ESB Asset Development UK Limited

Chleansaid Wind Farm: Borrow Pit Assessment

Technical Appendix 10.3

655007-P10.3 (00)

NOVEMBER 2021

RSK GENERAL NOTES

Project No.: 655007-P10.3 (00)

Title: Chleansaid Wind Farm: Borrow Pit Assessment

Client: ESB Asset Development UK Limited

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Office: Stirling

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Date:	16/11/2021	Date:	17/03/2022

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Date:	18/03/2022

CONTENTS

1 INTRODUCTION

1.1 This report provides a Borrow Pit Assessment for the Proposed Development and associated development infrastructure.

1.2 The report forms a Technical Appendix to the Environmental Impact Assessment (EIA) Report for the Proposed Development and should be read in conjunction with this document. It has been produced to address the requirement for aggregate for the Proposed Development to supply the construction needs for new and upgraded access tracks and hardstanding areas, including ongoing supply for track maintenance during the operation of the Proposed Development.

1.3 This report quantifies the aggregate requirement, appropriate locations within the site from which this material can be sourced and addresses the suitability of the material for the required purpose. Potential impacts from aggregate extraction, processing and transportation are considered and assessed. Design and mitigation measures to avoid or minimise these impacts are set out, along with a number of good construction practices that would be employed during all construction works.

Site location

1.4 The Proposed Development is located on the Dalnessie Estate, approximately 13 km to the north-east of Lairg in the Scottish Highlands, near the A836–A838 Junction. The Proposed Development falls within The Highland Council (THC) area, in the North, West and Central Sutherland ward. The land is currently used as a shooting estate and for sheep grazing. The turbine area is mostly open moorland and underlain by national important carbon rich soils, deep peat and priority peatland habitat. Surrounding land uses include commercial forestry, sporting and recreational uses.

1.5 The turbine area is bounded to the south and west by a large forestry plantation, and the ridge of Leathad Chleansaid to the north.

Development proposals

1.6 The Proposed Development infrastructure would include:

- Up to 16 wind turbines, of approximately 6 MW each, 12 with a maximum tip height of 200 m and four with a maximum tip height of 180 m;
- Hardstanding areas at the base of each turbine, with a permanent area of approximately 2156 m^2;
- One permanent meteorological mast and hardstanding areas for up to two permanent Lidar masts;
- Total length of access tracks is 17,002 m, of which 11,121 m is new access track with associated watercourse crossings and 5,881 m is existing access track and watercourse crossings which will need to be upgraded;
- An operations control building with parking and welfare facilities;
- A substation compound;

- An energy storage facility;
- Telecommunications equipment;
- Up to four temporary construction compounds;
- Two borrow pits, to provide suitable rock for access tracks, turbine bases and hardstandings; and
- Underground cabling linking the turbines with the substation.

1.7 Full details of the Proposed Development design are provided in **Chapter 2** of the EIA Report.

Aims

1.8 This report aims to undertake a review of available relevant Proposed Development information, including all track design specifications, to produce borrow pit designs and development plans in order to address the aggregate need for the Proposed Development construction and operational maintenance. Recommendations are made for mitigation measures and reinstatement to minimise potential landscape, visual, hydrological and hydrogeological impacts from the excavations. Potential impacts from noise, dust and vibration are also considered.

Assessment method

1.9 The assessment has involved the following stages:

- Desk study;
- Site reconnaissance;
- Borrow pit design;
- Environmental review.

2 DESK STUDY

Information sources

2.1 The desk study involved a review of available relevant information sources on the ground conditions in and around the site. Information sources included:

- Ordnance Survey (OS) mapping at 1:50,000, 1:25,000 and VectorMap Local raster mapping, Terrain 5 digital terrain model and OS OpenData mapping;
- Historical OS mapping as available to view online;
- High-resolution orthorectified aerial imagery;
- British Geological Survey (BGS) online and digital geological mapping, 1:50,000 scale;
- Scotland's Soils digital soil mapping, 1:250,000 scale;
- Data provided by the applicant, including turbine foundation and track design specifications;
- Archive and extensive data for the Proposed Development held by RSK.

Geology

2.2 Geological information is derived from the BGS GeoIndex online geological mapping and the Geological Survey of Scotland, 1:50,000 geological map series (BGS, 2000; 2004; 2021). Additional information has been derived from Johnstone & Mykura (1989) and Trewin (2002). Geology mapping is shown on **Figures 10.3.1a** and **Figures 10.3.1b**.

Bedrock geology

2.3 The majority of the site and the immediate surrounding area is underlain by the Loch Coire Formation of the Moine Supergroup, comprising metasedimentary bedrock of Neoproterozoic age. This bedrock is made up of migmatitic psammite with migmatitic semipelite, sedimentary rocks that have undergone moderate-grade metamorphism. An intrusion of the Loch Coire Granite rocks of Ordivician age runs the extent of the north-eastern edge of the turbine area forming the higher ground of Leathad Chleansaid and the hills immediately north. This is a silica-rich igneous intrusion comprising foliated leucogranite that has undergone partial metamorphism and shearing.

2.4 Two small amphibolite dykes of Neoproterozoic age are located just outside the site; both are small in footprint.

2.5 There are no mapped faults within the site. However, the wider area has been subject to extensive faulting, mainly by compression (thrust) faults associated with the continental collision and mountain building episode known as the Caledonian Orogeny in the Cambrian and Ordovician periods. A branch of the regionally important Naver Thrust Fault crosses the proposed access route approximately 3 km from the A836 and continues both north-west and east-south-east.

Superficial geology

2.6 The site is predominantly overlain by peat, with substantial cover from undifferentiated till and morainic deposits consisting of diamicton, sand and gravel. Till is a very variable glacial sediment deposited in the Pleistocene consisting of unsorted material ranging in size from clay to boulders, usually with a matrix of clay to sand.

2.7 Alluvium is also present within the site, mainly located within river valleys. Alluvium is a mixture of clay, silt, sand and gravel deposited by a watercourse in the Holocene.

2.8 The peak of Sròn Leathad Chleansaid lacks superficial deposits, as does the south-western floodplain of the Allt nan Con-uisge. Given this variation in slope and elevation within areas lacking superficial deposits, there does not seem to be any particular correlation between superficial deposits and slope/elevation within the site.

Rock volumes

2.9 Calculation of aggregate requirement was undertaken by the applicant's design team, and a total required volume was provided for the purpose of borrow pit design and assessment. A contingency of 20% was added to the estimated total, to allow for under-estimation in the requirements and for some of the excavated material being unsuitable for construction use.

2.10 The provided total aggregate volume required is **297,112 m^3**. Including 20% contingency, this amounts to a total of **356,500 m^3**.

2.11 The initial section of track within the access area would require upgrading and widening for the construction phase. An additional volume of aggregate has been estimated for these works, totalling **12,000 m^3**. It is anticipated that this material would be imported to the Proposed Development from a commercial source.

2.12 Two borrow pits are anticipated to provide the aggregate requirement for the turbine area. The volumes of material to be supplied from each borrow pit are provided in Table 10.3.1.

Table 10.3.1: Aggregate volumes

Aggregate source	Required Volume (m^3)	Design Volume (m^3)	Length (m)	Width (m)	Area (m^2)
Borrow Pit BP1	-	173,600	350	100	30,663
Borrow Pit BP2	-	273,900	150	203	28,939
Total (m^3):	**356,500**	**474,500**			

Design optimisation

2.13 Design optimisation considers alternative directions and modes of working. The optimised borrow pit designs provide in the first instance for the rock requirement whilst also considering, in line with PAN 50[1], potential impacts on:

[1] Scottish Government (1996). Controlling the Environmental Effects of Surface Mineral Workings. Planning Advice Note (PAN) 50: controlling the environmental effects of surface mineral workings. Accessed November 2021.

- Landscape;
- Ecology;
- Hydrology;
- Hydrogeology.

2.14 Potential impacts on human beings relate principally to operational factors and include:

- Noise;
- Vibration;
- Dust;
- Visibility.

2.15 The physical constraints of rock suitability and topography, and the requirement to plan for a suitable restoration scheme, have been primary considerations in the borrow pit design. The preferred option has been to open two borrow pits, to supply rock aggregate for the turbine area, with aggregate anticipated to be imported for upgrading of the proposed access area. The rock within the turbine area has been assessed visually by an experienced geotechnical specialist as potentially suitable for track and hardstanding construction; however, rock exposure within the turbine area is relatively limited and there may be local variations that restrict suitability of some of the aggregate, particularly for track running surfaces.

2.16 The two borrow pits are adjacent to proposed access tracks and have been designed to minimise visibility from the properties at Dalnessie and from public walking routes through the estate where possible.

3 BORROW PIT METHOD OF WORKING

The Quarries Regulations 1999

3.1 The principles of the *Quarries Regulations 1999*, as set out in the Health & Safety Executive's document "Health and Safety at Quarries: The Quarries Regulations 1999 Approved Code of Practice" (HSE, 2013) would be followed by the appointed Contractor to provide a safe working environment during the development of the Proposed Development's borrow pits. The excavation designs must, in the first instance, provide safe and stable slopes which encompass the principle of '*design for closure*'. Haul and access roads should be of adequate width for the plant to be used on site and allow for the provision of edge protection in all locations where applicable.

The Water Environment (Controlled Activities) (Scotland) Regulations 2011

3.2 The *Water Environment (Controlled Activities) (Scotland) Regulations 2011* as amended set out good practice guidelines to prevent pollution of the groundwater environment. These guidelines reflect good operational practices and would be implemented at the Proposed Development.

3.3 Where authorisations are required for process plant operation or consents to discharge (under the *Water Environment (Controlled Activities) (Scotland) Regulations 2011* as amended and the *Pollution Prevention and Control (Scotland) Regulations 2012*) these would be obtained in advance from the Scottish Environment Protection Agency (SEPA).

Borrow Pit 1: Development

3.4 Photograph 10.3.1 below shows a view across the area of Borrow Pit 1 (BP1), together with an image of exposed bedrock located close to the borrow pit location.

Photograph 10.3.1: (a) View north across BP1; (b) Exposed bedrock within the BP1 area.

3.5 The existing topography of the proposed borrow pit area and the borrow pit development plan are illustrated in **Figure 10.3.2**. Borrow pit cross-section lines are shown on **Figure 10.3.3**.

Topsoil stripping and storage

3.6 The peat depth reconnaissance surveys confirm that the proposed borrow pit area has some limited peat cover. Peat depth records range from 0 to 1.1 m with small bedrock outcrops along the northern slope. Average peat and soil depth across the borrow pit footprint is 0.7 m, based on site records. The borrow pit is located on the northern slope of Cnoc na Fuaralachd and is characterised by moorland habitat with a conifer plantation running parallel to the southern side of the borrow pit.

3.7 As the borrow pit footprint area is proposed to be used for the substation, electrical contractors' compound and construction compound areas, the majority of aggregate excavation work would be required early in the Proposed Development construction period in order to enable timely construction of the substation.

3.8 Topsoil and peat acrotelm would be removed in strips from the excavation area and would be stored in a temporary storage area. Topsoil and peat would be stored in separate mounds. The storage mounds would not exceed 2 m in height, to minimise compaction of the soil and peat, and would be shaped to promote shedding of water. Some limited blading would be undertaken on the soil mound surface to assist in shedding of water and to minimise surface erosion in wet conditions. Mounds would not be compacted.

3.9 As the borrow pit excavation develops, the topsoil and/or peat acrotelm would be removed in advance of the active excavation and would be used elsewhere in the Proposed Development as appropriate. Removed topsoil, plus rock material unsuitable for use as aggregate or fill, would be used in the final restoration of the borrow pit.

Extraction of rock

3.10 The psammite and semipelite bedrock would be obtained by blasting. The blast techniques to be used would depend on the depth of rock to the borrow pit floor level at 220 m AOD. Pattern blasting is recommended for the initial opening-up of the borrow pit, blasting at shallow depths initially at the borrow pit entrance and gradually increasing in depth as the land rises to the south-west.

3.11 Pattern blasting involves the drilling of blast holes on a grid layout, normally to a depth of up to 6 m, and is mostly used where no pre-existing natural face is present. Once the fragmented rock is removed, blasting can continue from the rock faces created, using continued pattern blasting or face blasting as appropriate. Face blasting typically involves one or two rows of blast holes drilled to the target depth parallel to and behind an existing face.

3.12 The proposed location of the borrow pit is on a north-east facing slope at the edge of Cnoc na Fuaralachd. The borrow pit has been designed to have one main working face, with two subsidiary faces, with a flat floor level at 220 m AOD. The faces would be up to 15 m in height, blasted at an angle of 75° from the horizontal. The general direction of working would be to the north-west, with blasted rock removed and transported to the relevant area of construction.

3.13 Drainage would be directed to the north-east corner, where water treatment would be provided for the borrow pit and for the hardstanding areas underneath the construction compounds. The borrow pit floor would have a gentle slope during rock extraction, to allow for free drainage out of the borrow pit. This may be modified as part of the restoration process, depending on the ecological outcomes desired following restoration.

3.14 The borrow pit would be accessed directly from the access track.

3.15 Effects during rock extraction from noise and dust would be minimised by keeping the use of processing plant to a minimum. The blast pattern would be kept tight to maximise fragmentation, although some processing is likely to be required to produce aggregate of suitable grade for track construction. Blast design, including charge weights and delays, is the responsibility of the contractor. Processing plant would be operated only for short periods of time, as necessary to provide the aggregate requirement for construction works.

Drainage

3.16 Natural surface runoff would be diverted around the active excavation area by construction of a low soil bund (0.5 m high) around the outer edge of the excavation, to ensure that runoff is prevented from flowing directly into the excavation. Blind ditches would be created as necessary to control water flow.

3.17 During blasting operations, joints and fractures in the sub-drill zone below the target extraction level are opened up by the expansion of gases generated by the explosives. In consequence, incident rainfall into the operational area would mostly infiltrate into the borrow pit floor. Any excess runoff would be diverted towards a constructed water collection sump, from where collected water would be allowed to discharge slowly into the trackside drainage system.

Restoration

3.18 The borrow pit excavation edges would be softened with respect to the immediately adjacent hillside by earthworks and/or restoration blasting as appropriate. Any unusable material from the excavation would be used in restoration of the borrow pit. Restored faces would have a maximum slope of 27° and stored topsoil would be replaced over the restored faces to facilitate re-vegetation and the final restoration of the borrow pit.

3.19 The borrow pit floor area is intended to be used to house the control building and battery storage system during the operational phase of the Proposed Development. Restoration would therefore be restricted to the parts of the borrow pit not required for these long-term uses. Relevant sections of the borrow pit floor, mainly the area used for the construction compound, would be ripped or routed to break up the surface and soils and turf material would be replaced over the area. The soils would contain a natural rough moorland seedbank and it is anticipated that natural vegetation would re-establish over time. Additional seeding may be required; this would be assessed by the Environmental Clerk of Works at the point of restoration and a suitable upland grass seed mix would be identified for this process.

Borrow Pit 2: Development

3.20 Photograph 10.3.2 below shows a view across the area of Borrow Pit 2 (BP2), together with an image of exposed bedrock located close to the borrow pit location.

3.21 The existing topography of the proposed borrow pit area and the borrow pit development plan are illustrated in **Figure 10.3.3**. Borrow pit cross-section lines are shown on **Figure 10.3.3**.

Photograph 10.3.2: (a) View north-west across BP2; (b) Exposed bedrock within the BP2 area.

Topsoil stripping and storage

3.22 The peat depth reconnaissance surveys confirm that the proposed borrow pit area is largely without peat. One confined pocket of peat up to 0.7 m is present in part of the area, but no other confirmed peat records are located within the borrow pit footprint. Soil and peat depths across the area range from 0 to 0.7 m, with an average depth of 0.36 m. The borrow pit area is on the south-eastern slope of Sròn Leathad Chleansaid and is characterised by rough open moorland.

3.23 The borrow pit would be worked in strips, to ensure that only enough aggregate for the development is obtained and to limit the impacts of the borrow pit to as confined an area as possible.

3.24 Topsoil and, where required, peat acrotelm would be removed in strips from the initial excavation area and would be stored in a temporary storage area. Topsoil and peat would be stored in separate mounds. The storage mounds would not exceed 2 m in height, to minimise compaction of the soil and peat, and would be shaped to promote shedding of water. Some limited blading would be undertaken on the soil mound surface to assist in shedding of water and to minimise surface erosion in wet conditions. Mounds would not be compacted.

3.25 As the borrow pit excavation develops, the topsoil and/or peat acrotelm would be removed in advance of the active excavation and would be used elsewhere in the

Proposed Development as appropriate. Removed topsoil, plus rock material unsuitable for use as aggregate or fill, would be used in the final restoration of the borrow pit.

Extraction of rock

3.26 The psammite and semipelite bedrock would be obtained by blasting. The blast techniques to be used would depend on the depth of rock to the borrow pit floor level at 242 m AOD. Pattern blasting is recommended for the initial opening-up of the borrow pit, blasting at shallow depths initially at the borrow pit entrance and gradually increasing in depth as the land rises to the north-east.

3.27 Pattern blasting involves the drilling of blast holes on a grid layout, normally to a depth of up to 6 m, and is mostly used where no pre-existing natural face is present. Once the fragmented rock is removed, blasting can continue from the rock faces created, using continued pattern blasting or face blasting as appropriate. Face blasting typically involves one or two rows of blast holes drilled to the target depth parallel to and behind an existing face.

3.28 The proposed location of the borrow pit is on rising and slightly undulating ground. The borrow pit has been designed to have two working faces and two subsidiary faces, with a gently sloping floor level at 242 m AOD. The main faces would be up to 15 m in height, blasted at an angle of 75° from the horizontal. The general direction of working would be to the north-east, with blasted rock removed and transported to the relevant area of construction.

3.29 Drainage would be directed to the south-east corner, where water treatment would be provided for the borrow pit. The borrow pit floor would have a gentle slope during rock extraction, to allow for free drainage out of the borrow pit. This may be modified as part of the restoration process, depending on the ecological outcomes desired following restoration.

3.30 The borrow pit would be accessed from a short access track link from the main track route to Turbine T7.

3.31 Effects during rock extraction from noise and dust would be minimised by keeping the use of processing plant to a minimum. The blast pattern would be kept tight to maximise fragmentation, although some processing is likely to be required to produce aggregate of suitable grade for track construction. Blast design, including charge weights and delays, is the responsibility of the contractor. Processing plant would be operated only for short periods of time, as necessary to provide the aggregate requirement for construction works.

Drainage

3.32 Natural slope runoff would be diverted around the active excavation area by construction of a low soil bund (0.5 m high) around the outer edge of the excavation, to ensure that runoff is prevented from flowing directly into the excavation. Blind ditches would be created as necessary to control water flow.

3.33 During blasting operations, joints and fractures in the sub-drill zone below the target extraction level are opened up by the expansion of gases generated by the explosives. In consequence, incident rainfall into the operational area would mostly infiltrate into the

borrow pit floor. Any excess runoff would be diverted towards a constructed water collection sump, from where collected water would be allowed to discharge slowly onto vegetated ground below the borrow pit.

Restoration

3.34 The borrow pit excavation edges would be softened with respect to the immediately adjacent hillside by earthworks and/or restoration blasting as appropriate. Any unusable material from the excavation would be used in restoration of the borrow pit. Restored faces would have a maximum slope of 27° and stored topsoil would be replaced over the restored faces to facilitate re-vegetation and the final restoration of the borrow pit. Excavated peat would be used within the lower part of the borrow pit to create an area of peatland habitat.

3.35 The borrow pit floor would be ripped or routed to break up the surface and soils and turf material would be replaced over the area. The site soils would contain a natural rough moorland seedbank and it is anticipated that natural vegetation would re-establish over time. Additional seeding may be required; this would be assessed by the Environmental Clerk of Works at the point of restoration and a suitable upland grass seed mix would be identified for this process.

3.36 Part of the borrow pit would be kept available for track and hardstanding maintenance work during the lifetime of the Proposed Development. Once the Proposed Development ceases operation, the borrow pit would be fully restored.

4 ENVIRONMENTAL REVIEW

4.1 Most potential environmental effects associated with borrow pit development have been considered within the relevant EIA Report chapters, in particular:

- Landscape and Visual Assessment (**Chapter 6**);
- Cultural Heritage and Archaeology (**Chapter 7**);
- Ecology (**Chapter 8**);
- Ornithology (**Chapter 9**); and
- Noise and Vibration (**Chapter 11**).

4.2 As a result, this section provides a brief review of environmental issues not addressed elsewhere.

Dust

4.3 Borrow pit operations are relatively small-scale, owing to the small aggregate volume requirement for the turbine area track and hardstanding construction.

4.4 Dust emissions can arise from ripping, processing, loading-out and stockpiled material. They are sensitive to weather conditions, typically being worst in dry and windy weather. Water sprays would be available on site for use in dust suppression in dry and windy conditions, to control and minimise dust emissions. Any processing plant brought to site would have integral dust suppression systems to control dust emissions during processing. Effects from dust would be limited to active excavation at the borrow pits, notably during ripping, processing and loading-out of oversized and processed material. With appropriate controls in place, effects from dust emissions would be negligible.

Lighting

4.5 Any lighting associated with the borrow pits should have a clearly defined purpose and be directed to where it is required in order to provide a safe working environment. Lighting would only be used when necessary and would be switched off when not required.

Site stability

4.6 Site stability has been assessed as part of the survey and design work for the borrow pits and has been incorporated into the design as part of a safe working environment. The proposed restoration scheme takes into consideration the requirement for long-term safety with respect to future land use.

5 CONCLUSIONS

5.1 This report sets out details with respect to the operational design for the borrow pits for the Proposed Development, in order to supply the need for the proposed access track, turbine foundations and hardstanding requirements for the Proposed Development. The borrow pit design and recommended methods of operation are in line with the *Quarries Regulations, Approved Code of Practice, 1999* (as amended) to provide a safe working environment and minimise risk of instability.

5.2 An Environmental Review of potential effects from the borrow pit operation has been undertaken. Use of best practice working methods and other mitigation methods as appropriate would be put in place during all borrow pit operations. It is concluded that residual effects would be minor, long-term and adverse during borrow pit operation, decreasing to negligible following full restoration of the borrow pit areas.

6 REFERENCES

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7 FIGURES

257000 258000 259000 260000 261000 262000 263000 264000

920000 919000 918000 917000 916000 915000 914000

A B B' A'

Legend:

- BP Cross-sections
- Permanent Lidar Location
- Permanent Met Mast
- Proposed Turbine Locations
- Turning Head
- Hardstanding
- Access Track
- Application Boundary
- Control Building and Substation Compound (100m x 75m)
- Substation Construction Compound and Battery Energy Compound (75m x 45m)
- Main Construction Compound (100m x 40m)
- Additional Construction Compound (100m x 40m)
- Mobilisation Compounds
- Borrow Pit

1:50,000 BGS Bedrock Geology

- Fault, Inferred
- Altnaharra Psammite Formation
- Klibreck Psammite Formation
- Loch Coire Granite
- Lewisianoid Gneiss Complex
- Loch Coire Formation
- Neoproterozoic Basic Minor Intrusion Suite
- Ousdale Arkose Formation

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	17/11/2021	First Draft	CM	CI	CI
01	20/01/2022	Update BP1 and Figure No.	CM	CI	CI
02	25/01/2022	Mobilisation Compounds	CM	CI	CI

Chleansaid Wind Farm

TITLE:

Figure 10.3.1a:
Bedrock Geology Mapping

0 0.5 1
Kilometres
SCALE: 1:25,000 @ A3

N W E S

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257000 258000 259000 260000 261000 262000 263000 264000

920000 919000 918000 917000 916000 915000 914000

Creag Dhubh
Old Shielings
Allt Gobhlach
Sròn Leathad Chleansaid
Bad Rà'fin
Dail na Copaig
Loch na Fuaralachd
Loch Dail na Copaig
Loch Beag Fuaralachd
Cnoc na Fuaralachd
Creag nam Fiadh Bheag
Lon na Cloiche Duaille
Bad Seasg Mòr
Allt nan Con
Coire a' Bhruaiche
Leathad na Cloiche Moire
Rhian Bridge
Blarbuie
Sheepfold
Quarry (dis)
Quarries (dis)
Cattle Grid
Old Circle
A836
River Thurso
MORAY FIRTH

B B' A A'

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

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Legend:

- Proposed Turbine Locations
- Permanent Lidar Location
- Permanent Met Mast
- Turning Head
- Hardstanding
- Access Track
- Application Boundary
- Control Building and Substation Compound (100m x 75m)
- Substation Construction Compound and Battery Energy Compound (75m x 45m)
- Main Construction Compound (100m x 40m)
- Additional Construction Compound (100m x 40m)
- Mobilisation Compounds
- Borrow Pit
- BP Cross-sections

1:50,000 BGS Superficial Geology

- Alluvium
- Peat
- River Terrace Deposits
- Till And Morainic Deposits (Undifferentiated)

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	17/11/2021	First Draft	CM	CI	CI
01	20/01/2022	Update BP1 and Figure No.	CM	CI	CI
02	25/01/2022	Mobilisation Compounds	CM	CI	CI

Chleansaid Wind Farm

TITLE:

Figure 10.3.1b:
Superficial Geology Mapping

0 0.5 1
Kilometres
SCALE: 1:25,000 @ A3

N W E S

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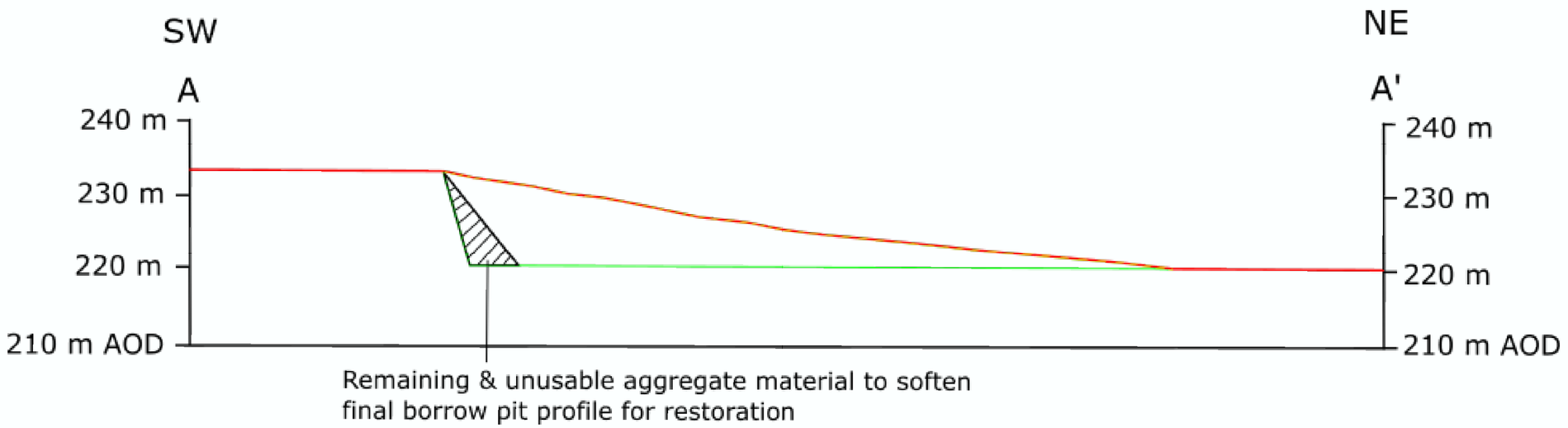
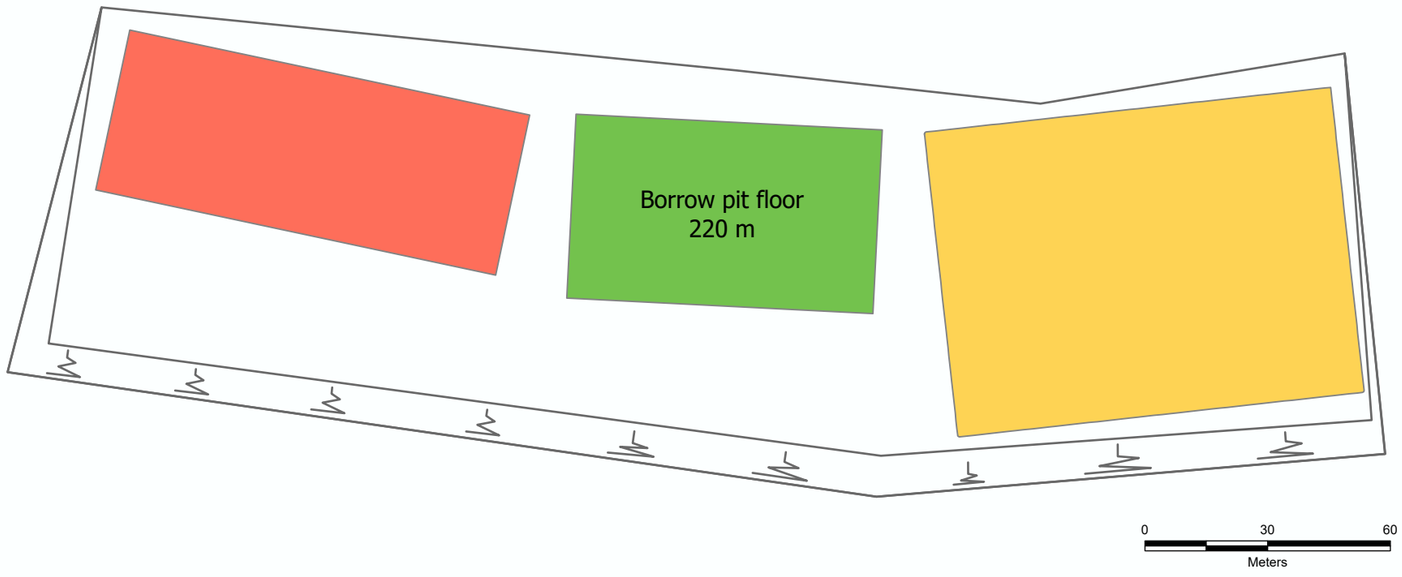
BP1 Cross-section



BP1 Design Plan



Legend:

- Control Building and Substation Compound (100m x 75m)
- Substation Construction Compound and Battery Energy Compound (75m x 45m)
- Main Construction Compound (100m x 40m)
- Existing Ground Profile
- Excavation Profile
- Indicative Restoration Profile
- Indicative Restoration

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	14/12/2021	First Draft	CM	CI	CI
01	25/01/2022	Update BP1	CM	CI	CI

Chleansaid Wind Farm

TITLE:

Figure 10.3.2:
Borrow Pit 1 Design

REV 01

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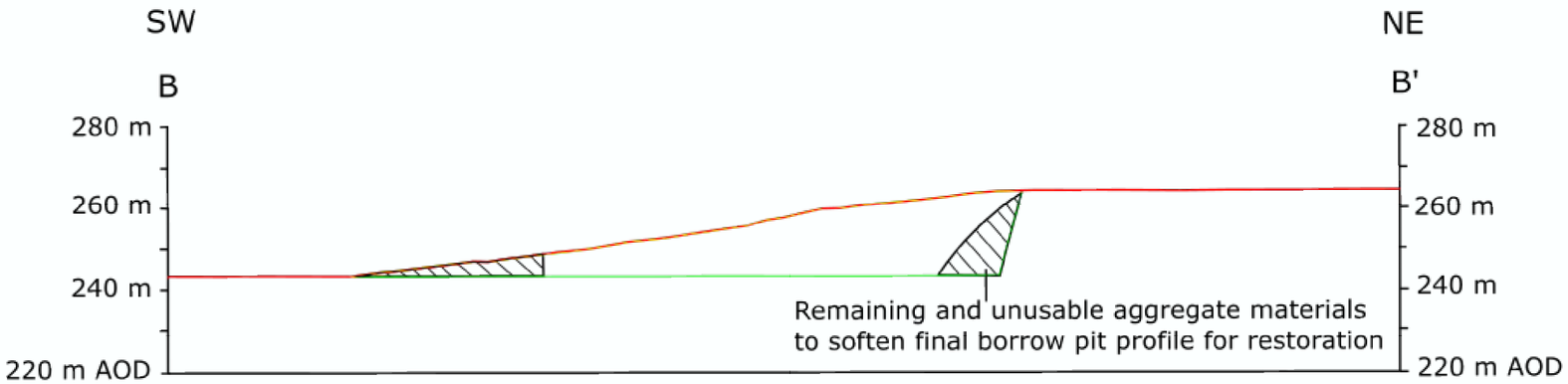
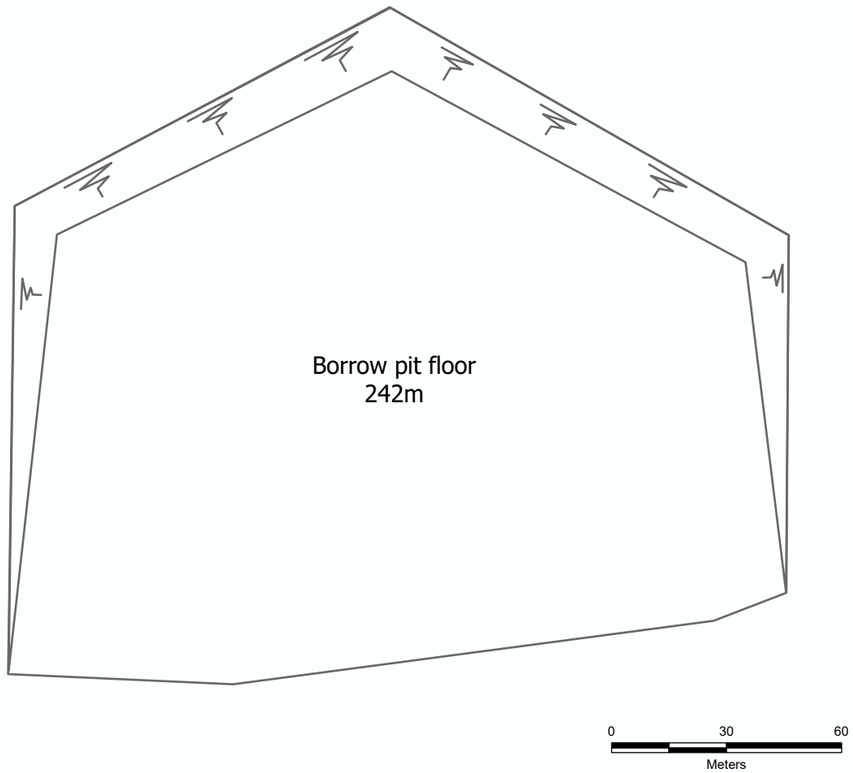
BP2 Cross-section



BP2 Design Plan



Legend:

- Existing Ground Profile
- Indicative Restoration Profile
- Indicative Restoration

Notes:
This map contains data from the following sources:
DATA SOURCE (DATE)

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	14/12/2021	First Draft	CM	CI	CI
01	20/01/2022	Update floor elevation	CM	CI	CI

Chleansaid Wind Farm

TITLE:

Figure 10.3.3:
Borrow Pit 2 Design

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