ESB Asset Development UK Limited

Millmoor Rig Wind Farm: Borrow Pit Assessment

Technical Appendix 10.2

663320 -P10.2 (01)

NOVEMBER 2022

RSK GENERAL NOTES

Project No.: 663320-P10.2 (01)

Title: Millmoor Rig Wind Farm: Borrow Pit Assessment

Client: ESB Asset Development UK Limited

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Author	Lucy McCulloch	**Technical reviewer**	Catherine Isherwood
Date:	19/08/2022	Date:	19/09/2022

Project manager	Robert Beck
Date:	20/08/22

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1 INTRODUCTION

1.1 This report provides a Borrow Pit Assessment for Millmoor Rig Wind Farm (hereafter referred to as 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 the EIA Report. 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 Proposed Development site ('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 in Wauchope Forest in the Scottish Borders south of Chesters. The site is located to the east of the Tweedsmuir hills in the Southern Uplands. The Proposed Development falls entirely within the Scottish Borders Council area. The land within the site is currently in use as active, short rotation commercial forestry (SRF).

1.5 The majority of the site falls within the Jed Water catchment, with the Jed Water flowing north east through the site. The Catlee Burn flows to the west of the site and the north west part of the site falls within the Catlee Burn catchment. The site is underlain by noncalcarious mineral gleys, brown forest soils and peaty soils.

Development Proposals

1.6 The Proposed Development infrastructure would include:

- up to 13 wind turbines, of approximately 6 MW each, five with a maximum tip height of 180 m, two with a maximum tip height of 200 m, four with a maximum tip height of 210 m and two with a maximum tip height of 230 m;
- hardstanding areas at the base of each turbine, with a permanent area of approximately 2,156 m^2;
- site entrance and access track from the A6088 using the route of an existing forestry track, and access track linking the turbine locations. Total length of access tracks is 14,909.9 m, of which 3,897.7 m is new access track with associated new watercourse crossings and 11,012.2 m is existing access track and watercourse crossings which will need to be upgraded;

- an operations control building with parking and welfare facilities;
- two potential substation compounds;
- an energy storage facility with a capacity of *c*. 14.8 MW;
- telecommunications equipment;
- up to two temporary construction compounds;
- three borrow pit search areas, 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 site 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; and
- 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; and
- 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 on a 1:50,000 scale and the British Geological Survey Lexicon of Named Rock Units (BGS, 2022; UKRI, 2022). Geology mapping is shown on **Figure 10.1**, Volume 2.

Bedrock Geology

2.1 The BGS GeoIndex (BGS, 2022) indicates that the northern region of the site is underlain by bedrock of the Hawick Group. The bedrock consists of thin to medium bedded calcareous greywacke and interbedded silty mudstones.

2.2 The southern region of the site, including the access area, is underlain by bedrock of the Ballagan Formation, which comprises grey mudstone and siltstones, with nodules and beds of ferroan dolomite; evaporite deposits are also present within the formation. Thin sandstones are found across much of the formation while thick sandstone layers are localised.

2.3 The north westernmost part of the site is underlain by bedrock from the Riccarton Group, with small areas from the Stratheden and Inverclyde Groups and from the Hawick Group. The Riccarton Group strata consist of greywackes with interbedded mudstones and dark grey, finely laminated siltstone beds. The Stratheden and Inverclyde Groups include undifferentiated sandstone and fine-grained (argillaceous) rocks.

2.4 A small area in the south of the site is underlain by the Birrenswark Volcanic Formation, comprising olivine-basalt lavas with impersistent sedimentary intercalations.

2.5 Some minor faulting is present in the area, with two faults located in the westernmost part of the site trending in a north-east to south-west direction. One minor earthquake has been recorded at 358698 603196, 3.1 km south west of the site, with a local magnitude (R_L) of 1.1, in 2016 (BGS, 2022).

Mineral Extraction

2.6 The BGS GeoIndex (BGS, 2022) has identified no mapped mineral occurrences or mineral abstraction sites on the land within the application boundary. The Coal Authority map (Coal Authority, 2022) has identified no occurrences of coal mining.

2.7 There are two quarries on the land within the application boundary indicated on 1:25,000 OS maps. These quarries are located within the western region of the site. No other quarries or mines have been identified within 3 km of the application boundary.

Superficial Geology

2.8 Superficial deposits are dominated by Devensian till, comprising diamicton deposited during the last glacial period. Diamicton is a very variable glacial sediment consisting of unsorted material ranging in size from clay to boulders, usually with a matrix of clay to sand. The till covers the majority of the site, with the exception of high elevation areas of Wardmoor Hill in the west, Weasel Hill in the north and Green Law in the south; these areas have no superficial deposits present.

2.9 The channels of the Black Burn and Carter Burn in the east and the Jed Water in the central region of the site are indicated to contain alluvial deposits. The alluvium is a sorted or semi-sorted mixture of clay, silt, sand and gravel of fluvial origin deposited in the Holocene period.

Rock Volumes

2.10 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.

2.11 The provided total aggregate volume required is **110,420 m^3**. Including 20% contingency, this amounts to a total of **132,504 m^3**.

2.12 Three borrow pit areas have been identified to provide suitable rock for use as aggregate in turbine bases, hardstanding areas and access tracks. The volumes of material that could be supplied from each borrow pit are provided in **Table 10.2.1**.

Table 10.2.1: Aggregate volumes

Aggregate Source	Required Volume (m^3)	Design Volume (m^3)
Borrow Pit BP1	44,168	103,067
Borrow Pit BP2	44,168	99,147
Borrow Pit BP3	44,168	77,708
Total (m^3):	**132,504**	**279,922**

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 (Scottish Government, 1996), potential impacts on:

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

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

- Noise;
- Vibration;
- Dust; and
- 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 up to three borrow pits to supply rock aggregate for the Proposed Development. 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 All three proposed borrow pits are adjacent to existing access tracks.

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

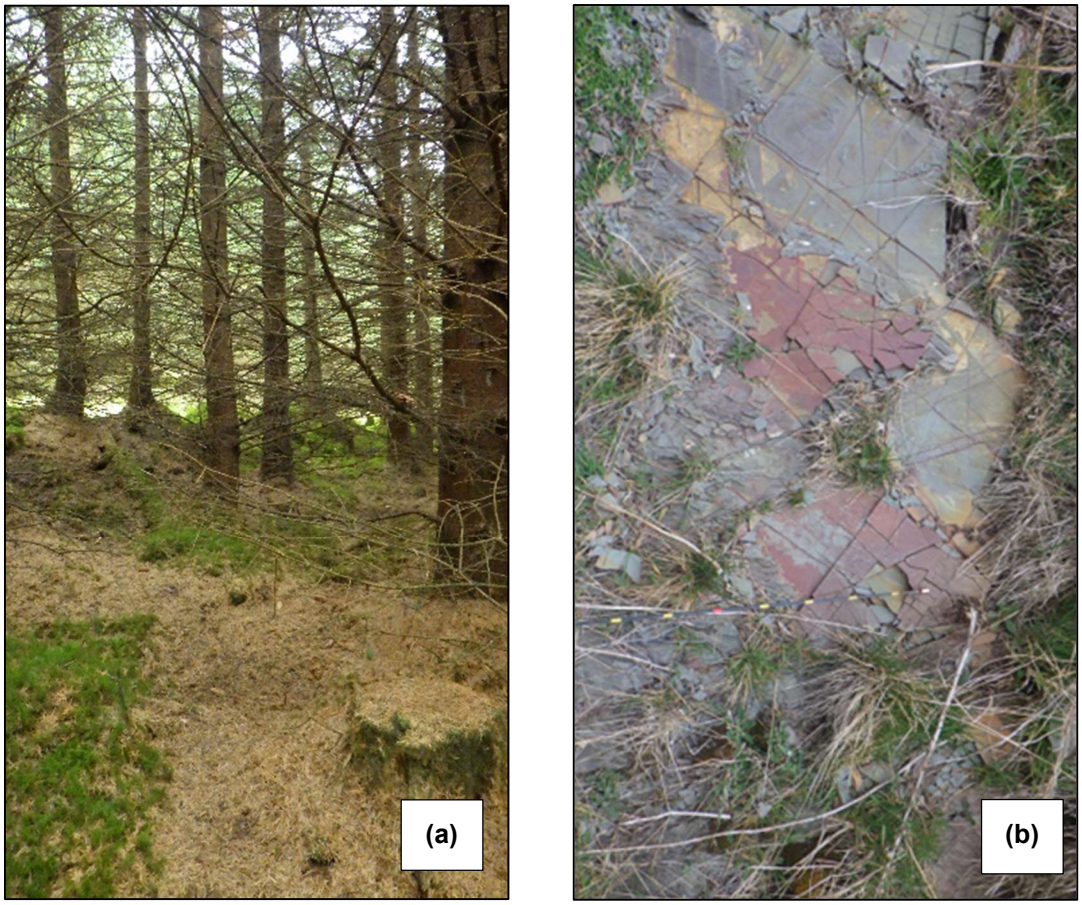
3.2 The *Water Environment (Controlled Activities) (Scotland) Regulations 2011* as amended set out good practice guidelines to prevent pollution of the groundwater environment. These guidelines reflect good operational practices and would be implemented at the Proposed Development.

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 10.2.1** below shows a view across the area to the east of Borrow Pit BP1, together with images of exposed bedrock located at a quarry close to the borrow pit location.

3.5 The existing topography of the proposed borrow pit area, the borrow pit development plan and the borrow pit cross-section line are illustrated in **Figure 10.2.1**.



Photograph 10.2.1: (a) View north in the area of Borrow Pit BP1; (b) Exposed bedrock at quarry south west of Borrow Pit BP1

Topsoil Stripping and Storage

3.6 Data collected during the Phase 1 and 2 peat depth surveys confirm that the proposed borrow pit area has no peat cover. Soil depths within the borrow pit area are recorded as 0 m; immediately surrounding the borrow pit area soil depths range from 0 to 0.15 m. The average soil depth across the borrow pit footprint is 0 m, based on site records. The borrow pit area is located on the north eastern slope of Wardmoor Hill. It is located 500 m north east of a disused quarry which provides good exposure of the underlying rock. The borrow pit is located within an area of forestry.

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

3.8 Topsoil would be removed in strips from the initial excavation area and would be stored in a temporary storage area. Topsoil would be stored in mounds which would not exceed 2 m in height, to minimise compaction of the soil. Additionally, the mounds would be shaped to promote shedding of water. Some limited blading would be undertaken on the soil mound surface to assist in the 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 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 greywacke 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 299 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 the lower north-eastern slope of Wardmoor Hill. The borrow pit has been designed to have one main working face, with two subsidiary faces, and a gently sloping floor level at 299 m AOD. The faces would be up to 8 m in height, blasted at an angle of 75° from the horizontal. The general direction of working would be to the south-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. 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 from a short access track link from the main track route to turbine T09. This track is already existing and would not require any upgrading or widening work.

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 For restoration the borrow pit floor would be ripped or routed to break up the surface; soils and turf material would then be replaced over the area. The soils would contain a natural 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 (ECoW) at the point of restoration and a suitable seed mix would be identified for this process.

Borrow Pit 2: Development

3.20 **Photograph 10.2.2** below shows a view looking south across Borrow Pit BP2. There was no exposed bedrock in this area.

Photograph 10.2.2: View south across Borrow Pit BP2

3.21 The existing topography of the proposed borrow pit area, the borrow pit development plan and the borrow pit cross-section line are illustrated in **Figure 10.2.2**.

Topsoil stripping and storage

3.22 Data collected during the Phase 1 and 2 peat depth surveys confirm that the proposed borrow pit area has no peat cover. Soil depths across the area range from 0.15 to 0.4 m, with an average depth of 0.29 m. The borrow pit area is located on relatively flat ground east of the Jed Water and adjacent to an existing access track. It is situated within an area of forestry.

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

3.24 Topsoil would be removed in strips from the initial excavation area and would be stored in a temporary storage area. Topsoil would be stored in mounds which would not exceed 2 m in height, to minimise compaction of the soil. Additionally, the mounds 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 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 sandstone and limestone 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 234 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 slightly to the south-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 gently rising ground. The borrow pit has been designed to have one working face and two subsidiary faces, with a gently sloping floor level at 234 m AOD. The working face would be up to 7 m in height, blasted at an angle of 75° from the horizontal. The general direction of working would be to the south-east, with blasted rock removed and transported to the relevant area of construction.

3.29 Drainage would be directed to the western 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 the main track route to turbine T04.

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 into the trackside drainage system.

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.

3.35 The borrow pit floor would be ripped or routed to break up the surface; soils and turf material would then be replaced over the area. The soils would contain a natural 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 seed mix would be identified for this process.

Borrow Pit 3: Development

3.36 **Photograph 10.2.3** below shows a view looking north across Borrow Pit BP3. There was no exposed bedrock in this area.

3.37 The existing topography of the proposed borrow pit area, the borrow pit development plan and the borrow pit cross-section line are illustrated in **Figure 10.2.3**.

Photograph 10.2.3: View north across Borrow Pit BP3

Topsoil stripping and storage

3.38 Data collected during the Phase 1 and 2 peat depth surveys confirm that the proposed borrow pit area has no peat cover. Soil depths across the area range from 0.15 to 0.4 m, with an average depth of 0.35 m. The borrow pit area is located on sloping ground north of turbine T01 within an area of felled forestry.

3.39 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.

3.40 Topsoil would be removed in strips from the initial excavation area and would be stored in a temporary storage area. Topsoil would be stored in mounds which would not exceed 2 m in height, to minimise compaction of the soil. Additionally, the mounds 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.

3.41 As the borrow pit excavation develops, the topsoil 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

3.42 The sandstone and limestone 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 270 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.

3.43 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.

3.44 The proposed location of the borrow pit is on a north facing slope. The borrow pit has been designed to have one working face and two subsidiary faces, with a gently sloping floor level at 270 m AOD. The working face would be up to 8 m in height, blasted at an angle of angle of 75° from the horizontal. The general direction of working would be to the south, with blasted rock removed and transported to the relevant area of construction.

3.45 Drainage would be directed to the north-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.

3.46 The borrow pit would be accessed from the main track route to turbine T01.

3.47 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

3.48 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.

3.49 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

3.50 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.

3.51 The borrow pit floor would be ripped or routed to break up the surface; soils and turf material would then be replaced over the area. The soils would contain a natural 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 seed mix would be identified for this process.

4 ENVIRONMENTAL REVIEW

4.1 Most potential environmental effects associated with borrow pit development have been considered within relevant EIA Report chapters. As a result, this section provides a brief review of environmental issues not addressed elsewhere.

Dust

4.2 Borrow pit operations are relatively small-scale, owing to the small aggregate volume requirement for the new and upgraded access tracks and hardstanding areas, including ongoing supply for track maintenance during the operation of the Proposed Development.

4.3 Dust emissions can arise from blasting, 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 the Proposed Development for use in dust suppression in dry and windy conditions, to control and minimise dust emissions. Any processing plant brought to the Proposed Development 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 blasting, processing and loading-out of oversized and processed material. With these appropriate controls in place, effects from dust emissions would be negligible.

Lighting

4.4 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

4.5 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 to ensure that environmental effects are kept to a practical minimum.

6 REFERENCES

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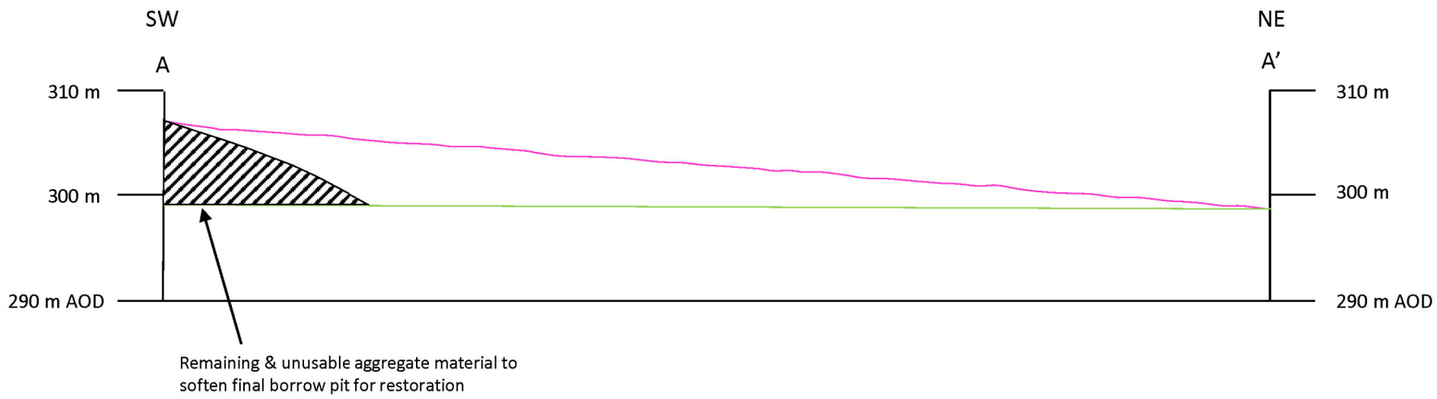
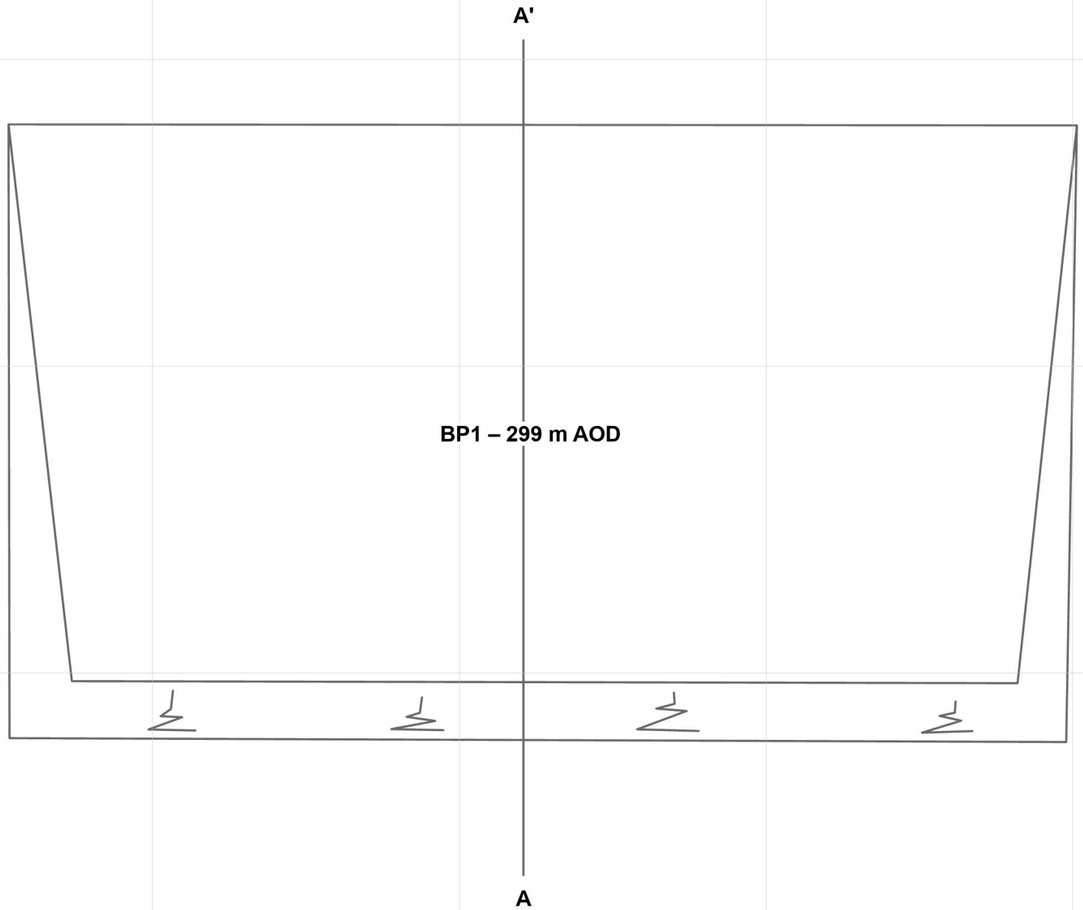
361300 361350 361400 361450 361500 361550 361600

606900 606850 606800 606750 606700

BP1 Cross Section



BP1 Design Plan



Legend:
- Existing ground profile
- Indicative excavation profile
- Indicative restoration

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

Rev	Date	Description	Drn	Chk	App
00	10/11/2022	First Draft	DL	CI	CI

Millmoor Rig Wind Farm

TITLE: Figure 10.2.1
Borrow Pit 1 Design

ID:P663320 Borrow Pit_Plans_Borrow Pit 1

0 0.5 1
Kilometres

Design Plan Scale: 1:1,000 @ A3

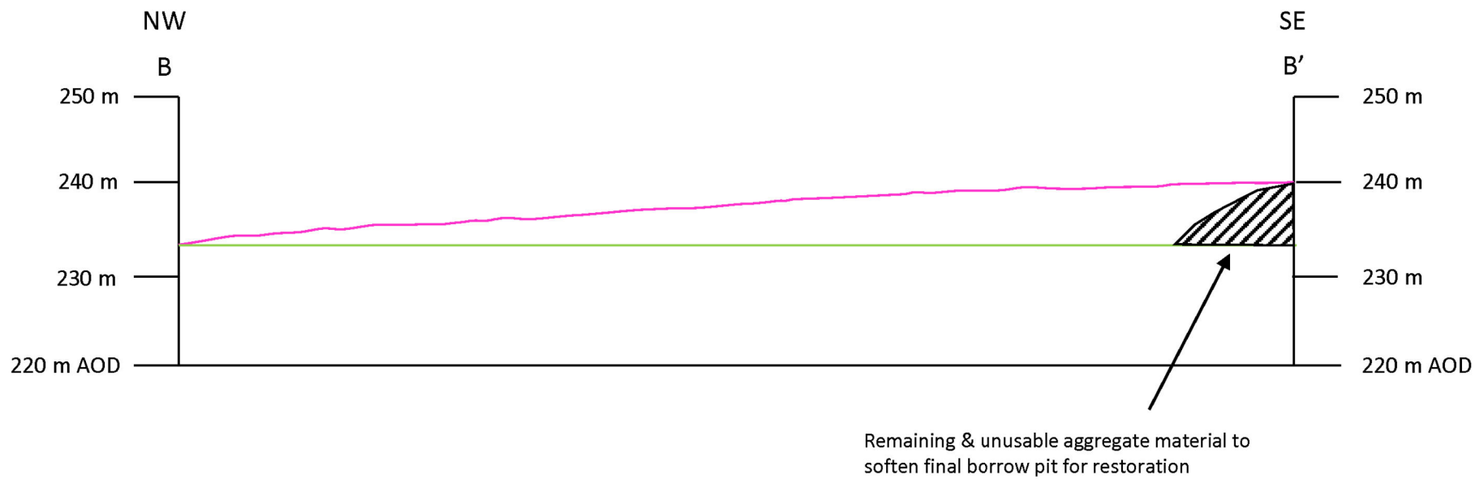
REV 00

Path: H:\600000 - Glasgow\663320 Millmoor Rig Wind Farm EIA\01 - GIS\03Figures\02Draft

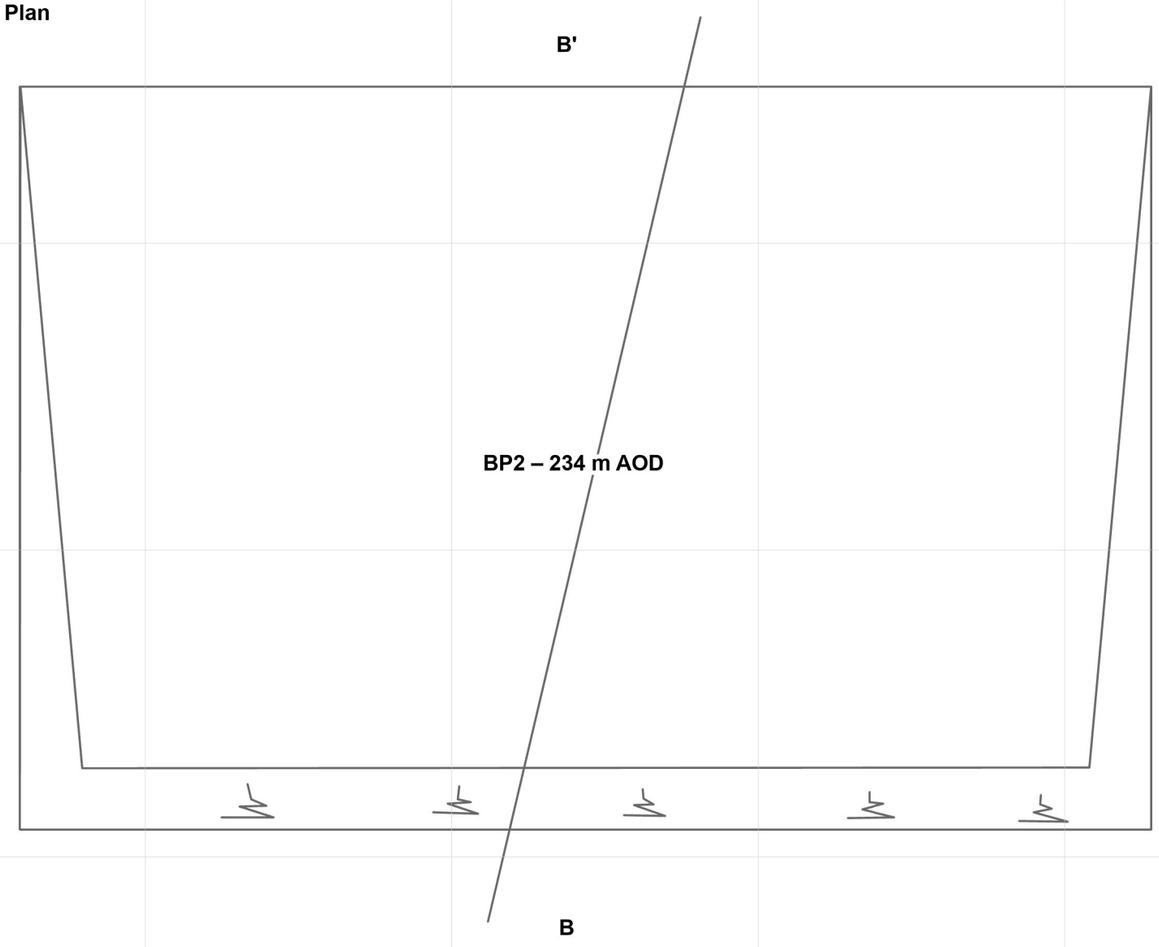
362950 363000 363050 363100 363150 363200

606950 606900 606850 606800 606750 606700

BP2 Cross Section



BP2 Design Plan



Legend:
- Existing ground profile
- Indicative excavation profile
- Indicative restoration

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

Rev	Date	Description	Drn	Chk	App
00	10/11/2022	First Draft	DL	CI	CI

Millmoor Rig Wind Farm

TITLE: Figure 10.2.2
Borrow Pit 2 Design

ID:P663320 Borrow Pit_Plans_Borrow Pit 2

0 0.5 1
Kilometres

Design Plan Scale: 1:1,000 @ A3

REV 00

Path: H:\600000 - Glasgow\663320 Millmoor Rig Wind Farm EIA\01 - GIS\03Figures\02Draft

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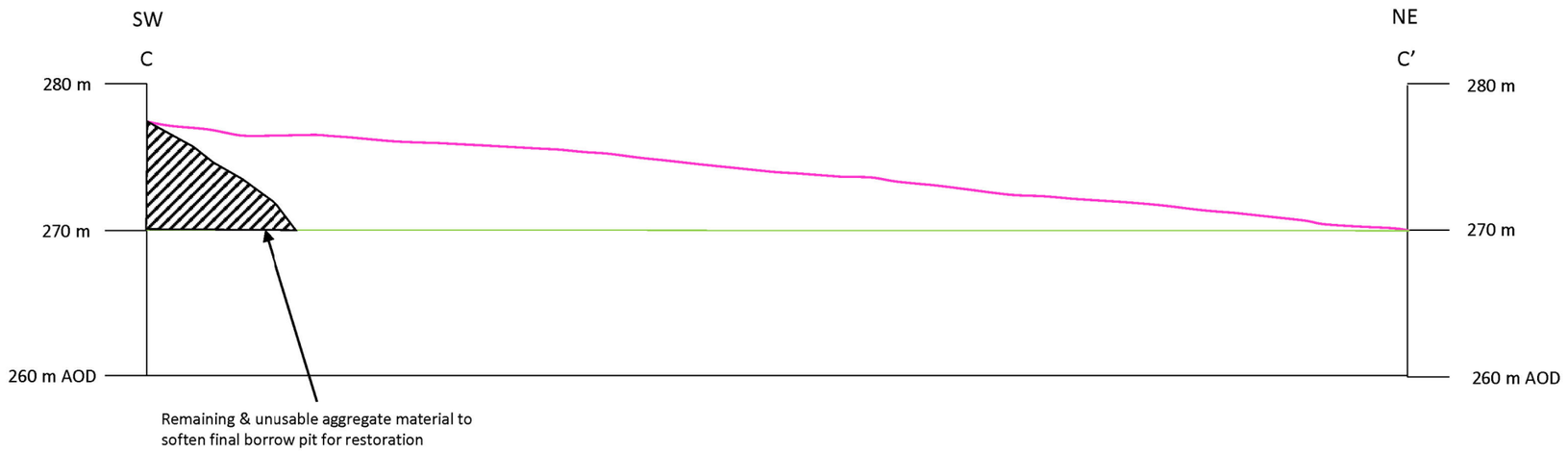
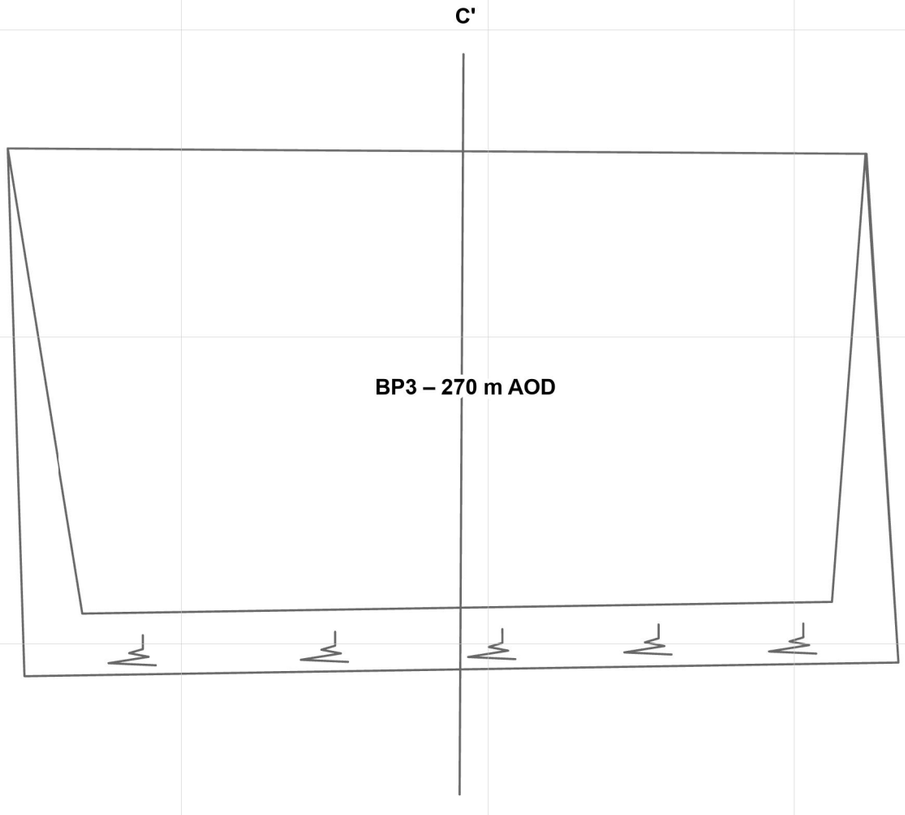
606000 605950 605900 605850 605800

BP3 Cross Section



BP3 Design Plan



Legend:
- Existing ground profile
- Indicative excavation profile
- Indicative restoration

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

Rev	Date	Description	Drn	Chk	App
00	10/11/2022	First Draft	DL	CI	CI

Millmoor Rig Wind Farm

TITLE: Figure 10.2.3
Borrow Pit 3 Design

ID:P663320 Borrow Pit_Plans_Borrow Pit 3

0 0.5 1
Kilometres

Design Plan Scale: 1:1,000 @ A3

REV 00

Path: H:\600000 - Glasgow\663320 Milmoor Rig Wind Farm EIA\01 - GIS\03Figures\02Draft