best regards,
Jenny Hazzard (contact details in the signature line at the foot of this email)

Watercourses – Buffers and Crossings
All watercourses within 1km of proposed infrastructure have been identified and quality/classification information sought. A buffer of 50m has been applied around all watercourses for proposed new infrastructure, with the exception of water crossing points.

Three new water crossings are proposed, plus upgrading of one existing crossing. Outline information on the proposed crossings will be provided in the EIA Report, including location plans, preliminary cross-sections and information on proposed construction. Detailed designs will be agreed with SEPA prior to construction.

Peat
A peat depth survey has been undertaken in line with *Guidance on Developments on Peatland - Site Surveys (2017)*. Very little peat was identified, with only six of 609 probes recording deep peat (1-1.5m thick). 92.4% of probes identified peat depth of zero or less than 0.5m.

A peat slide risk assessment has been undertaken and risks have been identified as negligible or low.

An outline peat management plan is being prepared.

Private Water Supplies

SLC was consulted regarding the presence of Private Water Supplies (PWS) within 500m of the proposed turbines and borrow pit search area, and within 250m of the proposed new access track. No information was available and SLC has suggested contacting SEPA for any relevant information. **We would therefore be most grateful for any data you may hold with respect to known PWS in the above-noted study area (shown on the attached plan)**.

Evidence of a possible PWS was observed during the ecology site survey work, at NGR NS 79806 29434. A stone structure was identified, with a clay pipe leading to a trough-like structure, fenced off from the surrounding grazing land. The structure appeared to be disused, as shown in the photographs below. It is located between the former properties at High Broomerside and Low Broomerside, and it is considered likely that it was used for a water supply when those properties were occupied and in use. There is no evidence to suggest that the structure is currently used to supply water, and no other PWS within the search area have been identified from site survey work.

GWDTE

A National Vegetation Survey has been undertaken to map and characterise wetlands at the site and identify habitats which could be groundwater dependent.

Across much of the southern site area (on the lower slopes and at the foot of Broomerside Hill and Hagshaw Hill), potentially moderately groundwater dependent habitats were identified as being present. In some localised areas, potentially highly groundwater dependent habitats were present.

Superficial geology at the site largely comprises till, except on the higher ground in the north of the site where there is no recorded superficial geology. The till deposits are anticipated to contain little groundwater, with groundwater flow limited to localised areas of higher sand and gravel content. With the bedrock underlying the main site area comprising a low productivity aquifer, this would suggest there is little groundwater present near the surface across much of the main site.

The areas in which habitats suggesting potential groundwater dependency have been identified are mainly on the slopes of Broomerside and Hagshaw Hill, and on the relatively flat ground at the foot of these hills, in the south of the site. Given the nature of the geology and anticipated absence of substantial groundwater, it is considered that surface water flow running off the hillsides and ponding on low-permeability till at the foot of the hills is likely to be sustaining the habitats identified.

Even where BGS mapping shows a localised area of peat, the peat depth survey identified peat depths consistently less than 50 cm, with till beneath. It is again considered likely that surface water flow shedding from the nearby hillsides sustains the habitats identified at this location.

It is therefore considered that GWDTE are not present at the Proposed Development site, and impacts on GWDTE are not proposed to be considered further.

Flood Risk
SEPA flood risk map indicates that most of the site has no identified flood risk. A desk-based Stage 1 Flood Risk Assessment (FRA) will be undertaken and included as an appendix to the EIA Report.

Borrow Pits
Two adjacent circular borrow pit search areas have been identified near the proposed access track into the site (shown on the attached site layout plan). The borrow pit search areas are substantially larger than the estimated area required for excavation, therefore investigations will be undertaken to identify the most suitable and least sensitive areas for extraction. Information on proposed working methods and restoration will be provided in the EIA report and agreed prior to commencement of workings.

In addition to the two borrow pit search areas identified above, the application will include the potential to recover some material from a large colliery spoil heap (bing) on the site at Douglas West. The former Douglas West Bing is located to the north-east of the former railway and station at Douglas West (see the second page of the attached figure - Figure 1.2b – the bing is marked on OS mapping as "Disused Workings", adjacent to the proposed construction compound). The bing consists of stone and coal mining waste excavated from the adjacent abandoned pits and deposited here until the 1960s. The main heap is around 200 m long, 120 m wide at the base, and is around 20 m high above surrounding ground level. It is steep sided on the south, east and west sides and the north side slopes more gently to ground level. The bing continues northward for circa a further 200 m at a lower level from the main heap and is more heavily landscaped. The top of the southern area is relatively flat and exposed. Most of the top and northern area has been partially landscaped.

Subject to appropriate environmental and geotechnical testing it is considered the colliery spoil may provide a viable resource for the construction of wind farm roads and a review has been undertaken to see how this could be extracted. To minimise the impact on existing landscape screening and cover planting it is proposed to carry out extraction from the south-east corner of the heap by forming a ramp part way up the face and working the area to form a working platform/s which can be used to load site trucks which will transport the material to the road locations which are primarily to the south and west of its position.

It is considered that approximately 62,500 m^3 may be used which will reduce the spoil heap by around 35 m (in lateral extent) if worked from the south. During extraction it will be necessary to form working platforms to reduce the height of excavations and to maintain stable slopes. When extraction is complete it is proposed to retain some of these platforms for landscape planting and to grade the slopes of the new excavated faces to provide shallower gradients which can be topsoiled and seeded. Details of the proposed work is shown on the Aecom drawing attached.

If this proposal can be adopted then approximately 12,500 fewer off site vehicle movements will be required (6250 each way).

Jenny Hazzard | Director | ITPEnergised
Office: +[redacted] | Mobile: [redacted]

7 Dundas Street, Edinburgh EH3 6QG
www.itpenergised.com

ITPEnergised incorporates Energised Environments Limited & ITPE Ltd.

ITPENERGISED
Earth. Smart. Solutions

Please consider the environment before printing this e-mail

ITPEnergised Group: Argentina, Australia, China, India, Kenya, New Zealand, Portugal, Spain, United Kingdom.

SEPA
Scottish Environment Protection Agency
Buidheann Dìon Àrainneachd na h-Alba
Our ref: PCS/162333
Your ref:

Ms J Hazzard
ITPEnergised
7 Dundas Street
Edinburgh
EH3 6QG

If telephoning ask for:
Brian Fotheringham

05 December 2018

By email only to: jenny.hazzard[redacted]

Dear Madam

Pre-planning enquiry
Hagshaw Hill Wind Farm Repowering

Thank you for your consultation email which SEPA received on 15 November 2018, in respect of the above proposals.

We acknowledge the proposed development comprises the replacement of the existing 26 turbines of the original Hagshaw Hill development, with 14 larger turbines occupying the original development area plus additional land to the south, delivering approximately 84MW of generation and around 20MW storage capacity. We also recognise that the 20 turbines constructed in the Hagshaw Hill wind farm extension are to be retained.

We accept the proposed scheme has not been subject to a formal scoping process and instead you have been engaged in direct consultation with the Energy Consents Unit and the relevant regulatory statutory consultees.

In adopting this approach we note as part of the EIA process and assessment work you undertaken you have followed all relevant guidance and best practice with respect to the water environment and geology (including peat). We have as requested reviewed the scope of the preliminary survey and assessment work undertaken, the conclusions drawn and would offer the following initial comments for you.

We welcome pre-application engagement, however the advice given at this stage is based on emerging proposals and we cannot rule out potential further information requests as the project develops.

1. Scope of preliminary survey work

Watercourse – Buffers and Crossings

1.1 Satisfied with the approach taken to identify all watercourses in and within the vicinity of the site. We note the further information provided in respect of the new and upgraded watercourse crossings and that these details will be subject to further discussion with SEPA. We would highlight the potential increased risk of flooding that could occur from these new structures and this outcome should be acknowledged and discussed within the FRA prepared for the site.

Angus Smith Building
6 Parklands Avenue, Eurocentral,
Holytown, North Lanarkshire ML1 4WQ
tel 01698 839000 fax 01698 738155
www.sepa.org.uk • customer enquiries 03000 99 66 99

Peat

1.2 Note the scale of the survey work already carried out at the site and the initial conclusions that 'deep peat' is not present across the majority of the site, although some small pockets have been identified. We expect these findings to be further detailed in the outline PMP being prepared for the site.

Private Water Supplies

1.3 Unfortunately we do not hold records of PWS's and are therefore unable to offer any further advice on this specific issue. It will therefore be your responsibility to establish that no PWS's are present and/or could be impacted upon by the wind farm activities.

GWDTE

1.4 We acknowledge that you have completed a NVC survey and we note the interpretation you have provided on the findings of the survey and the inference that the wetland habitats present at the site are considered to be predominately surface water fed. Although we are not disputing these conclusions we would expect this information to be provided in the ES to allow my ecology colleagues to concur with your findings.

Flood risk

1.5 Satisfied with the scope of the FRA provided it ensures all watercourse crossings are designed to ensure they are capable of passing forward the appropriate design flow.

Borrow Pits

1.6 Accept the use of stone won from within the site is a more sustainable strategy for obtaining material for the upgrading of the existing and also for the construction of new tracks at the site. We will expect further details to be provided on the design, management and restoration of these borrow pits to be included in forthcoming submissions. We will also expect detailed track designs to be provided in the EIA.

Colliery Bing

1.7 We note the opportunity the colliery spoil heap may offer as a source of stone for the construction track works at the site. We note your acknowledgement that to allow this material to be used additional environmental and geotechnical testing will require to be undertaken to establish if it is fit for purpose. We do not have any comments to offer on the excavation and restoration strategy you are proposing as our interests are more focussed on the structural integrity of the material, to withstand repetitive vehicular movement and also the need to confirm that the un-weathered material does not have the potential to leach contaminants (once it is exposed), into the environment, primarily the water environment.

1.8 As noted in a subsequent email it may be prudent to engage with SEPA (regulatory services/ contaminated land) once the results of the initial test results of the colliery spoil are available. This early engagement will hopefully give both parties the required assurances that the material is indeed suitable for its intended use and in addition whether any authorisation will be required from us to reuse the arisings from the bing on the site.

Forestry

1.9 We are assuming that there is no requirement for the removal of trees to facilitate the development.

Regulatory advice for the applicant

2. Regulatory requirements

2.1 Authorisation is required under The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR) to carry out engineering works in or in the vicinity of inland surface waters (other than groundwater) or wetlands. Inland water means all standing or flowing water on the surface of the land (e.g. rivers, lochs, canals, reservoirs).

2.2 Management of surplus peat or soils may require an exemption under The Waste Management Licensing (Scotland) Regulations 2011. Proposed crushing or screening will require a permit under The Pollution Prevention and Control (Scotland) Regulations 2012. Consider if other environmental licences may be required for any installations or processes.

2.3 A Controlled Activities Regulations (CAR) construction site licence will be required for management of surface water run-off from a construction site, including access tracks, which:

- is more than 4 hectares,
- is in excess of 5km, or
- includes an area of more than 1 hectare or length of more than 500m on ground with a slope in excess of 25˚

See SEPA's Sector Specific Guidance: Construction Sites (WAT-SG-75) for details. Site design may be affected by pollution prevention requirements and hence we strongly encourage the applicant to engage in pre-CAR application discussions with a member of the regulatory services team in your local SEPA office.

2.4 Below these thresholds you will need to comply with CAR General Binding Rule 10 which requires, amongst other things, that all reasonable steps must be taken to ensure that the

2.5 discharge does not result in pollution of the water environment. The detail of how this is achieved may be required through a planning condition.

2.6 Details of regulatory requirements and good practice advice for the applicant can be found on the Regulations section of our website. If you are unable to find the advice you need for a specific regulatory matter, please contact a member of the regulatory services team in your local SEPA office at:

SEPA ASB
Angus Smith Building
6 Parklands Avenue
Maxim Business Park
Eurocentral
Holytown
North Lanarkshire
ML1 4WQ

Tel no [redacted]

If you have any queries relating to this letter, please contact me by telephone [redacted] or by e-mail to planning.sw@sepa.org.uk

Yours faithfully

Brian Fotheringham
Senior Planning Officer
Planning Service

Disclaimer

This advice is given without prejudice to any decision made on elements of the proposal regulated by us, as such a decision may take into account factors not considered at this time. We prefer all the technical information required for any SEPA consents to be submitted at the same time as the planning or similar application. However, we consider it to be at the applicant's commercial risk if any significant changes required during the regulatory stage necessitate a further planning application or similar application and/or neighbour notification or advertising. We have relied on the accuracy and completeness of the information supplied to us in providing the above advice and can take no responsibility for incorrect data or interpretation, or omissions, in such information. If we have not referred to a particular issue in our response, it should not be assumed that there is no impact associated with that issue. For planning applications, if you did not specifically request advice on flood risk, then advice will not have been provided on this issue. Further information on our consultation arrangements generally can be found on our website planning pages.

From: Jack, Fraser <[redacted]>
Sent: 11 October 2018 22:26
To: Iain Lamb <[redacted]
Cc: Laird, Stuart <Stuart.Laird@southlanarkshire.gov.uk>
Subject: RE: Hagshaw Hill wind farm repowering: scope of transport chapter of EIA report

Dear Iain,

Thank you for your e-mail below and apologies for the delay in replying to you.

The scope covers most of the items that we would look to be considered. Any structures along the route should also be considered along with an agreed route for construction traffic (to avoid sensitive receptors (if applicable)). Not sure from the plan whether there will be new access tracks to be constructed.

In terms of accident records, my colleague Stuart Laird may be able to advise. I have copied him into this e-mail.

Regards

Fraser Jack
Team Leader - Development Management
Roads and Transportation Services
Community and Enterprise Resources
South Lanarkshire Council
Montrose House
154 Montrose Crescent
Hamilton, ML3 6LB
Tel: 01698 455260
Email[redacted]
Council Website: www.southlanarkshire.gov.uk

From: Iain Lamb [redacted]
Sent: 04 October 2018 12:09
To: Jack, Fraser
Subject: RE: Hagshaw Hill wind farm repowering: scope of transport chapter of EIA report

Dear Fraser

You may recall that we sent the email below a couple of months ago now and we don't seem to have received a reply. We're now preparing a draft ES chapter in line with the scope below and would be grateful for your views before we proceed too far.

Regards

Iain

From: Iain Lamb
Sent: 06 August 2018 16:11
To: Fraser Jack [redacted]
Subject: Hagshaw Hill wind farm repowering: scope of transport chapter of EIA report

Dear Fraser

As discussed, we've been commissioned to prepare the transport chapter of the EIA report for the proposed repowering of the exiting Hagshaw Hill wind farm. The indicative layout of the proposed development is shown in the attached plan. I suspect that the exact locations of the turbines will alter slightly as design work progresses but the access route (via the private road from Junction 11 of the M74) will remain the same.

We propose the following scope for the transport chapter of the EIA report:

Introduction

- The Traffic and Transport chapter will assess the effects arising from the proposed development with respect to the construction and operation of the development.
- It will consider all vehicle movements associated with the construction and operation of the proposed development, including consideration of construction traffic and the source of and vehicle movements associated with the delivery (and export, if required) of material and components to the site. The operational phase is likely to have little traffic impact as the proposed development will be visited by only the occasional maintenance and inspection vehicle. The decommissioning phase is too far in the future to be considered at present and will therefore not be included in the assessment.

Baseline Description

- The baseline will be informed by site visits and collection of data. The transport network around the proposed development will be visited and any potentially sensitive receptors will be identified. Data on traffic flows and accidents will be obtained for the roads likely to experience an increase in traffic arising from the proposed development.

Relevant Guidance

- The methodology will principally follow the 'Guidelines for the Environmental Impact of Road Traffic' prepared by the Institute of Environmental Assessment.
- The impact of the traffic estimated to be generated by the proposed development on the surrounding road network will be subject to a screening process using the following two rules outlined in the Guidelines to identify the appropriate extent of the assessment area:
    - Rule 1 - include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%).
    - Rule 2 - Include any other specifically sensitive areas where traffic flows have increased by 10% or more.
- The assessment of the baseline situation will determine which sections of road should be subject to which of the above rules. Where the predicted increase in traffic flows is lower than the appropriate thresholds, the Guidelines suggest the significance of effects can be stated to be low or insignificant and further detailed assessments are not warranted.

Proposed Scope of Assessment

- It is anticipated that the geographical scope of assessment will extend from Junctions 10 to 13 of the M74 and the B7078 between Junctions 11 and 12 of the M74. The turbine components are likely to be delivered from King George V dock in Glasgow via the M8 and

M74 so the geographical scope of that part of the assessment will extend to cover that part of the road network.

Potential Impacts

- Where the estimated increase in traffic flows is expected to be greater than the appropriate rule above, the potential impacts on the following topics will be considered in more detail:
    - Severance;
    - Driver delay;
    - Pedestrian delay;
    - Pedestrian amenity;
    - Fear and intimidation; and
    - Accidents.
- The potential for cumulative effects from other relevant developments in the study area will also be considered.

Potential Mitigation

- Potential mitigation measures will be identified once the impacts have been assessed. These measures may include restrictions on vehicle routeings and times in order to avoid or reduce impacts on sensitive receptors and 'good practice' measures to be included in a Construction Traffic Management Plan (CTMP).

I hope that the above would cover everything that you would wish to see addressed in the assessment, but please let me know of any omissions or any local issues you would wish to see us address. It would be helpful if you could please provide me with contact details for someone in SLC who could comment on the accident rates on the section of the B7078 in the study area (we'd like to understand if it has atypically-high accident rates)

Regards

Iain

Iain Lamb
Transport Development Associate
Mob: [redacted]
Tel: 0131 208 1267
Web: www.tranplanworld.co.uk

Transport Planning Limited
Forsyth House, 93 George Street, Edinburgh, EH2 3ES
Also at 4 West Philpstoun Steadings, Old Philpstoun, Linlithgow, EH49 7RY Tel: 01506 830893

Regd in Scotland No. SC379909 Regd office: Apex 2, 97 Haymarket Terrace, Edinburgh EH12 5HD

From: SMITH George <[redacted]
Sent: 04 October 2018 14:42
To: Iain Lamb [redacted]>; GILLESPIE Jason <[redacted]
Cc: LOGAN Lesley <[redacted]
Subject: RE: Hagshaw Hill wind farm (South Lanarkshire) repowering: scope of transport chapter of EIA report

Iain,

Many thanks for your email and the opportunity to comment on the scope of your forthcoming Environmental Impact Assessment (EIA). Please accept my apologies for the delay in responding, this was due to your email being lost in holiday traffic.

The submitted scope for the transport chapter of the EIA report is considered to be acceptable.

We understand that your client is proposing to submit a Section 36 application for the replacement of 14 of the existing 20 turbines at Hagshaw Hill Wind Farm near Douglas. The proposed turbine blade length will be around 64.5m.
We also note that the scope of your assessment will be based upon the Institute of Environmental Assessment's Guidelines for the Environmental Impact of Road Traffic, and that a swept path assessment of the turbine delivery route will be provided. Given the increase in turbine size, Transport Scotland would also seek a full abnormal load assessment be provided, which evaluates the proposed route for any abnormal loads on the trunk road network. This will require to identify any accommodation measures required, including the removal of street furniture, junction widening and any traffic management. The full abnormal load assessment need not be included within the EIA, but approval will be required prior to commencement of deliveries to site. We would also note that you should take account of the removal of the existing turbines within your assessment.

Transport Scotland will be consulted on the application by Energy Consents once the application is submitted, and we will review your Transport Chapter at that stage. In the meantime, I trust the above comments will allow you to proceed with your assessment, however, if you have any further questions please do not hesitate to contact me.

Regards

GEORGE SMITH
Associate
124 St Vincent Street, Glasgow, United Kingdom, G2 5HF

Direct Dial: [redacted]
Main Office: +44 141 468 4205
Website: www.systra.co.uk

https://twitter.com/SYSTRA_LTD
www.linkedin.com/company/36421

From: Iain Lamb
Sent: Thursday, October 04, 2018 12:08 PM
To: GILLESPIE Jason <[redacted]>; SMITH George <[redacted]>
Subject: RE: Hagshaw Hill wind farm (South Lanarkshire) repowering: scope of transport chapter of EIA report

Dear George / Jason

We sent the email below a couple of months ago now and we don't seem to have received a reply. We're now preparing a draft ES chapter in line with the scope below and would be grateful for your views before we proceed too far.

Regards

Iain

From: Iain Lamb
Sent: 06 August 2018 16:52
To: 'jgillespie@systra.com' <[redacted]>; [redacted]
Subject: Hagshaw Hill wind farm (South Lanarkshire) repowering: scope of transport chapter of EIA report

Dear George / Jason

We've been commissioned to prepare the transport chapter of the EIA report for the proposed repowering of the existing Hagshaw Hill wind farm, located to the west of the M74 near Douglas in South Lanarkshire Council's area (I'm not sure whose 'patch' this would be in hence why I'm sending to both). There is an existing wind farm of 26 turbines on the site and it is proposed that they be replaced by 14 larger turbines, with a blade length of around 64.5m. The indicative layout of the proposed development is shown in the attached plan. I suspect that the exact locations of the turbines will alter slightly as design work progresses but the access route (via the private road from Junction 11 of the M74) will remain the same.

The site is of a size that it will require a Section 36 consent from the Energy Consents Unit, the application for which will be accompanied by an EIA report. We propose the following scope for the transport chapter of the EIA report:

Introduction

- The Traffic and Transport chapter will assess the effects arising from the proposed development with respect to the construction and operation of the development.
- It will consider all vehicle movements associated with the construction and operation of the proposed development, including consideration of construction traffic and the source of and vehicle movements associated with the delivery (and export, if required) of material and components to the site. The operational phase is likely to have little traffic impact as the proposed development will be visited by only the occasional maintenance and inspection vehicle. The decommissioning phase is too far in the future to be considered at present and will therefore not be included in the assessment.

Baseline Description

- The baseline will be informed by site visits and collection of data. The transport network around the proposed development will be visited and any potentially sensitive receptors will

be identified. Data on traffic flows and accidents will be obtained for the roads likely to experience an increase in traffic arising from the proposed development.

Relevant Guidance

- The methodology will principally follow the 'Guidelines for the Environmental Impact of Road Traffic' prepared by the Institute of Environmental Assessment.
- The impact of the traffic estimated to be generated by the proposed development on the surrounding road network will be subject to a screening process using the following two rules outlined in the Guidelines to identify the appropriate extent of the assessment area:
    - Rule 1 - include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%).
    - Rule 2 - Include any other specifically sensitive areas where traffic flows have increased by 10% or more.
- The assessment of the baseline situation will determine which sections of road should be subject to which of the above rules. Where the predicted increase in traffic flows is lower than the appropriate thresholds, the Guidelines suggest the significance of effects can be stated to be low or insignificant and further detailed assessments are not warranted.

Proposed Scope of Assessment

- It is anticipated that the geographical scope of assessment will extend from Junctions 10 to 13 of the M74 and the B7078 between Junctions 11 and 12 of the M74. The turbine components are likely to be delivered from King George V dock in Glasgow via the M8 and M74 so the geographical scope of that part of the assessment will extend to cover that part of the road network and will be accompanied by swept path assessments of the vehicle carrying the turbine blade .

Potential Impacts

- Where the estimated increase in traffic flows is expected to be greater than the appropriate rule above, the potential impacts on the following topics will be considered in more detail:
    - Severance;
    - Driver delay;
    - Pedestrian delay;
    - Pedestrian amenity;
    - Fear and intimidation; and
    - Accidents.
- The potential for cumulative effects from other relevant developments in the study area will also be considered.

Potential Mitigation

- Potential mitigation measures will be identified once the impacts have been assessed. These measures may include restrictions on vehicle routeings and times in order to avoid or reduce impacts on sensitive receptors and 'good practice' measures to be included in a Construction Traffic Management Plan (CTMP).

I hope that the above would cover everything that you would wish to see addressed in the assessment, but please let me know of any omissions or any other issues you would wish to see us address.

Regards

Iain

Iain Lamb
Transport Development Associate
Mob: [redacted]
Tel: 0131 208 1267
Web: www.tranplanworld.co.uk

Transport Planning Limited
Forsyth House, 93 George Street, Edinburgh, EH2 3ES
Also at 4 West Philpstoun Steadings, Old Philpstoun, Linlithgow, EH49 7RY Tel: 01506 830893

Regd in Scotland No. SC379909 Regd office: Apex 2, 97 Haymarket Terrace, Edinburgh EH12 5HD

SUMMARY OF CONSULTATIONS

Consultee	Corrsespondence
NATS	NATS En-route Plc (NATS), was initially consulted on May 24th 2018. NATS pre-planning TOPA commissioned 15th August 2018
Glasgow Airport	Glasgow Airport was initially consulted on May 24th 2018. NDA and proforma Terma Agreement received October 11th 2018
Glasgow Prestwick Airport	Glasgow Prestwick Airport (GPA) was initially consulted on May 24th 2018. A detailed radar impact assessment was submitted to GPA on 22/08/2018, indicating no radar impacts. (attached) GPA subsequently approved the development on 22/08/2018 with no objection.
MoD	None

NATS

From: natssafeguarding@[redacted]
Sent: 15 August 2018 15:47
To: ianfletcher[redacted]
Subject: NERL Pre-Planning Consultancy Windfarm Application Form

Thank you for submitting your Windfarm planning application form.

Your application will be processed in the next 4 - 6 weeks.

Your application details are:

Turbine locations

- NATS-PPA-Turbine-Entry-Hagshaw-DWX-V1.xls

Wind farm Name

Hagshaw Hill and Douglas West Extension

Wind farm Address

Douglas, South Lanarkshire, Scotland

Developer

3R Energy

Applicant Address

3R Energy
Lanark Auction Market
Hyndford Road
Lanark
ML11 9AX

From: Ian Fletcher [redacted]
Sent: 24 May 2018 15:54
To: AULD, Alasdair E (redacted)
Subject: Hagshaw Hill and Douglas West Extension - NATS En-route Study

Hi Ali,

I am working on these two projects for 3RE. Hagshaw Hill will be the first repowering in Scotland apparently, so quite a watershed. More impressively it will have operated the full term of circa 23 years. So positive for the credential of wind energy I think.

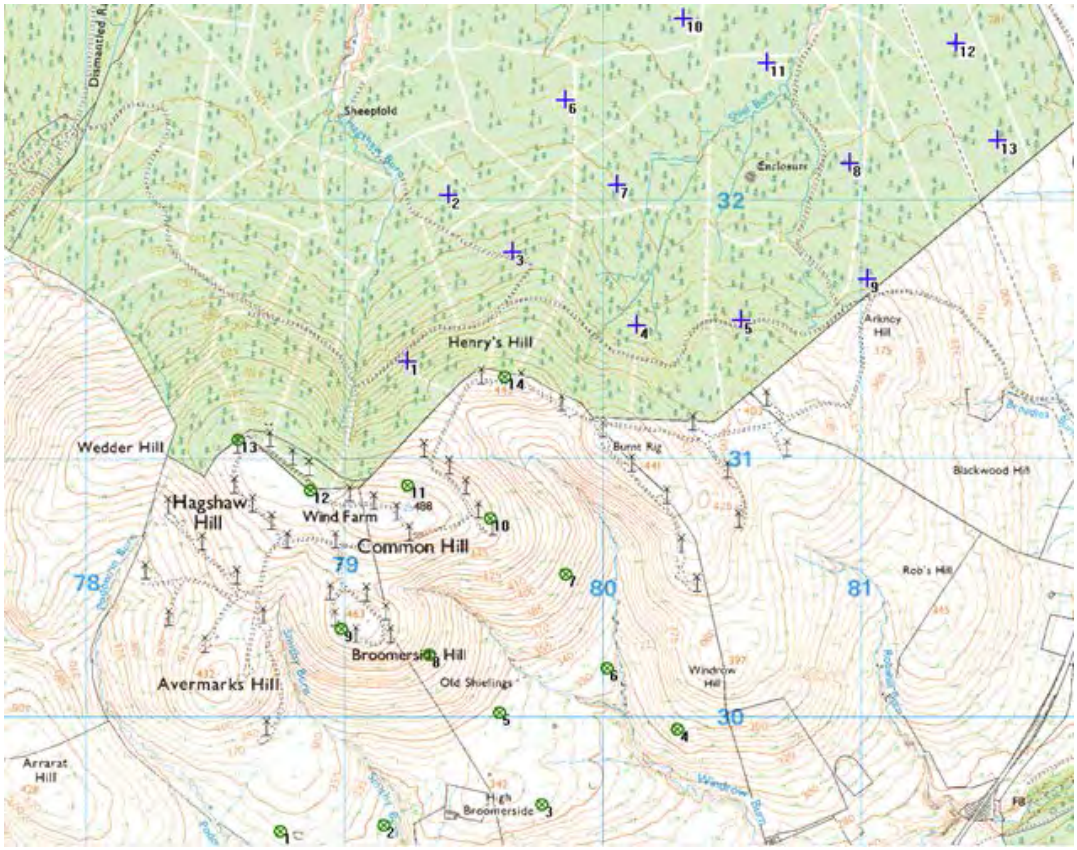
However, not without aviation issues!

The turbines across both sites will have 175m to 200m tip heights. My screening work has determined that the larger turbines will be visible to Lowther and Cumbernauld, but some will also be seen by Glasgow. So we will need to establish satisfactory mitigation with NERL. It looks like the Nutberry patch as for everything else, but also relying on the GLA Terma rather than terrain screening.

3RE are initially dealing with these two projects in phases with Hagshaw expected to be first into planning. What I would like to do with NATS if possible, is a single study to cover the entire development in terms of agreeing the technical solution feasibility. You will see from the below that the two projects do form a single cluster of turbines. If it does work out in terms of this mitigation in principle, are we then able to submit in the two phases against the single feasibility study?

We will also have to deal with Glasgow Airport itself, through NATS too. Hence it makes sense to conduct a single all encompassing Terma study as we have done elsewhere, eg Inverclyde.

So I just wanted to give you the broad picture here so we can discuss how best to take this forward. Are you around for a call soon?



Turbine locations on OS 1:25,000; Green=Hagshaw Hill Repowering, Blue=Douglas West Extension

Wider area map attached. Up to 200m tip height.

Hagshaw Hill Repowering

Turbine	Eastings	Northings	100km NGR	Base elevation (m AOD)
1	278749	629561	NS 78749 29561	
2	279149	629586	NS 79149 29586	
3	279760	629664	NS 79760 29664	
4	280287	629958	NS 80287 29958	
5	279599	630020	NS 79599 30020	
6	280015	630194	NS 80015 30194	
7	279854	630559	NS 79854 30559	
8	279327	630246	NS 79327 30246	
9	278985	630347	NS 78985 30347	
10	279561	630773	NS 79561 30773	
11	279242	630900	NS 79242 30900	
12	278864	630881	NS 78864 30881	
13	278586	631078	NS 78586 31078	
14	279618	631320	NS 79618 31320	

Douglas West Extension

Turbine	Eastings	Northings	100km NGR	Base elevation (m AOD)
1	279242	631379	NS 79242 31379	
2	279401	632022	NS 79401 32022	
3	279649	631800	NS 79649 31800	
4	280129	631517	NS 80129 31517	
5	280532	631536	NS 80532 31536	
6	279854	632389	NS 79854 32389	
7	280053	632063	NS 80053 32063	
8	280954	632146	NS 80954 32146	
9	281020	631699	NS 81020 31699	
10	280311	632707	NS 80311 32707	
11	280633	632534	NS 80633 32534	
12	281367	632610	NS 81367 32610	
13	281525	632232	NS 81525 32232	

Regards

Ian

WIND BUSINESS SUPPORT

Odstone
Westcot Lane
Wantage OX12 9PZ
[redacted]
Company number 08305860

GLASGOW AIRPORT

From: Kirsteen Macdonald [redacted]
Sent: 11 October 2018 17:07
To: Ian Fletcher
Subject: RE: Hagshaw Hill

Hi Ian

See attached fully signed copy of NDA, hard copy will be in the post tomorrow. Also attached find the proforma Terma Agreement. As discussed previously GAL Admin and legal fees are payable by the applicant. GAL admin fee is £5k, legal fees will vary depending on how much the applicant wishes to amend the proforma agreement. If they do wish to discuss/negotiate terms I'll have to get admin and legal fees before I provide a word version you can track changes too.

Let me know how you wish to proceed

Kirsteen

From: Ian Fletcher [mailto:ianfletcher@windbusiness.co.uk]
Sent: 19 September 2018 11:49
To: Kirsteen Macdonald <Kirsteen.Macdonald@glasgowairport.com>
Subject: Hagshaw Hill

Hi Kirsteen,

Now you have the attached signed NDA (also hard copy sent in post), can you confirm that the next step is to sign the Terma mitigation agreement, after which we will commission the combined NATS/GLA Terma study through a NATS contract?

Regards

Ian

WIND BUSINESS SUPPORT

Odstone
Westcot Lane
Wantage OX12 9PZ
[redacted]
Company number 08305860

From: Ian Fletcher [redacted]
Sent: 24 May 2018 15:59
To: 'Kirsteen MacDonald ([redacted])'
Subject: Hadshaw Hill Repowering and Douglas West Extension

Dear Kirsteen,

I am working on these two projects for 3RE. Hagshaw Hill will be the first repowering in Scotland apparently, so quite a watershed. More impressively it will have operated the full term of circa 23 years. So positive for the credential of wind energy I think.

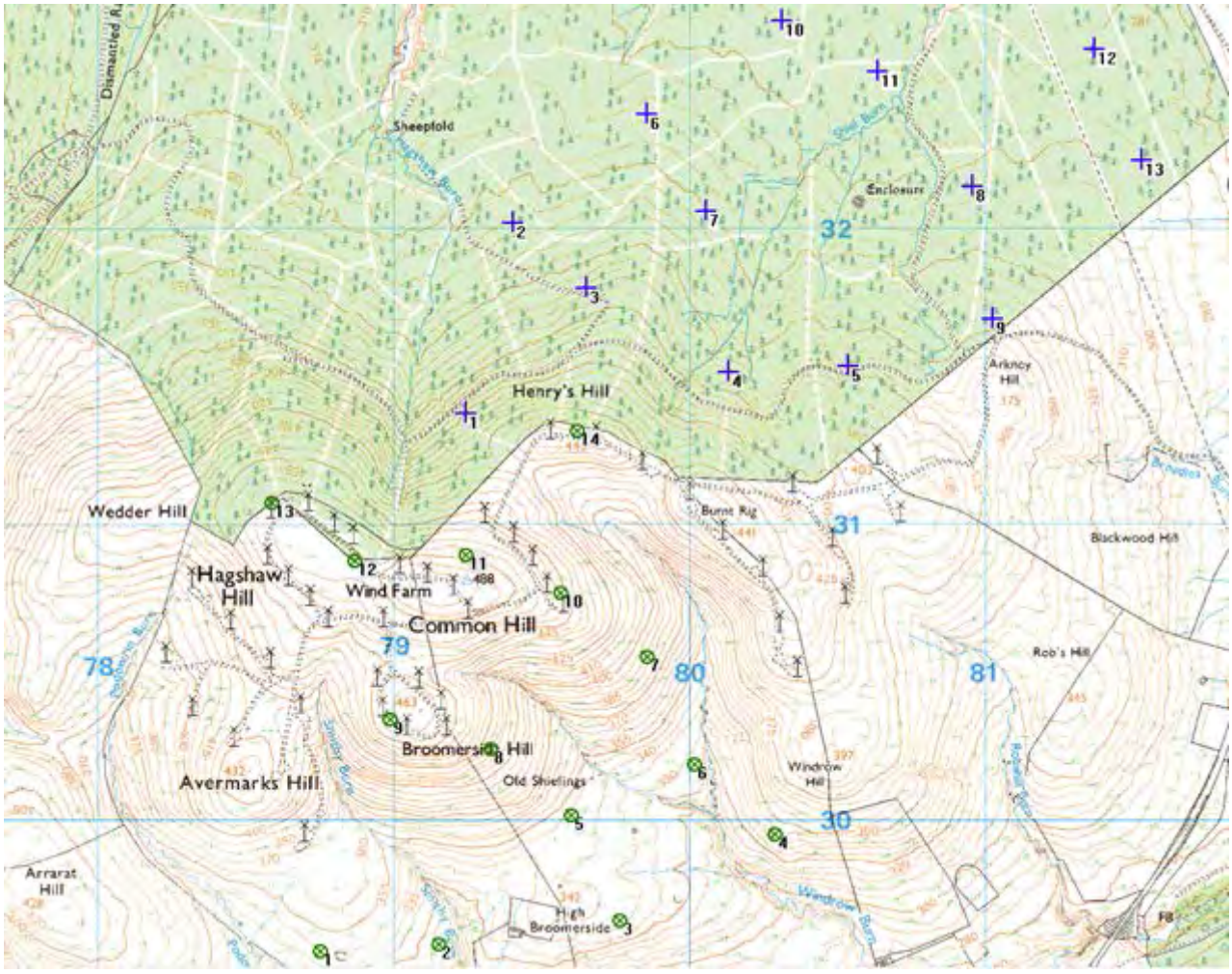
However, not without aviation issues!

The turbines across both sites will have 175m to 200m tip heights. My screening work has determined that some of these larger turbines will be visible to the Glasgow PSR, as well as the NERL Lowther Hill and Cumbernauld radars. So we will need to establish satisfactory mitigation with both yourselves and with NERL.

3RE are initially dealing with these two projects in phases with Hagshaw expected to be first into planning. What I would like to do with GLA if possible, is a single study to cover the entire development in terms of agreeing the technical solution feasibility. You will see from the below that the two projects do form a single cluster of turbines. If it does work out in terms of the Terma mitigation in principle, are we then able to submit in the two phases against the single feasibility study?

We will also have to deal with NERL, through NATS too. Hence it makes sense to conduct a single all encompassing Terma study as we have done elsewhere, eg Inverclyde.

So I just wanted to give you the broad picture here so we can discuss how best to take this forward. Are you around for a call soon?



Turbine locations on OS 1:25,000; Green=Hagshaw Hill Repowering, Blue=Douglas West Extension

Wider area map attached. Up to 200m tip height.

Hagshaw Hill Repowering

Turbine	Eastings	Northings	100km NGR	Base elevation (m AOD)
1	278749	629561	NS 78749 29561	
2	279149	629586	NS 79149 29586	
3	279760	629664	NS 79760 29664	
4	280287	629958	NS 80287 29958	

5	279599	630020	NS 79599 30020	
6	280015	630194	NS 80015 30194	
7	279854	630559	NS 79854 30559	
8	279327	630246	NS 79327 30246	
9	278985	630347	NS 78985 30347	
10	279561	630773	NS 79561 30773	
11	279242	630900	NS 79242 30900	
12	278864	630881	NS 78864 30881	
13	278586	631078	NS 78586 31078	
14	279618	631320	NS 79618 31320	

Douglas West Extension

Turbine	Eastings	Northings	100km NGR	Base elevation (m AOD)
1	279242	631379	NS 79242 31379	
2	279401	632022	NS 79401 32022	
3	279649	631800	NS 79649 31800	
4	280129	631517	NS 80129 31517	
5	280532	631536	NS 80532 31536	
6	279854	632389	NS 79854 32389	
7	280053	632063	NS 80053 32063	
8	280954	632146	NS 80954 32146	
9	281020	631699	NS 81020 31699	
10	280311	632707	NS 80311 32707	
11	280633	632534	NS 80633 32534	
12	281367	632610	NS 81367 32610	
13	281525	632232	NS 81525 32232	

Regards

Ian

WIND BUSINESS SUPPORT

Odstone
Westcot Lane
Wantage OX12 9PZ
[redacted]
Company number 08305860

GLASGOW PRESTWICK AIRPORT

From: Steve Jones [redacted]
Sent: 22 August 2018 14:22
To: Ian Fletcher
Subject: RE: Hagshaw Hill Repowering - Consultation

Good Afternoon Ian,

Thanks for sending this through.

Having digested all your hard work, we are happy that the figures (including the large reduction in terrain screening when assessed for full diffraction) are conclusive enough to not consider an objection on radar clutter grounds (nor safeguarding at that distance when not under an instrument flight profile or affecting minimum sector altitudes).

As requested, we are happy to lodge this "no-objection" to the consultation once we have received it.

Kind regards,

Steve

Glasgow Prestwick Airport

Glasgow Prestwick Airport Ltd.
Aviation House
Prestwick
KA9 2PL
Scotland
United Kingdom

Steve Jones
Senior Air Traffic Control Officer
Glasgow Prestwick Airport Ltd.

T: (+[redacted]

[redacted]
www.glasgowprestwick.com

From: Ian Fletcher [mailto:[redacted]
Sent: 22 August 2018 12:17
To: Steve Jones
Subject: RE: Hagshaw Hill Repowering - Consultation

Dear Steve,

There has been a design freeze on this site now and the submission is due to be made in September. Hence I have been able to do the full GPA PSR impact analysis. Fortunately it looks very safe, no impacts.

I have attached my full impact assessment report and very happy to receive comments.

If you accept the findings I hope that you will be able to lodge a no objection to the submission once consulted. If there is anything that does concern you now it would be great to know ahead of Submission in case I can do something about it.

Kind regards

Ian

WIND BUSINESS SUPPORT

Odstone
Westcot Lane
Wantage OX12 9PZ
[redacted]
Company number 08305860

In case of problems, alternative email [redacted]

From: Ian Fletcher [redacted]
Sent: 24 May 2018 17:22
To: SJones [redacted]
Subject: Hagshaw Hill Repowering - Consultation

Dear Steve,

I would like to consult with you on a pre-submission wind farm proposal. Because there are maps etc, which might not come through too well on email, I have attached a document with the details of the proposal.

As discussed the site is fully terrain screened, even with 200m turbines replacing the existing much smaller machines. However, because the screening is close to the radar diffraction effects may be significant and so based on line of sight only I don't feel able to definitively state that there would be no radar impacts. I would need to do a little more work to determine that.

None the less I am hoping that the site is beyond your area of interest at a range of over 40km from the mid-point of the main runway.

Hopefully you have enough information to determine a response, but if not please do not hesitate to come back to me or call me to discuss the project.

Thanks for your co-operation in looking at this ahead of the submission.

Kind regards

Ian

WIND BUSINESS SUPPORT

Odstone
Westcot Lane
Wantage OX12 9PZ
[redacted]
Company number 08305860

WIND BUSINESS SUPPORT

Version 1
20/08/2018
Author: Ian Fletcher

HAGSHAW HILL REPOWERING

Glasgow Prestwick Airport
PSR Impact Assessment

A report for 3R Energy and
Glasgow Prestwick Airport Ltd.

3R Energy
Wind • Biomass
Tel: 01555 660244

Glasgow Prestwick Airport

COMMERCIAL-IN-CONFIDENCE

Tel: 07971 780936
Email: Info@windbusiness.co.uk

Wind Business Support Ltd, Oxon SN7 7NW, UK - Co. Number 08305860

INTRODUCTION

3R Energy commissioned Business Support to work with Glasgow Prestwick Airport (GPA). The purpose of the work and the following assessment, was to determine the expected impacts of the proposed Hagshaw Hill Repowering on the airport's primary surveillance radar (PSR).

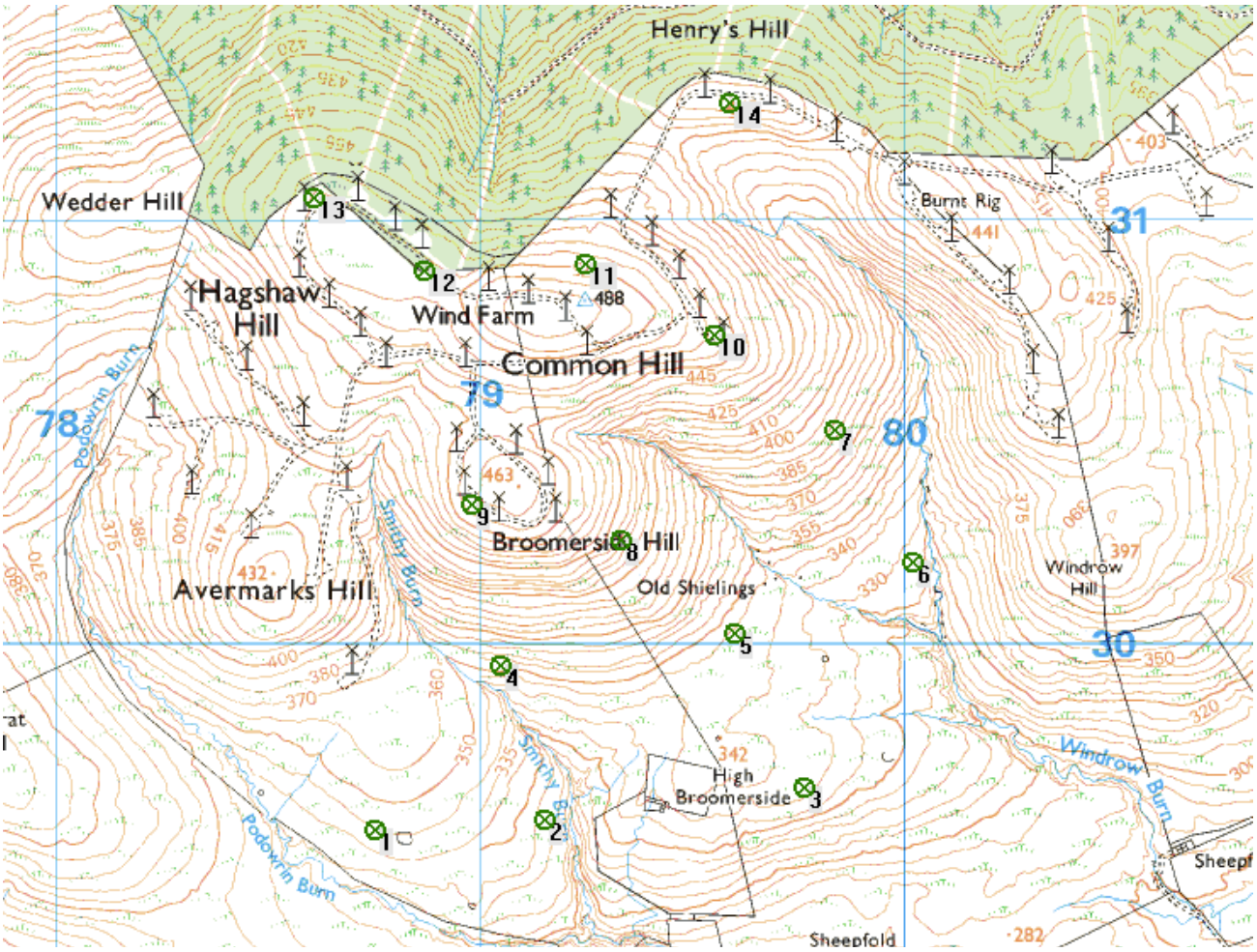
This assessment has been conducted in two stages. Firstly, a simple radar Line of Sight (LoS) analysis to determine the degree of terrain screening between turbines and radar, taking account of atmospheric refraction effects. Secondly a detailed radar detection study taking full account of the radar cross section of the turbine, the specific radar parameters and diffraction effects. Details of the assessment methods and the results are described below. The last section provides conclusions on the technical radar impacts. Note that whether or not a radar displays any detected objects also depends upon the settings and processing of the radar. This assessment only considers the potential for technical impacts before radar processing. It does not consider the operational significance of any impacts, should turbines generate radar returns.

THE PROPOSED DEVELOPMENT

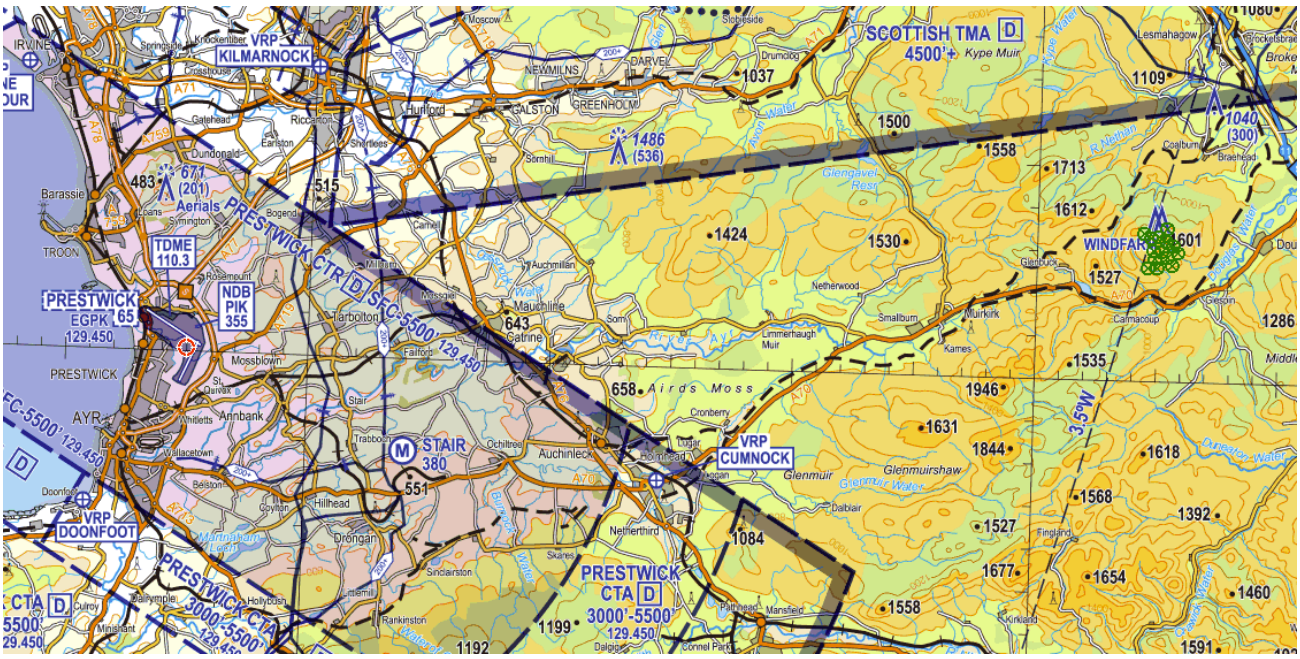
The proposed development consists of 14 turbines with a hub height of 134m, a rotor diameter of 132m and a tip height of 200m; locations as per table below. The following are the current turbine locations at August 2018; data provided by 3RE post design freeze.

Turbine	Eastings	Northings	100km NGR	Base Elevation
1	278749	629561	NS 78749 29561	340
2	279149	629586	NS 79149 29586	314
3	279760	629664	NS 79760 29664	333
4	279042	629950	NS 79042 29950	356
5	279595	630026	NS 79595 30026	345
6	280015	630194	NS 80015 30194	328
7	279831	630506	NS 79831 30506	385
8	279327	630246	NS 79327 30246	414
9	278976	630329	NS 78976 30329	454
10	279546	630730	NS 79546 30730	455
11	279242	630900	NS 79242 30900	473
12	278864	630881	NS 78864 30881	470
13	278604	631053	NS 78604 31053	468
14	279584	631279	NS 79584 31279	441

Table 1 – turbine details



Turbine location on OS 1:25,000; © Crown copyright. All rights reserved. License number 100040585



Site location on CAA Aviation chart; © Crown copyright. All rights reserved. License number 100040585

RADAR DETAILS

Prestwick PSR is a Marconi processor sitting below a Watchman turning and antenna system.
Turning Rate - 15rpm; other details below.

The turbines lie at a range of between 42km and 43.3km, which is between 22.7nm and 23.4nm; hence the radar will be on main beam, left hand data column.

POSITION		
Location	236921.55E	626100.21N
Height	16.02m AGL	35.25m AOD
TRANSMITTER		
Power	650kw peak	490 watts mean
Pulse Width	0.85µS	
Frequencies	2885MHz	3014MHz
ANTENNA		
Beam shape	$COSEC^2$	Main and Auxiliary
Tilt	0º	
3dB beam width	1.5º	
1^{st} side lobe	-26.0dB or better	
Peak Antenna gain	33.8dB (Main)	31.0dB (Auxiliary)
Main/Aux Beam switch	9.2 nm (Tx 1)	9.9 nm (Tx 2)
Auxiliary Beam	Receive only	
RECEIVER		
Law used	R^{-2} to R^{-4} (Main)	R^{-4} to R^{-6} (Aux)
MDS (Sensitivity)	-107.2dBm (Main)	-107.6dBm (Aux)

Table 2 – Radar details

RADAR LINE OF SIGHT ANALYSIS

The table below provides a good initial indication of the visibility of the proposed development to the Glasgow Prestwick Primary Radar. The results are derived from a radar Line of Sight (LoS) assessment.

Turbine ID	Turbine base height	Radar to turbine	LOS visibility	LOS max tip height	Blockage point height	Radar to blockage
	m AOD	km	m	m	m AOD	km
1	340	42	-283	483	120	5.12
2	314	42.4	-318	518	120	5.12
3	333	43	-312	512	120	5.12
4	356	42.3	-281	481	120	5.07
5	345	42.9	-309	509	120	5.04
6	328	43.3	-336	536	121	5.09
7	385	43.1	-291	491	121	4.98
8	414	42.6	-242	442	120	4.98
9	454	42.3	-197	397	121	5.03
10	455	42.9	-224	424	122	4.99
11	473	42.6	-215	415	121	4.83
12	470	42.2	-210	410	122	4.88
13	468	42	-221	421	123	4.85
14	441	43	-276	476	124	4.87

Table 3 – LOS results

The intermediate terrain has a blocking point at Torcross, about 1km west of Tarbolton and 5km from the radar for all turbines.

INTERPRETATION OF RESULTS

On the basis of the LoS analysis all the turbines are highly screened.

Turbine ID	Turbine base height	Turbine tip height	Radar to turbine	LOS visibility	LOS max tip height
	m AOD	m AOD	km	m	m
9	454	654	42.3	-197	**397**
12	470	670	42.2	-210	**410**
11	473	673	42.6	-215	**415**
13	468	668	42	-221	**421**
10	455	655	42.9	-224	**424**
8	414	614	42.6	-242	**442**
14	441	641	43	-276	**476**
4	356	556	42.3	-281	**481**
1	340	540	42	-283	**483**
7	385	585	43.1	-291	**491**
5	345	545	42.9	-309	**509**
3	333	533	43	-312	**512**
2	314	514	42.4	-318	**518**
6	328	528	43.3	-336	**536**

Table 4 – LOS results in order of visibility

The most visible turbine is 9. With common intermediate terrain, this turbine therefore has the greatest potential to be visible to the radar and is therefore the first turbine to assess more robustly using modelling that additionally includes diffraction effects. Diffraction allows radio waves to bend around terrain, which in some cases can render turbines visible that do have full line of sight screening. This turbine becomes the test case to either ensure that all turbines will not have an impact on the primary radar, or to determine that some may and hence that additional turbines must be assessed.

NOTES ON THE LINE OF SIGHT ASSESSMENT

Refraction arising from atmospheric variations is estimated by using a standard 4/3rds earth curvature radius model. This is the basis for determining the radar Line of Sight (***LoS***).

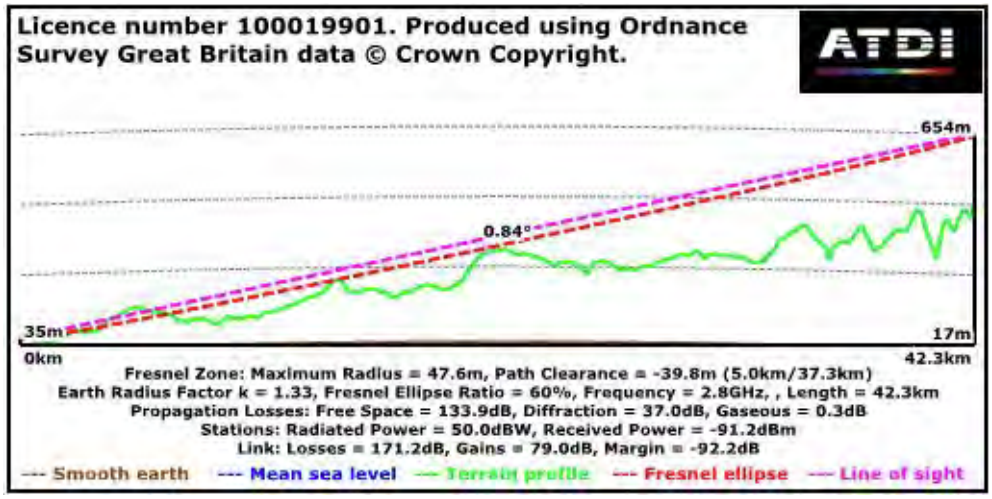
The assessment uses Ordnance Survey 10m elevation data, interpolated in order to derive the height of intermediate terrain that may provide a level of terrain screening between radar and turbine. Accuracy is estimated on the basis of 2m errors in elevation at both radar and turbine.

Diffraction effects are not included, generated by the interaction of the radio waves with the terrain. Diffraction can have a very significant effect on the detectability of a turbine. It is taken into account in the assessments conducted by most aviation stakeholders including NATS and the MoD. For this reason, the LoS figures above should only ever be used as an initial indication of detectability with more detailed assessments required to gain a more robust result in many cases.

Whether or not a radar displays any detected objects also depends upon the settings and processing of the radar.

RADAR LINE OF SIGHT CHARTS

The following charts show the terrain profile between the radar and selected turbines, using a 4/3rds earth radius base. The red-circled sections indicate the primary blocking point, providing the terrain screening.



GPA Radar to Hagshaw Hill Repowering – T9 tip height

FULL DIFFRACTION ASSESSMENT

The output of the analysis for each turbine is in the form of two tables. The first table provides the results for the specific turbine centrally, in grey, with steps for the same turbine with progressively less elevation above and more elevation below. This provides a result for the turbine with an illustration of how marginal it is through the steps above and below. Broadly, shades of green are undetectable with shades of yellow marginal and red detectable, causing impacts. The second table provides the details of the analysis for reference purposes only.

TURBINE 9

The results give a very clear result in this case. The turbine is very likely to be undetectable. There is a large margin such that a considerably larger turbine at the same location would also be expected to be undetectable.

Radar Detectability Results (indicative)			NOTE: turbine elevation varies, size fixed		
Tip height (m)	Hub (m)	Rotor (m)	Margin (dBm)	Detectability	
180	134.0	132.0	-49.03	Likely to be	undetectable
185	134.0	132.0	-48.50	Likely to be	undetectable
190	134.0	132.0	-48.00	Likely to be	undetectable
195	134.0	132.0	-47.47	Likely to be	undetectable
200	**134.0**	**132.0**	**-46.98**	**Likely to be**	**undetectable**
205	134.0	132.0	-46.45	Likely to be	undetectable
210	134.0	132.0	-45.96	Likely to be	undetectable
215	134.0	132.0	-45.44	Likely to be	undetectable
220	134.0	132.0	-44.96	Likely to be	undetectable

Run Details			**Wind Turbine Details**		
Site	Hagshaw Hill Repowering		Hub Height	134	m
Turbine ID	9		Rotor Diameter	132	m
Location	NS 78976 30329		Tip Height agl	200	m
Base Elevation	454	m	**Calculated Values**		
Radar ID	GPA PSR		tip height AOD	654	m
Type	Marconi S511H		Tower RCS	319.62	m2
Radar to Turbine	42.3	km	Rotor RCS	215.38	m2

Detailed Results For Specified Tip Height

	dBm	Margin (dBm)	Detectability	
Received Static Power	-160.16	-53.16	Likely to be	undetectable
Received Dynamic Power	-155.17	-48.17	Likely to be	undetectable
Received Combined Power	-153.98	-46.98	Likely to be	undetectable

Settings

Tip Height Step	5	m			
Uncertainty band	3	dBm			
Marginal at	5	dBm			
Hold rotor dia.	1	1 or 0*	1=fixed value, 0=changes linearly with tip height		
Hold hub height	1	1 or 0*	1=fixed value, 0=changes linearly with tip height		
RCS Split	NERL				
Aux (high) Beam	0	1 or 0	STC	0	1 or 0

*If both values are 1 the turbine is lowered without changing any dimensions

NOTES ON THE DETECTION ASSESSMENT

This assessment method has been recommended by the Civil Aviation Authority, being published in their July 2006 version of CAP764 – CAA Policy and Guidelines on Wind Turbines. Subsequent editions have simplified methods to be of more wide-spread benefit but with reduced reliability. This type of assessment is used by the MoD as their most reliable method, to determine their position in borderline cases. Similar methods are used by NATS.

The assessment takes account of the specific radar characteristics, refraction and diffraction effects. Static and dynamic turbine elements are segmented at 10m intervals, with the reflected power aggregated at the radar antenna. The total strength of the aggregated signal is compared to the radars minimum detection threshold. A positive margin indicates a received signal above the threshold, giving the radar the capability to detect the turbine. A negative margin renders the turbine undetectable.

The results depend upon the digital terrain map used in calculating the signal attenuation over the ground between the radar and turbine as well as the software used. In this case the 50m terrain data and the ATDI software matches that used by the MoD in their own assessments. The assessment process at NATS is very similar, also using ATDI software.

The results should be taken as a strong indication rather than a robust fact. The uncertainty is reflected in the visibility descriptions in the sensitivity table. Uncertainties arise because radar operators are not able to share all their radar details with external parties and some must be estimated. The results are also very sensitive to the RCS of the turbine, which in practice varies dramatically each time the turbine is interrogated by the radar. The turbine dimensions are used to generate typical radar cross-section (RCS) values for the tower and rotor, using the method recommended by the CAA as reasonably representative for the purposes of assessing radar visibility. The model does build in a degree of conservatism to reduces the chances of effects such as anomalous propagation rendering turbines visible unexpectedly.

CONCLUSIONS AND RECOMMENDATIONS

The wind farm lies well within the operating range of the Glasgow Prestwick primary surveillance radar.

The line of sight visibility of the entire wind farm to the GPA primary radar was checked. This showed that all turbines did have full terrain screening, though varying by degree significantly. The range was from the turbines falling 197m below the line of sight horizon to 336m below the horizon.

Because of the potential for diffraction effects it was considered necessary to conduct a full diffraction modelling assessment of the visibility of a test case turbine. This was conducted for turbine 9, selected as the most likely to be visible, having the lowest degree of terrain screening. The full diffraction assessment determined that this turbine was very unlikely to be visible/detectable. The margin is high enough to have a high degree of confidence.

It was not considered unnecessary to conduct the more rigorous diffraction modelling assessments on any further turbines, based on the results of the test case and the complete line of sight analysis.

In conclusion it is very unlikely that any of the proposed turbines will have any impacts on the Glasgow Prestwick Airport Primary Surveillance Radar. There is a large safety margin. It should be noted that radio waves are not 100% predictable and all mathematical modelling has a degree of uncertainty because of this. That noted, the results of this assessment are very positively that no impacts are anticipated to arise.

From: Windfarms [redacted]>
Sent: 30 October 2018 09:34
To: Anna Hudson <[redacted]>
Cc [redacted]
Subject: WF 33055 - Hagshaw Hill Wind Farm - Douglas, South Lanarkshire T1 - T14 - NS 79131 30823

Dear Sirs,

I am responding to an email of 15-10-2018, regarding the above named proposed development.

The above application has now been examined in relation to UHF Radio Scanning Telemetry communications used by our Client in that region and we are happy to inform you that we have **NO OBJECTION** to your proposal.

Please note that this is **not** in relation to any Microwave Links operated by Scottish Water

Atkins Limited is responsible for providing Wind Farm/Turbine support services to TAUWI.

Atkins Limited is responsible for providing Wind Farm/Turbine support services to the Telecommunications Association of the UK Water Industry. Web: www.tauwi.co.uk
Windfarm Support
ATKINS
The official engineering design services provider
for the London 2012 Olympic and Paralympic Games
Web: www.atkinsglobal.com/communications

Dear Ms Hudson,

Thank you for your request for information on Fixed Links with respect to Wind Farm Planning. Provision of this information is currently under review to ensure compliance with GDPR Legislation. Fixed Link information is available on the Ofcom Website at the following location: https://www.ofcom.org.uk/spectrum/information/spectrum-information-system-sis/spectrum-information-portal
Please accept our apologies for any inconvenience.

Kind Regards

Spectrum Management Centre

From: Anna Hudson <[redacted]
Sent: 15 October 2018 09:57
To: Spectrum Licensing <S[redacted]>
Subject: EXTERNAL:Consultation | Hagshaw Hill Wind Farm, South Lanarkshire

Dear Sirs,

I am writing on behalf of my client, 3REnergy, with regard to a proposed 14-turbine wind energy development in South Lanarkshire.

The proposed development details are given below:

12-character UK NGR for the site centre: 279131/630823
Search radius from the site centre: 1500m
Site name: Hagshaw Hill Wind Farm
Nearest town: Douglas, South Lanarkshire
Email address for reply: anna.hudson@itpenergised.com

Details of the individual turbines are given in the table below:

	X	Y	Max. Tip height	Max. Rotor Diameter
T1	278749	629561	200m	155m
T2	279149	629586	200m	155m
T3	279760	629664	200m	155m
T4	279041	629949	200m	155m
T5	279595	630026	200m	155m
T6	280015	630194	200m	155m
T7	279830	630506	200m	155m
T8	279327	630246	200m	155m
T9	278976	630328	200m	155m
T10	279546	630730	200m	155m
T11	279242	630900	200m	155m
T12	278864	630881	200m	155m
T13	278604	631053	200m	155m
T14	279584	631278	200m	155m

I would be most grateful for information on fixed wireless links and scanning telemetry links in the area, which have the potential to be affected by this development.

Please let me know if there is any further information required.

Kind regards,

Anna

Anna Hudson | Principal Consultant | ITPEnergised
Office: [redacted]
7 Dundas Street, Edinburgh, EH3 6QG

From: JRC Windfarm Coordinations <[redacted]
Sent: 15 October 2018 11:36
To: Anna Hudson <[redacted]>
Subject: Consultation |Hagshaw Hill Wind Farm, South Lanarkshire [WF884920]

-- do not edit anything below this line --

Dear Anna,

A Windfarms Team member has replied to your coordination request, reference **WF884920** with the following response:

Dear Anna

JRC analyses proposals for wind energy developments on behalf of the UK Energy Industry. We assesses the potential of such developments to interfere with radio systems operated by UK and Irish Energy Industry companies in support of their regulatory operational requirements.

The Energy Industry considers that any wind energy development within:

** 1000m of a link operating below 1GHz; or*
** 500m of a link operating above 1GHz, requires detailed coordination.*

For turbines with a blade diameter of 32m or less this distance is reduced to:
** 500m for links below 1GHz; and*
** 300m for links above 1GHz before a detailed coordination is required.*

There is an EXCLUSION ZONE around most Base Station sites of 500m, i.e. no development is permitted. This will be evaluated on a case by case basis for smaller turbines.

Unfortunately, part (or all) of the proposed development breaches one or more of these limits.

T6 280015 630194 200m 155m

T7 279830 630506 200m 155m

T10 279546 630730 200m 155m

The affected links are:

460MHz Telemetry and Telecontrol:

JESPVS1 GREEN LOWTHER SP (D&G)
to JESPVO4 DOUGLAS WEST SS

>1GHz Microwave Point to Point:

Operated by:

*Therefore **JRC OBJECTS TO THE PROPOSED DEVELOPMENT.***

Unfortunately no link details apart from the link identifiers can now be supplied due to persistent breaches in confidentiality. This can be reviewed on a case by case basis and may require a non-disclosure agreement to be drawn up. However, JRC are still willing to work with developers in order to clear as many turbines as possible, including those that may initially fall within the coordination zone. For more information about what to do next, please click Objections: What to do next.

The JRC objection shall be withdrawn after simple analysis shows no issues; when a satisfactory coordination has been achieved and the zone of protection is implemented; or when an appropriate mitigation agreement is in place.

NOTE:
The protection criteria determined for Energy Industry radio systems can be found at http://www.jrc.co.uk/wind-farms/

Regards

Wind Farm Team

The Joint Radio Company Limited
Delta House
175-177 Borough High Street
LONDON
SE1 1HR
United Kingdom

Office: 020 7706 5199

We hope this response has sufficiently answered your query.
If not, please **do not send another email** as you will go back to the end of the mail queue, which is not what you or we need. Instead, **reply to this email keeping the subject line intact or login to your account** for access to your coordination requests and responses.

https://breeze.jrc.co.uk/tickets/view.php?auth=o1xqmdqaafggiaaawoDSfEOoocWilg%3D%3D

From: Jenny Hazzard
Sent: 13 November 2018 10:53
To: 'JRC Windfarm Coordinations' <[redacted]>
Cc: 'ted.aksamit@jrc.co.uk' <[redacted]>
Subject: FW: Consultation |Hagshaw Hill Wind Farm, South Lanarkshire [WF884920]

Hello – I'm following up on the email below in hopes of a response to allow completion of our assessment of potential impacts on telecommunications infrastructure for the above-noted site. I would be very grateful for a response confirming no conflict, or indication of any further information being required.
Many thanks,
Jenny
Jenny Hazzard | Director | ITPEnergised
Office: [redacted]
7 Dundas Street, Edinburgh EH3 6QG
www.itpenergised.com

From: Jenny Hazzard
Sent: 18 October 2018 15:02
To: 'JRC Windfarm Coordinations' <[redacted]>
Cc: Anna Hudson <[redacted]>
Subject: FW: Consultation |Hagshaw Hill Wind Farm, South Lanarkshire [WF884920]

Dear Sirs,
Having received the holding objection below, would it be possible please to undertake further analysis to confirm if there is a practical concern with the proposed development as set out in Anna Hudson's previous email (attached)?
I have reviewed the layout in relation to the locations of Green Lowther and Douglas West SS and assume the preliminary concern relates to proximity of the proposed turbines to Douglas West SS. However, the nearest proposed turbine is >2km from the SS (or link path) and there are existing turbines (Hagshaw Hill Extension) in the area between i.e. considerably closer to the substation.
I would be most grateful if you could review and either confirm that there is no conflict, or let us know if further detailed analysis is required.
Please let me know if any additional information is required.
Best regards,
Jenny
Jenny Hazzard | Director | ITPEnergised
Office: [redacted]
7 Dundas Street, Edinburgh EH3 6QG
www.itpenergised.com
