

# CLASHINDARROCH II

## WIND FARM

**Borrow Pit Assessment**  
Prepared for: Vattenfall Wind Power Ltd

Technical Appendix 11.2

Technical Appendix 11.2  
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## 1.0 Introduction

1. SLR Consulting Ltd (SLR) was commissioned by Vattenfall Wind Power Ltd (Vattenfall) to undertake a borrow pit assessment at the proposed Clashindarroch II Wind Farm (the proposed development), which would be located approximately 6 kilometers (km) south west of Huntly, Aberdeenshire, to the north east of the Clashindarroch Wind Farm. The site location is shown in Figure 1 (the Site).
2. The proposed development would be likely to comprise 14 turbines with associated infrastructure including a substation and access tracks. The proposed development would be accessed via the existing tracks to the Clashindarroch Wind Farm.
3. The purpose of this report is to consider the extent of any proposed borrow pits at the site and consider the potential impact to the proposed development if these were to be present, such that suitable controls and appropriate methodologies could be employed during the construction and commissioning of the wind farm to mitigate against associated risks.

### 1.1 Objectives of Report

4. This report provides details of the proposed borrow pits (located on Figure 1), which would be necessary to provide the aggregates required to construct the proposed development, as described in Chapter 3: Description of the Development, of this Environmental Impact Assessment Report (EIA Report). This report presents an assessment of the proposed borrow pits and evaluates the merit of the selected borrow pits' locality and likely stone productivity in the context of the construction requirements of the proposed development.
5. It is proposed to reuse one of the existing borrow pits from the construction of the Clashindarroch Wind Farm or use one of the two additional search areas (BP2 and BP3). These proposed borrow pit locations have been selected because of their potential to be either a simple extension to an existing pit, due to their morphology, accessibility from existing access tracks, orientation and the expected proximity of rock to the surface. The borrow pits are in areas where the peat coverage is minimal and where bedrock outcrops and aggregate reserves are known to occur near the surface.

### 1.2 Site Location and Description

6. The proposed development would be located in Clashindarroch Forest, adjacent to the operational Clashindarroch Wind Farm and approximately 6km to the south west of Huntly. Access to the site would be gained via the existing access track constructed as part of the Clashindarroch Wind Farm. The access would be from the A920 at Craighead, 3km south west of Huntly.
7. The site straddles several hills including Auchindinnie Hill (330m Above Ordnance Datum (AOD)), Raven Hill (421m AOD), Craigend Hill (492m AOD), Grumack Hill (517m AOD), Muckle Black Hill (522m AOD) and Red Hill (526m AOD). The site comprises upland forestry and open moorland. There are existing forestry tracks that serve much of the site, accessed from the Clashindarroch Wind Farm access tracks.
8. The proposed development would include the following key components (full details are provided in Chapter 3: Description of Development of this EIA Report):

- 14 turbines, of a maximum tip height of 180m with external transformers;
  - turbine foundations (20-22m in diameter) and associated crane hardstandings (approx. 74.75 x 42m in extent);
  - A total of approximately 10.9km of new access tracks with a typical 5m running width and associated drainage;
  - Upgrading of up to 1.9km of existing onsite access tracks;
  - Underground cabling along access tracks to connect the turbine locations, and electrical substation;
  - 1 substation compound including a control building; and
  - 1 permanent met mast 112m in height.
9. In addition, the following activities would be required during the construction phase of the proposed development:
- Temporary construction compound and storage area;
  - A central laydown area with onsite concrete batching compound;
  - Removal and management of material during foundation and track construction; and
  - Up to three borrow pits (one (BP1) formed by extension to an existing borrow pit and two additional search areas (BP2 and BP3), should they be necessary).
10. Existing infrastructure from the operational Clashindarroch Wind Farm would be utilised for the proposed development where ever possible and these have therefore been included within the site boundary. This includes the use of the existing access tracks and one of the original borrow pits during construction.
11. This report provides details of the proposed reopening of one of the original borrow pits to provide the aggregates required to construct the proposed development. The site is located as shown on Figure 1 which illustrates the proposed layout for the proposed development.

## 2.0 Detailed Site Assessment – Desk Based

### 2.1 Desk Study

12. The assessment of the character of the borrow pits within the application boundary included a desk based assessment, as well as determining the extent of the potential borrow pits in their current geological setting. As part of this SLR reviewed historical plans, aerial photographs, geological plans and created site specific plans, including those showing the slope and extent of the borrow pits. The work undertaken also involved a review of the available memoirs and information from the site including a review and assessment of the borrow pits used for the construction of the Clashindarroch Wind Farm.

#### 2.1.1 Sources of Site Information

- Previous Reports and Site Investigations. This included review of the Clashindarroch Wind Farm ES (dated 2009), as well as anecdotal information from site based staff;
- Soil Surveys; and
- Geological and Hydrogeological Setting.

#### 2.1.2 Additional Sources of Information

13. The following sources of information were also reviewed and assessed as part of the assessment:
  - British Geological Survey (BGS) Scotland Sheets 86W – Huntly - Solid and Drift Geology Edition. 1:50,000 series;
  - The Macaulay Institute for Soil Research Soil Survey of Scotland Sheet 29 – Banff, Land Capability for Agriculture Map. 1:50,000 scale, 1982;
  - BGS Map and Map data viewers ([www.bgs.ac.uk/data/mapViewers/home.html](http://www.bgs.ac.uk/data/mapViewers/home.html)); and
  - Scotland's Environment ([www.environment.scotland.gov.uk](http://www.environment.scotland.gov.uk)).

### 2.2 Previous Reports

14. Background on site conditions was reviewed from previous Environmental Statement for the Clashindarroch Wind Farm, to determine likely conditions at site and along existing tracks. This highlighted where previous areas for borrow pits were identified. From this it was clear that the site offered limited potential to develop new borrow pit sites.

### 2.3 Soil Surveys

15. Soils plan from ([http://map.environment.gov.scot/Soil\\_maps](http://map.environment.gov.scot/Soil_maps)), indicate that the site is dominated by mineral podzols to east of the Burn of Bedlaithen, with predominantly peaty podzols to the west. One area of peat is indicated between Red Hill and Muckle Black Hill to west of the development site and not impacting the site, along the top of the catchment on a flat lying plateau area. There is no evidence of any significant peat underlying the areas where potential turbines or infrastructure could be located within the site boundary.

### 2.4 Geological and Hydrogeological Setting

#### 2.4.1 Superficial Geology

16. The geology of the superficial deposits and bedrock at the site have been determined by a review of existing geological information published by the BGS, and onsite inspection of the ground conditions.

17. A search was also made of the BGS GeoIndex<sup>1</sup> for geological conditions and online boreholes. The database indicates that the BGS hold no borehole data for the site or its immediate surrounds.
18. The geological information presented in this report has been obtained from various sources. The area was originally mapped in 1880 and re-mapped in the 2000, by the BGS; the BGS Memoir Geology of the Huntly District (1925) is no longer published
19. The superficial geology on site is largely absent, with bedrock found at or close to surface across much of the site. Glacial Till is mapped across the site, generally confined to the valleys between the summits of hills. There is no peat mapped on site, however this is not definitive and there may be peat which has not been mapped by existing reference sources.
20. The Superficial geology of the site is detailed in Figure 2 – Superficial Geology<sup>2</sup>.

#### 2.4.2 Bedrock Geology

21. The geology of the site comprises predominately Neoproterozoic age Dalradian metasediments and meta-igneous rocks.
22. The existing access track generally lies on the boundary between the Corinancy Pelite Member to the west and the younger Clashindarroch Formation to the east. The existing and proposed borrow pit locations are sited predominately on the Clashindarroch Formation comprising semipelite, pelite, gritty psammite and quartzite. The remainder of the access track and proposed turbine locations are sited on the Clashindarroch Formation. The area to the north of the site generally comprises Ordovician age igneous and meta-igneous rocks. There are no major faults within the site boundary; however the area to the north of the site is heavily faulted.
23. The bedrock geology of the site is shown in Figure 3 – Bedrock Geology. Details of the geological units present on sand immediately adjacent to site are detailed in Table 1-1.

<sup>1</sup> <http://mapapps2.bgs.ac.uk/geoindex/home.html>

<sup>2</sup> <http://www.bgs.ac.uk/opengeoscience/home.html>

**Table 1-1**  
**Solid Geology Summary**

Age	Supergroup	Group	Formation	Member	Description
Ordovician (488-433 Ma)	Caledonian Supersuite (CIGSS)	North-East Grampian Basic Suite (NEBAS)	Succoth-Brown Hill Intrusion (SUBH)		Meta-gabbroic-rock and serpentine.
NEOPROETOZOIC (1000 – 542 Ma)	DALRADIAN SUPERGROUP (DALN)	SOUTHERN HIGHLAND GROUP (SOHI)	MacDuff Formation (MCD)		Metagreywacke: interbedded psammite and semipelite with subsidiary pelite.
			Clashindarroch Formation (CLAS)		Phyllitic semipelite and pelite, represented by andalusite-cordierite schist in parts with rare quartzite and psammite.
				Garnel Burn Pelite Member (GBPE)	Pelite, magnetic.
		ARGYLL GROUP (ARGY)	Blackwater Formation (BLWR)	Grumack Hill Quartzite Member (GHQU)	Quartzite and gritty psammite.
				Corninacy Pelite Member (COPE)	Gritty psammite and Pelites, dark-grey, graphitic in parts, commonly andalusite-bearing, phyllitic to slaty with bands of metabasalt and ultramafic rock.

## 2.4.3 Mining and Quarrying

24. The BGS GeoIndex website<sup>3</sup> shows that there are no active mines or quarries within the vicinity of the proposed development or its site boundary. There is no history of mining or quarrying within the site, other than the use of borrow pits associated with the construction of the Clashindarroch Wind Farm.

## 2.4.4 Economic Geology

25. There is limited information of the economic uses of the rock types within the site. The rock has been previously used in the construction of the Clashindarroch Wind Farm with a borrow pit being used as a source for both aggregate and track construction.

<sup>3</sup> <http://www.bgs.ac.uk/opengeoscience/home.html>

#### 2.4.5 Hydrological Setting

26. The solid geology underlying the site is classified as concealed, of limited potential, or without significant groundwater, with the site underlain by impermeable Precambrian and intrusive rocks<sup>4,5</sup>.

<sup>4</sup> <http://www.bgs.ac.uk/opengeoscience/home.html>

<sup>5</sup> BGS Hydrogeological Sheet 18 (1:625,000)

## 3.0 Detailed Site Assessment – Site Based

### 3.1 Site Reconnaissance Survey

27. A site reconnaissance survey was undertaken in early May 2017, when an experienced hydrogeologist and a geologist visited the site to consider the site setting and determine where areas of concern may be present. Further site visits were undertaken in 2018 and 2019 to look at potential borrow pit search areas.
28. There are limited options within the proposed development site boundary for the potential to develop new borrow pits, based on previous work that has been undertaken and assessments from the Clashindarroch Wind Farm.
29. On review and assessment of the borrow pits used during the construction of the Clashindarroch Wind Farm, it was established that there would be potential to reopen the existing borrow pit in the central part of the site (see Photographs 1-1, 1-2 and 1-3). The borrow pit is in a good location to assist in the construction of the proposed development and have the potential to be extended to provide adequate volumes of material. The existing borrow pit is located towards the north of the proposed turbines and has a good established access track provided during its previous operation; the pit has been partially restored but is still in use by Forestry Commission Scotland (FCS) and could be easily fully reopened.
30. The geological setting of the borrow pit comprises rocks of the Clashindarroch Formation comprising semipelite, pelite, gritty psammite and quartzite. The borrow pit has the potential to be extended to the west.
31. Photographs of the borrow pit in its operational stage would suggest that the high wall is relatively vertical and therefore this allows a good estimation to be made of volumes of rock that could be extracted from any borrow pit extension.



**Photograph 1-1**  
**General View of Ground Conditions at the Existing Borrow Pit Looking South (NGR 251290, 611747)**





**Photograph 1-2**  
**General View of Ground Conditions at the existing Borrow Pit Looking West**





**Photograph 1-3**  
**General View of Ground Conditions at the Existing Borrow Pit Looking West**



## 4.0 Borrow Pit Search Areas

32. There are limited options within the proposed development site boundary for the potential to develop new borrow pits.
33. On review following the reconnaissance survey and assessment of the borrow pits used during the construction of the Clashindarroch Wind Farm, it was established that there would be the potential to reopen the existing borrow pit located towards the centre of the site only (see Photographs 1-1, 1-2 and 1-3). A second borrow pit to the south of Kye Hill, which was proposed for use during the construction of the Clashindarroch Wind Farm was found to be unsuitable for use as construction materials. The existing central borrow pit is in a good location to assist in the development of the proposed wind farm and is likely to have the potential to be extended to provide adequate volumes of material. The borrow pit is located towards the north of the proposed turbines close to the existing access track. It has a good established access track constructed during its previous operation (see Figure 4 - Existing Borrow Pit Location). It is estimated that a volume of 60,000m<sup>3</sup> was removed during the previous workings.
34. To meet the requirements for the proposed development, construction aggregates would be sourced from reopening of the existing borrow pit. Prior to any extraction from the borrow pit it would be necessary to remove some restoration soils in order to expose the full length of operational face within the pit. Full consideration of appropriate storage locations for the excavated restoration soils would need to be considered prior to any excavation. As shown in Photographs 1-1, 1-2 and 1-3 the nature of the restoration soils is a loose mixture of unsorted granular materials ranging from fine grained material to cobbles and also including silty material. It is likely that in the region of 10,000m<sup>3</sup> of restoration material would require removal from the borrow pit site prior to any extraction works. Table 1.2 gives further detail of the restoration material that would require excavation at the borrow pit.
35. The location of the borrow pit extension (plus additional search areas 2 and 3) have been selected because of their morphology, accessibility from existing access tracks, orientation and the expected proximity of rock to the surface. The aggregate has already been proven to be suitable for construction purposes and the borrow pits are in areas where the peat coverage is minimal and where bedrock outcrops and aggregate reserves are expected to occur near the surface.
36. A preliminary assessment of the borrow pit extension has been undertaken to evaluate its merit in the context of the construction requirements of the proposed development.

### 4.1 Borrow Pit Extension BP1 (NGR 345709, 834516)

37. The borrow pit would be located on bedrock comprising Clashindarroch Formation i.e. comprising semipelite, pelite, gritty psammite and quartzite metasedimentary rocks. This proposed borrow pit extension is located on shallow bedrock and has a suitable profile for maximising extraction from the borrow pit once it has been reopened. It is anticipated that once the restoration overburden is removed from the borrow pit, it should offer a significant volume of material. The rock comprises primarily semipelite. No significant peat cover exists at this location over the virgin excavation area (see Figure 2).
38. The general characteristics and indicative aggregate volumes estimated from the borrow pit extension are provided in Table 1-2.

**Table 1-2**  
**Borrow Pit Extension (BP1) (NGR 345709, 834516)**

Site Area	Maximum dimensions – Potential Excavation Area 150 m length, 100 m width
Height of Excavation	8 m maximum
Area of land impacted*	~6,600 m <sup>2</sup>
Gradient of floor during construction	Slope increases to the west at 1 in 100
Details of Extraction	Combination of ripping and blasting
Overburden type and depth	Restoration soils present from former restoration works. Approximate volume of 10,000m <sup>3</sup> to be removed prior to any extraction. Within the virgin excavation area of the proposed excavation there is limited soil cover, peaty soil less than ~0.2 m but not an extensive cover.
Extent of Aggregate Extraction	An approximate volume of 80,000 - 120,000m <sup>3</sup> of rock depending on excavation depth.
<i>Aggregate Composition</i>	These rocks are described as semipelites.

\* assumes 10% additional land take for access tracks and any site preparation areas

## 4.2 Summary of Volumes

39. Indicative aggregate volumes from the borrow pit extension (BP1) are as follows:

**Table 1-3**  
**Estimated Volumes from Borrow Pit**

Borrow Pit	Volume of gravel/rock (m3)	Predominant Material
BP1	80,000-120,000m <sup>3</sup>	Rock comprising semipelite, pelite, gritty psammite and quartzite
<i>Total</i>	80,000-120,000m <sup>3</sup>	

40. It is anticipated that borrow pit BP1 could supply the majority of the aggregate for construction of the new access tracks, crane pads and bases for the proposed development.
41. Based on initial assessment there is sufficient rock to satisfy the demands for construction of the proposed development within this borrow pit. However, the rock quality as evidenced from the Clashindarroch Wind Farm was not suitable as a wearing course, and import of materials to top dress the tracks and hardstandings was required. As such a volume of 20% of the required total tonnage, might have to be imported for the proposed development in order to meet the required standards for tracks and hardstandings. However, no account has been taken in the calculations (above) for 'winning' of rock during the construction phase. The calculations undertaken in this report assume no rock or materials would be found onsite during the construction programme. The extent of material sourced in this manner would therefore minimise the extraction of rock from the borrow pit.

## 5.0 Construction Requirements

42. The proposed developments and its subsequent maintenance would require the construction of a purpose built network of access tracks. These tracks would be single track and unbound. The total linear meterage of permanent new access track has been estimated to be approximately 10.9km. No floating tracks would be required onsite. The standard cut/fill construction tracks are based upon an estimated carriage width of 5m and an average fill thickness of 1m. The construction of the track system itself, including the upgrade works and passing places would therefore require the provision of some  $\sim 60,000\text{m}^3$  of processed aggregate (based on acquiring no material along the route as part of the construction process). In addition a further  $\sim 40,000\text{m}^3$  of aggregate would be required for the turbine bases and hard standing areas. The concrete requirements for the turbine bases would be produced at a temporary onsite concrete batching plant.
43. A total maximum volume of aggregate required for the tracks and turbine bases would be in the order of  $\sim 110,000\text{m}^3$ , which is accommodated within the volumes assessed from the borrow pit extension BP1. There would be no initial requirement to import material to upgrade tracks and initial infrastructure, including temporary construction compounds as aggregate could be sourced from reopening of the existing borrow pit onsite, which could be accessed off existing tracks constructed as part of the Clashindarroch Wind Farm. However, to finish tracks and hardstandings suitable top dressing material would need to be imported.
44. Temporary compounds and associated infrastructure would require approximately  $6,000\text{m}^3$  of additional materials.
45. In addition to the provision of aggregate for access track construction, turbine bases, temporary compounds and associated infrastructure, approximately  $6,000\text{m}^3$  of processed aggregate would also be required in order to manufacture the concrete onsite to cast the wind turbine bases. Unlike the track making material this category of aggregate would be required to meet highly specified performance and engineering characteristics. It is presently assumed that the aggregate for the turbine bases would be imported from offsite, until the material in the borrow pit has been tested and found to be suitable.
46. In summary, the total maximum volume of required stone to be won onsite would be in the order of  $116,000\text{m}^3$ , which is consistent with the volumes assessed from the borrow pit extension (BP1). An additional  $6,000\text{m}^3$  of processed aggregate would be imported for the turbine bases, plus top dressing stone for tracks and hardstandings.

### 5.1 Extraction Operations

47. The requirement to produce various grades of aggregate would necessitate the use of mobile plant and equipment. This operation would comprise of a number of different elements which are summarised below:
  - **Drilling and Blasting** - It is envisaged that a major proportion of the proposed extraction materials would require drilling and blasting due to the relative strength and competency of the metasedimentary rocks. Safe operation, transportation and storage of the explosives would need to be considered in detail. The Contractor might also wish to re-evaluate any alternatives to the requirement for blasting on the basis of the available rock quality data.
  - **Initial Stripping and Preparation** – As the borrow pit has been previously used, initial access track to it is already in place. At BP1 the track would require a minimal element of upgrading but the track should still remain in a useable condition. Following access into the borrow pit the overburden/unsuitable material would need to be excavated prior to any extraction. It is anticipated that the removal of these soils would consist of a series of excavators and dump trucks to transport the material to a suitable stockpile area. It is anticipated that an area of approximately  $5,000\text{m}^2$  –  $10,000\text{m}^3$  would be required to store the restoration materials. In addition the area required for the storage of plant (such as crushers and loaders) and the materials storage area would require to be stripped of the superficial material including any soil



which lies above bedrock. This material would need to be carefully lifted and placed in storage mounds within the appropriate storage area.

- **Crushing and Screening** - The primary component of this operation would consist of a mobile crushing and screening system. Modern mobile crushing plants are available in a number of different formats and are usually available complete with screening capability. The contractor would need to provide a plant setup that meets the project requirements in terms of the ability to process the raw material, the quantities of the material required and the quality and size gradings of the product.
- **Drainage** - It is likely that a drainage and surface water management system would be required in order to control surface water run-off. Due to the relatively small size of any proposed excavation together with the associated site plant equipment it is thought that the system would comprise of a peripheral cut-off ditch together with minor attenuation features or soakaways.

## 5.2 Environmental Management

48. There are a number of general pollution prevention measures that could be employed to ensure that both ground and surface waters would not be contaminated at any stage of the proposed development. The proposed development would be designed, constructed, operated and decommissioned in line with relevant Pollution Prevention Guidelines (PPG/GPPs) published by SEPA and other codes of best practice, to ensure that both ground and surface waters are not contaminated. These would include:
- GPP2 – Above Ground Oil Storage Tanks;
  - PPG3 – Use and Design of Oil Separators in Surface Water Drainage Systems;
  - PPG4 – Treatment and Disposal of Sewage Where Foul Sewer is Available;
  - GPP5 – Works and Maintenance in or near Water;
  - PPG6 – Working at Construction and Demolition Sites;
  - PPG18 – Managing Fire water and Major Spillages;
  - GPP21 – Pollution Incident Response Planning; and
  - PPG22 – Dealing with Spillages on Highways.
49. **Guidance for Pollution Prevention (GPPs), published by SEPA.** It is aimed that the new series will provide environmental good practice guidance for the whole United Kingdom, and environmental regulatory guidance directly to Northern Ireland, Scotland and Wales.
- Controlling the Environmental Effects of Surface Mineral Workings, Planning Advice Note PAN50
  - Code of Practice for Site Investigations, BS5930;
  - Control of Water Pollution from Construction Sites; and
  - Environmental Good Practice on Site.

## 6.0 Proposed Borrow Pit Design

50. Indicative borrow pit reuse designs is shown in Figure 4. The indicative borrow pit profile has been designed to best utilise the borrow pit based on the previous excavation profiles. Following removal of the overburden material, excavation would commence on the historical high wall, continuing the previous excavation operation. A rectangular shaped excavation has been proposed within the borrow pit in order to meet the estimated requirements for construction materials. Based upon the indicative borrow pit profile a total maximum in situ excavation volume of 144,000m<sup>3</sup> could be achieved.
51. As discussed in section 5.0 above, the total required volume of material is ~116,000m<sup>3</sup>. The borrow pit profile for BP1 is based on a cut of 150m x 100m by a cut depth of 8m, giving a volume of 120,000m<sup>3</sup> as described in Table 1.2.
52. Other primary details and features of the proposed excavation areas include the following:
- The footprint area of the excavation is outlined in Figure 4 for the proposed borrow pit;
  - The proposed individual faces would not exceed a gradient of 2 (V) in 1 (H);
  - The borrow pit floor would be excavated to a nominal depth but would in practice would be inclined gently down slope into the pit;
  - The maximum height of any single face would be no more than 12.5m; however, based on the current design the maximum total cut would only be ~8m; and
  - Drainage would be managed using a peripheral cut off ditch.
53. Following completion of excavation within the borrow pit a suitable restoration profile would be adopted. The profiles would utilise the stockpiled restoration soils that are to be excavated in order to reopen the pit, to create slopes with the excavation at an approximate gradient of 1 (V) in 2 (H). The crest of the slopes would intersect the uppermost rock face at a position which partially obscures the lower part of the faces. The toe of the restoration faces would be blended in to the borrow pit floor, which itself would be re-profiled on a small scale basis to allow drainage and the re-introduction of appropriate cover. The upper part of the borrow pit faces would remain exposed and would be allowed to become weathered. It is envisaged that over time, this face would acquire an appearance similar to that of other natural rock exposures in the locality.

## 7.0 Conclusion

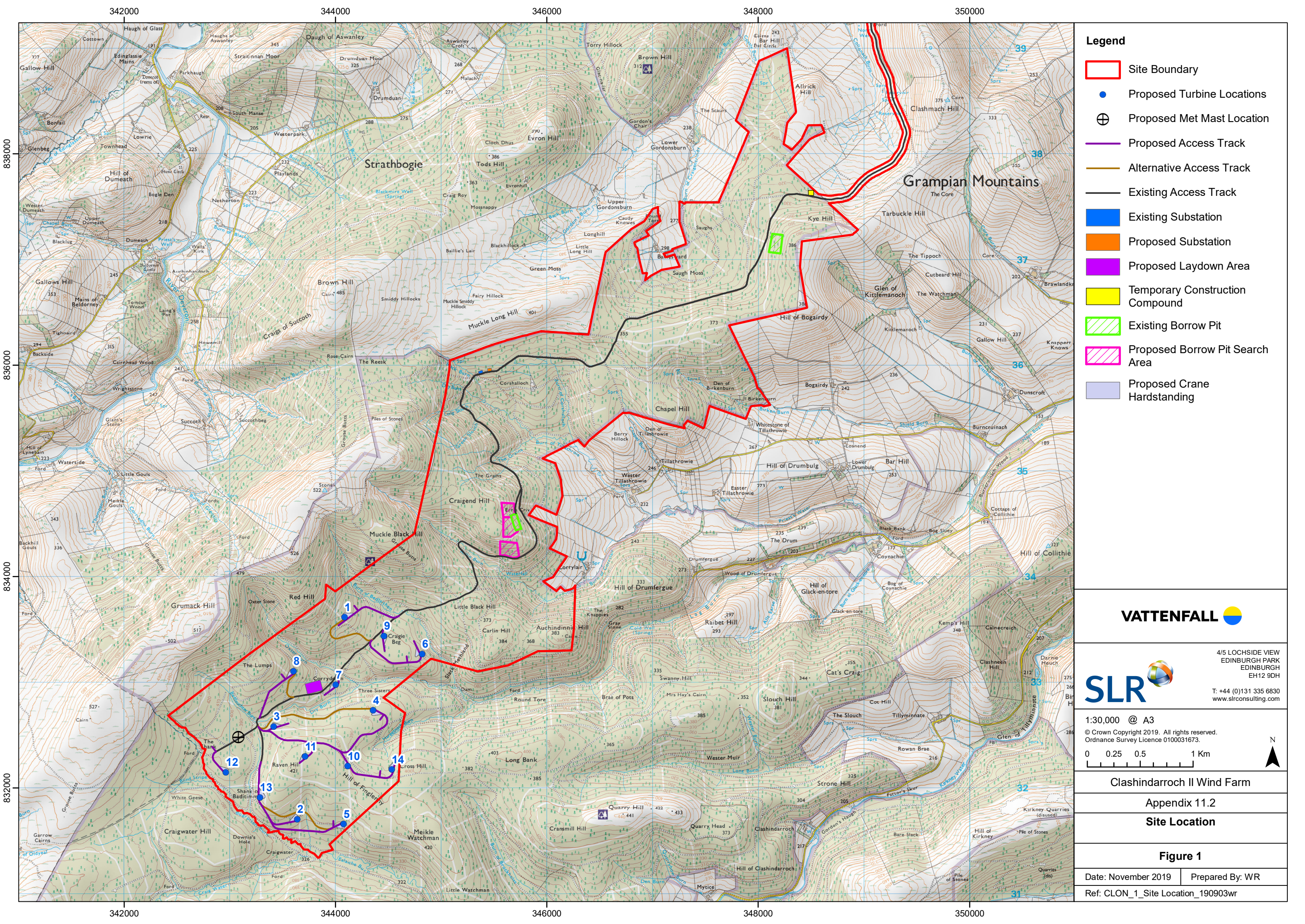
54. In conclusion, one borrow pit used during the construction of the Clashindarroch Wind Farm has been selected to be reopened and extended for construction of the proposed development. Assessment of the borrow pit has identified that there is likely to be sufficient volume of aggregate available for the requirements of the proposed development. Reopening an existing borrow pit would cause minimal impact to the ground conditions and water environment. Additional aggregate would be required for the wind turbine bases, and top dressing of tracks and hardstanding areas, and this material would be sourced offsite.
55. The proposed borrow pit is located in sensitive areas due to the locality of water courses, comprehensive design standards and mitigation measures would be enforced to ensure that there are no negative impacts on these receptors. The implementation of the Draft Construction Environment Management Plan (Technical Appendix 4.1: Draft CEMP) and following best practice guidelines would provide adequate mitigation to prevent impact to the water environment.



# FIGURES







- Legend**
- Site Boundary
  - Proposed Turbine Locations
  - Proposed Met Mast Location
  - Proposed Access Track
  - Alternative Access Track
  - Existing Access Track
  - Existing Substation
  - Proposed Substation
  - Proposed Laydown Area
  - Temporary Construction Compound
  - Existing Borrow Pit
  - Proposed Borrow Pit Search Area
  - Proposed Crane Hardstanding

**VATTENFALL**

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4/5 LOCHSIDE VIEW  
EDINBURGH PARK  
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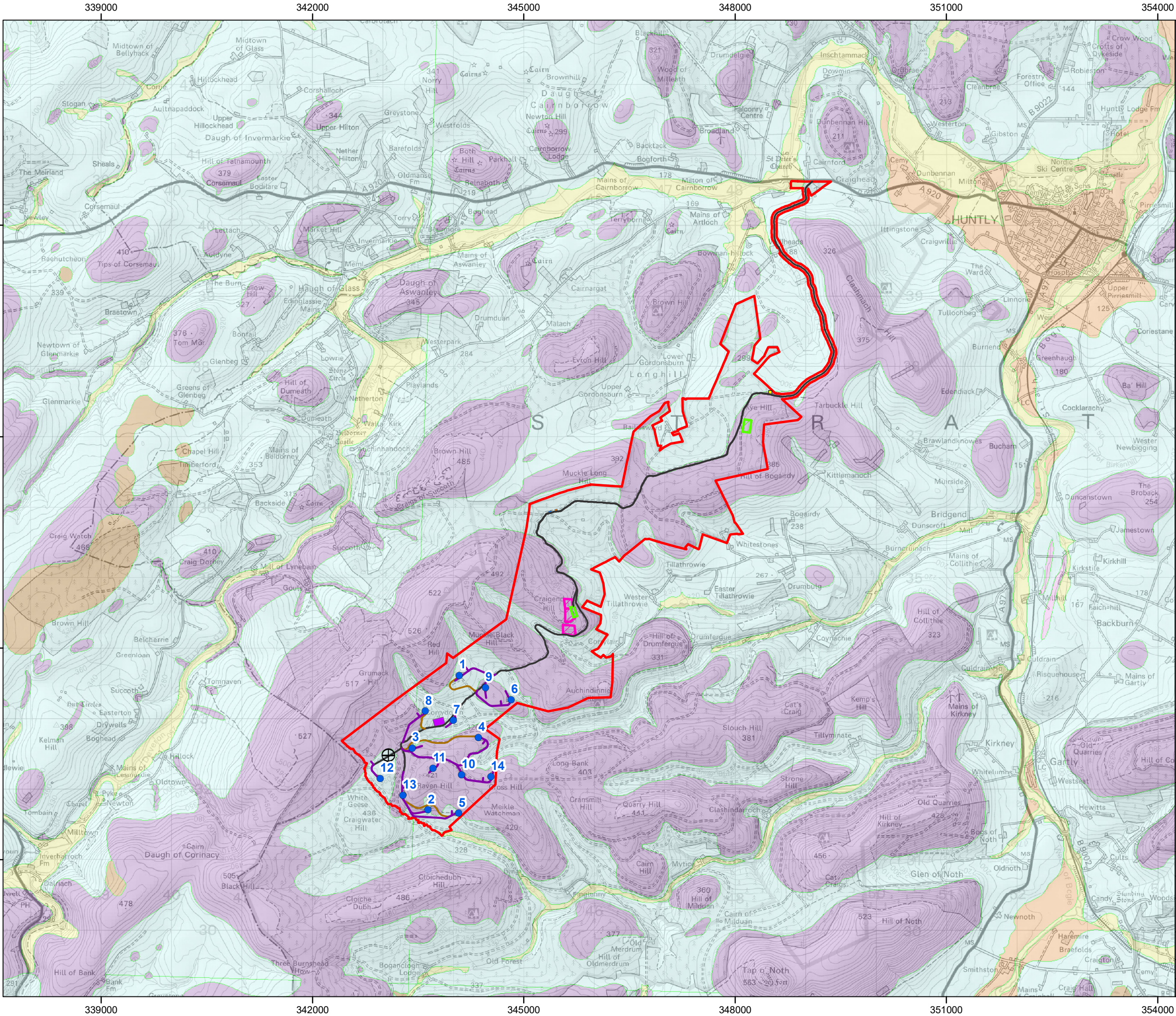
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0 0.25 0.5 1 Km

N

Clashindarroch II Wind Farm	
Appendix 11.2	
Site Location	
Figure 1	
Date: November 2019	Prepared By: WR
Ref: CLON_1_Site Location_190903wr	





**Legend**

- Site Boundary
- Proposed Turbine Locations
- Proposed Met Mast Location
- Proposed Access Track
- Alternative Access Track
- Existing Access Track
- Existing Substation
- Proposed Substation
- Proposed Laydown Area
- Temporary Construction Compound
- Existing Borrow Pit
- Proposed Borrow Pit Search Area
- Proposed Crane Hardstanding

**Superficial Geology**

- Peat
- Alluvium - clay, silt and gravel
- Alluvium and river terrace deposits
- River terrace deposits
- Till, Devensian
- Bedrock at or near surface

**Notes**

1. Superficial geology data obtained via BGS wms.  
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0 0.5 1 2 Km

N

Clashindarroch II Wind Farm

Appendix 11.2

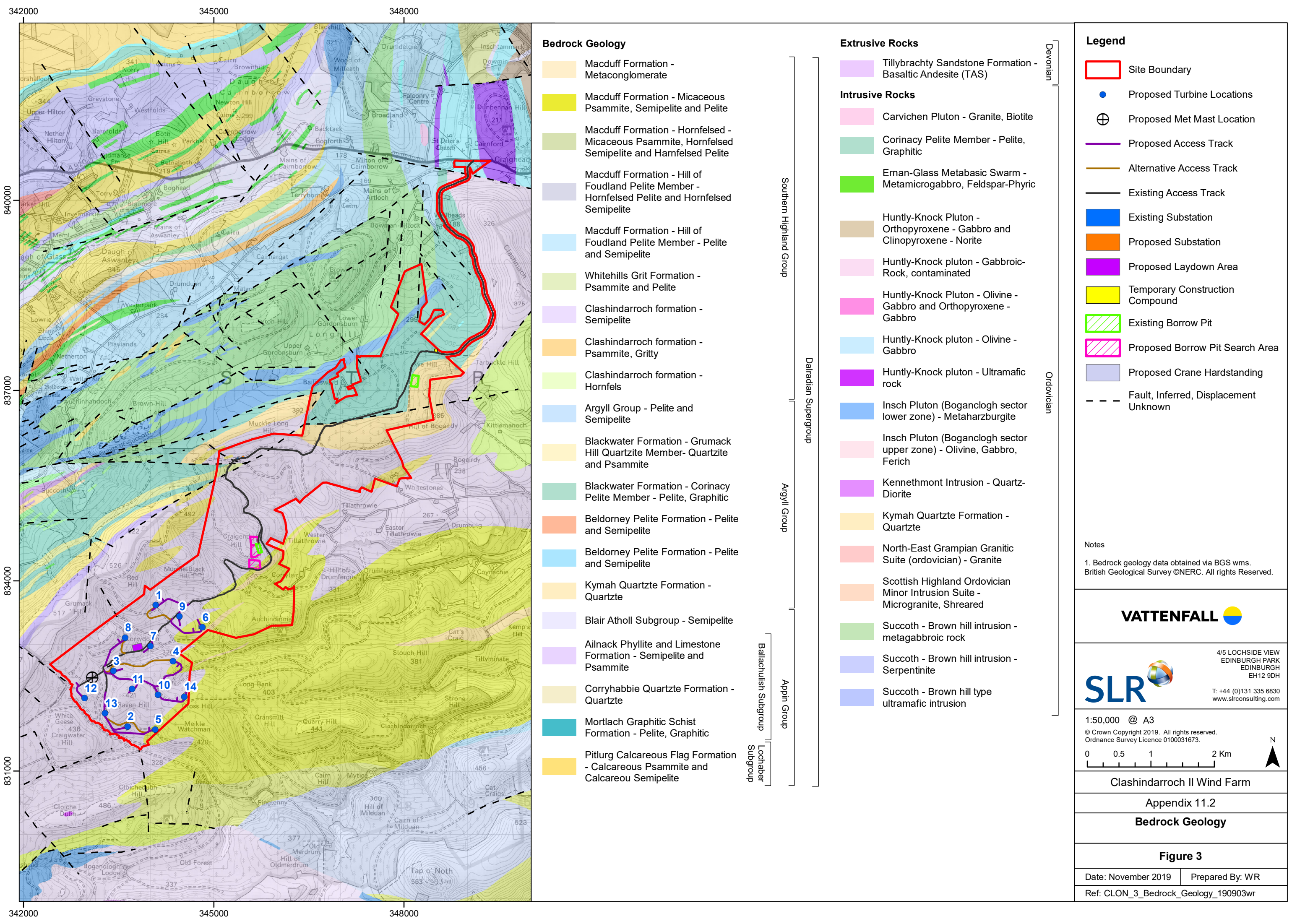
**Superficial Geology**

**Figure 2**

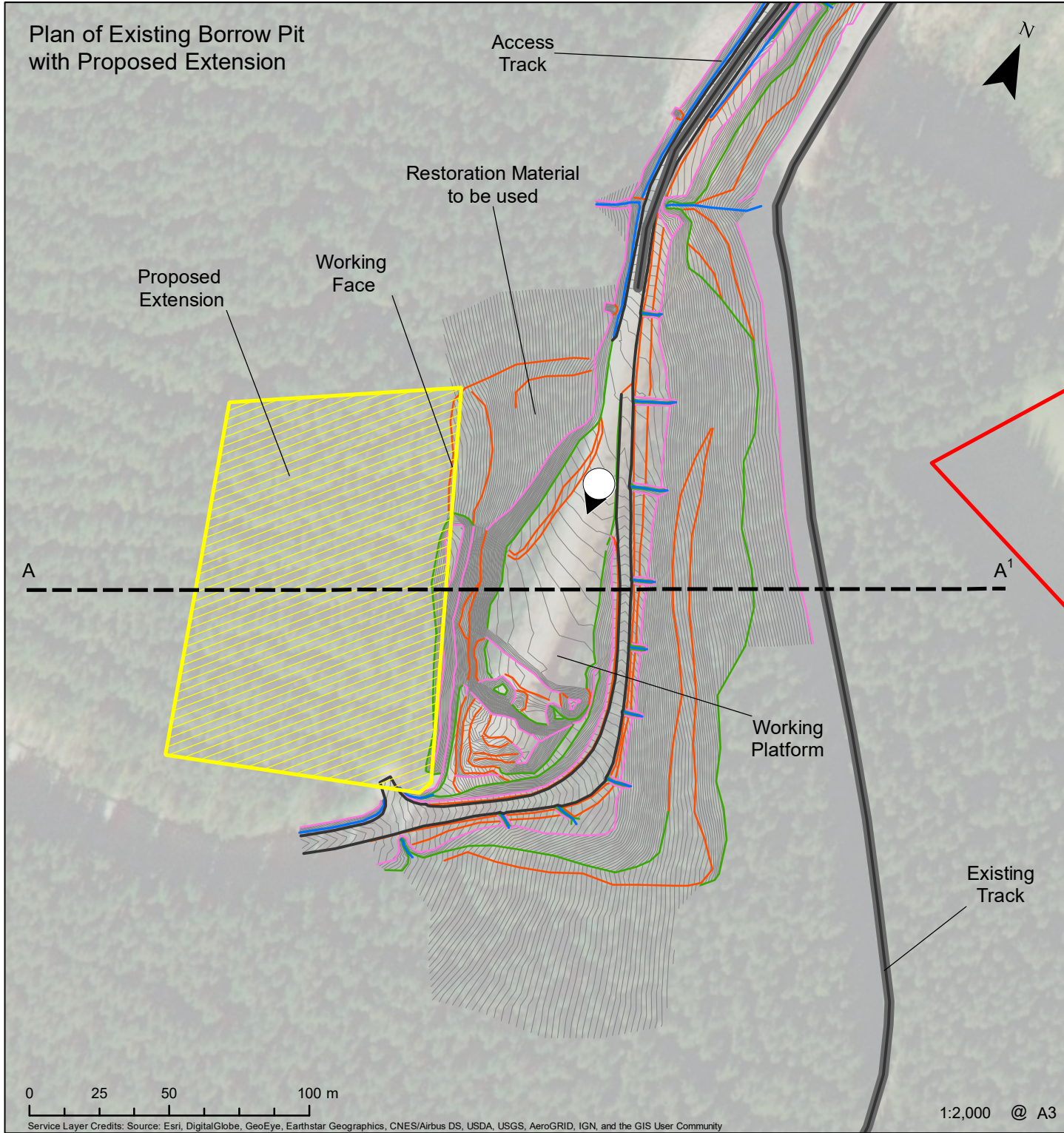
Date: November 2019 Prepared By: WR

Ref: CLON\_2\_Superficial\_Geology\_190903wr







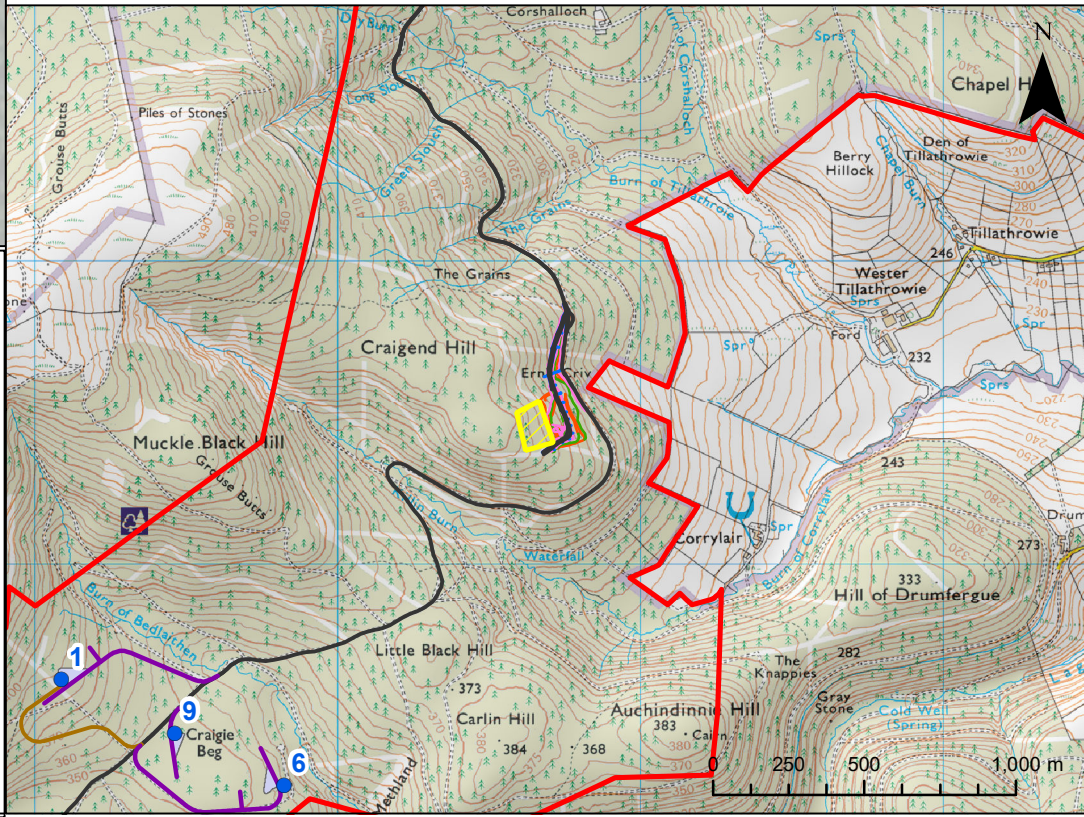
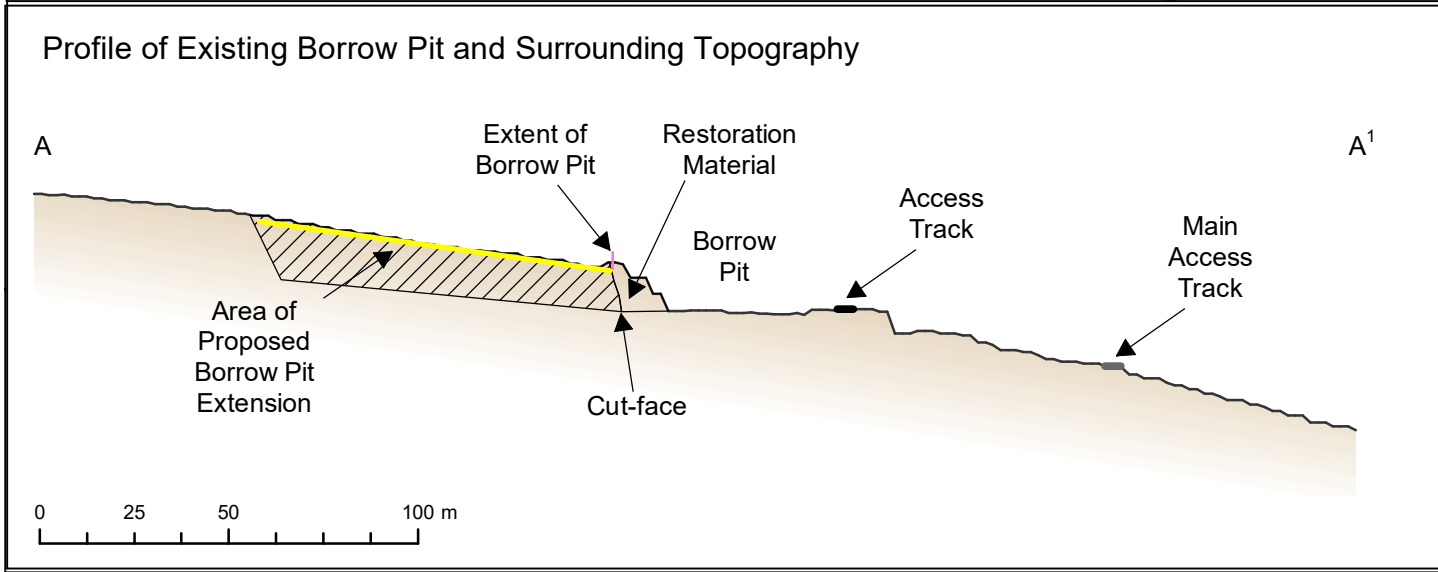


Borrow Pit (NGR 345709, 834516)	
Site Area	Maximum dimensions – Potential Excavation Area 150 m length, 100 m width
Height of Excavation	8-12 m maximum
Area of land impacted*	~15,000 m <sup>2</sup>
Gradient of floor during construction	Slope increases to the west at 1 in 100
Details of Extraction	Combination of ripping and blasting
Overburden type and depth	Restoration soils present from former restoration works. Approximate volume of 10,000m <sup>3</sup> to be removed prior to any extraction. Within the virgin excavation area of the proposed excavation there is limited soil cover, peaty soil less than ~0.2 m but not an extensive cover.
Extent of Aggregate Extraction	An approximate volume of 80,000m <sup>3</sup> of rock depending on excavation depth.
Aggregate Composition	These rocks are described as semipelites.



Photograph of Existing Borrow Pit (Taken from North Looking South)

- Legend**
- Site Boundary
  - Proposed Turbine Locations
  - Existing Access Track
  - Proposed Access Track
  - Alternative Access Track
  - Proposed Borrow Pit Extension
- Existing Borrow Pit**
- Breakline
  - Top of Bank
  - Bottom of Bank
  - Contours
  - Drainage Ditch
  - Photo Location



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Clashindarroch II Wind Farm

Appendix 11.2

**Existing Borrow Pit Layout  
with Proposed Extension**

**Figure 4**

Date: November 2019 Prepared By: WR

Ref: CLON\_4\_Existing\_Borrow\_Pit\_with\_Proposed\_Ext\_190903wr



## EUROPEAN OFFICES

### United Kingdom

#### AYLESBURY

T: +44 (0)1844 337380

#### BELFAST

T: +44 (0)28 9073 2493

#### BRADFORD-ON-AVON

T: +44 (0)1225 309400

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T: +44 (0)117 906 4280

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