Technical Appendix 2.2: Borrow Pit Assessment

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1.1 Introduction

1.1.1 To reduce the volume of imported aggregate transported and any consequent environmental impacts, borrow pits are to be located within the Site (subject to further geotechnical evaluation), to source aggregate required for track construction, turbine bases, crane pads, compounds and hardstanding areas. This report provides details of the proposed on-site borrow pits for use during the construction phase of the Proposed Development. The Proposed Development is described in **Chapter 2: Development Description (EIAR Volume 2)** and the proposed borrow pit search areas are shown on **Figure 2.2.1** (**Annex 1** to this Technical Appendix). **Section 1.4** of this report provides specific information about the borrow pit search areas and restoration details.

Aims of this Report

1.1.2 This report provides geo-engineering information on the potential borrow pits that would be opened within the Site. The aim of this assessment is to provide:

- A preliminary indication of the suitability of the bedrock as construction material;
- Potential borrow pit locations;
- Indicative borrow pit dimensions;
- Indicative extraction volumes;
- Estimates of overburden volumes from borrow pit locations;
- An indication of potential extraction methods;
- Recommendations for geotechnical testing; and
- Preliminary borrow pit re-instatement and rehabilitation proposals.

1.1.3 This report outlines the methodology used by Ramboll for borrow pit assessment along with the analysis undertaken, conclusions drawn, and recommendations for borrow pit design at each location.

Limitations

1.1.4 It should be noted that all borrow pit information provided within this report is indicative only and is based on desk study and reconnaissance within the Site boundary alone. No intrusive investigation (other than peat probing) has been carried out and consequently the suitability of the rock, suggested extraction methods and volumes are broad estimates and should be treated as such. A detailed ground investigation (such as boreholes and trial pits) would be required to determine the suitability of the rock (extent and quality), potential for groundwater ingress, and to determine geotechnical parameters. Recommendations would then be made with regards to groundwater control, slope stability, extraction methods and finalised detailed design. The search areas have been identified for a borrow pit to allow for any adjustments following the results of the ground investigation. The final dimensions of each borrow pit are likely to be significantly different to the individual search areas (i.e. they would be smaller).

1.1.5 This report represents the findings and opinions of experienced geotechnical consultants based upon the information obtained from a variety of sources as detailed below. Ramboll believes the information obtained from third parties is reliable but does not guarantee its authenticity. The information has been accepted *de facto* but professional judgement has been used in its interpretation.

1.2 Methodology

1.2.1 This report comprises a desk-based study. The desk study consisted of a review of the available geological and hydrogeological data together with additional information relating to the Site including:

- 1:50,000 and 1:25,000 scale Ordnance Survey (OS) topographic mapping;
- OS Elevation Digital Terrain Mapping (DTM) data;
- Review of geological mapping within the Site boundary, British Geological Survey (BGS)[1] 1:50,000 scale;
- Review of publicly available aerial photography and OS aerial imagery;
- BGS 1:625,000 scale hydrogeological map[2]; and,
- Review of peat probe survey field data – refer to **Technical Appendix 8.5 (EIAR Volume 4)**.

1.2.2 Four borrow pit search areas have been identified. These proposed borrow pit locations have been considered in more detail in this report, with preliminary layouts and volume estimates calculated of material which could be extracted. This is discussed in more detail in subsequent sections of this report.

Borrow Pit Constraints

1.2.3 One of the principal factors affecting borrow pit location is the thickness of overburden material, due to the increased effort required for its excavation and handling before the source of the aggregate is reached. Therefore, this assessment has sought to identify optimal borrow pit locations where there would be no, or only a very thin veneer of superficial deposits, especially peat (due to its high moisture content and broader environmental considerations).

1.2.4 In addition, the identification of borrow pit search areas has sought to avoid areas of high groundwater table in order to reduce the potential for adverse effects on groundwater dependent terrestrial ecosystems (GWDTE). In doing so, the borrow pit search areas also reduce the potential for erosion and additional processes required for handling and treatment of groundwater. At this stage groundwater mitigation measures are considered not to be required. However, groundwater levels within the proposed borrow pit search areas are not known and would be confirmed as part of the findings from detailed ground investigation.

1.2.5 The borrow pit search areas have also been selected to avoid existing watercourses due to the potential for runoff of sediment and fine-grained material.

1.2.6 Consideration is also given to the potential for visual effects and impacts on the setting of cultural heritage features; however, it is considered that, with sensitive development and appropriate restoration, significant effects on visual amenity associated with borrow pits can be avoided.

1.2.7 The locations of the potential borrow pits have been selected to be close to the existing access tracks where possible and in all cases close to proposed site infrastructure to allow early opening of borrow pits to support the construction effort and to minimise any additional new track requirements that would increase volume of imported aggregate that would need to be brought to site.

[1] British Geological Society BGS Geo Index mapping. Available: https://mapapps2.bgs.ac.uk/geoindex/home.html

[2] British Geological Survey, 1:625,000 scale digital hydrogeological data. Available: http://www.bgs.ac.uk/products/hydrogeology/maps.html

1.3 Desk Study and Site Information

1.3.1 The Site location and setting are described within **Chapter 2: Development Description (EIAR Volume 2)**.

Topography

1.3.2 The Site predominantly comprises open moorland, improved grassland and semi-improved grassland, with areas of forestry located in the valleys, predominantly to the east of the B797. The Site terrain is undulating with multiple hills within the Site boundary such as Ravengill Dod (499 m Above Ordnance Datum (AOD)), Coom Dod (553 m AOD) and Brown Dod (489 m AOD). This landscape is typical of the wider location within the Southern Uplands. Topography elevations are shown on **Figure 8.7.1, Technical Appendix 8.7 (EIAR Volume 4)**.

Superficial Geology

1.3.1 The 1:50,000 scale geological mapping available from the BGS[1] shows superficial geology is absent across the majority of the Site. Localised areas of peat are mapped across the Site, with the largest area mapped at the Harryburn Brae and Peat Hill. A large area of site shows Devensian Till – Diamicton, presenting along the north and extending to the northwest part of the Site. Alluvium with Clay, sand and silt deposits are shown to be present within valley formations and lower slopes of the hill formations located outside the Site boundary. Alluvial deposits are shown to be present along watercourse formations. Refer to **Figure 8.3 (EIAR Volume 3a)** which accompanies **Chapter 8: Hydrology, Hydrogeology, Geology and Soils (EIAR Volume 2)**.

1.3.2 Peat probing undertaken in 2025 and 2026 confirmed the majority of the Site has either no peat present or has a shallow depth of peat present (refer to **Figure 8.6**, **EAIR Volume 3a**). The findings of the peat surveys are presented within **Technical Appendix 8.5 (EIAR Volume 4)**.

1.3.3 The depth of superficial deposits was taken into account when selecting potential borrow pit locations, typically avoiding areas with >0.5 m peat or other superficial deposits.

Bedrock Geology

1.3.4 The underlying bedrock across the Site comprises Portpatrick Formation (Wacke) to the northeast of Leadhills and Kirkcolm Formation (Wacke) in the northwest of Leadhills. There are small areas of Crawford Group (Chert) which is faulted, shown crossing the Site in a northeast to south westerly direction, and this comprises lava, chert, tuff and mudstone succession. This is shown in **Figure 8.7.3.1** within **Technical Appendix 8.7 (EIAR Volume 4)**.

1.3.5 The 1:50,000 scale geological mapping available from the BGS[1] shows most of the Site is underlain by the following formations:

- Kirkcolm Formation- Wacke (KKF);
- Portpatrick Formation and Glenwhargen Formation (Undifferentiated) - Wacke (PPGW);
- Crawford Group and Moffat Shale Group (Undifferentiated) - Mudstone, Chert and Smectite-Claystone (CRMF); and
- Stewartry Group - Sandstone, Breccia and Conglomerate (STEW).

The underlying bedrock formation for each borrow pit is as follows:

- BP1 – KKF
- BP2 – KKF
- BP3 – CRMF at the west of the borrow pit and KKF at the east.
- BP4 – PPGW

Structural Geology

1.3.6 The Leadhills fault runs across the Site between the KKF and PPGW in a northeast to southwest direction.

1.3.7 The BGS 1:625,000 scale hydrogeology mapping[2] defines the rocks as follow:

- KKF = low productivity aquifer (Highly indurated greywackes with limited groundwater in near surface weathered zone and secondary fractures).
- PPGW = low productivity aquifer (Highly indurated greywackes with limited groundwater in near surface weathered zone and secondary fractures).
- CRMF = low productivity aquifer (Very limited groundwater from fractures. Very limited outcrop areas).
- STEW = highly productivity aquifer (Regionally important aquifer up to 1500 m thick with sandstones and breccias yielding up to 40 L/s).

1.3.8 The average annual rainfall for the nearest weather station (Met Office weather station at Camps Reservoir[3]) is 1353.45 mm, based on the most recent dataset (1991 to 2020).

Surface Water Features

1.3.9 The entirety of the Site, including access tracks and proposed turbine locations is shown to be within the River Clyde catchment (SEPA Catchment No. 97). Larger tributaries of the River Clyde, that are located within the site boundary include the following:

- Glengonnar Water (flows in a northerly direction adjacent to the B797, crossed from east to west at the location of a current ford at Lettershaws);
- Laggen Gill (crossed by proposed access track at its downstream extents);
- Kirk Gill (crossed by proposed access track at its downstream extents);
- Glencaple Burn (crossed by the access track at its upstream extent, between Turbine 11 and Turbine 12, and crossed by the access track at its downstream extent approximately 250 m north of the Glencaple properties at an existing ford location);
- Glenkip Burn (crossed by proposed access track between Turbine 4 and Turbine 7);
- Glendorch Burn (crossed by proposed access track between Turbine 1 and Turbine 3); and
- Elvan Water/Shortcleugh Water (Offsite, adjacent to the southeast of the B7040 and immediately south of the southern site boundary); and

1.3.10 Multiple unnamed watercourses are present on the Site, including a number of watercourses which are crossed by existing infrastructure in the form of circular culverts.

1.3.11 Surface water flood risk associated with the aforementioned watercourses, appears to be confined to the main channel and immediate surrounding area. Small areas of Low risk of flooding are expected to impact the northern access track, with the area of highest risk of associated with land in the north where the proposed access track crosses Laggen Gill and Glengonar Water.

1.3.12 SEPA mapping identifies some limited areas of elevated surface water flood risk on the Site. Generally, the Site is at a very low risk of surface water flooding (less than a 1 in 1,000 (0.1%) annual probability).

[3] https://weather.metoffice.gov.uk/forecast/gcv7wm5dw#?date=2026-05-06

Groundwater Dependent Terrestrial Ecosystems (GWDTE)

1.3.13 The following information should be read in conjunction with **Technical Appendix 8.2 (EIAR Volume 4**, which provides the hydrological assessment of potential impacts of the Proposed Development on GWDTE. It confirmed that no GWDTE are present on Site.

Surface Water

1.3.14 The borrow pit search areas have been selected to avoid borrow pit extraction within 50 m of existing watercourses or waterbodies and with standard mitigation (i.e., an upslope cut-off/ diversion ditch to intercept surface water together with minor attenuation features or soakaways) the borrow pits are not considered likely to have any significant effect on surface water.

Suitability of Bedrock within the Site as an Aggregate

1.3.1 The wacke bedrock beneath the east/southeast of the Site is part of the PPGW which the BGS Lexicon describes as Wacke and Siltstone turbidite succession. The west of the Site is underlain by KKF which is described in the BGS Lexicon as a Sandstone/Siltstone turbidite sequence. There is also CRMF present from the northeast to southwest of the Site which the BGS Lexicon describe as lava, chert, tuff and mudstone succession. The wacke, mudstone and siltstone formations are argillaceous rocks and possess the potential for generating increased fines during excavation and processing which may limit its use as a structural fill material.

1.3.2 Sandstone is commonly used source of construction aggregate and, according to the BGS, the vast majority of sandstone quarried in the UK is used for crushed rock aggregate. Its suitability as aggregate largely depends on its strength, porosity and durability, which are in turn governed by characteristics such as mineralogical composition, grain size and sorting, cementation and weathering state.

1.3.3 A key factor in the suitability of rock as aggregate is the mineral constitution and mode of occurrence, as often their quality is not uniform. The weathering state of the rock is also of high importance, as this weakens the aggregate and reduces durability. The depth of weathering is dependent on the distribution of joints and other rock discontinuities.

1.3.4 Walkover surveys were not conducted. Hence, the rock type, discontinuity spacing and bedding orientation cannot be verified at this stage. An assumed rock type and weathering profile will be used for the purposes of this assessment based on the desk study information above. However, it is recommended that these assumptions be confirmed through a walkover survey where possible.

1.3.5 The proposed borrow pit locations would need detailed investigations to verify rock type and quality, bedding orientation and weathering profile to minimise extraction of unsuitable or argillaceous material with a potential for high fines content after excavation/ grading.

1.4 Borrow Pit Locations and Restoration Details

1.4.1 The proposed borrow pit search areas have been selected based on a preferential morphology for stone extraction (limited cover, rock close to surface and steep slopes). The search areas have been sited to avoid areas with >0.5 m peat, as far as practicable, or other significant depths of superficial deposits. They also take into account visual, ecological, hydrological and cultural heritage constraints. The search areas identified allow for any adjustments following the results of the ground investigation. The borrow pits are likely to be smaller in size relative to the search areas.

1.4.2 The borrow pit search areas are located with the aim of providing four areas of site-won rock within the Site boundary, in an effort to minimise transportation of aggregate.

1.4.3 The preliminary estimation of potential material quantities which could be extracted from the proposed borrow pit locations are provided in Tables 2.2.1 to 2.2.4. The volumes given have been calculated from 3D modelling of the borrow pits assuming all extraction is undertaken from a single layer or 'bench', taking into account gradients of the ground surface and the indicative borrow pit footprint dimension and depth approximations. Please note that these figures do account for a 20% reduction due to wastage (associated with bands of unsuitable fine-grained bedrocks or highly weathered material) or bulking of excavated materials.

1.4.4 No account has been taken in the calculations for 'winning' rock during the construction phase (e.g. through track and turbine base excavations and widening of the existing track). The extent of material sourced in this manner would minimise the extraction of rock from the borrow pits.

1.4.5 Overburden/ soils together with processing residue would be carefully stockpiled adjacent to the excavation void for use in the borrow pit restoration process. The stockpiles would be located and battered so as to limit instability and erosion. Silt fences and mats will be used to minimise sediment levels in runoff from the stockpiles.

1.4.6 It is anticipated that, upon completion, the borrow pits would be partially reinstated. This would involve the reworking of faces to stabilise them, partial infilling with site-won material and landscaping with soils excavated during construction of the Proposed Development. There would also be the potential for environmental enhancement by creating small wetlands or other desirable habitats, further details of which are set out within the **Outline Biodiversity Enhancement Management Plan (OBEMP) (EIAR Volume 4, Technical Appendix 6.7)**

1.4.7 Borrow pit restoration would utilise processing residues and overburden and would create slopes within the excavation at an approximate gradient of 1 (V) in 1 (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 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 this face would acquire an appearance similar to that of other natural rock exposures in the locality.

Borrow Pit Details

1.4.8 An indicative borrow pit design has been prepared for each proposed borrow pit search area, and includes the following details and assumptions:

- The footprint area of the excavation for the proposed borrow pit;
- A typical cross section for the borrow pit;
- Assumed quarry face profile approximately 70 degrees;
- The borrow pit floor is excavated to a nominal depth but would in practice be inclined gently down slope into the excavation;
- The maximum height of any single face would be no more than 20 m; and
- Drainage would be managed using a peripheral cut off ditch.

Proposed Borrow Pit BP1 (NGR Ref. 288241 618637)

1.4.9 Proposed borrow pit BP1 is located north of Turbine 2, to the west of the Site, as shown on **Figure 2.2.1**. The majority of peat cover at this location is <0.5 m depth; however, there are localised areas of 0.6 m peat depth present at this location based on the Stage 2 peat probe surveys undertaken.

Table 2.2.1: Proposed Borrow Pit BP1	
Borrow Pit Site Area	Maximum dimensions of search area: 100 m length 185 m width
Borrow Pit Search Area	14,603 m²
Borrow Pit Excavation Dimensions	Assumed dimensions: 80 m length 150 m width
Height of Excavation	20 m maximum
Area of Land Impacted	10,000 m^2 (Total Footprint incl. tie-in) 6,000 m^2 (Total Footprint excl. tie-in)
Slope Angle from DTM mapping	The slope angle of the search area is approx. 15 degrees
Elevation of floor during construction	445 to 466 m Above Ordnance Datum (mAOD)
Details of Extraction	Rock type, rock quality and weathering profile are based on assumptions for this assessment as no walkover was conducted to observe the rock within the Borrow Pit Search area. The assumptions are: ▪ Hard digging to easy ripping is assumed (Sandstone and siltstone). ▪ Hard digging to breaking is assumed (Wacke). ▪ Orientation and spacing of discontinuities are unknown, As such a 70° angle of repose is assumed for the faces of the excavation.
Overburden Type and Depth	Superficial deposits during the peat probing survey recorded a maximum depth of 0.71 m of peat in this location, an overburden of 0.75 m is assumed.
Indicative volume of aggregate extraction	Approximate volume of 57,300 m^3 once 25% reduction applied.
Aggregate Composition	Assumed fine to coarse grained sandstone and siltstone with low to moderate weathering potential.

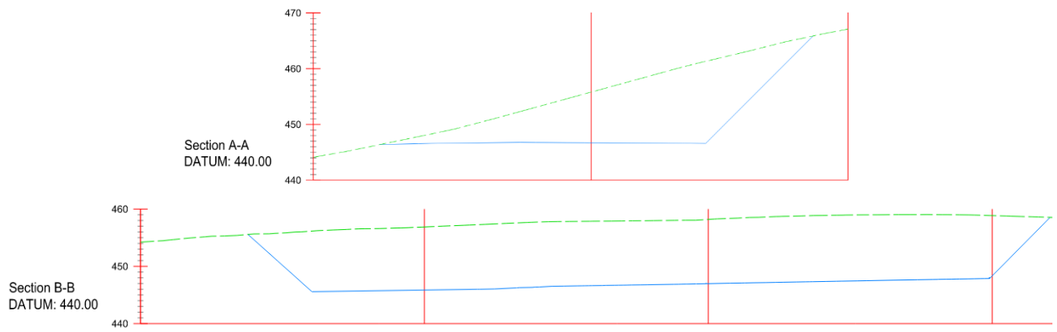

Chart 1 Typical Borrow pit Sections BP1

Proposed Borrow Pit BP2 (NGR Ref. 289501 620267)

1.4.10 Proposed borrow pit BP2 is located northeast to the Indicative Construction Compound 3, at the northwest of the Site boundary, as shown on **Figure 2.2.1**. The majority of peat cover at this location is <0.5 m depth; however, there is one localised area of 0.7 m peat depth present at this location based on the Stage 2 peat probe surveys undertaken.

Table 2.2.2: Proposed Borrow Pit BP2	
Borrow Pit Site Area	Maximum dimensions of search area: 175 m length 190 m width
Borrow Pit Search Area	25,802 m²
Borrow Pit Excavation Dimensions	Assumed dimensions: 120 m length 60 m width
Height of Excavation	11 m maximum
Area of Land Impacted	6,600 m^2 (Total Footprint incl. tie-in) 5,000 m^2 (Total Footprint excl. tie-in)
Slope Angle from DTM mapping	The slope angle of the search area is approx. 13 degrees
Elevation of floor during construction	358 to 371 m Above Ordnance Datum (mAOD)
Details of Extraction	Rock type, rock quality and weathering profile are based on assumptions for this assessment as no walkover was conducted to observe the rock within the Borrow Pit Search area. The assumptions are: ▪ Hard digging to easy ripping is assumed (Sandstone and siltstone). ▪ Hard digging to breaking is assumed (Wacke). ▪ Orientation and spacing of discontinuities are unknown, As such a 70° angle of repose is assumed for the faces of the excavation.
Overburden Type and Depth	Superficial deposits during the peat probing survey recorded a maximum depth of 0.65 m of peat in this location, an overburden of 0.75 m is assumed.
Indicative volume of aggregate extraction	Approximate volume of 22,200 m^3 once 25% reduction applied.
Aggregate Composition	Assumed fine to coarse grained sandstone and siltstone with low to moderate weathering potential.

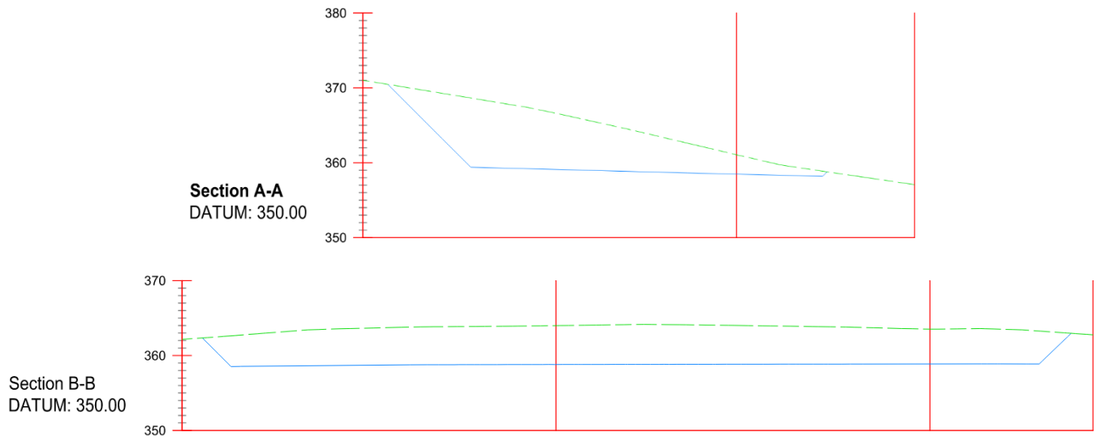

Chart 2 Typical Borrow pit Sections BP2

Proposed Borrow Pit BP3 (NGR Ref. 290243 618760)

1.4.11 Proposed borrow pit BP3 is located to the south of the Indicative Substation and BESS, to the southeast of the Site boundary, as shown on **Figure 2.2.1**. The majority of peat cover at this location is <0.5 m depth; however, there are localised areas of up to 0.85 m peat depth present at this location based on the Stage 2 peat probe surveys undertaken.

Table 2.2.3: Proposed Borrow Pit BP3	
Borrow Pit Site Area	Maximum dimensions of search area: 95 m length 200 m width
Borrow Pit Search Area	21,523 m²
Borrow Pit Excavation Dimensions	Assumed dimensions: 95 m length 150 m width
Height of Excavation	17 m maximum
Area of Land Impacted	13,800 m^2 (Total Footprint incl. tie-in) 10,650 m^2 (Total Footprint excl. tie-in)
Slope Angle from DTM mapping	The slope angle of the search area is approx. 12 degrees
Elevation of floor during construction	451 to 470 m Above Ordnance Datum (mAOD)
Details of Extraction	Rock type, rock quality and weathering profile are based on assumptions for this assessment as no walkover was conducted to observe the rock within the Borrow Pit Search area. The assumptions are: ▪ Hard digging to easy ripping is assumed (Sandstone, shale, mudstone and siltstone). ▪ Hard digging to breaking is assumed (Wacke). ▪ Breaking is assumed (Chert). ▪ Orientation and spacing of discontinuities are unknown, As such a 70° angle of repose is assumed for the faces of the excavation.
Overburden Type and Depth	Superficial deposits during the peat probing survey recorded a maximum depth of 1.0 m of peat in this location, an overburden of more than 0.5 m is assumed.
Indicative volume of aggregate extraction	Approximate volume of 60,863 m^3 once 25% reduction applied.
Aggregate Composition	Assumed fine to coarse grained sandstone and siltstone with low to moderate weathering potential. Or very fine grained chert and mudstone with low to moderate weathering potential.

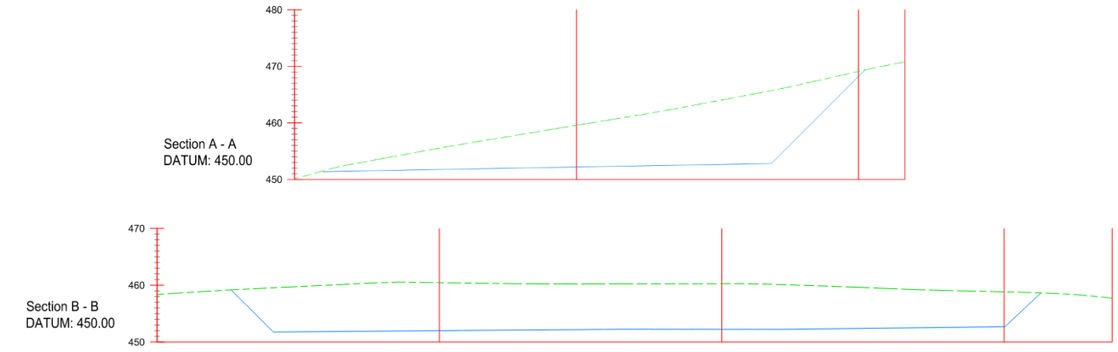

Chart 3 Typical Borrow pit Sections BP3

Proposed Borrow Pit BP4 (NGR Ref. 291622 618437)

1.4.12 Proposed borrow pit BP4 is located south of Turbine 15, in the eastern area of the Site, as shown on **Figure 2.2.1**. The majority of peat cover at this location is <0.5 m depth; however, there are localised areas of up to 0.9 m peat depth present at this location based on the Stage 2 peat probe surveys undertaken.

Table 2.2.4: Proposed Borrow Pit BP4	
Borrow Pit Site Area	Maximum dimensions of search area: 180 m length 150 m width
Borrow Pit Search Area	19,596 m²
Borrow Pit Excavation Dimensions	Assumed dimensions: 130 m length 100 m width
Height of Excavation	16 m maximum
Area of Land Impacted	10,500 m^2 (Total Footprint incl. tie-in) 7,500 m^2 (Total Footprint excl. tie-in)
Slope Angle from DTM mapping	The slope angle of the search area is approx. 13 degrees
Elevation of floor during construction	440 to 461 m Above Ordnance Datum (mAOD)
Details of Extraction	Rock type, rock quality and weathering profile are based on assumptions for this assessment as no walkover was conducted to observe the rock within the Borrow Pit Search area. The assumptions are: ▪ Hard digging to easy ripping is assumed (Siltstone). ▪ Hard digging to breaking is assumed (Wacke). ▪ Orientation and spacing of discontinuities are unknown, As such a 70° angle of repose is assumed for the faces of the excavation.
Overburden Type and Depth	Superficial deposits during the peat probing survey recorded a maximum depth of 0.9 m of peat in this location, an overburden of more than 0.5 m is assumed.
Indicative volume of aggregate extraction	Approximate volume of 51,750 m^3 once 25% reduction applied.

Table 2.2.4: Proposed Borrow Pit BP4	
Aggregate Composition	Assumed fine to coarse grained wacke and siltstone with low to moderate weathering potential.

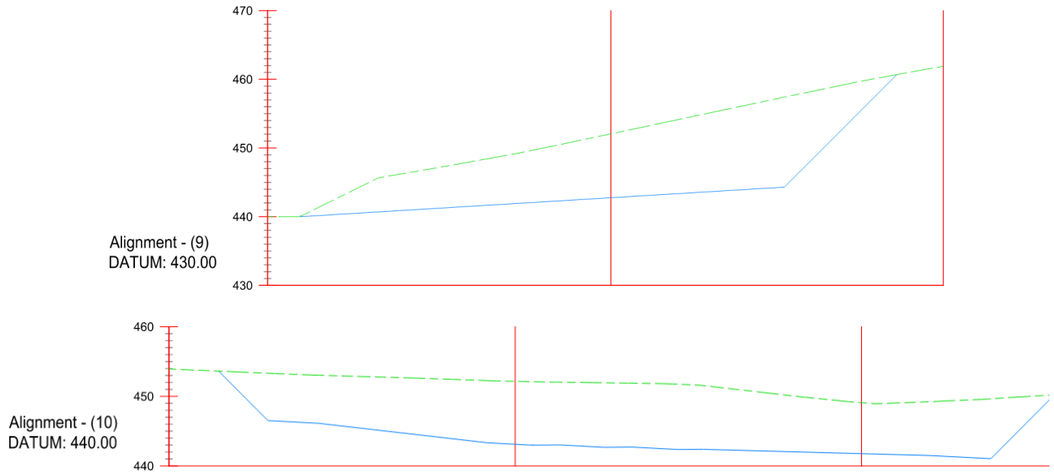

Chart 4 Typical Borrow pit Sections BP4

1.5 Summary

1.5.1 No walkovers were carried out across the Site therefore assumptions on bedrock at proposed borrow pit locations are based on the published BGS[1] data and the Site setting (slope angles and ground cover). Won materials within the Site would likely comprise of sandstone, siltstone and mudstones. A detailed assessment to determine the suitability of the rock would be required to confirm the exact extraction methods based on the intrusive site investigation data[4].

1.6 Construction Requirements

1.6.1 The requirement to produce various grades of aggregate would necessitate the use of mobile plant and equipment. This operation would comprise the different elements summarised below.

Excavation of Materials

1.6.2 Hard digging to easy ripping is envisaged to be the methodology required for extraction of materials based on the assessment of observed rock strength from BGS data. Rock samples should be taken for strength testing by an approved geotechnical laboratory to derive point load and Unconfined Compressive Strength (UCS) values. The contractor may wish to re-evaluate any alternatives to the requirement for digging on the basis of the available rock quality data (drilling and blasting may be required but it is considered unlikely).

Initial Stripping and Preparation

1.6.3 The initial access routes to the borrow pits would need to have some preparation prior to the introduction of the main items of excavation plant, particularly, those located off the existing access tracks to the Site.

1.6.4 It is anticipated that initial preparation would consist of a series of passes using an excavator with blade along or near to the final route of the permanent access track. This would have the effect of removing vegetation and any soft material, and also in compacting the weathered material located immediately above the bedrock. The gradients of prepared access way would be no steeper than 1(V) in 10(H). The borrow pit would be accessed from the existing track network. There is the potential for some short sections of track to be constructed from imported materials, unless locally sourced suitable materials can be located. In addition, the area of the proposed borrow pits 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 an appropriate storage area.

Crushing and Screening

1.6.5 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.

1.6.6 It is also envisaged that a rubber tyred front end loader would also be required in order to serve the crushing and stockpiling operation, as well as to produce loadout facilities for the truck and shovel based roadmaking operation.

Drainage

1.6.7 A drainage and surface water management system would be provided in order to control surface water runoff. Due to the relatively small size of any proposed excavation together with the associated plant site, the system would comprise of a peripheral cut-off ditch together with minor attenuation features or soakaways.

1.6.8 Given the low to moderate permeability and generally thin veneer of the overlying peat and superficial deposits it is not anticipated that groundwater ingress would be significant. However, the flow capacity of the bedrock would need to be determined to identify whether fracture flow is likely to be encountered and if standing water is likely to collect in the base of the excavation.

1.6.9 Water entering the borrow pits would need to be removed by either gravity drainage design or pumping depending on the overall morphology of the pit. The general topography in the areas identified is conducive to gravity drainage owing to the moderate to steep slopes. Discharge consent may be required from SEPA for this activity. Water removed from the excavations would be passed through an appropriate sediment settling system to remove suspended sediment prior to discharge. The constructed drainage system and water pumped from the excavations would not be discharged directly to any natural watercourse.

1.6.10 It is not anticipated that volumes of groundwater that would require management would be encountered by the opening of the borrow pits at the Site due to the high elevations and slope angles. However, the groundwater regime would need to be verified through further ground investigation.

[4] A revision of the graphical method for assessing the excavatability of rock, Pettifer and Fooks, Quarterly Journal of Engineering Geology and Hydrogeology 1994; v. 27; p. 145-164,

Environmental Management

1.6.11 The Proposed Development would be designed, constructed, operated and decommissioned in line with relevant environmental legislation, guidance and good practice, to ensure that soils, and both groundwater and surface water are not contaminated.

1.6.12 During construction activities, a Construction Environmental Management Plan (CEMP) would be used to manage the potential impacts on the environment, and a specific plan covering borrow pits would be developed as part of the CEMP. An outline CEMP (**Technical Appendix 2.1, EIAR Volume 4**) is submitted as part of the application for consent. A detailed version would be produced by the appointed construction contractor post-consent (in accordance with the outline version) and sought for approval with the relevant planning authorities prior to the commencement of construction works.

1.6.13 Assuming good practice techniques are adhered to at all times and the implementation of mitigation measures as discussed above, it is anticipated that residual impacts from borrow pit activities on surface water, groundwater and soils would not be significant.

1.7 Conclusions and Recommendations

1.7.1 Four proposed borrow pit search area locations have been investigated using desktop data analysis, fieldwork and visual appraisals.

1.7.2 No existing borrow pits were observed within the Site boundary.

1.7.3 The proposed borrow pits are likely to be predominantly fine grained with a high percentage of argillaceous rocks. The quality of finer grained materials would be verified through further ground investigation to minimise material unsuitable for construction being generated at the locations. No ground investigation has been undertaken within the Site to inform the assessment.

1.7.4 The proposed borrow pits are located on slopes with slope angles between 12° and 15°, which could be excavated within a single layer of excavation. The overburden depths within the Site are moderately deep, with the borrow pit max peat depths averaging 0.8m. The borrow pit locations possess limited potential for peat cover.

1.7.5 The estimated amount of aggregate which could be won from the proposed borrow pits has been calculated as approximately 192,100 m^3. This figure allows for a 25% reduction for unsuitable material or bulking of materials on excavation. This figure equates to approximately 97% of the estimated volume of aggregate required during the construction phase of the Proposed Development (197,960 m^3). To note, further site won aggregate would be available from the construction of the substation and BESS compounds which would mean that 100% of the aggregate required for construction of the Proposed Development could be won from a combination of the borrow pits and construction of on-site infrastructure. Refer to **Chapter 2: Description of Proposed Development (EIAR Volume 2)** for further details.

1.7.6 The primary use of aggregate arisings would be for the construction of tracks using unbound aggregate to the turbine suppliers' specifications and conforming to the Specification for Highways Works.

1.7.7 Detailed ground investigations, slope stability assessments and geotechnical testing would be required to inform the detailed design of the borrow pit to confirm the suitability of the material for use as part of the Proposed Development. It is anticipated that impacts on groundwater, surface water and soils from extraction of aggregate would not be significant, assuming use of good practice construction techniques and implementation of mitigation measures as set out in this document

Legend

- Site Boundary

Site Layout

- Turbine Layout
- New Standard Track Centreline
- New Floating Track Centreline
- Upgraded Track Centreline
- Turbine Hardstanding
- Indicative Substation and BESS
- Indicative Construction Compound
- Borrow Pit Search Area
- Proposed Borrow Pit (Base)
- Proposed Borrow Pit (Slope incl. Tie-In)

Figure Title
Borrow Pits

Project Name
Ravengill Energy Park

Project No./Filery ID
1620017435 / REH2024N04129

Date	Figure No.	Revision
April 2026	2.2.1	1.0

Prepared By	Scale
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Client
Ravengill Energy Park Limited

RAMBOLL

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