

APPENDIX A6.1 - Response to Stage 1 Checking Report

Natural Power Memorandum			
To	ECU	Date	07/04/2022 17:35:00
From	Natural Power Consultants	Ref.	1278097-A



Response to Stage 1 Checking – PSRA Lethen Wind Farm

Natural Power has reviewed the Stage 1 Checking Report (Ref: 63068) for the Lethen Wind Farm, Peat Slide Risk Assessment (EIAR TA 9.2). The following responses address all checking report recommendations.

1. – Review the Geomorphological Map to confirm all artificial drainage and erosion is included and comment on the omission of muirburn from mapping.

Natural Power has reviewed the supplied Figure A3: Geomorphological Map and confirm that only significant areas of soil erosion are highlighted (orange hatched areas). The highlighted areas are shown where near to proposed wind farm infrastructure.

Areas of muirburn was not highlighted on the geomorphological map due to its pervasive presence across the project site. Muirburn is also visible on the aerial imagery base map. It is also salient to add that not all areas of muirburn are linked to sites of soil erosion, thus the soil erosion terrain elements were prioritised for digitization on the geomorphological map.

Natural Power confirm that only significant artificial drainage and drainage areas are shown on the geomorphological map. Areas of highest intensity were prioritised in the mapping and where interstitial to the wind farm layout. Natural Power confirms that the supplied geomorphological information is relevant and contributed to the qualitative peat slide risk assessment.

2. - Justification on why Phase 1 probing grid does not cover entire red line boundary (RLB)

Phase I peat probing was implemented across areas proposed for development. The periphery of the project site to the east and north are not proposed for development due to external planning constraints including access and ecology. These areas were not available to survey.

ECU best practice guidance advises: ‘Low resolution - Usually 100 m X 100 m on a regular grid pattern across the whole area proposed for development.’ There is no stipulation for blanket probing across the red line boundary area.

3. - Phase 2 probing not carried out in line with ECUBPG, which requires substantial additional detailed probing at all infrastructure locations in line with ECUBPG.

Natural Power disagrees with recommendation (3). In this scenario the best practice guidance is being incorrectly applied. The aim of the ECUBPG¹ on peatland survey is to demonstrate that impacts on peat have been minimised. ECUBPG¹ does not advise on peat probing strategies for the purposes of geotechnical assessment with exception of highlighting the dedicated guidance document² on this subject.

All peat probing has been agreed with the environmental regulator (SEPA) prior to undertaking on the basis that a focused approach would be used for Phase 2 detailed probing. SEPA's consultation response on this aspect detailed within the main EIAR Chapter for Hydrology, Hydrogeology and Geology. Chapter 9 Table 9.2 states: ‘SEPA would welcome the opportunity to prove advice on Phase 2 peat probing before it is completed. **A proportionate approach focusing on areas of deep peat can be taken.**’ This focussed approach aligns with planning aims and geotechnical guidance and standards on design of site investigation.

Natural Power has documented this process fully including development of the detailed probing strategy which targets peatland and deep peat areas only.

¹ Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland, on-line version only.

² Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments Prepared for Energy Consents Unit Scottish Government Second Edition, April 2017

Fundamentally Natural Power concludes there would be no reinforcement to the Peat Slide Risk Assessment with additional probing across areas not defined as peatland or across areas of shallow soils ruled out of the probing strategy. It can be clearly demonstrated that the proposed wind farm infrastructure has sought to avoid the areas of deep peat and furthermore the peat slide risk assessment is supported by a wide-ranging peat depth dataset suitable for characterization of peat deposits with respect of geotechnical risk assessment.

Blanket coverage of soil probes at detailed intervals across the site would not enhance the peat slide risk assessment to a degree which would warrant the overcoming of safety, practical and economic restrictions to obtaining such a dataset. This rationale aligns with the statutory guidance on peat slide risk assessment².

Peat depth information, although an important factor, is not in isolation the critical means of assessing peat or ground stability risk. The peat slide risk assessment has applied a variety of desk study methodologies, field reconnaissance and geotechnical engineering assessment to ensure risk assessment is accurate and representative of site conditions. In this case assessment of peat slide risk does not require substantial additional detailed probing as the peat depths and distribution has been characterised for the purposes of peat slide risk assessment.

4. - Where the Phase 2 probing has been conducted it is not in line with SNH 2017 guidance on spacing, comment on reasons why not.

The SNH 2017 guidance on spacing should not be applied with respect of geotechnical investigation standards. The following rationale has been applied to the detailed probing in line with the specific guidance document on peat slide risk assessment².

- Probing and sampling locations are optimised using the findings of the site reconnaissance and geomorphological mapping and reflect the nature and extent of the proposed construction works.
- Phase 1 probing one probe per 100m (or one probe per hectare) across the developable area which has been supplemented with significant additional probing at infrastructure and along tracks.

Grid spacing of detailed probing has been set by a competent person justifying the number of total probes bases on the size and variability of the developable area. 10-20m Grids and 50m linear spacing on tracks with 10m right angle offsets have been used. This is considered by Natural Power more than sufficient to inform the peat slide risk assessment. Further this level of detailed probing has been conducted in agreement with SEPA. In addition, the ground investigation has further considered the guidance²:

Topography and morphology: peat depths are likely to be shallower on steeper slopes, and therefore sufficient samples/probes taken to reflect the range of slope angles identified over the development site;

Hydrology: the hydrology of the site has been recorded and mapped where possible including any evidence of surface and subsurface drainage pathways and the depth of water strikes encountered during peat probing;

Land management: peat will vary according to local land management practices, with peat that has been subject to burning, draining or cutting exhibiting differing characteristics to adjacent undisturbed peat. In general terms, sufficient sampling locations has been investigated to produce an outline map of variability in peat depth across the development site (to inform layout iterations).

Natural Power considers that under the requirements set out in the dedicated guidance² there is no cause to undertake any additional detailed peat probing at this stage nor would this enhance the peat slide risk assessment.

5. - Comment on the user defined inputs and limitations of the interpolation.

To prepare the interpolated peat depths and associated data layers a spatial interpolation method termed 'Ordinary Kriging' was applied. Ordinary Kriging assumes spatial autocorrelation but does not assume any overriding trends or directional drift. This is therefore considered a good option for contours of peat depth. The output cell size was set at 10m, the search radius fixed at 100m with a spherical semi-variogram model used. The Kriging algorithm considers multiple data points close together, giving greater weight to the points most proximal.

6. - Confirmation / justification on the risk scoring in relation to cracking / muirburn / artificial drainage

Natural Power confirms it has applied the subjective risk scoring on the contributory risk factors as per the classes presented in Table 4.7.1. Engineering judgement, experience and visual assessment from site survey are used to justify the scoring.

This is a subjective risk scoring based in probability factors as reported. It is reiterated that this has been determined during visual assessment undertaken in the field probing survey. Field workers examined for evidence of any major crack networks which may allow surface water to penetrate the peat mass. Cracking and muirburn areas were not directly coincident with proposed wind turbines. These conditions were recorded at T16 (see geomorphological map) however no peat was recorded at this location thus soil erosion conditions were deemed to be affecting the mineral soil substrate only.

Artificial hydrological features are evaluated and noted alongside the conjunction of the season and weather preceding the site visit. Artificial drains have also been identified across the site. Maximum scores of '2' were reached with the engineering judgement being that these features were unlikely contributory risk factors due to the majority of turbine locations not sited on peatland. Natural Power considers the risk scoring used within the assessment to provide a realistic and balanced risk assignment for the proposed wind farm infrastructure.

7. - Confirmation that GWDTEs, potential dwellings, B9007, private tracks, GCR sites, PWS, and recreational use of the land has all been considered and de-risked.

Natural Power confirms it has reviewed these elements with the following conclusions:

GWDTEs: Confirmed as per Section 3.4 of the Peat Slide Risk Assessment – ‘The presence of GWDTEs are associated with source zones to the minor watercourses and considered within the peat slide risk assessment.’ Watercourses and their source zones (thus GWDTEs) are a fundamental part of the risk assessment and Natural Power believes this be sufficiently clear in the way the risk assessment has been structured.

Potential Dwellings – Discussion of potential peat landslide run-out is provided in Section 4.12 of the report. It should be clear that: The significant distance and low risk of the planned infrastructure from peat slide with applied control measures; there is considered to be a low to negligible risk to this receptor downstream from the development. Terrain slope angles are not generally within the range which would lead to a large-scale peat slide (<3 degrees).

B9007 – Existing Infrastructure is upslope at higher elevation. The proposed wind farm infrastructure is on separate terrain units. There is negligible risk from peat landslide associated with construction on the wind farm to this public road.

Private Tracks – Confirmation of the presence of these tracks have been considered alongside their incorporation and upgrade as part of the proposed wind farm. In addition, factor of safety against peat slide mapping was used to screen and assess risk at these locations. See figure A8 within the peat slide risk assessment.

GCR Sites – Confirmed considered and scoped out of assessment

PWS – Confirmed and scoped out of assessment due to proximity and low risk category of the proposed development.

Recreational Use of the Land – This is not a core requirement for the peat slide risk assessment and further would be always set under the hierarchy of adverse consequences which has in the case of this risk assessment considered in line with guidance²:

- The potential for harm to life during construction.
- The potential economic costs associated with lost infrastructure, or delay in program.
- The potential for reputational loss associated with occurrence of a peat landslide in association with construction activities.
- The potential for permanent, irreparable damage to the peat resource (both carbon stock and habitat) associated with mobilisation (and ultimately loss) of peat in a landslide.
- The potential for ecological damage to watercourses subject to inundation by peat debris.

Lethen Wind Farm has been characterised in the two lowest peat slide risk categories. There are discrete areas of the development where risk is elevated however in general the terrain and soil conditions are not major factors which could lead to large scale peat instability. It is the conclusion of Natural Power that the proposed development would with the recommended controls enhance the potential for recreational use of the land by opening and increasing safety for access and would not elevate risk for recreational users.

8. - Confirmation that damage to the proposed infrastructure is acceptable to the Developer and will not influence their decisions.

The risk of damage to proposed infrastructure with controls under the risk assessment framework is low to negligible. It is confirmed that the developer has accepted the conclusions of the peat slide risk assessment and incorporated the findings into the EIAR. It is not clear what is inferred by the review comment above nor which developer decisions are being referred to.

9. - Confirmation on whether High Risk area at existing track near T03 is considered.

This is currently explained in the reporting:

The risk map at Figure A7 is the initial GIS based model for uncontrolled risk of peat slide based on methodology set out in the accompanying peat slide risk assessment. Additional qualitative and quantitative assessment is included within the main report with detailed control measures.

The existing track section northwest of T3 is elevated risk due to the spatial proximity to the main watercourse and elevated peat depths and terrain slope angle factors at this location. Table 4.11 within the report clearly considers these points and recommends the following mitigation

- Minimise upgrade construction works and where possible utilise existing infrastructure where suitable.
- No stockpiling or surcharging of the peatland to the south of this specific access track section.
- A system of ongoing monitoring throughout the construction phase should be in effect to monitor any movement in the peat.
- A rapid reaction strategy should be development to ensure measures can be deployed to protect the watercourse in the event of any movement.

Natural Power considers this issue to have been addressed in the current reporting.

10. - The track between T16/17 and either side of T10 should be reviewed, with limited probing available and the track passing through small Medium risk areas.

Natural Power has reviewed the dataset including inputs to Figure A7 – Peat Stability Risk Zonation. With recommended control measures in the report. Proposed access track between T16 & T17 does not traverse peatland conditions which could give rise to peat slide. Peat is largely absent and of depth <1m for a limited segment of this proposed track. Proposed access track approach to T10 does not interact with deep peat nor does it cross any areas of elevated peat slide risk. The factor of safety against peat slide data has been reviewed (Figure A8 of the report) and it is confirmed that there is no need to amend the existing peat slide risk assessment conclusions.

