



Renantis UK Limited

The Repowered and Extended Ben Aketil Wind Farm: Groundwater-Dependent Terrestrial Ecosystems Assessment

Technical Appendix 9.3

663617-P9.3 (00)

MAY 2023

RSK



RSK GENERAL NOTES

Project No.: 663617-P9.3 (00)

Title: The Repowered and Extended Ben Aketil Wind Farm: Groundwater-Dependent Terrestrial Ecosystems Assessment

Client: Renantis UK Limited (formerly Falck Renewables Wind Limited)

Date: May 2023

Office: Stirling

Status: Final

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1 INTRODUCTION

- 1.1 This report provides a Groundwater-Dependent Terrestrial Ecosystem (GWDTE) Assessment for The Repowered and Extended Ben Aketil Wind Farm (hereafter the 'Proposed Development').
- 1.2 The report forms a Technical Appendix to the Environmental Impact Assessment Report (EIAR) for the Proposed Development and should be read in conjunction with the EIAR. It has been produced in response to concerns over development in areas with, or that have potential to affect, sensitive groundwater-dependent habitats raised by the Scottish Environment Protection Agency (SEPA) and The Highland Council's (THC) Ecology Officer.
- 1.3 Within this Technical Appendix, the following definitions will be used: the 'Site' refers to everything within the application red line boundary and the 'Developable Area' refers to an area within the red line boundary defined by the applicant as the area where the turbines and associated infrastructure would be located.
- 1.4 GWDTE are protected under the Water Framework Directive and are potentially sensitive receptors to the impacts of development. This report identifies the potentially groundwater-dependent habitats present at the Proposed Development ('the Site') and identifies and assesses the potential impacts of the Proposed Development on these habitats. Design and mitigation methods to avoid or minimise these risks are set out, along with good construction practices that would be employed during all site works.

Site Location

- 1.5 The Site is located on the Isle of Skye, in The Highland Council area, south-west of Coishletter and Edinbane, north-east of Dunvegan, and north of the settlements of Roskhill and Caroy. The Site incorporates the existing Ben Aketil Wind Farm comprising 12 operational wind turbines and associated wind farm infrastructure. Currently, access is gained to the operational Ben Aketil Wind Farm via a track leading southwards from the A850, 2 km west of Edinbane.
- 1.6 The land in the Developable Area slopes downward from north-east to south-west, generally consisting of upland moorland habitat, rough grazing and watercourses, most notably the Caroy River in the western part of the Site. There is an area of commercial forestry to the north of the Site boundary through which the Northern Site Access track runs.

Development Proposals

- 1.7 The Proposed Development infrastructure would include:
- decommissioning and removal of the twelve existing turbines and related infrastructure including hardstandings and the existing operational control building;

- erection of nine new turbines of approximately 5.6 to 6.6 MW each, with a maximum tip height of 200 m, a rotor diameter of approximately 140 m to 155 m and hub height of 115 to 122.5 m;
- hardstanding areas at the base of each turbine, each 3,820 m², with a maximum total area of 34,380 m²;
- approximately 9 km of new track, of which 1.5 km will consist of floating track;
- approximately 2.3 km of upgraded track;
- two substations and associated compounds including parking and welfare facilities;
- an energy storage facility;
- up to six construction compounds;
- a storage bund area;
- two potential borrow pits, to provide suitable rock for access tracks, turbine bases and hardstandings; and
- underground cabling linking the turbines with substations.

1.8 Full details of the Proposed Development design are provided in **Chapter 2** of the EIAR.

Aims

1.9 This report aims to undertake a review of relevant baseline information, including habitat and vegetation data and hydrogeological details, in order to provide an assessment of the risk to groundwater-dependent habitats. Recommendations will be made for mitigation measures and construction methods that should be implemented to minimise the risk of disturbance or damage to sensitive habitats during construction works and ongoing development operations.

Assessment Method

1.10 This assessment has involved the following stages:

- desk study;
- vegetation mapping;
- hydrogeological assessment;
- detailed assessment of sensitive habitats;
- identification of protection and mitigation measures.

2 DESK STUDY

Information Sources

- 2.1 The desk study involves a review of available relevant information sources on the ground conditions at the Proposed Development. Information Sources included:
- Ordnance Survey topographical mapping at 1:50,000, 1:25,000 and VectorMap Local Raster;
 - British Geological Survey (BGS) geological mapping, superficial and bedrock;
 - BGS online borehole records;
 - Centre for Ecology and Hydrology Flood Estimation Handbook Web Service;
 - Data provided by the client, including turbine foundation and track design specifications;
 - The Highland Council's private water supplies records;
 - Scotland's Soils digital soil mapping, 1:250,000 scale; and
 - Scottish Environment Protection Agency's (SEPA) *A functional wetland typology for Scotland*.

Climate and Topography

- 2.2 The Proposed Development is located approximately 15 km west of Portree and 5 km east of Dunvegan, on the Isle of Skye. The Isle of Skye is part of the Highland Council area and is situated within the UK Meteorological (Met) Office's Northern Scotland climate district (Met Office, 2016). Much of Northern Scotland is exposed to the rain-bearing westerly winds associated with Atlantic depressions which pass close to, or across the UK. Scotland's Western Isles and north-west coast are, on average, the windiest in the UK and are fully exposed to the Atlantic weather fronts. On average, annual temperatures are around 9°C in areas of lower altitude, including the Western Isles, and 1°C on some of the higher summits.
- 2.2.1 The Proposed Development is around 10 km south-west of the Prabost climate monitoring station (Met Office, 2023). Rainfall patterns at the Site are expected to be similar to those observed at the Prabost monitoring station. Average annual rainfall from 1991-2020 for the Prabost monitoring station is 1,769.05 mm compared to 1,702.52 mm for the Northern Scotland climate district. The altitude at the Prabost monitoring station is 67 m above Ordnance Datum (AOD).
- 2.3 The Proposed Development lies on relatively low undulating ground which slopes gently from north-east to south-west. Elevations in the Site range from around <5 m AOD in the southernmost part of the Site, to 268 m AOD near the eastern margin.
- 2.4 The highest point within the Site is the peak of Ben Aketil on the eastern margin of the Site at 268 m AOD. From Ben Aketil, the ground slopes down to the north, west and south. The westernmost part of the site begins to rise again on the western side of the Caroy River. The southernmost part of the site is just above sea level, near where the Caroy River flows into the sea loch Loch Caroy.

- 2.5 The Northern Site Access slopes down from the existing Ben Aketil Wind Farm and joins the A850 at approximately 50 m AOD.

Geology

- 2.5.1 Geological information is derived from BGS GeoIndex online geological mapping and the BGS Lexicon of Named Rock Units (BGS, 2023a; 2023b).

Bedrock Geology

- 2.6 The Site is underlain by basalt lavas from the Skye Lava Group varying in composition from alkali basalt to hawaiite and mugearite, all of Palaeogene age. Some lavas include larger crystals of feldspar and are described as feldspar-phyric. The majority of the bedrock has a finely crystalline and relatively uniform texture and dark grey to brown colour.
- 2.7 A series of dykes is present across the Site. These form part of the North Britain Palaeogene Dyke Suite and consist of basalt and microgabbro. The dykes all trend in a north-west to south-east direction and are associated with the Skye Central Complex that forms the Cuillin hills.
- 2.8 The area is cut by a series of north-west to south-east trending extensional faults cross-cut by later north-south or north-east to south-west trending faults, relating to a period of folding and basin formation. The faults are not geologically active and recent seismic activity in the area is very limited. No earthquakes have been recorded within the Site. Within 5 km of the Site one minor earthquake was recorded in 1986, with a Richter local magnitude (RM_L) of 1.5.

Superficial Geology

- 2.9 BGS GeoIndex (2023a) indicates that the Site is dominated by extensive peat deposits in most areas, which appear slightly sparser in the east and south.
- 2.10 Small pockets of Devensian diamaction till are distributed around the Site, particularly around watercourses. Till is described as highly variable glacial sediment consisting of unsorted material ranging in size from clay to boulders, usually with a matrix of clay to sand.
- 2.11 Alluvium consisting of clay, silt, sand and gravel is also present within the Site, particularly around the Caroy River where it appears relatively extensive.
- 2.12 No artificial ground was identified within the Site.

Soils and Peat

- 2.13 The Soil Survey of Scotland (1981) digital soils mapping indicates that soil coverage within the Site predominantly consists of peat, peaty gleys and peaty podzols of the Darleith Association. Areas of brown earth soils are present, particularly near the Caroy River. Two areas of blanket peat are identified: in the north-west of the Site, and south of the Aketil Burn in the south-east of the Site.
- 2.14 Some peat data within the Developable Area had been gathered previously and the results were provided to RSK. Additional Phase 1 survey work on a 100 m grid to cover

additional parts of the Developable Area, the existing wind farm and a proposed access corridor was undertaken by RSK in June 2022. A Phase 2 peat depth and condition survey was undertaken by RSK in August and November 2022 for areas of proposed infrastructure and access tracks. Details are provided in **Technical Appendices 9.1 and 9.2**.

- 2.15 According to NatureScot's Carbon and Peatland Map (2016), the majority of the Site is underlain by Class 1 soils and peatland, defined as 'nationally important carbon-rich soils, deep peat and priority peatland habitat' which are considered to be areas likely to be of high conservation value. Elsewhere in the Site, Class 0 soils are found around the Caroy River. Some minor areas of the Site are underlain by Classes 2, 3 and 5 soils or peatland.

Hydrogeology

- 2.16 The Site is underlain by bedrock forming part of the Skye North groundwater body. This is classed as a low productivity aquifer with small amounts of groundwater in the near-surface weathered zone and secondary fractures. Flow is virtually all through fractures and discontinuities (Scottish Government, 2023).
- 2.17 The Skye North groundwater body is considered to have good water quality and is in good overall status (Scottish Government, 2023).
- 2.18 Regional groundwater flow will tend to mimic the natural topography, predominantly flowing south and west from the slopes of Ben Aketil toward the Caroy River and Loch Caroy. In the area around the Northern Site Access, groundwater flow would mainly be towards the north-west and the Red Burn.
- 2.19 The superficial deposits within the Site are predominantly peat. Peat bodies will hold some groundwater but drainage is impeded and poor. Flow within peat is known to be extremely slow, although it can contribute some limited baseflow to local streams and burns. The diamicton till, alluvium and alluvial fan deposits may hold groundwater but their restricted area indicates that they would not be able to hold significant volumes.
- 2.20 There are no superficial aquifers within the application boundary.

Hydrology

- 2.21 The Site is located across two catchments: the Caroy River and Red Burn (FEH, 2023). The Caroy River catchment covers the majority of the Site and incorporates the main watercourse, the River Caroy.

Caroy River Catchment

- 2.22 The Caroy River catchment has a total area of 13.06 km² and drains 86.6% of the site.
- 2.23 The Caroy River flows south through the Site and provides the main drainage within this catchment. Several smaller tributaries drain into the Caroy River in the north of the Site around Gleann Eoghainn and in the south around Upper Feorlig. In the centre of the Site, the Rageary Burn and associated tributaries drain west into the Caroy River. In the south of the Site, the Aketil Burn drains south-west into the Caroy River.

2.24 The northern area of the Caroy River catchment is an upland region characterised by heather moorland, peatland and minor areas of forestry. The south is characterised by lower lying ground, peatland and areas of agricultural land.

Red Burn Catchment

2.24.1 The Red Burn catchment has a total area of 13.21 km² and drains 10% of the site.

2.25 The Red Burn and its tributaries provide drainage for the north-west of the Site and the Northern Site Access. The Allt a' Choire and several associated tributaries drain north-west out of the Site towards the Red Burn. The Northern Site Access crosses the Allt a' Choire and two other minor tributaries which drain west towards the Red Burn: the Allt Donachaidh and an unnamed tributary.

9.25.1 The southern part of the Red Burn catchment is an upland area characterised by peatland and moorland; the rest of the catchment predominantly comprises areas of commercial forestry and rough open land, with some evidence of lazy bed cultivation in the lower reaches.

Catchment Statistics

2.26 The catchment wetness index (PROPWET) for both the Caroy River and Red Burn is 0.73, indicating that soils in the Site are wet for 73% of the time. Both catchments have a baseflow index (BFI HOST19) of 0.26, indicating a very low input of groundwater baseflow to surface watercourses. The standard percentage runoff (SPR HOST) is 55-57%, indicating that this percentage of rainfall onsite is converted into surface runoff from rainfall events; this represents a high runoff risk where soils have a limited capacity to store rainfall and/or a slow infiltration rate and will quickly saturate, leading to rapid runoff.

2.27 Catchment statistics derived from the Flood Estimation Handbook Web Service are provided in **Table 9.3.1** (CEH, 2023) Catchment statistics are provided for the main catchments within the site.

Table 9.3.1: Proposed Development Catchment Statistics.

Catchment Name	Catchment Wetness Index (PROPWET)	Base Flow Index (BFI HOST19)	Standard Percentage Runoff (SPR HOST)	Site Area %
Caroy River	0.73	0.259	55.45%	86.6
Red Burn	0.73	0.258	57.07%	10.0

Private Water Supplies

2.28 Inspection of THC's private water supply (PWS) database indicates that there are seven private water supplies (PWS) within 2 km of the site. An initial risk screening indicates that these are all located in separate catchments or separate sub-catchments from all proposed works and are therefore not considered to be at any risk from the Proposed Development.

3 VEGETATION AND GROUNDWATER DEPENDENCY

3.1 GWDTE are defined by the UKTAG (2004) as:

‘A terrestrial ecosystem of importance at Member State level that is directly dependent on the water level in or flow of water from a groundwater body (that is, in or from the saturated zone). Such an ecosystem may also be dependent on the concentration of substances (and potential pollutants) within that groundwater body, but there must be a direct hydraulic connection with the groundwater body.’

3.2 In line with the guidance provided in UKTAG (2004), a dual ecological and hydrogeological approach to identifying GWDTE has been used. This involves a detailed study of vegetation communities in order to determine the potential level of groundwater dependency, combined with a detailed hydrogeological study in order to identify locations where groundwater reaches the surface and is therefore able to provide a source of water to terrestrial ecosystems.

3.3 Determining groundwater dependency is complex as most water-dependent terrestrial ecosystems rely on a combination of groundwater, surface water and rainwater, and many vegetation communities will use whatever source of water is available. In some topographical and hydrogeological conditions, a particular ecosystem is surface water dependent. Seasonal patterns of water availability influence water use, providing an additional level of complexity; groundwater reliance is typically greater in the summer when rainfall and surface water are less available (Isherwood, 2013).

Vegetation Mapping

3.4 Vegetation within the Proposed Development has been surveyed using a combined Phase 1 habitat and National Vegetation Classification (NVC) survey method and is reported in full in **Chapter 7**, with mapping provided in **Figures 7.3a and 7.3b** of the EIAR. The key findings relating to groundwater dependency are summarised below.

3.5 NVC communities identified by SEPA as likely to be highly or moderately groundwater-dependent, depending on the hydrogeological setting, are listed in SEPA’s publications ‘Planning advice on on-shore windfarm developments’ (SEPA, 2017a) and ‘Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems’ (SEPA, 2017b).

3.6 UKTAG Annex 1 differentiates communities by class, where Class 1 is potential high groundwater-dependency, Class 2 is potential moderate groundwater-dependency and Class 3 is potential low groundwater-dependency (UKTAG, 2009).

3.7 National Vegetation Classification (NVC) survey mapping indicates that the majority of the Site largely comprises blanket mire and wet modified bog, with small areas of dry and wet heath, and acid and marshy grassland. A variety of acid flushes are found across the Site, primarily within the blanket mire habitats.

3.8 Habitats within the southern area of the Site and around the proposed Southern Site Access are a mix of improved fields for grazing with some remnant patches of bog, some areas of planted broadleaf woodland and acid grassland. The north of the Site is bordered

by dense spruce and pine plantation, some of which shows evidence of fire damage. The Northern Site Access runs through this area of forestry.

3.9 The potentially groundwater-dependent NVC communities identified within the site are found in **Table 9.3.2**.

Table 9.3.2: Potential Groundwater Dependency Classification of Identified NVC Communities Within the Proposed Development.

SEPA (2017b) groundwater dependency classification	NVC community	UKTAG (2009) groundwater dependency classification
Highly groundwater-dependent	M6 <i>Carex echinata</i> – <i>Sphagnum recurvum/auriculatum</i> mire	1 (High)
	M9 <i>Carex rostrata</i> – <i>Calliergon cuspidatum/giganteum</i> mire	1
	M10 <i>Carex dioica</i> – <i>Pinguicula vulgaris</i> mire	1
	M23 <i>Juncus effusus</i> – <i>Galium palustre</i> rush-pasture	2 (Moderate)
	W7 <i>Alnus glutinosa</i> – <i>Fraxinus excelsior</i> – <i>Lysimachia nemorum</i> woodland	1
Moderately groundwater-dependent	M15 <i>Scirpus cespitosus</i> – <i>Erica tetralix</i> wet heath	2 (Moderate)
	M25 <i>Molinia caerulea</i> – <i>Potentilla erecta</i> mire	3 (Low)
	M27 <i>Filipendula ulmaria</i> – <i>Angelica sylvestris</i> mire	2
	MG9 <i>Holcus lanatus</i> – <i>Deschampsia cespitosa</i> grassland	2
	MG10 <i>Holcus lanatus</i> – <i>Juncus effusus</i> rush-pasture	2
	U6 <i>Juncus squarrosus</i> – <i>Festuca ovina</i> grassland	2

4 DETAILED ASSESSMENT

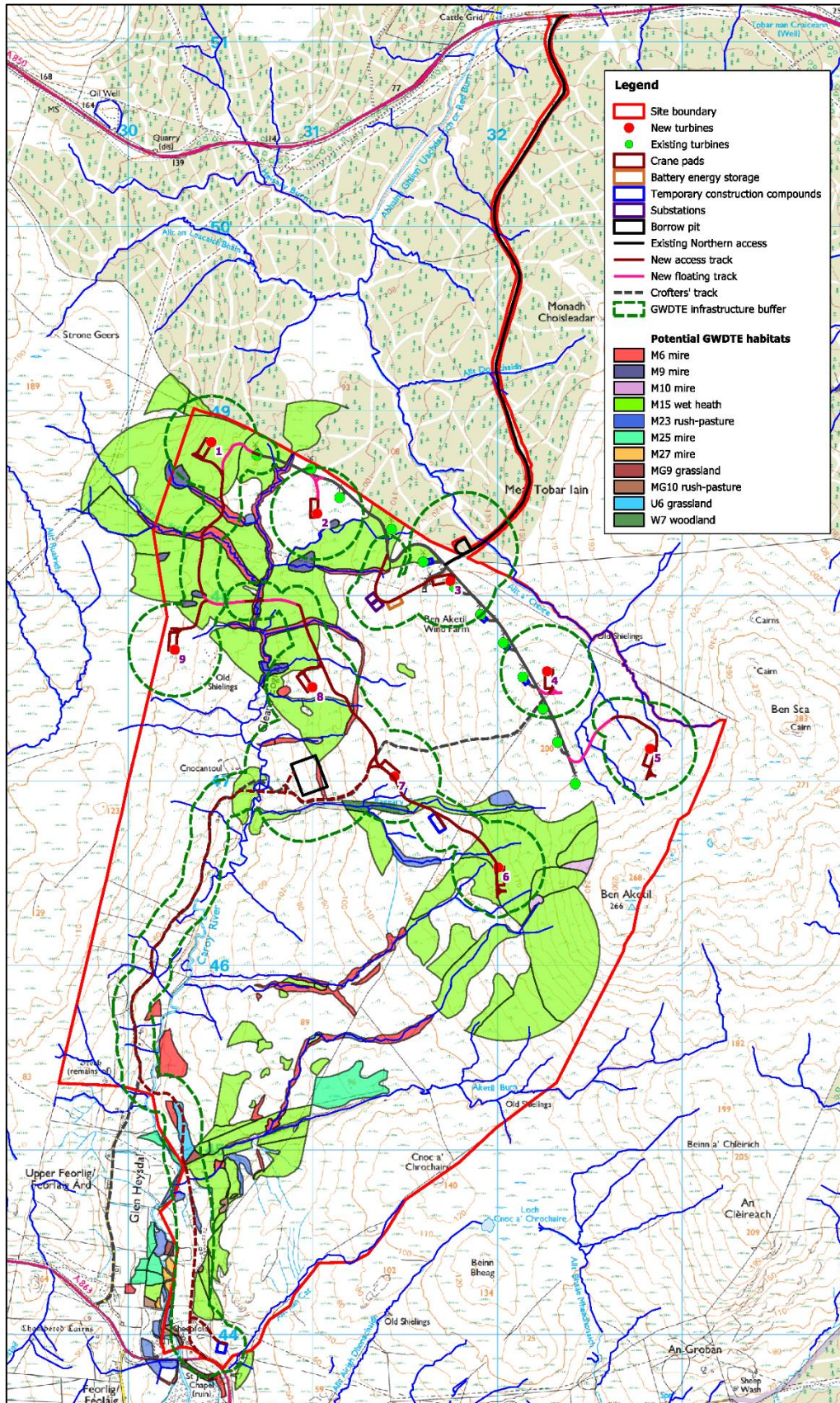
- 4.1 The area assessed, which consists of land within the Proposed Development and a 250 m buffer zone around this, has been reviewed to identify areas of NVC habitats that require assessment.
- 4.2 Detailed consideration is required for sensitive habitats that lie within 100 m of access tracks, which typically have excavations less than 1 m in depth, or within 250 m of excavations deeper than 1 m, such as turbine foundations and borrow pits (SEPA, 2017b). The combined infrastructure buffer is provided as a green dashed line in the figures provided, for reference purposes. An overview map showing areas of potentially groundwater-dependent communities is provided in **Map 9.3.1**.

Conceptual Site Model

- 4.3 Of the NVC communities identified in **Table 9.3.2**:
- SEPA (2017b) identifies M6, M9, M10 and W7 as ‘... likely to be ... highly groundwater dependent ... depending on the hydrogeological setting’ and UKTAG (2009) identifies them as Class 1 (high) in Scottish settings.
 - SEPA (2017b) identifies M23 as ‘... likely to be ... highly groundwater dependent ... depending on the hydrogeological setting’ and UKTAG (2009) identifies it as Class 2 (moderate) in Scottish settings.
 - SEPA (2017b) identifies M15, M27, MG9, MG10 and U6 as ‘... likely to be ... moderately groundwater dependent ... depending on the hydrogeological setting’ and UKTAG (2009) identifies them as Class 2 (moderate) in Scottish settings.
 - SEPA (2017b) identifies M25 as ‘... likely to be ... moderately groundwater dependent ... depending on the hydrogeological setting’ and UKTAG (2009) identifies it as Class 3 (low) in Scottish settings.
- 4.4 In this sense, communities M6, M9, M10 and W7 are considered to be more sensitive than the other communities, and M25 is the least sensitive habitat for the Site.

Habitats on Peat

- 4.5 A significant proportion of the habitats identified as potentially highly groundwater-dependent are on areas of confirmed peat over 0.5 m in depth, most notably the areas of M15 and M15-dominated mosaic habitats which are widespread around the site. Water flow through peat does occur but is very slow, except in areas with peat pipes or conduits to allow focused flow, and peat bodies are typically considered to be impermeable. Water held within peat is not usually considered to form part of the groundwater body.
- 4.6 Blanket peat, such as is present within the site, is generally considered to be ombrotrophic and receives all its nutrients from rainwater (JNCC, 2022). Localised flushing can occur adjacent to watercourses but is rarely extensive away from the watercourse channel. It is recognised that peat present within the Site has a wide range of depths; however, it remains likely that the dominant water source in the Site, irrelevant of peat depth, is rainwater with shallow through-flow within the uppermost vegetated layer.



Map 9.3.1: Overview map of Proposed Development and areas of potentially groundwater-dependent communities.

- 4.7 The Phase 1 and 2 peat surveys noted that the base was predominantly firm or hard, indicating a high presence of clay or clayey material. Clay material would provide an impermeable barrier layer between the peat deposit and the bedrock, effectively preventing any existing groundwater from reaching the ground surface.
- 4.8 Bedrock in the Site is classed as low productivity aquifers; it is therefore unlikely that the small amount of potential groundwater present within the bedrock is accessible to surface habitats.
- 4.9 No springs or seepage features were identified within the study area or immediate surroundings and the only spring identified on topographical mapping is over 1.7 km distant from the Proposed Development, at a relatively low elevation.

Habitats not on Peat

- 4.10 Some of the identified habitats are located within areas with no identified peat, particularly along the Southern Access Track. Although these identified habitats are small, the nature of the underlying substrate requires assessment.
- 4.11 The areas identified consist of raised marine deposits and diamicton till which are both naturally variable materials.
- 4.12 Many of the habitats identified in these areas are part of mosaics, such as M6/M19, M15/M19 or M15/U4. In many cases, the second habitat has no potential groundwater dependency. This indicates that the first, main habitat is unlikely to be groundwater-dependent in this setting. Combined with a lack of identifiable springs and seepage points, this suggests that groundwater is generally not accessible to habitats within the Proposed Development or immediate surroundings.

Potential Impacts

- 4.13 Potential impacts to identified potential GWDTE include direct and indirect impacts.
- 4.14 Direct impacts would arise as a result of habitat loss through construction activity and the associated requirement to excavate vegetation and soil material within the identified sensitive habitat area.
- 4.15 Indirect impacts would arise as a result of changes in water supply to the sensitive habitat or of changes in the nutrient supply as a result of 'flushing'. Most sensitive habitats are nutrient-poor and require continued supply of nutrient-poor water to retain their structure and vegetation community. Excavation works can provide a sudden influx of nutrient material arising from the soil disturbance, which can overwhelm such nutrient-poor communities causing temporary or permanent changes to the habitat as a result. Nutrient flushing is usually associated with changes to water supply pathways, and specifically with introduction of drainage from areas of active excavation that discharge into or upslope of such sensitive habitat areas.

Conclusions Relating to Groundwater Dependency

- 4.16 It is concluded that those habitats within the study area that are found on peat are unlikely to be groundwater-dependent as there is no groundwater source available to them.
- 4.17 It is also concluded that habitats within the study area that are not located on peat cannot truly be described as groundwater-dependent as there is no reliable source of shallow

groundwater on which they can depend. These are likely to rely on a combination of rainfall and surface runoff, with some direct surface water in areas adjacent to watercourses. In many cases, habitats tend to follow the watercourses and waterbodies within the Site, indicating a reliance on surface water.

- 4.18 Nevertheless, these habitats are considered to be sensitive, and a level of protection is required to minimise and, if necessary, mitigate any impacts that may occur. The areas of habitats identified above are within the combined infrastructure buffer and are discussed individually in the following sections.

Potential GWDTE Area 1

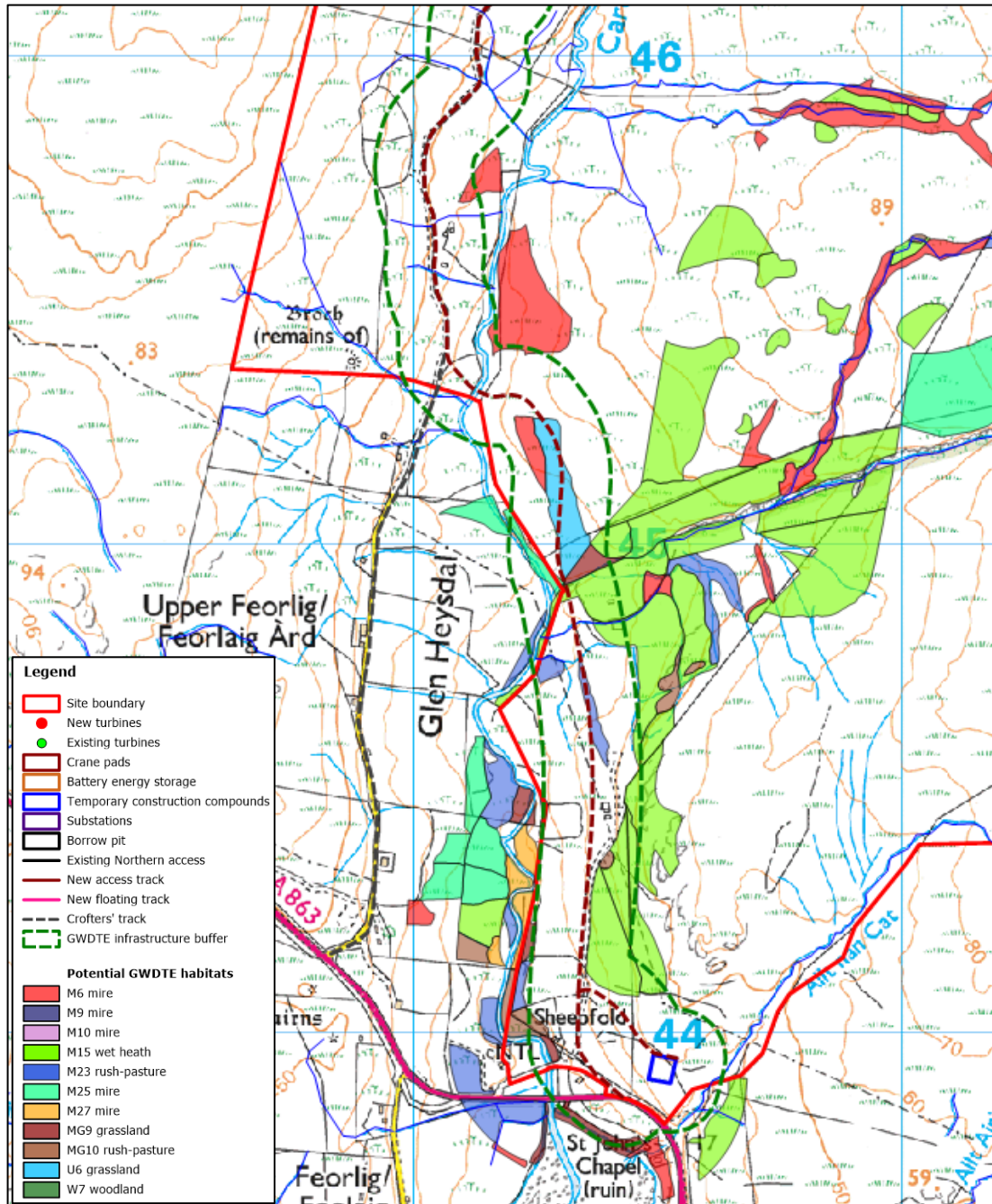
- 4.19 Area 1 covers part of the Southern Site Access track from the entrance off the A863 until the new track meets the existing Crofters' Track, including the southernmost part of the Crofters' Track (**Map 9.3.2**).

Habitats Present

- 4.20 There are several large areas of M15 wet heath and M15-dominated mosaic habitats present, two of which extend into the GWDTE infrastructure buffer. These are adjacent to the new access track in the southernmost section, with one small area extending across the track route.
- 4.21 Four areas of M6 mire or M6-dominated habitat are present, from the coastal margin north to the Caroy River valley, although none are directly affected by proposed infrastructure.
- 4.22 One medium-sized area of U6 grassland is present north of the Aketil Burn; this is crossed by the new track route.
- 4.23 The other habitats within the infrastructure buffer are generally small areas. These include MG9 grassland, MG10 rush-pasture, M23 rush-pasture, M25 mire and M27 mire. One area of M23 is crossed by the new track route; the other habitat areas are set back from proposed construction areas.

Setting and Infrastructure

- 4.24 Bedrock in this area consists mainly of basalts and microgabbros of the Skye Lava Group. Superficial deposits consist mainly of diamicton till in the Caroy River valley and areas of peat on higher ground set back from the river. Alluvium deposits are present along the Caroy River in some areas, and marine and raised marine beach deposits are present at the southern extent, near the existing coastline.
- 4.25 The bedrock is a low productivity aquifer with small amounts of groundwater in the near-surface weathered zone and secondary fractures.
- 4.26 Infrastructure in Area 1 includes the main southern access track from the A863, a temporary construction compound and upgrading of the existing Crofters' Track. Watercourse crossings of the Aketil Burn and Caroy River would be required.



Map 9.3.2: Potential GWDTE Area 1, Southern Access Track

Assessment and Mitigation

- 4.27 No indications of groundwater at surface were identified in this area.
- 4.28 It is anticipated that habitats adjacent to the Caroy River, particularly the areas of M25 mire, M27 mire and some areas of M6 mire rely on water within the river valley alluvial sediments, which would be in continuity with the river water.
- 4.29 Most of the other habitats are associated either with diamicton till or with peat, and are likely therefore to rely on surface water and shallow through-flow in the upper vegetation, as they would be insulated from the groundwater.

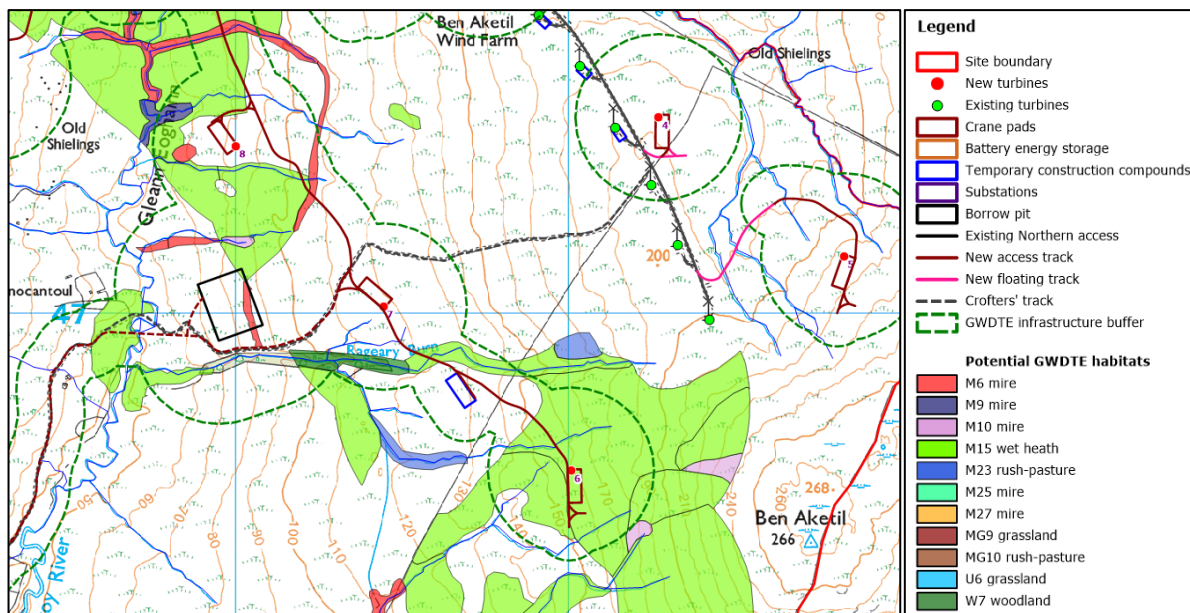
- 4.30 Many of the habitats in Area 1 are mosaics, which include one or more vegetation community with no groundwater dependence. This also indicates that groundwater is unlikely to be a key water source in this area.
- 4.31 Direct impacts on sensitive habitats would arise from widening of existing track, construction of new track, installation of the temporary construction compound and installation of new watercourse crossing structures.
- 4.32 The section of new track from the A863 up to the Crofters' Track avoids most of the potentially sensitive habitats. All the areas of M15 wet heath apart from one section are located upslope, and are therefore unlikely to be affected by the works. It may be possible to microsite the track section currently indicated to cross the M23 rush-pasture habitat, as the track is near the margin of this area. Sensitive construction would help to minimise any incursion into this habitat area.
- 4.33 The main impact would be on the area of U6 grassland north of the Aketil Burn, which is bisected by the new track. It may be possible to minimise the direct habitat loss by micrositing of the track. Impacts to habitats below the track can be minimised by careful installation of cross-drainage, to help maintain hydrological continuity, and by careful use of sediment and water control methods to avoid flushing of habitats. This is particularly important for the area of M6 mire downslope of the track route, as this is a very sensitive habitat type.
- 4.34 Two areas of M6 mire habitat are located within the buffer zone around the section of Crofters' Track requiring upgrade. One of these is located on the eastern side of the River Caroy, and will not therefore be affected by any upgrading works to the track on the western side of the river.
- 4.35 The second area is downslope of the track. Where possible, track widening work would be undertaken on the western side of the track, to maximise separation from the area of M6 habitat. Careful control of surface water and sediment would help to avoid changes in water supply and nutrient flushing. Any required modified or additional trackside drainage would be minimised in terms of depth and length and would not discharge directly into or upslope of identified sensitive habitat areas, to minimise potential for water and nutrient flushing into these areas.
- 4.36 There may be options to improve or extend areas of habitats in Area 1 through vegetation management and/or drainage management as compensation for the unavoidable direct habitat loss. This would be discussed with the environmental manager as part of the construction works mitigation.

Potential GWDTE Area 2

- 4.37 Area 2 continues along the Southern Access Track, across the Caroy River into the Developable Area. Within the Developable Area, Area 2 includes Turbines 4, 5, 6, 7 and 8, the main construction compound, Borrow Pit 1 and related access tracks (**Map 9.3.3**).
- 4.38 Although two of the additional temporary construction compounds lie within this area, as these are existing hardstanding areas and would not require any additional construction work they have not been considered within this assessment as no additional impacts would be associated with their use.

Habitats Present

- 4.39 Area 2 includes several large areas of M15 wet heath and M15-dominated mosaic habitats. These are present around the Caroy River at the crossing location, along the Rageary Burn, and two large areas at Turbine 6 and near Turbine 8.
- 4.40 Several areas of M6 mire are noted, one within Borrow Pit 1 footprint and others associated with watercourses and drainage channels. An area of W7 woodland is associated with the Rageary Burn, downslope of the burn crossing location.
- 4.41 Two small areas of M10 mire are present, one right on the infrastructure buffer margin south-east of Turbine 6 and one between Borrow Pit 1 and Turbine 8. An area of M9 mire is present associated with the Caroy River west of Turbine 8.



Map 9.3.3: Potential GWDTE Area 2, Southern Part of the Developable Area

Setting and Infrastructure

- 4.42 Area 2 is underlain by basalts and microgabbros from the Skye Lava Group. Superficial deposits are predominantly peat with areas of diamicton till around the Rageary Burn and the smaller unnamed watercourses, and alluvial deposits associated with the Caroy River. The bedrock is a low productivity aquifer with small amounts of groundwater in the near-surface weathered zone and secondary fractures.
- 4.43 Proposed infrastructure in Area 2 includes construction of Turbines T4 to T8, establishment of the main construction compound between Turbines 6 and 7, and excavation of Borrow Pit 1. Upgrading of the Crofters' Track, plus construction of new cut and floating track sections, would also be required.
- 4.44 There are no sensitive habitats associated with Turbines 4 and 5.
- 4.45 A number of new and upgraded watercourse crossings are required, including a replacement crossing of the Caroy River, a crossing of the Rageary Burn and six crossings of unnamed watercourses.

Assessment and Mitigation

- 4.46 No indications of groundwater at surface were identified in Area 2.
- 4.47 The presence of blanket peat indicates that access to groundwater would be limited for most of the habitats in Area 2. Habitats on blanket peat rely on rainfall and shallow through-flow within the vegetated layer, as they are isolated from groundwater by the peat.
- 4.48 The area of W7 woodland is located within a narrow rocky gorge associated with the Rageary Burn. Its main water supply would be expected to derive from surface water and from shallow through-flow in the vegetated layer above the gorge sides.
- 4.49 The areas of M10 mire are in close association with minor watercourses and are most likely to derive their main water supply from surface water.
- 4.50 The area of M9 mire, around the mainstem of the Caroy River and one of its tributaries, is also most likely to derive its main water supply from surface water and shallow groundwater in continuity with the river water. One area of M6-dominated mosaic extends across the hill slope; this is associated with a constructed mound or bund, which may form an old land boundary. This bund impedes natural surface drainage, causing a focusing of water on the upslope side and leading to development of the M6 mosaic habitat.



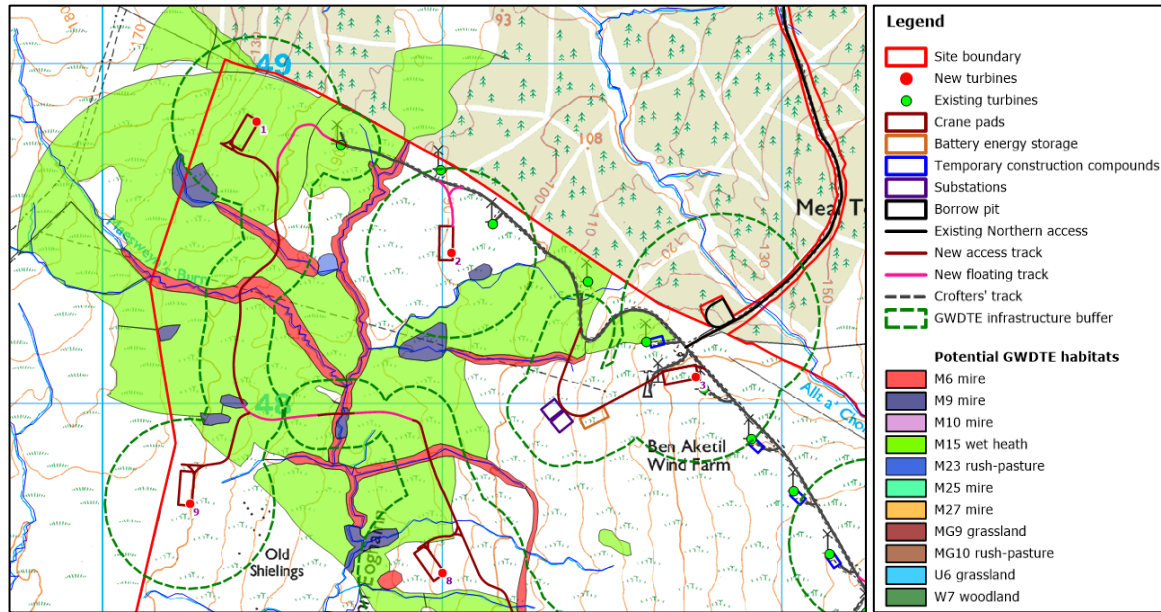
Photograph 9.3.1: View of bund and associated M6-dominated mosaic habitat on the upslope side. View N from NG 3122 4735.

- 4.51 Many of the habitats in Area 2 are mosaics, which include one or more vegetation community with no groundwater dependence. This also indicates that groundwater is unlikely to be a key water source in this area.
- 4.52 Direct impacts on the identified sensitive habitats include habitat loss from construction of new and upgraded tracks, excavation of the borrow pit and construction of the turbines and crane pads for Turbines 6 and 8.

- 4.53 Where possible, track widening works would be targeted away from identified areas of sensitive habitats, thereby avoiding direct impacts and minimising potential risks.
- 4.54 Where new track is required to cross areas of sensitive habitat, micro-siting will be employed to minimise the area of habitat loss. Cross-drains would be employed to ensure continuity of flow within the habitat area. Any required modified or additional trackside and hardstanding drainage would be minimised in terms of depth and length and would not discharge directly into or upslope of identified habitat areas, to minimise potential for water and nutrient flushing in these areas.
- 4.55 Deeper excavations required for the turbines and borrow pit would have perimeter drainage installed prior to start of excavations. The preferred method would be to use earth bunds, rather than installation of cut-off drains, although in some circumstances cut-off drains are likely to be required. Any cut-off drains would be minimised in terms of length and depth, to minimise concentration of flows and unnecessary diversion of water. Water discharge from drainage systems would be spread across the ground in order to minimise changes to flow into downstream sensitive habitats and would not be discharged directly into sensitive habitat areas.
- 4.56 Water collecting in turbine and borrow pit excavations would be directed into settlement ponds to allow for removal of sediment. Treated water would not be discharged into or upslope of identified sensitive habitat areas, to minimise potential for water and nutrient flushing into these areas. If necessary, water would be directed into trackside drainage to avoid potential impacts on sensitive habitat areas.
- 4.57 There may be options to improve or extend areas of habitats through vegetation management and/or drainage management within Area 2 as compensation for the unavoidable direct habitat loss. This would be discussed with the environmental manager as part of the construction works mitigation.

Potential GWDTE Area 3

- 4.58 Area 3 covers the northern part of the Developable Area, including Turbines 1, 2, 3 and 9. Also within this area are the repower substation and extension substation, battery energy storage area, Borrow Pit 2 and related access tracks. The Northern Site Access enters the Site in this area (**Map 9.3.4**).
- 4.59 Although two of the additional temporary construction compounds lies within this area, as these are existing hardstanding areas and would not require any additional construction work they have not been considered within this assessment as no additional impacts would be associated with their use.



Map 9.3.4: Potential GWDTE Area 3, Northern Part of the Developable Area

Habitats Present

- 4.60 Large areas of M15 wet heath and M15-dominated mosaic habitats are distributed around Area 3, particularly along the proposed track and around Turbine T1, extending south towards Turbines 8 and 9. A smaller area is present between Turbines 2 and 3.
- 4.61 A number of elongated areas of M6 mire and M6-dominated mosaics are present within Area 3, all of them associated with watercourse channels including Maesweyn's Burn, the Caroy River mainstem and several unnamed tributaries to the Caroy River.
- 4.62 A number of small areas of M9 mire and M9-dominated mosaics are located within Area 3. Some of these are also associated with watercourse channels, but others appear to be located within drainage channels or areas of flatter ground. These habitats are often directly associated with the areas of M6 and M6-dominated mosaics.

Setting and Infrastructure

- 4.63 Area 3 is underlain by basalts and microgabbros from the Skye Lava Group. Superficial deposits in this area are dominated by peat, with small pockets of alluvium and till in and around the watercourses in Gleann Eoghainn. The bedrock is described as a low productivity aquifer with a limited amount of groundwater present in the near-surface weathered zone and in secondary fractures.
- 4.64 There are several watercourses in Area 3, all of which are headwaters to the Caroy River. Apart from the Caroy River, the main watercourse in the area is Maesweyn's Burn.
- 4.65 Development in Area 3 includes much of the proposed major infrastructure including Turbines 1, 2, 3 and 9, two substations, borrow pit, battery energy storage system (BESS) and two temporary construction compounds. Sections of new track would be required to connect Turbines 1, 8 and 9. Floating track is proposed for stretches of new track either side of the Caroy River between Turbines 8 and 9, and as the new access to Turbine 2. An additional section of new track would be required to give access to the substations

and BESS, near Turbine 3. The existing access track within the wind farm area is not expected to require any modifications.

Assessment and Mitigation

- 4.66 No indications of groundwater at surface were present in this area.
- 4.67 The presence of blanket peat across much of the area indicates that access to groundwater would be significantly restricted for most of the habitats in Area 3. Habitats on blanket peat rely on rainfall and shallow through-flow within the vegetated layer, as they are isolated from groundwater by the peat.
- 4.68 Most of the large area of M15 wet heath and M15-dominated mosaic habitat are located on peat deposits of 1.0 m or deeper, indicating that they are unable to rely on groundwater for water and nutrient supply. In addition, the presence of vegetation communities with no potential groundwater dependence indicates that it is unlikely that the mosaic habitats can be classified as groundwater-dependent.
- 4.69 The areas of M6 mire, M9 mire and areas of M6-dominated and M9-dominated mosaic habitats are largely associated with surface watercourses and surface water drainage channels, indicated by their elongate and sinuous form. This association indicates that their principal water source is likely to be surface water.
- 4.70 Direct impacts on the identified sensitive habitats include habitat loss from construction of the turbine foundation and crane pad at Turbine 1. There would also be direct habitat loss associated with much of the access track, notably between Turbines 1, 9 and 8. Indirect impacts could arise from changes to water supply and nutrient flushing arising from construction works, mainly likely to affect habitats downslope of construction works.
- 4.71 Any required modified or additional trackside and hardstanding drainage would be minimised in terms of depth and length and would not discharge directly into or upslope of identified sensitive habitat areas, to minimise potential for water and nutrient flushing in these areas.
- 4.72 Deeper excavations required for the turbines would have perimeter drainage installed prior to the start of excavations. The preferred method would be to use earth bunds, rather than installation of cut-off drains, although in some circumstances cut-off drains are likely to be required. Any cut-off drains would be minimised in terms of length and depth, to minimise concentration of flows and unnecessary diversion of water. Water discharge from drainage systems would be spread across the ground in order to minimise changes to flow into downstream sensitive habitats.
- 4.73 Water collecting in excavations for the turbines would be directed into settlement ponds to allow for removal of sediment. Treated water would not be discharged directly into or upslope of identified sensitive habitat areas, to minimise potential for water and nutrient flushing into these areas. If necessary, water would be directed into trackside drainage to avoid potential impacts on sensitive habitat areas.
- 4.74 There may be options to improve or extend areas of M6, M9 and M15 habitats through vegetation management and/or drainage management within Area 3 as compensation for the unavoidable direct habitat loss. This would be discussed with the environmental manager as part of the construction works mitigation.

5 PROTECTION AND MITIGATION

Design and Mitigation

- 5.1 Wetland habitats are known to be sensitive to changes in their water supply, whether this is from groundwater, surface water, shallow through-flow or rainwater. With this in mind, the following good practice construction methods would be used for all development on or adjacent to wetland or bog areas.
- Where track sections cross wetland or bog areas, cross-drainage would be provided within the track construction to ensure continuity of flow. This may take the form of a drainage layer within the track, suitably closely spaced drainage pipes or both as appropriate. These would be determined on a case-by-case basis to suit each individual area.
 - Removing protective layers of soil and superficial deposits makes groundwater vulnerable to pollution from leaks or spills from vehicles or equipment used during construction. Earthworks would be kept to a practical minimum within these areas, to reduce the area of wetland affected by the construction works.
 - Trackside drainage would be kept to a practical minimum and would only be installed where required to protect the track from erosion.
 - All works through and adjacent to wetland areas would be supervised by the environmental manager.
 - Site-specific mitigation, including drainage segregation to avoid 'flushing' from excavation works, and micro-siting to avoid specific higher sensitivity areas, would be identified and established where appropriate.
 - Water would not be discharged directly into watercourses. Additional protection, in terms of sediment traps using silt fencing, straw bales or excavated sumps or settlement ponds, would be put in place between the water discharge location and watercourses. Sediment trap installation and monitoring would be overseen by the environmental manager.

Monitoring

- 5.2 Targeted monitoring would be put in place to provide a check on the identified wetland areas to ensure that mitigation and protection measures are in place and effective.
- 5.3 The monitoring programme would include establishment of groundwater monitoring boreholes within the borrow pit areas to a depth of at least 1 m below the deepest expected excavation. Groundwater level monitoring would be undertaken to determine whether groundwater is present within the borrow pit areas and, if it is, at what level the seasonally highest groundwater table stands. Any groundwater within the borrow pit area would be managed in line with best practice, with discharge via a settlement pond to allow any entrained sediment to be removed prior to discharge. Any required discharge licence would be obtained prior to excavation commencing.
- 5.4 Surface water monitoring would be established within the existing watercourse network. Details are provided in **Technical Appendix 9.4**.

- 5.5 All areas of sensitive habitat would be visited and assessed prior to any construction work by the environmental manager. Assessment would include collection of representative photographs of the areas which are most likely to be affected by the works. Regular assessment visits would be undertaken throughout the construction period and after reinstatement to ensure that habitat protection is effective, and any restoration and recovery works become established.
- 5.6 All proposed monitoring would begin at least 6 months prior to construction work, would continue throughout the construction period and for at least 12 months following reinstatement.

6 CONCLUSIONS

- 6.1 A detailed assessment of the interactions between the proposed works for the Proposed Development and any potentially groundwater-dependent terrestrial ecosystems has been undertaken.
- 6.2 Potentially groundwater-dependent NVC communities identified within the Site are:
- M6 mire;
 - M9 mire;
 - M10 mire;
 - M15 wet heath;
 - M23 rush-pasture;
 - M25 mire;
 - M27 mire;
 - MG9 grassland;
 - MG10 rush-pasture;
 - U6 grassland; and
 - W7 woodland
- 6.3 M6, M9, M10 and W7 have potentially high groundwater dependency. M23 has potentially moderate to high groundwater dependency. M15, M27, MG9, MG10 and U6 have potentially moderate groundwater dependency. M25 has potentially moderate to low groundwater dependency.
- 6.4 Owing to the distribution of habitats within the Site, identified habitats have been assessed in smaller sub-areas within the Site.
- 6.5 The potentially groundwater-dependent habitats have been assessed specifically within the context of the Proposed Development, considering the local bedrock and superficial geology, peat distribution and site observations.
- 6.6 Superficial deposits within the Site consist mainly of peat. Blanket peat, such as is present within the Site, is considered to be ombrotrophic and receives all its nutrients from rainwater. Localised flushing can occur adjacent to watercourses but is rarely extensive away from the watercourse channel. It is recognised that peat present within the Site has a wide range of depths; however, it remains likely that the dominant water source in the Site, irrelevant of peat depth, is rainwater with shallow through-flow within the uppermost vegetated layer.
- 6.7 Habitats found within the Site Access are associated with a range of superficial deposits, including areas of clay-rich diamicton till and alluvium. Diamicton till is often heavily dominated by clay material and would mainly act to insulate the groundwater in the bedrock from the ground surface in areas where it is present, effectively preventing groundwater discharge at surface. Alluvium deposits can hold groundwater, but their association with surface watercourses indicates that their water content would be in continuity with surface water rather than deriving from deeper groundwater sources.

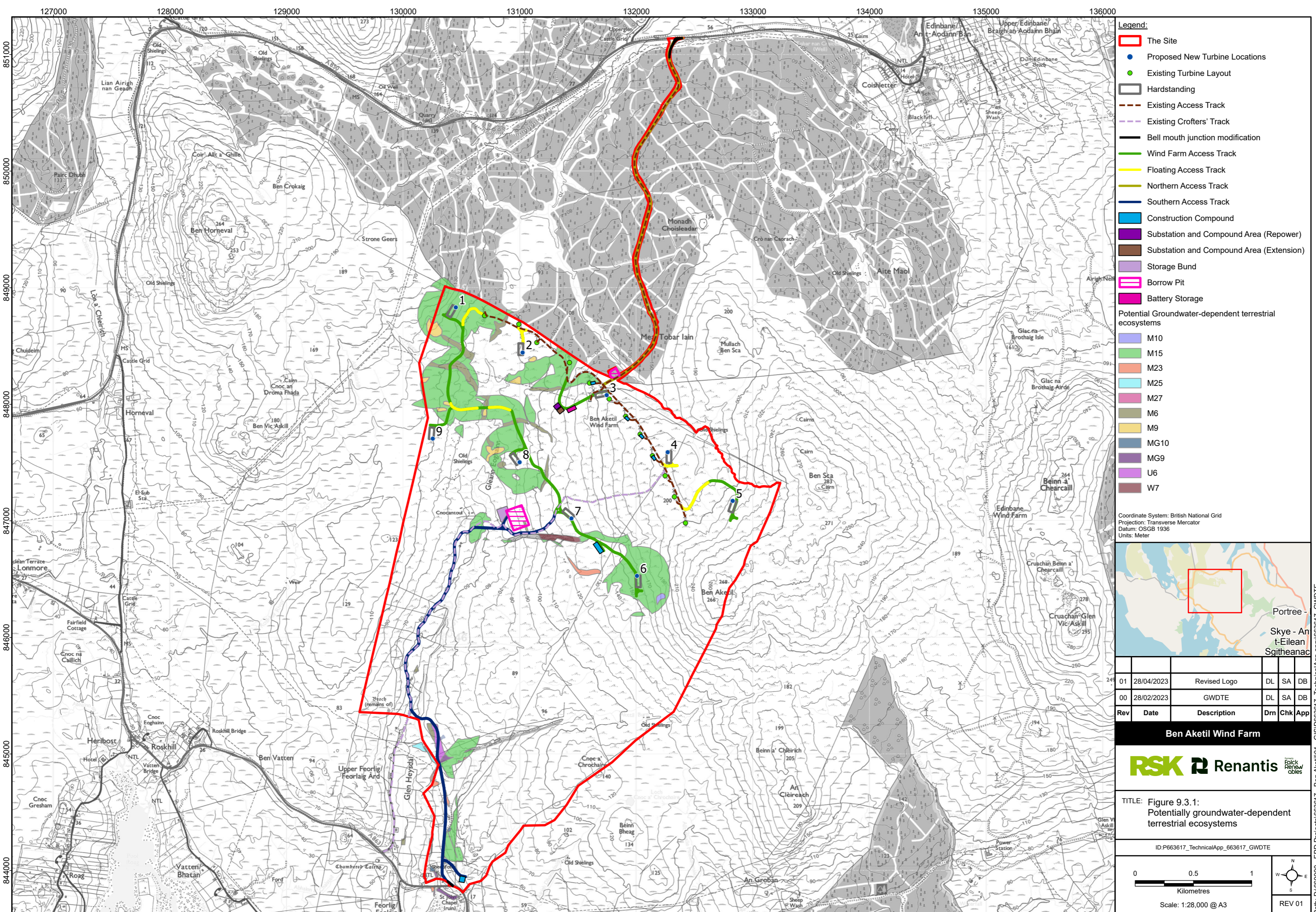
- 6.8 It is therefore determined that potentially groundwater-dependent communities within the Site Access are reliant on surface water and shallow groundwater in association with watercourses.
- 6.9 Impacts to sensitive habitats would arise from direct habitat loss as a result of construction activity; and indirect habitat loss or modifications arising from changes to water or nutrient supply to the habitats resulting from upslope construction works and installation of drainage structures such as ditches and earth bunds.
- 6.10 Impacts to wetland habitats and watercourses would be kept to a practical minimum through use of best practice construction and mitigation measures. Specific mitigation measures, to avoid changes to the watercourse hydrochemistry through 'flushing' of excavated material in surface runoff, have been set out and would be adhered to during all site works. Careful construction to ensure suitable continuity of flow across site tracks would help to minimise any potential impacts to the wetland habitats within the Site.

7 REFERENCES

- BGS (2023a). GeolIndex online geological mapping. British Geological Survey. Available at: <http://mapapps2.bgs.ac.uk/geoindex/home.html>, accessed March 2023.
- BGS (2023b). BGS Lexicon of Named Rock Units. Available at: <https://www.bgs.ac.uk/technologies/the-bgs-lexicon-of-named-rock-units/>, accessed March 2023.
- CEH (2023). Flood Estimation Handbook Web Service. Centre for Ecology and Hydrology. Available at: <https://fehweb.ceh.ac.uk/> (subscription service), accessed March 2023.
- Isherwood, C.E. (2013). Wetland Types and Groundwater Dependence. Unpublished MSc Dissertation, School of Civil Engineering and Geoscience, Newcastle University.
- JNCC (2022). 7130 Blanket Bogs: Raised bogs and mires and fens. Available at: <https://sac.jncc.gov.uk/habitat/H7130/>, accessed March 2023.
- Met Office (2016). Northern Scotland: climate. Available at: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/regional-climates/norther-scotland_-_climate---met-office.pdf, accessed March 2023.
- Met Office (2023). UK climate averages, Prabost. Available at: <https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gf5wbt9v5>
- NatureScot (2016). Scotland's Soils, Carbon and Peatland 2016 Map. Available at: <https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/>, accessed March 2023.
- SEPA (2017a). Planning guidance on onshore windfarm developments. Scottish Environment Protection Agency, Land Use Planning System Guidance Note 4 (LUPS-GU4). Available at: <https://www.sepa.org.uk/media/136117/planning-guidance-on-on-shore-windfarms-developments.pdf>, accessed March 2023.
- SEPA (2017b). Guidance on assessing the impacts of development proposals on groundwater abstractions and groundwater dependent terrestrial ecosystems. Scottish Environment Protection Agency, Land Use Planning System Guidance Note 31 (LUPS-GU31). Available at: <https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions-and-groundwater-dependent-terrestrial-ecosystems.pdf>, accessed March 2023.
- Soil Survey of Scotland (1981). Soil maps of Scotland at 1:250,000 scale. Macaulay Institute for Soil Research, Aberdeen. Available at: <https://soils.environment.gov.scot/maps/soil-maps/national-soil-map-of-scotland/>, accessed March 2023.
- UKTAG (2004) Guidance on the identification and risk assessment of groundwater dependent terrestrial ecosystems. UK Technical Advisory Group on the Water Framework Directive. Available at: https://www.wfduk.org/sites/default/files/Media/Characterisation%20of%20the%20water%20environment/Risk%20assessment%20of%20terrestrial%20ecosystems%20groundwater_Draft_210104.pdf, accessed February 2023.
- UKTAG (2009). Annex 1: NVC plant communities and dependency on groundwater. Annex 1 to UKTAG (2004). Available at: <http://www.wfduk.org/sites/default/files/Media/Characterisation%20of%20the%20water%20environment/UKTAG%20guidance%205%20ab%20ANNEX%201%20updated%205%20October%2009.pdf>, accessed February 2023.

FIGURES

Figure 9.3.1: Potentially groundwater-dependent terrestrial ecosystems



- Legend:**
- The Site
 - Proposed New Turbine Locations
 - Existing Turbine Layout
 - Hardstanding
 - Existing Access Track
 - Existing Crofters' Track
 - Bell mouth junction modification
 - Wind Farm Access Track
 - Floating Access Track
 - Northern Access Track
 - Southern Access Track
 - Construction Compound
 - Substation and Compound Area (Repower)
 - Substation and Compound Area (Extension)
 - Storage Bund
 - Borrow Pit
 - Battery Storage
- Potential Groundwater-dependent terrestrial ecosystems**
- M10
 - M15
 - M23
 - M25
 - M27
 - M6
 - M9
 - MG10
 - MG9
 - U6
 - W7

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



Rev	Date	Description	Drn	Chk	App
01	28/04/2023	Revised Logo	DL	SA	DB
00	28/02/2023	GWDE	DL	SA	DB

Ben Aketil Wind Farm

TITLE: Figure 9.3.1:
Potentially groundwater-dependent
terrestrial ecosystems

ID:P663617_TechnicalApp_663617_GWDE

