

## **Chapter 3: Site Selection and Design Evolution**

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## Chapter 3: Site Selection and Design Evolution

### 3.1 Introduction

This chapter explains the selection criteria used by Drumbuie Renewables and their agents Community Windpower, when looking for potential wind farm sites to develop. Drumbuie Renewables is a local business and landowner and is well versed with the environment where the proposed development is located. Together, the Applicant and Agent saw a gap where wind turbines could provide the local area with clean, green energy.

This particular area has been characterised by having a good wind resource, evident by the location of several other wind farms operating in this area. Drumbuie Renewables has access to an area of land that sits within these wind farm sites, with most infrastructure already constructed and available to use, due to the operational Sanquhar Community Wind Farm. Herds Hill Wind Farm seems a logical proposal for the local area, and after initial consultations, is an ideal location with high potential, to provide the local area of Kirkconnel and Kelloholm with a direct green power supply.

### 3.2 Initial Site Selection Criteria

Wind power has become a leading renewable energy technology in recent years. It is environmentally beneficial and sensible to site wind farms in areas of high wind speeds to maximise the generation capability of the wind turbines.

From a study by the University of Oxford, it recognised that Scotland has the best wind resource in Europe, possessing approximately 25% of Europe's wind resource. A House of Commons report also found that in 2014, Scotland held over 40% of the UK's wind capacity. As a result, wind energy in Scotland is now playing an increasing part with regard to renewable energy generation and will be integral to delivering the ambitious renewable energy targets set by the Scottish Government as outlined further in Chapter 4: Planning Policy.

An area of land deemed suitable for a wind farm will use the following criteria to produce a series of maps and initial desk-based research to assess its feasibility:

- The NOABL wind speed atlas, which gives average wind speeds in metres per second (m/s) at 45m above ground level (agl)
  - The Ministry of Defence (MoD) low flying area maps and tactical training area (TTA) maps
  - National Air Traffic Services (NATS) safeguarding maps
  - National Grid network operators' distribution and transmission maps for the 33 kilovolt (kV) and 132 kV networks
  - Planning policy that supports the implementation of renewable energy, including: National Planning Framework 4, Policy 11
  - Maps of existing and planned regional and national designated areas for landscape, ecology and wildlife and archaeological sites
  - Adopted and emerging Local Development Plans
  - Location maps of existing and proposed wind farms
  - 1:50,000, 1:25,000 and 1:10,000 Ordnance Survey (OS) maps and contour data; and
  - 'Spatial Planning for Onshore Wind Turbines – Natural Heritage Considerations' (updated in June 2015).
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## Herds Hill Wind Farm

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### Wind Resource

Initial assessment of the wind resource was undertaken using the ETSU NOABL wind speed atlas, which estimates annual wind speeds at a specific height for every square kilometre of the United Kingdom. The atlas identified the minimum wind speed for the area of Herds Hill to be approximately 7.2 m/s at 45m above ground level (agl).

Furthermore, data from nearby meteorological masts have provided average wind speeds at approximately 80m agl to be in the region of 9 m/s, therefore confirming there is an excellent wind resource in this locality.

### Grid Connection

A private, direct line would deliver the generated electricity to the local area. The final destination of the green energy has not yet been decided and is subject to further consultations with the local community councils, local businesses and local communities, along with the Local Authority.

### Access and Transportation

Details of the proposed access to the site and onto the site can be found in Chapter 12: Traffic and Transport. Herds Hill Wind Farm will be utilising the same access route and site entrance as Sanquhar Community Wind Farm and sharing some of the existing access tracks onto site. Therefore, this route has been deemed suitable to transport three turbines and associated infrastructure.

### Onsite Aggregate and Borrow Pit

Due to the Agent's previous work on the site for the operational Sanquhar Wind Farm, it is well known that the rock available from onsite borrow pits is of suitable quality, and that the quantity of stone available is more than sufficient for the construction requirements of the proposal.

### Cumulative Wind Farms

In total, there are 9 wind farms either consented or operational, situated within a 10km radius. Table 3.1 identifies these sites and their distance from the proposed turbines.

**Table 3.1: Operational and Consented Wind Farms within 10km of Herds Hill Wind Farm.**

| Wind Farm            | Status      | Distance from Herds Hill                |
|----------------------|-------------|---|
| Sanquhar             | Operational | Herds Hill T2 lies within Site Boundary |
| Sanquhar II          | Consented   | Herds Hill T2 lies within Site Boundary |
| Whiteside Hill       | Operational | 1.1km to the south                      |
| Sandy Knowe          | Operational | 1.4km to the north                      |
| Hare Hill Extension  | Operational | 4.2km to the west                       |
| Twenty Shilling Hill | Operational | 5km to the south                        |
| Hare Hill            | Operational | 6.4km to the west                       |
| Glenmuckloch         | Consented   | 6.7km to the north                      |
| Lethans              | Consented   | 7.3km to the north                      |

In addition to this there are 4 wind farms in the planning system (Lethans Extension, Sandy Knowe Extension, Lorg and Eucharhead) which are awaiting a planning decision and 4 wind farms which are in Scoping (Cloud Hill, Rowancraig, Appin and Hawcleuchside); all within the 10km study area.

### 3.3 Turbine Layout Considerations

The summary of the evolution of the proposed wind farm is detailed in the table below. This shows how Drumbuie Renewables and Community Windpower have worked together, to ensure that the final design is the most appropriate proposal to deliver green energy, and also the best fit for the landscape.

**Table 3.2: Summary of evolution of the wind farm design.**

| Layout | Date           | No. Turbines      | Description of changes  | Figure |
|--------|----------------|-------------------|---|--------|
| A      | August 2022    | 8 at 180m to tip. | Initial turbine layout based on initial desktop assessments and site walkovers.   | 3.1    |
| B      | August 2022    | 7 at 180m to tip  | After initial assessment and review of layout A, it was decided that this would have to much of an impact on the environment and deemed unnecessary for the local area. Therefore, the scheme was reduced to 7 turbines.  | 3.2    |
| C      | February 2023  | 3 at 180m to tip. | Revised turbine layout submitted with the Scoping Report. These changes were made to ensure the best fit for the landscape. 3 turbines would suffice to power local businesses. The site boundary was also edited to a smaller area, only surrounding the turbines and existing Sanquhar WF access tracks.  | 3.3    |
| D      | August 2023    | 3 at 149m to tip. | After the first round of public exhibitions in Sanquhar and Kirkconnel, and after reviewing the Scoping Opinion from Dumfries & Galloway Council which included a scoping response from the Council Landscape Architect, the tip heights were reduced. This was to avoid significant visual impacts upon the landscape, remove the requirement for visible night-time aviation lighting, as well as fitting in with the neighbouring two Sanquhar II WF turbines (149m to tip), which was granted permission on 31 <sup>st</sup> August. Turbine 1 has also been moved slightly south to fall within the Dumfries & Galloway Council Preferred Area for Wind Farms (as depicted in the LDP2, Map 8 – see Figure 3.7). | 3.4    |
| E      | September 2023 | 3 at 149m to tip. | New proposed access tracks were redesigned and shortened. It is also proposed that the  | 3.5    |

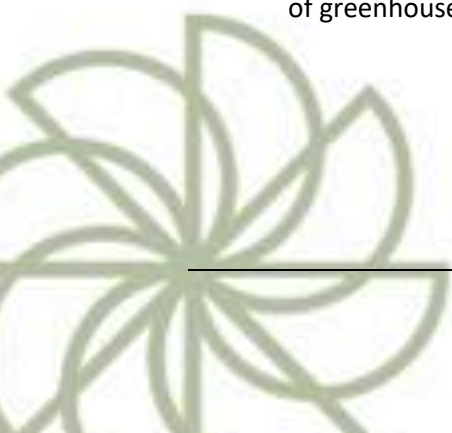
## Herds Hill Wind Farm

|   |              |                  |  |     |
|---|--------------|------------------|--|-----|
|   |              |                  | already existing area of hardstanding close to the site is used as the base for the temporary construction compound, which eliminates the need to create a new one, and it reduces the amount of temporary habitat loss. |     |
| F | October 2023 | 3 at 149m to tip | After initial draft plans from the ecologist and ornithologist were reviewed, access tracks were altered to avoid the wetter areas of the moorland areas which had benefited from replanting.                            | 3.6 |
| G | October 2023 | 3 at 149m to tip | Following draft photomontages and wirelines from the Landscape and Visual Consultant, Turbine 1 was adjusted slightly, 200m to the south, where the views from key viewpoints will be minimised.                         | 3.7 |

### 3.4 Conclusion


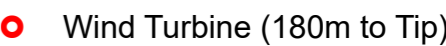
The three turbines proposed at Herds Hill provide an excellent opportunity for Drumbuie Renewables to generate and provide power to local businesses. After the thorough site feasibility assessments, the proposed development was deemed suitable for a wind farm due to the following factors:

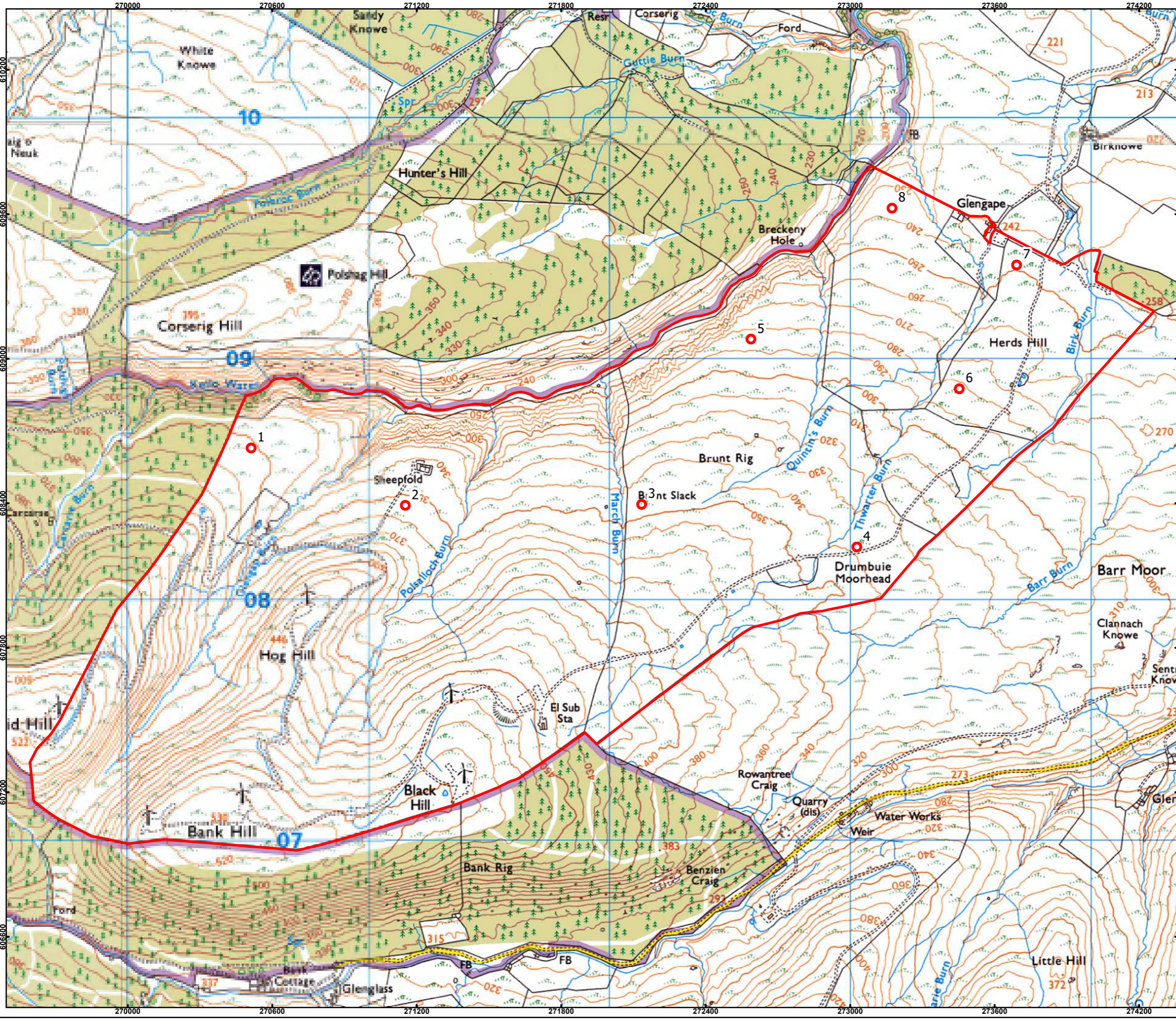
- Of most importance the site possesses exceptionally high average wind speeds, well above 7 m/s. It is anticipated that the capacity factor will be 45% for the Herds Hill scheme.
- The wind farm will harness the latest technological advancements in wind turbine technology, allowing more efficient and productive wind turbines to contribute to the ambitious targets as set out in the Draft Energy Strategy and Just Transition Plan (January 2023).
- The development falls entirely within the preferred area for wind farm development, as seen in Figure 3.8, which is an extract from Map 8 available within the Dumfries and Galloway Council Local Development Plan 2 (2019).
- Existing access route is already approved and utilised for the operational Sanquhar Community Wind Farm.
- The design fits well with existing wind farm developments, especially when sited next to the consented Sanquhar II turbines 49 and 50 (both are 149m to tip), the operational Sanquhar turbines (130m to tip) and Sandy Knowe turbines (125m to tip).
- The wind farm would generate clean, green electricity, using the natural resource of the wind, powering the equivalent of 10,885 homes per annum and displacing almost 17,625 Tonnes of carbon dioxide per annum; a highly important and valuable contribution to Scottish Government targets for increasing renewable energy generation and reducing the emission of greenhouse gases.



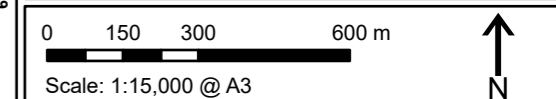
# 397 Herds Hill

## Legend

-  Site Boundary
-  Wind Turbine (180m to Tip)



Notes: N/A  
Revisions: N/A  
Layout: 397-220804-9003



### Figure 3.1- Turbine Layout A



Date: 12/08/2022 Ref: 397-220804-7009  
Produced: GW Reviewed: DW Approved: GC

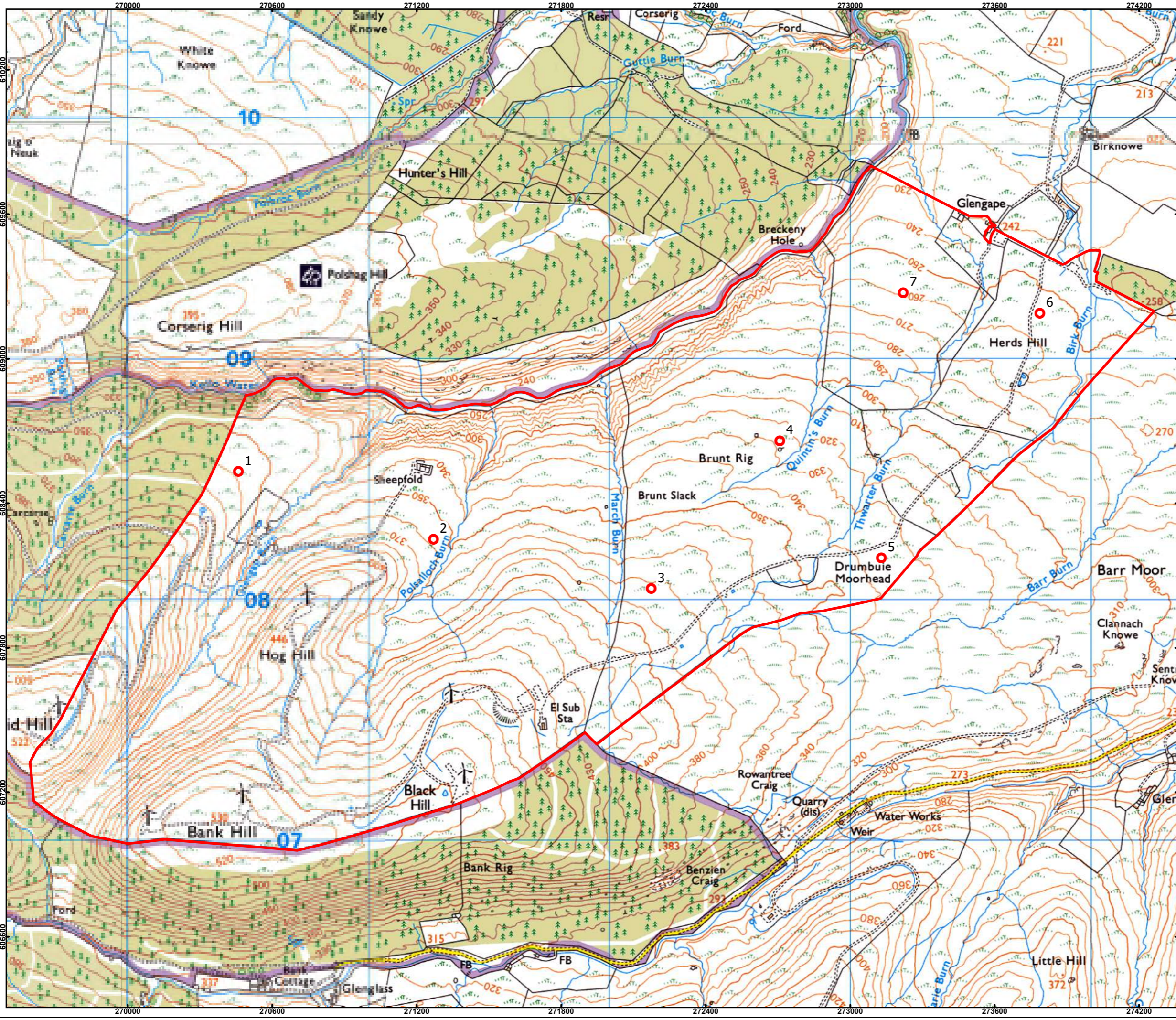


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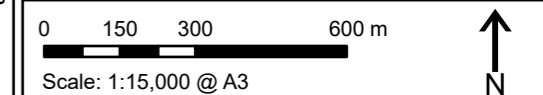
# 397 Herds Hill

## Legend

-  Site Boundary
-  Wind Turbine (180m to Tip)



Notes: N/A  
Revisions: N/A  
Layout: 397-220809-9004



### Figure 3.2- Turbine Layout B



Date: 18/08/2022      Ref: 397-220818-7050  
Produced: GW      Reviewed: DW      Approved: GC

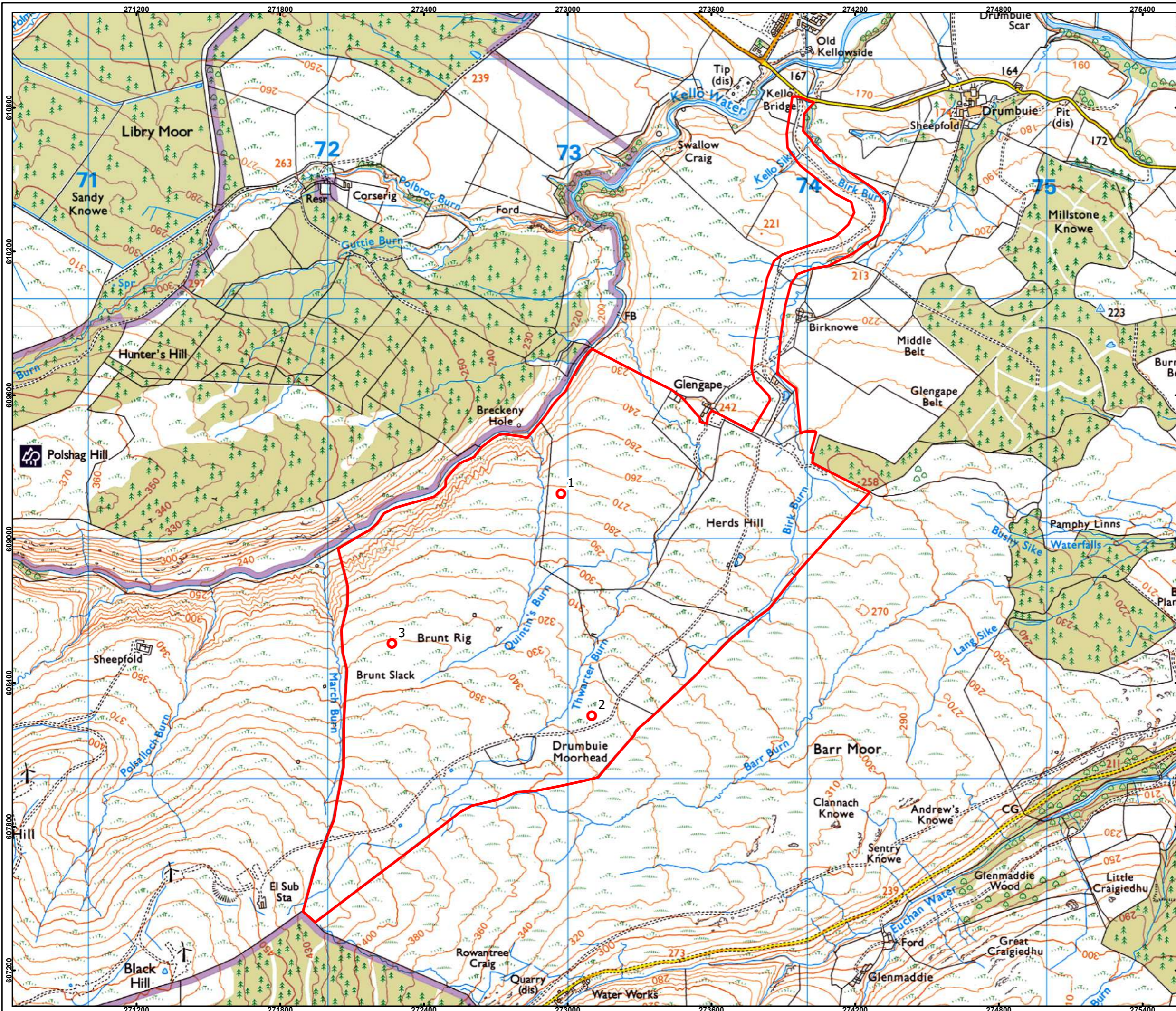


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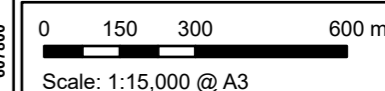
# 397 Herds Hill

## Legend

-  Site Boundary
-  Wind Turbine (180m to Tip)



Notes: N/A  
Revisions: N/A  
Layout: 397-220905-9005



### Figure 3.3- Turbine Layout C

Date: 19/02/2023 Ref: 397-220804-7009-A  
Produced: GW Reviewed: DW Approved: GC



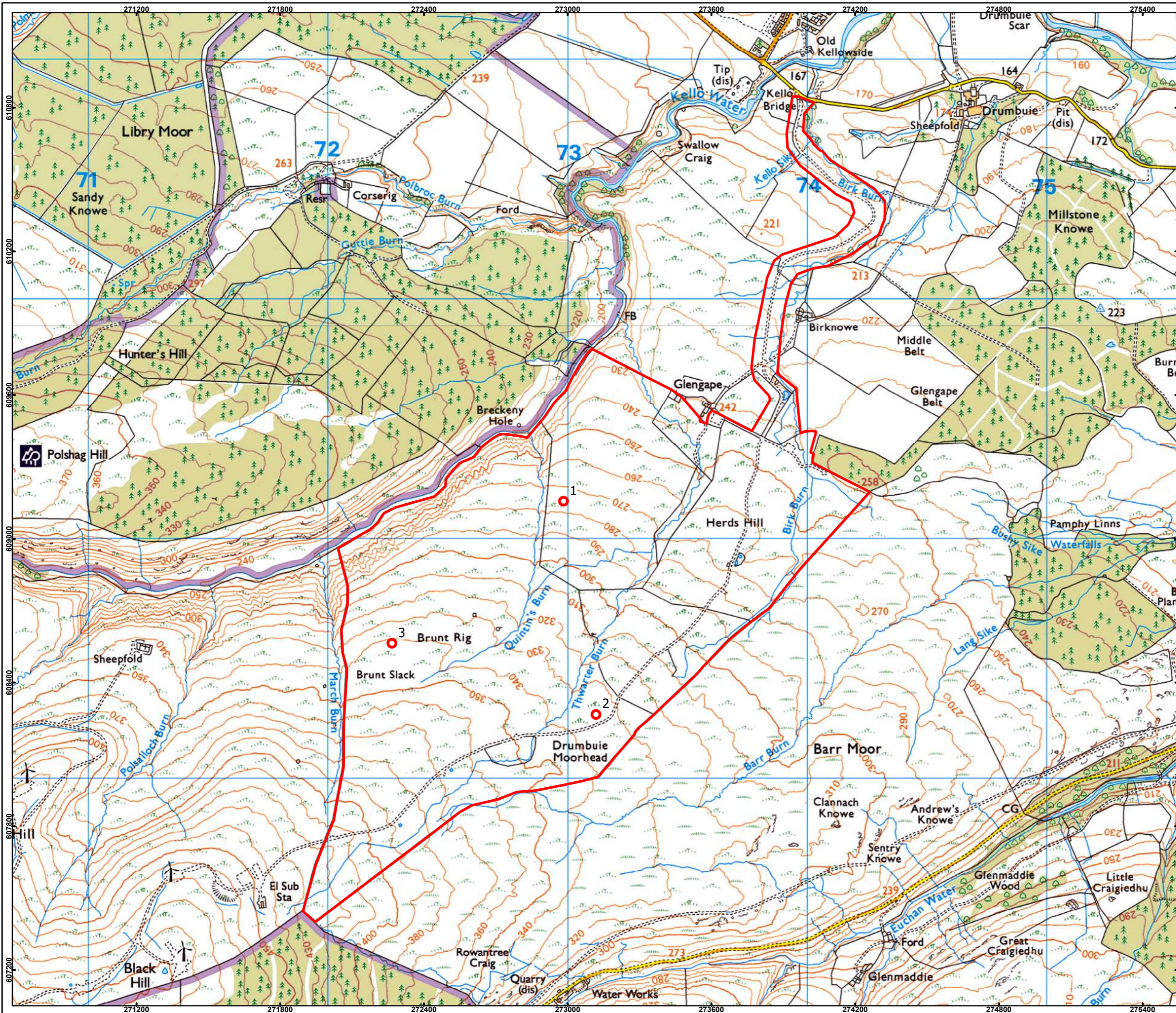
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# 397 Herds Hill

## Legend

- Site Boundary
- Wind Turbine (149m to Tip)



Notes: N/A  
 Revisions: N/A  
 Layout: 397-220905-9005-B

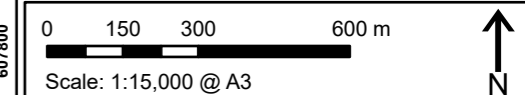


Figure 3.4- Turbine Layout D

Date: 05/09/2023      Ref: 397-220804-7009-C  
 Produced: GW      Reviewed: DW      Approved: GC

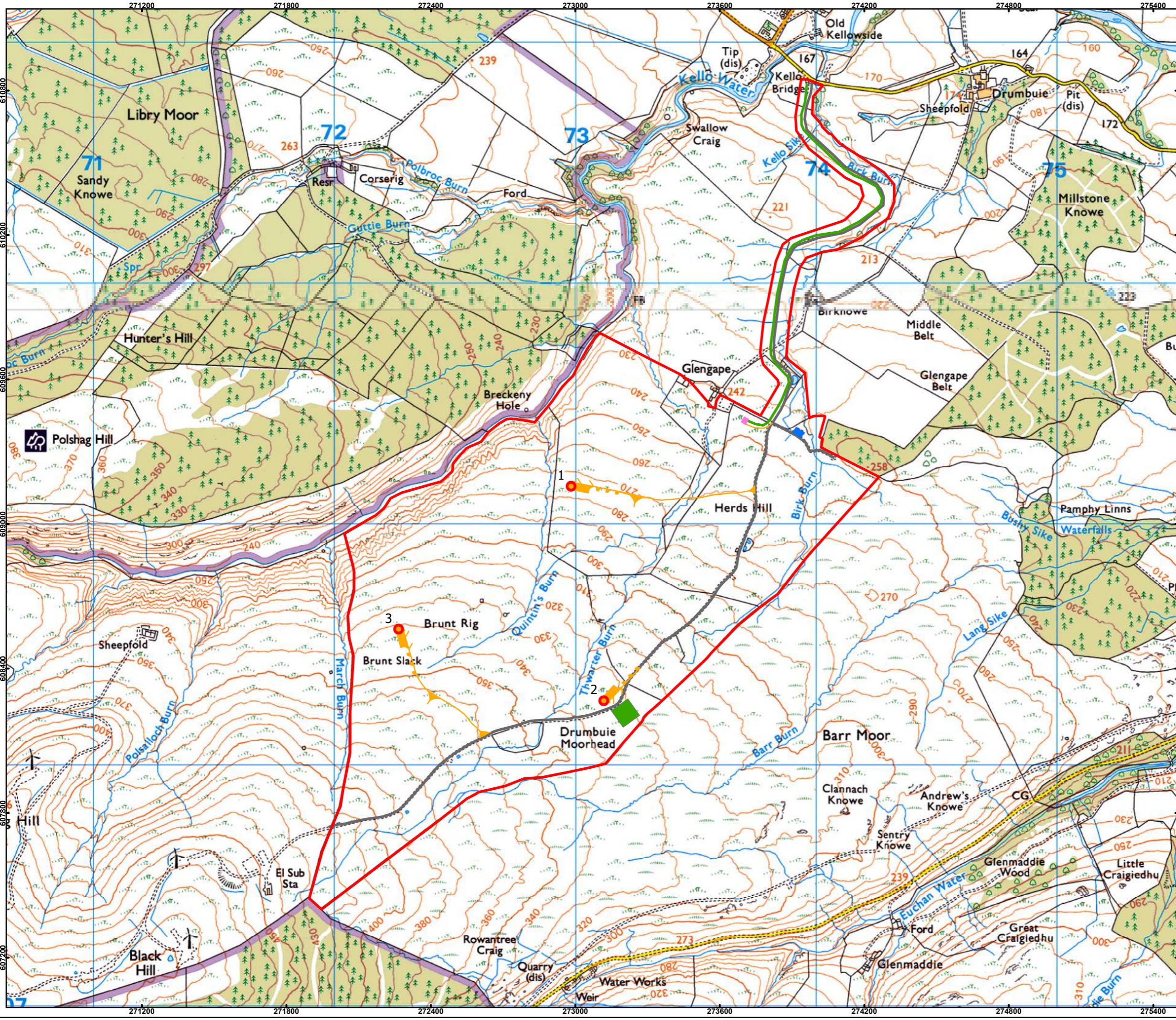
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# 397 Herds Hill

## Legend

- Site Boundary
- Wind Turbine (149m to Tip)
- Existing Access Tracks
- Cable Route
- New Access Tracks
- Substation & Control Room
- Temporary Construction Compound
- Existing Borrow Pit



Notes: N/A  
 Revisions: N/A  
 Layout: 397-220905-9005-B

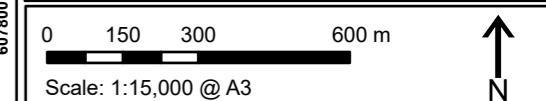


Figure 3.5- Turbine Layout E

Date: 14/09/2023      Ref: 397-220928-7025-D  
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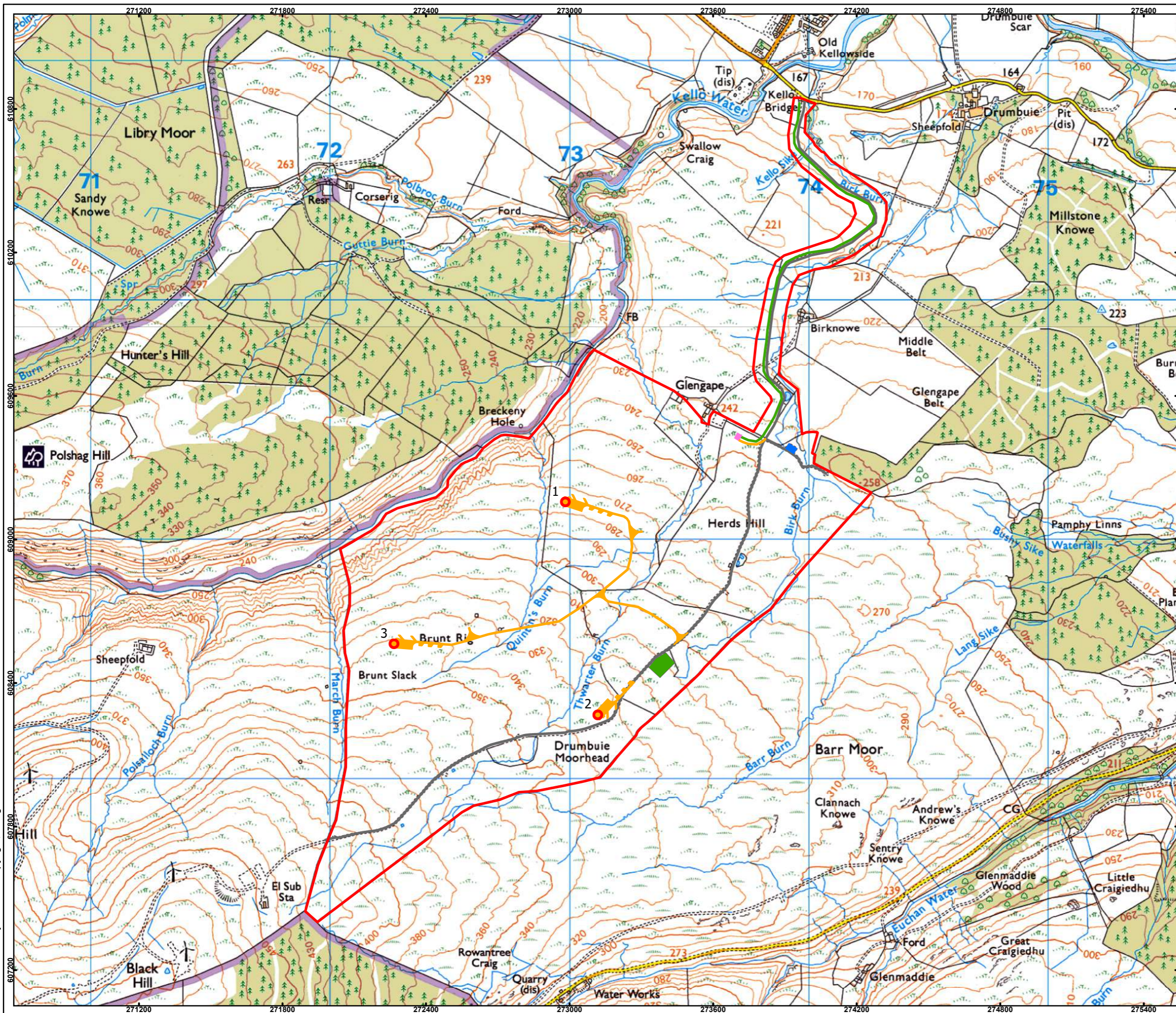
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# 397 Herds Hill

## Legend

- Site Boundary
- Wind Turbine (149m to Tip)
- Existing Access Tracks
- Cable Route
- New Access Tracks
- Substation & Control Room
- Temporary Construction Compound
- Existing Borrow Pit



Notes: N/A  
 Revisions: N/A  
 Layout: 397-220905-9005-B

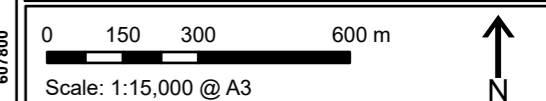


Figure 3.6- Turbine Layout F

Date: 12/10/2023 Ref: 397-220928-7025-G  
 Produced: GW Reviewed: DW Approved: GC

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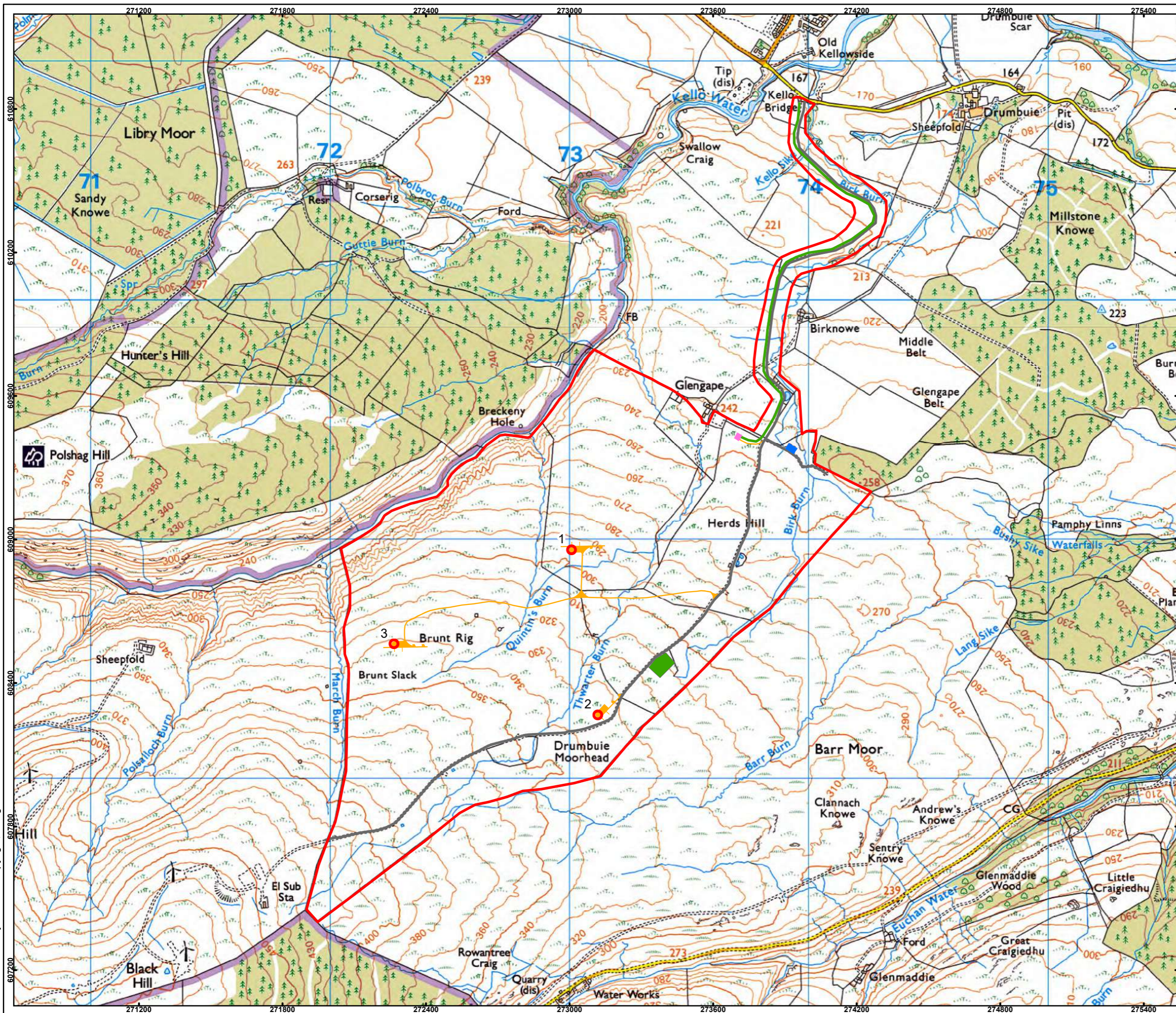
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# 397 Herds Hill

## Legend

- Site Boundary
- Wind Turbine (149m to Tip)
- Existing Access Tracks
- Cable Route
- New Access Tracks
- Substation & Control Room
- Temporary Construction Compound
- Existing Borrow Pit



Notes: N/A  
 Revisions: N/A  
 Layout: 397-220905-9005-C

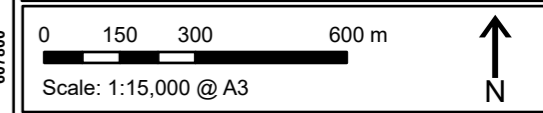


Figure 3.7- Turbine Layout G

Date: 31/10/2023 Ref: 397-220928-7025-J  
 Produced: GW Reviewed: DW Approved: GC





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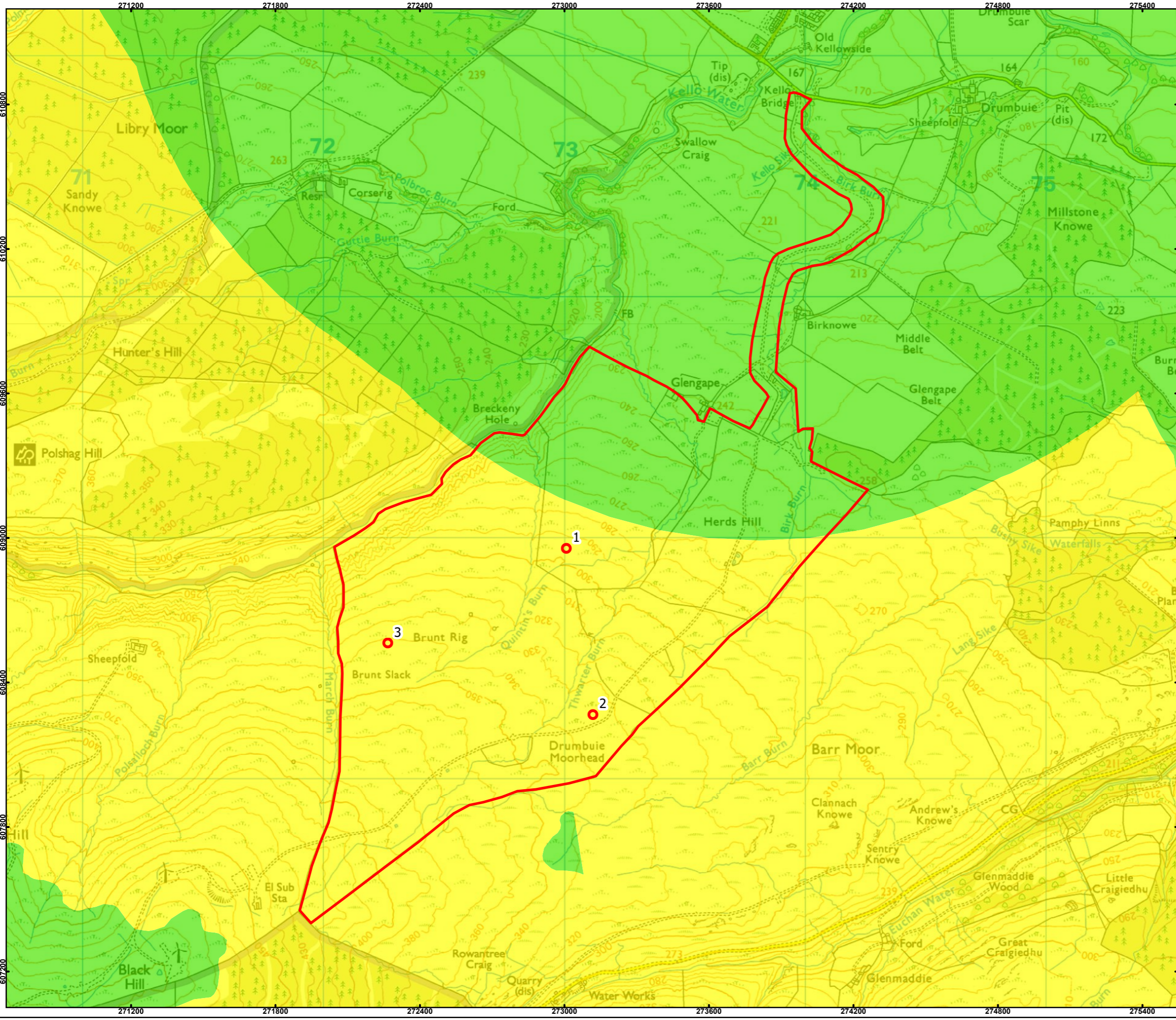
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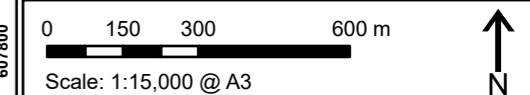
# 397 Herds Hill

## Legend

-  Site Boundary
-  Wind Turbine (149m to Tip)
- DGC Map 8 Preferred Areas**
  -  Areas with potential for wind farm development
  -  Areas of significant protection



Notes: Map 8 of the Spatial Framework for Onshore Wind Farms within Dumfries and Galloway Council's Local Development Plan 2.  
Revisions: N/A  
Layout: 397-220905-9005-B



### Figure 3.8- DGC LDP2 Wind Farm Spatial Framework

Date: 07/09/2023 Ref: 397-230905-7047  
Produced: GW Reviewed: DW Approved: GC



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