Hill of Fare Windfarm Information Group (HOFWIG)

Response to Additional Information Report (AIR) Issued by RES

September 2024

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1. INTRODUCTION

The Hill of Fare Windfarm Information Group (HOFWIG) was formed in October 2022 in response to a proposal by the developer RES and the Dunecht Estate to build a windfarm consisting of 18 turbines, each 250m tall, on the Hill of Fare, Aberdeenshire [ECU00004592 and APP/2023/2196].

The group, which brings a wide range of professional expertise, consists of members of the local communities around the Hill of Fare, including Midmar, Torphins, Echt, Hirn and Banchory.

The developer submitted the application in December 2023, which included an Environmental Assessment Impact Report (EIAR). HOFWIG submitted an Objection Document to the Energy Consents Unit (ECU) and local Councillors in late January 2024. An Addendum to the HOFWIG Objection was submitted in July 2024.

The total number of objections submitted to the ECU up to 2nd August 2024 numbered 1,476, with 284 in support, or 84% against the proposal. Many of these objections have yet to be made public. We note that most of the representations in support were tick box forms collected in January 2024 on Banchory High Street by activists who had travelled from England and Wales who didn't know the details of the proposal and furthermore, did not even know where the Hill of Fare was.

Consultee objections were received from the six Community Councils around the Hill (Banchory, Crathes/Drumoak/Durris, Echt/Skene, Inchmarlo/Brathens/Glassel, Torphins and Midmar). Other Consultee objections were received from Historic Environment Scotland (HES), NATS Safeguarding, and Scotways. NatureScot, RSPB and SEPA submitted holding objections which required additional information. All consultee responses have been published on the ECU website apart from the one from Scotways.

Aberdeenshire Council Planners have made a recommendation to Object to the proposal.

RES submitted an Additional Information Report (AIR) to respond to the objections received. This focusses on issues raised by NatureScot, SEPA, RSPB and HES. It does not address any of the concerns raised by any of Community Councils, Scotways or NATS Safeguarding.

The AIR was made public on the ECU website on 3rd September 2024. The notice states that comments on the AIR should be made by 2nd October 2024, about 2 weeks short of the 6-week statutory public consultation period. Local democracy is being bypassed and communities are being disadvantaged in this application process.

All documents have been assessed by local experts against the Scottish Government's National Planning Framework 4 (NPF4) and Aberdeenshire's local planning policies.

This Response to the Additional Information Report presents a synopsis of the work done. We have in addition summarised the latest status on noise assessment guidelines (ETSU-R-97).

HOFWIG encourages planners, our elected representatives in Aberdeenshire Council, and the Scottish Government's ECU to read this additional analysis and take it into account.

Hill of Fare Windfarm Information Group

September 2024

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2. SUMMARY OF HOFWIG RESPONSE TO AIR

The AIR submitted by RES was intended to provide "*information to address objections/concerns raised specifically relating to the cumulative impact on red kite and for a Private Water Supply Risk Assessment (PWSRA)*." In addition, it provides an update to the Peat Management Plan (PMP), an assessment of the cultural heritage, and a photomontage from Meikle Tap showing all infrastructure. Typing, spelling, and referencing errors within the EIAR were also corrected.

Table 3.2 in the AIR gives a summary of the developer's responses to the objections and concerns and is supplemented by 8 Appendices.

Our analysis confirms that assessments made by RES are poor and have many omissions and inconsistencies. We conclude that many of the objections and concerns raised are not adequately addressed and that the report raises more concerns about the impact this windfarm will have on peat, private water supply (PWS), red kites and historical environment.

We also give information on an update to the noise assessment guidance ETSU-R-97, which has not been included in the AIR.

The science behind the most recent assessments in the AIR (i.e., peat, PWS, red kites, and historical environment) is uncertain at best and we conclude that decisions on whether to proceed with this development should not be made based on such flawed information due to the major impact it will have.

We note that both NPF4 and the Scottish Planning Policy require that the **precautionary principle** be applied. This states that "*where there is uncertainty as to the level of risk of environmental harm attached to a proposed action, this principle enables preventative or restrictive measures to be taken without having to wait until the harm materialises*."

We conclude that the precautionary principle must be applied to prevent the Hill of Fare windfarm development due to the lack of appropriate information assessing its impact on PWS, peat, red kites and historic environment.

Overview of HOFWIG response

Peat assessment - AIR and Appendix 4

SEPA objection due to anomalies in excavation peat volumes

- The AIR documents significant changes to the excavation volumes of peat in the updated Peat Management Plan (PMP), and it is difficult to understand the basis of these changes given the limited data available and the fact that no new data have been used. We conclude that there remains significant uncertainty as to how much peat will be removed.
- There could be as much as 25% of the site covered by deep peat, defined as >0.5m based on expert and Government bodies, instead of 8% as stated by the developer who defines deep peat as >1.0m. We conclude that the developer's evaluation of excavated peat is a significant under-estimate.
- The updated PMP reports a 28% increase of peaty soils with <0.5m depth and a 205% increase of peaty soils with >0.5m depth being excavated at the site compared to the figures reported in the EIAR.
- This means significantly more carbon will be released in constructing this windfarm, which will have an important knock-on effect on the carbon calculations, making it even less likely this development will repay the carbon generated during its construction.

- We are also concerned about the plan to re-use the excavated peat. Five of the six samples analysed in the laboratory indicate that the peat is **not** suitable for re-use. The updated PMP assumes 86% of the peat excavated will be re-used. This is highly unlikely and will result in greater carbon emissions during construction.

SEPA request to micro-site some turbines

- There is usually some uncertainty around the specific location of wind turbines and micro-siting is standard practice. However, the EIAR has not assessed much of the site in detail and does not appear to give any commitment or details of additional surveys. This objection/request is not mentioned in Table 3.2 of the AIR.
- We conclude that that RES has not responded to this objection/request.

SEPA request move the construction compound to the borrow pit area between T14 and T15 or float it

- Table 3.2 in the AIR states that the borrow pit areas are "*outwith areas of peat, with the exception of small patches and it is not guaranteed that the entire borrow pit search area will be utilised"*.
- The peat survey maps however clearly show the presence of peat in the construction compound area as well as in the borrow pit areas.
- No mention is made of moving the construction compound or floating it. We conclude that RES has not responded to this objection/request.

SEPA request to move or float the battery storage facility

- RES claim that the BESS has been micro-sited out of areas of deep peat and is located within an area of commercial/plantation forestry which will have been drained, resulting in peat being degraded or of modified condition.
- The peat survey maps clearly show that the proposed location for the BESS contains peat, including deep peat. We conclude that RES has not addressed the issues raised by SEPA.

SEPA request to reduce or move the borrow pits located on deeper peat

- The excavated volumes have been updated and show an increase in peat is expected to be removed from borrow pit areas.
- We conclude that RES has not addressed the issues raised by SEPA.

Private Water Supply (PWS) assessment - AIR and Appendices 1-3

General observations

- It is crucial that essential private water supplies (PWS) in rural areas like this are protected. There are no other options for residents because there is no mains water available. Statements about risk assessments, mitigations and safeguards need to be based on quantitative analysis and sound science to ensure that there will be **no** impact on PWS for residents living around the Hill.
- RES commissioned an analysis on the impact of the development on PWS. The introduction to the report states that the geology is *"generally associated with complex hydrogeological conditions (e.g., unknown fracture networks, varying weathered zone, flows and zones of contributions) which are extremely difficult to characterise and do not lend themselves to quantification.* ***The risk assessment has therefore adopted a qualitative approach****".*

- No quantitative assessments have been provided, and the conclusions and mitigations proposed are therefore insufficient to provide assurance that PWS will not be impacted. The precautionary principle must be applied.
- It is well known that there are radioactive uranium rocks present in the Hill. In spite of the risks associated with the release of radon and heavy metals into the atmosphere and groundwater during blasting, RES continue to ignore this issue. Furthermore, repeated requests to the ECU, SEPA, Aberdeenshire Council, and the UK Health Protection Agency as to which statutory body is responsible for risk assessment at the application stage, has resulted in each body naming another as the responsible body. This issue needs to be immediately addressed and as part of the approval process, not subsequent to it, where mitigation would be challenging if not impossible.

SEPA objection due to access tracks impact on PWS

- No risk assessment has been made of subsidence of the upgraded track close to the collection tanks, despite this being highly likely on peatland. It is possible in due course that the track depth will exceed the 1m limit set by SEPA to limit buffer zones around the collection tanks to 100m. We conclude that 250m buffer zones would be more appropriate to minimise impacts on PWS.
- No general assessment has been made of the impact of the 17.6km of 4.5m wide tracks on the other catchment areas across the site. This includes "floating" tracks on deep peat. We conclude that the risks are unknown which is not acceptable.

SEPA objection due to impact on groundwater flow and groundwater quality

- The risk assessments provided by RES for the Dunecht Estate PWS are qualitative only despite the request from SEPA to provide a "*bespoke qualitative and **quantitative** risk assessment",* and they under-estimate the impact on PWS.

SEPA objection due to impact on Braeside PWS

- RES have only provided an updated map and no further information.
- We conclude that RES has not addressed the issues raised by SEPA.

Red kite - AIR and Appendix 5

NatureScot and RSPB's objections due to the cumulative Impact on red kite population

- We conclude that there are insufficient good quality data from local windfarms, including Glendye, to make a proper assessment of the impact of windfarms on endangered raptors like the red kite, and the precautionary principle should apply.

Cultural heritage - AIR and Appendix 6-8

Basis of AIR

- RES commissioned a report by SLR to counteract the objections made by HES. The "basis of report" is poorly referenced and ignores much of the research related to the recumbent stone circles (RSCs), landscape and lunar cycles. No details of the qualifications and expertise of the report's authors has been given.

General comments

- It is critical to recognise that this area is something more than a collection of randomly place listed buildings and monuments. Several important cultural assets are within a few hundred metres of each other, as HES summarise "*The area bounded by Midmar Kirk, Sunhoney, and Midmar Castle, approximately 1800m by 900m can be considered an area*

of Nationally important historic interest. In total this relatively small area includes six scheduled monuments, three "A" listed sites, four "B" listed sites, three sites of local historic interest, two dwellings (now removed from the list), and a war memorial."

- Research indicates that the orientation and length of the recumbent stones in recumbent stone circles (RSCs) are meant as a 'frame for viewing the rising and setting of the moon at certain times' and that these RSCs were used as calendars in Mesolithic times. Hunter-gatherer societies in Scotland had both the need and sophistication to track time across the years, to correct for seasonal drift of the lunar year, and this occurred nearly 5,000 years before the first formal calendars known in the Near East. These monuments are nothing short of remarkable.

HES objection to impact on Sunhoney RSC

- Sunhoney RSC is one of the oldest, and most cup marked RSCs in Scotland. SLR have however diminished its importance and ignored its clear relationship to the Hill of Fare.
- We note the research that concludes there is a clear connection between the orientation of the RSC and the landscape: it forms a 'Megalithic window' focused on the moon's trajectory above the Hill of Fare. This is an ancient, Mesolithic lunar calendar, thousands of years older than other formal time-measuring monuments created in Mesopotamia.
- The fact that the windfarm will not interfere physically with the stone circle does not mitigate its effects. It will destroy the aspect of its place both historically, physically, and spiritually.
- Trees surrounding Sunhoney and electricity pylons in the distance are not relevant to the impact the dominating windfarm will have.

HES objection to impact on Christchurch (Midmar) RSC

- The Christchurch (Midmar) RSC is probably the best known in Aberdeenshire and is closest to the proposed windfarm and will be most severely impacted it.
- SLR presents the idea that "extensive research" has shown that there will be little impact, and, as with Sunhoney, specifically refer to the views across the recumbent stone, avoiding mentioning the views as a whole experience. Our research concludes however that the RSC 'Megalithic window' is, like Sunhoney, focused on the Moon's trajectory across the local horizon, in this case, the Hill of Fare. SLR maintains that since the "interactions with celestial bodies" or "the lunar cycle" will not be obstructed, then there is no real impact. This is incorrect, particularly in autumn and winter when the sun passes low along the ridge of the hill from east to west. Similarly, due to the proximity of the RSCs to the Hill of Fare, the turbines will be located between the RSCs and the Moon in the night sky. The potential significance of the orientation of the RSCs and lunar cycles is ignored.

Update on Noise Assessment Guidelines (ETSU-R-97)

- We note that an independent review of ETSU-R-97 in February 2023 by WSP highlighted several shortcomings. The Department for Energy Security and Net Zero (DESNZ) have stated, under Freedom of information, that the guidance "would benefit from targeted updates" and that the previous government have contracted Noise Consultants Ltd to update ETSU-R-97 by Spring 2025.
- The WSP key recommendations relate to Amplitude Modulation, where ETSU-R-97 does not adequately address
    - the adverse impact (which increases noise annoyance)

- the noise limits which are based on outdated or insubstantial evidence. Notably, controlling values for night-time noise levels should not be higher than during the day. The night-time noise level in ETSU-R-97 is 43dB, high for quiet countryside settings, whereas the WHO standard is much lower at 30dB. The areas around the Hill of Fare have been recorded much lower again at around 15-20dB and frequently much lower. A 10dB is a doubling (or halving) of loudness. ±3dB is normally perceptible.

- The RES Noise Impact Assessment also uses the assumption in their calculations that the ground absorption factor is 0.5, which allows RES to achieve the setback distances from turbines to houses they are stating. However, when the ground is covered in ice and compacted snow the ground becomes a fully reflective surface and make a nonsense of the Noise Impact Assessment calculations for several weeks in the year

3. PEATLANDS - CONTEXT

Introduction

Peat soils are formed from carbon-rich, dead, and decaying, plant material under waterlogged conditions. Due to the process of peat accumulation, peatlands are carbon rich ecosystems that store and sequester more carbon than any other type of terrestrial ecosystem. Peatlands form over thousands of years – 1m of peat takes around 1,000 years to be created.

When peatlands are excavated or drained, the carbon from organic matter contained in the peat dries and oxidises gradually to CO_2. It is permanently lost from the system. Over time, this process also results in soil compaction and subsidence, making it difficult to restore.

Peatlands are important source catchments for drinking water and have a role in the regulation of water flows. They also support species and habitats that depend on waterlogged conditions - often extreme - and are of international importance for biodiversity conservation. They often contain a rich palaeo-ecological and historic archive with preserved artefacts from past human societies and a wealth of information about our changing environment, land management and climate.

According to the UN Centre for Ecology and Hydrology (UNEH), peatlands are among the most carbon-rich ecosystems on Earth, providing a net cooling effect on climate, reducing flood risk, and supporting biodiversity.

The total global peatland area is estimated to be 4.23 million km^2, approximately 2.84% of the world land area. Some 16% of the world's peatlands are drained.

Peat in Scotland

There are three broad peatland types in the UK: blanket bog, raised bog and fen bog. Blanket bog is rare throughout the world but, according to the International Union for Conservation of Nature (IUCN)'s Peatland Programme, it is the most widespread habitat in the UK.

Blanket bog is a type of peatland found in only a few parts of the world with cool, wet and, usually, oceanic climates. In Scotland it is found in the uplands, in areas with gentle slopes and poor drainage. **The proposed Development includes blanket bog with variable peat depths across the site.**

Blanket bogs have sometimes been referred to as the 'rainforests' of the UK due to the unique flora and fauna they support, and their global rarity.

The total mapped peatland area for Scotland is 19,478 km^2 which is 67% of the UK's total peat area. Although estimates vary, Scottish soils store approximately 3,000Mt of carbon, the majority (1,600Mt) held in peats and peaty soils (James Hutton Institute, ClimateXChange 2018). Scotland's 2018-2032 Climate Change Plan (updated in Dec 2020) estimates that around 80% of Scotland's peatland is degraded. The urgency to preserve and restore degraded peatland is now more important than ever and is reflected in stronger Scottish Government policies on the subject.

Impacts of windfarm construction on peatland

Windfarm construction can damage peatland hydrology causing the vegetation to change or allow erosion with ecological and carbon loss effects often beyond the footprint of the construction area. There has been no national assessment of the area developed for windfarms on peatland. We don't know the full effects of this type of development or what peatland has been lost.

The first study to investigate windfarm development on peatland was carried out at SPR's Whitelee Wind Farm over a period of 31 months. It found that forest-felling, borrow pits, turbine base and track construction were significant drivers of fluvial macronutrient loading. Low/poor water quality occurred in small headwater catchments most disturbed by the development. At the site exit,

dissolved organic carbon and soluble reactive phosphorus concentrations increased during construction. Carbon was lost and stream water quality negatively affected.

The Hill of Fare windfarm site is characterised by blanket bog and is criss-crossed by a myriad of watercourses. There is ***no*** evidence from the planning application that construction-phase changes to the ground flow regime, with the extraction and de-watering of at least 17,595m^3 of peat will ***not*** do long-term damage.

4. PEAT ASSESSMENT SUMMARY - AIR AND APPENDIX 4

Anomalies in excavation peat volumes

SEPA objection/request

SEPA noted that there were some anomalies in the excavation peat volumes in the PMP (Tables 4.1 and A1) compared to the Peat Depth Survey in Figure 10.5 of the EIAR. For example, T13 and its associated crane hard standing are described as being on shallow soils, but Table A.1 states that 1,711m^3 of peat will be excavated.

RES response

The updated PMP has significantly changed the excavated peat volumes (see Table 4.1 below for a summary of the changes). In the excavation calculations, organic soils <0.5m depth are defined as peaty soils. Where peat is present, excavated volumes are calculated for "acrotelic" (<0.5m) and "catotelmic" (>0.5m) layers. Major changes have been made to estimates of excavated peat on crane hardstanding, battery storage, substation, construction compounds and batching plant locations as highlighted in red in Table 4.1.

Infrastructure component	Excavated volumes (m3)					
	Organic soils (<0.5m)		Peaty soils Acrotelm (<0.5m)		Peaty soils Catotelm (>0.5m)	
	May 2024	Oct 2023	May 2024	Oct 2023	May 2024	Oct 2023
Turbines	3,668	3,668	1,527	1,527	186	186
Crane hardstanding, battery storage, substation	12,828	16,178	3,307	1,305	1,751	406
Construction compounds & batching plant	849	1,836	679	0	307	0
Excavated tracks & turning heads	3,178	3,178	8,694	8,694	320	320
Floating tracks	0	0	0	0	0	0
Borrow pits	7,756	8,581	602	0	222	0
TOTAL	**28,279**	**33,438**	**14,809**	**11,527**	**2,786**	**912**

Table 4.1: Summary changes of estimated peat excavated PMP dated May 2024 (AIR) and Oct 2023 (EIAR)

HOFWIG analysis

The updated PMP in the AIR shows significant changes to the excavation volumes of peat, and it is difficult to understand the basis of these changes given the limited data available and the fact that no new data have been used. We conclude that there remains significant uncertainty as to how much peat will be removed.

We note the significant increase in peaty soils expected to be excavated (see Table 4.1), with 28% more peaty soils with <0.5m depth and 205% more peaty soils with >0.5m depth.

This means significantly more carbon will be released in constructing this windfarm, which will have an important knock-on effect on the carbon calculations.

Many of the changes made are difficult to reconcile. Referring to T13 hardstanding highlighted by SEPA for example, the average peat depth has decreased from 0.66m to 0.25m, and only 270 m^3 of soil is now estimated to be excavated - no peat - compared to 1,711m^3 peaty soil previously estimated. The peat survey map shows about limited coverage of data (about 10% of the area) and depth ranges measured up to 0.6m. No new data are available.

We also note that the peat depth probes for T1, T2, T5, T6 and T12 which show peat of 0.5-1m depth on the peat depth survey map (Figure 10.5 in the EIAR) seem to have been ignored on the peat excavation figures in Table A.1 of the AIR. These findings are summarised in Table 4.2 below. It appears that peat probes figures have been combined and averaged, resulting in depths generally <0.5m despite deeper peat being present. This latest analysis by the developer suggests that there is very little peat present, whereas the maps show that this is not the case.

Turbine	Peat Depth survey (Figure 10.5 of EIAR)	Av peat depth	Organic soils excavated (m3) (<0.5m)	Peaty soils excavated (m3) Acrotelm (<0.5m)	Peaty soils excavated (m3) Catotelm (>0.5m)
1	0.5-0.55m	0.43m	438	0	0
2	0.55-0.6m	0.31m	324	0	0
5	0.5-0.6m	0.42m	430	0	0
6	0.5-1.0m	0.37m	384	0	0
12	0.5-0.7m	0.41m	423	0	0

Table 4.2: Comparison of average peat depths and estimated volumes excavated (Table A.1 of the AIR), compared to peat survey data for T1, T2, T5, T6 and T12 turbines (Figure 10.5, EIAR)

Furthermore, we challenge the developer's definition of peat as having a depth of >0.5m and deep peat as having a depth >1.0m. This has been justified based on a reference to the Government's 'Guidance on developments on peatland' (2017). This guidance however lists deep peat as >0.5m, not >1m (see e.g., table on page 14).

Many expert and Government bodies (e.g., Scottish soils) define deep peat as >0.5m deep. This includes the UK Forestry Standard, the Carbon & Peatland 2016 map, the 'UK Natural Capital: Peatlands' report published by the Office of National Statistics (ONS, 2019). Dr Patricia Bruneau, Soil Science Advisor at NatureScot, also advises 0.5m depth to be the criterion for deep peat to be used for planning purposes.

In England, deep peat is defined as >0.4m.

The developer RES states that the proposed infrastructure layout has been designed to 'avoid areas of deep peat' and has used the definition of deep peat as being >1.0m. However, if deep peat is defined as >0.5m, then some of the tracks and the infrastructure proposed are sited on deep peat (see Peat Depth Survey, Figure 10.5 of the EIAR).

RES currently claim that only 8% of the peat probe locations are on deep peat (see Table 4.3 below, taken from p.6 of the AIR Technical Appendix 10.2). However, if their 'shallow' peat

(>0.5m-1.0m) is included as deep peat as per the definitions above, then this rises to 25%, which is significant.

Peat Depth Range (m)	Peat Depth Categorisation	Number of Locations	% of Locations
< 0.5	Soils not classified as peat	2108	74.7
0.5 – 1.00	Shallow	473	16.8
1.01 – 1.50	Deep	117	4.1
1.51 – 2.00		73	2.6
2.01 – 3.00		39	1.3
3.01 – 4.00	Very deep	10	0.4
4.01 – 5.00		2	0.1
> 5.00		0	0
Total		**2822**	**100**

Table 4.3: Peat depth at probing locations (Technical Appendix 10.2, Peat Management Plan, AIR, May 2024)

We are also very concerned about the plan to reinstate the excavated peat. The PMP proposes to re-use excavated peat and soils, and states that "*the characteristics of the excavated peat determine how suitable it is for re-use, for example unconsolidated and saturated peat will have limited use for reinstatement works".*

Only six samples from the whole site were laboratory tested to determine their characteristics using the Von Post classification which measures degree of humidification. The results indicate that "*the peat at the site is generally moderately highly or very highly decomposed, even within the first 0.5m depth in five of the six locations. This could affect the suitability of the peat for re-use at the site and as outlined in Section 3.2, the supervising engineer with determine the suitability of excavated pear for reuse".*

Despite over 80% of the limited data indicating that the peat is not suitable for re-use, the updated PMP assumes a re-use figure of 39,368 m^3, of the total 45,874 m^3 excavated (some 86%), which is highly unlikely.

The laboratory samples also indicate that peat is present at <0.5m depth.

HOFWIG conclusions

The AIR documents significant changes to the excavation volumes of peat, and it is difficult to understand the basis of these changes given the limited data available and the fact that no new data have been used. We conclude that there remains significant uncertainty as to how much peat will be removed.

The definition of deep peat in the application is flawed and should be <0.5m based on the developer's and other references, and not >1.0m as applied in the EIAR and AIR. Hence, there could be as much as 25% of the site covered by deep peat, defined as >0.5m based on expert and Government bodies, instead of 8% as stated by the developer. We conclude that the developer's evaluation of excavated peat is a significant under-estimate.

The updated Peat Management Plan (PMP) reports a 28% increase of peaty soils with <0.5m depth and a 205% increase of peaty soils with >0.5m depth being excavated at the site compared to the figures reported in the EIAR.

This means significantly more carbon will be released in constructing this windfarm, which will have an important knock-on effect on the carbon calculations making it even less likely this development will repay the carbon generated during its construction.

We are also concerned about the plan to re-use the excavated peat. Five of the six samples analysed in the laboratory indicate that the peat is **not** suitable for re-use. The updated PMP assumes 86% of the peat excavated will be re-used. This is highly unlikely and will result in greater carbon emissions during construction.

Micro-siting of turbines

SEPA objection/request

SEPA requested the applicant to confirm commitment to investigating possible micro-siting further off deeper peat onto shallower peat and/or mitigating of the possible peat excavation volumes with floating of hardstanding areas for turbines T1, T2, T3, T4, T5. T6, T7, T8, T11, and T12.

Furthermore, SEPA noted that the applicant had requested micro-siting allowance of up to 100m. SEPA requested a micro-siting condition should be attached which prevents micro-siting of any excavations into deeper peat or further encroachment into the relevant buffer zones without prior consultation and agreement with SEPA, and that a peat survey is submitted to support any micro-siting on areas not already surveyed.

RES response

There is usually some uncertainty around the specific location of wind turbines and micro-siting is standard practice. However, the EIAR has not assessed much of the site in detail does not appear to give any commitment or details of additional surveys. This objection/request is not mentioned in Table 3.2 of the AIR.

HOFWIG analysis/conclusion

We conclude that that RES has not responded to this objection/request.

Move the construction compound to the borrow pit area between T14 and T15 or float it

SEPA objection/request

50% of the construction compound is located on peat >0.5m, and the developer was asked to move it (e.g., to the borrow pit area between T14 and T15) or float this component.

RES response

Table 3.2 in the AIR states that the borrow pit areas are "*outwith areas of peat, with the exception of small patches and it is not guaranteed that the entire borrow pit search area will be utilised"*.

HOFWIG analysis/conclusion

The peat survey maps clearly show the presence of peat in the construction compound area.

No mention is made of moving the construction compound or floating it. We conclude that RES has not responded to this objection/request

Move or float the battery storage facility

SEPA objection/request

About 1/3 of the battery storage facility is located on peat >0.5m and the estimated excavated peat volume represent nearly 25% of the total estimated excavated peat. The developer is asked to move it or floated.

RES response

Table 3.2 of the AIR states that "*during the design iteration process…the Battery Energy Storage System (BESS) has been micro-sited out of areas of deeper peat and is located within an area of*

commercial/plantation forestry which will have been drained resulting in peat being degraded or of modified condition."

HOFWIG analysis/conclusion

The proposed location for the BESS contains peat (including deep peat), and we conclude that RES has not addressed the issues raised by SEPA.

Reduce or move the borrow pits located on deeper peat

SEPA objection/request

No estimated peat excavation is provided for five borrow pits, including two located on deeper peat. Reduce or remove borrow pits currently located on deeper peat.

RES response

An update to the PMP was provided.

HOFWIG analysis/conclusion

The excavated volumes have been updated (see Table 5.1 above) and show an increase in peat is expected to be removed from borrow pit areas. We conclude that RES has not addressed the issues raised by SEPA.

5. PRIVATE WATER SUPPLY (PWS) SUMMARY – AIR and APPENDICES 1-3

General observations

There are ca. 300 people in 150 homes, as well as farms and businesses that are totally reliant on pure drinking water from the Hill of Fare. It is crucial that essential private water supplies (PWS) in rural areas like this are protected. There are no other options for residents because there is no mains water available.

Construction of roads, crane hardstanding, turbine foundations, construction compounds, batching plants, battery storage, substation and borrow pits will all require removal of overburden as well as excavation or blasting into deeper rocks which will affect water flow and quality. Geological mapping of the Hill of Fare shows that this a prime site containing uranium rich bearing rock which was considered for uranium extraction in the 1970s. Blasting, excavation crushing, and transportation of the rock will release uranium containing dust into the air and groundwater around the Hill of Fare and the Dee Valley Special Landscape area. The activities will also release radon gas, known to be carcinogenic, both into the air and into the groundwater creating a significant health hazard for residents.

Statements about risk assessments, mitigations and safeguards need to be based on quantitative analysis and sound science to ensure that there will be **no** impact on PWS for residents living around the Hill.

RES commissioned an analysis on the impact of the development on PWS. The introduction to the report, states that the geology is *"generally associated with complex hydrogeological conditions (e.g., unknown fracture networks, varying weathered zone, flows and zones of contributions) which are extremely difficult to characterise and do not lend themselves to quantification.* ***The risk assessment has therefore adopted a qualitative approach****".*

No quantitative assessments have been provided, and the conclusions and mitigations proposed are therefore insufficient to provide assurance that PWS will not be impacted. The precautionary principle must be applied.

It is well known that there are radioactive uranium rocks present in the Hill. In spite of the risks associated with the release of radon and heavy metals into the atmosphere and groundwater during blasting, RES continue to ignore this issue. Furthermore, repeated requests to the ECU, SEPA, Aberdeenshire Council, and the UK Health Protection Agency as to which statutory body is responsible for risk assessment at the application stage, has resulted in each body naming another as the responsible body. This issue needs to be immediately addressed and as part of the approval process, not subsequent to it, where mitigation would be challenging if not impossible.

Impact on collection tanks due to access tracks

SEPA objection/request

The turbine bases are proposed to be at a depth of 2.5-3.5m, but SEPA stated that there is no information about the depths of the upgraded and new access tracks. SEPA require a 250m buffer zone between the new access tracks and the groundwater fed PWS (collection tanks) if excavations are >1m depth.

RES response

RES state that the upgrading of access tracks within 100m of the PWS sources will consist of widening the track, verge creation and drainage installation, and claim that there will be no excavation below 1m in depth.

HOFWIG analysis

Subsidence risk of tracks constructed on peat

Fig 5.1 shows the PWS infrastructure layout in the East of the site, highlighting the Dunecht catchment area in light green, as well as the HOF collection tanks and 100m buffer zones referred to by SEPA. The AIR has assessed the impact of the upgraded access track to the north of the collection tanks only.

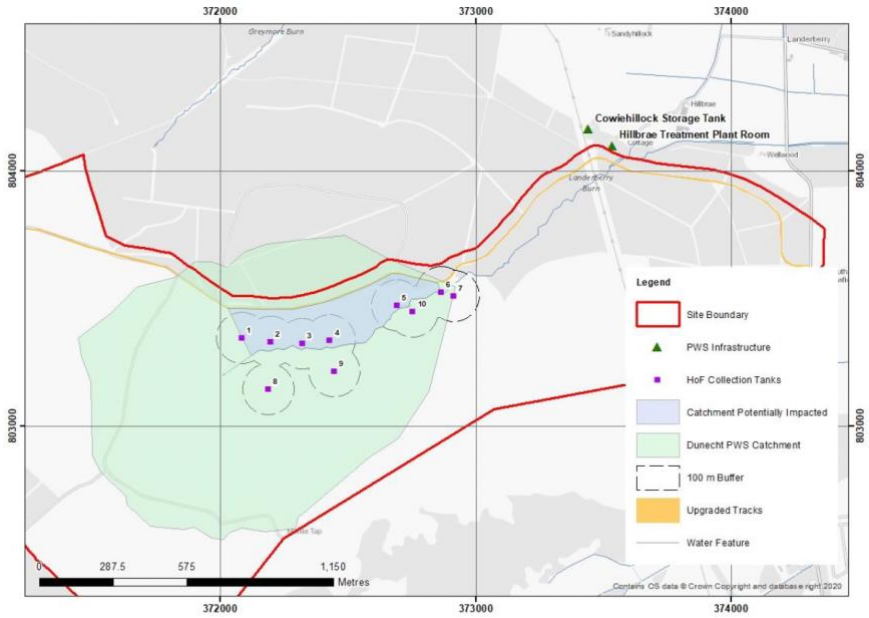

Figure 5.1: PWS infrastructure layout detail in East (taken from Figure 2.2, AIR Appendix 1)

The long-term hydrological impacts of tracks on peatlands, particularly "floating" tracks, and the resulting carbon loss due to drainage effects are unknown (IUCN, 2016). Tracks may impound or divert water flow, potentially resulting in waterlogging on one side of the track and drying on the other. (SNH, Constructed Tracks in the Scottish Highlands, 2015, NatureScot, Constructed Tracks in the Scottish Uplands, 2013 – link currently down!).

What published scientific literature there is about roads constructed over peat makes clear that both short-term and long-term subsidence is almost inevitable, and this will occur to different degrees and at different rates along a road length. This variable subsidence tends to have significant operational and environmental consequences. The fact that peat compresses under load is a well-established aspect of engineering on peat.

The International Union for the Conservation of Nature (IUCN) in their 'Briefing Notes 12: Tracks on Peatland', 2016, concur with this view, and state:

- "*Given that road-construction traffic for developments such as windfarms may involve regular passage by vehicles with payload capacities of 30 tonnes and after turbine construction, crawler cranes of up to 250 tonnes,* ***the necessary thickness and weight of the carriageway makes subsidence into the peat over time unavoidable***"
- "***All constructed tracks result in long term effects****. Apart from direct loss of habitat beneath the route, one of the greatest effects of a constructed track is that in many places it cuts across the general pattern of surface seepage so characteristic of a blanket mire landscape.*"

The discussion in the AIR infers that because the track will be made of permeable material and no dewatering is required that somehow this will mitigate any issues. However, windfarm tracks sustain heavy and long loads, and this is known to have the potential to alter drainage patterns, as discussed above. No risk assessment has been made that subsidence of the track may lead to excavations >1m. To safeguard the PWS, we strongly recommend that the buffer zones around the collection tanks should be increased to 250m from the current 100m.

Impact assessment of all tracks on site

Furthermore, the development comprises a total of 7.3km of new track construction and 10.3km of upgrades to existing tracks (see Figure 5.2).

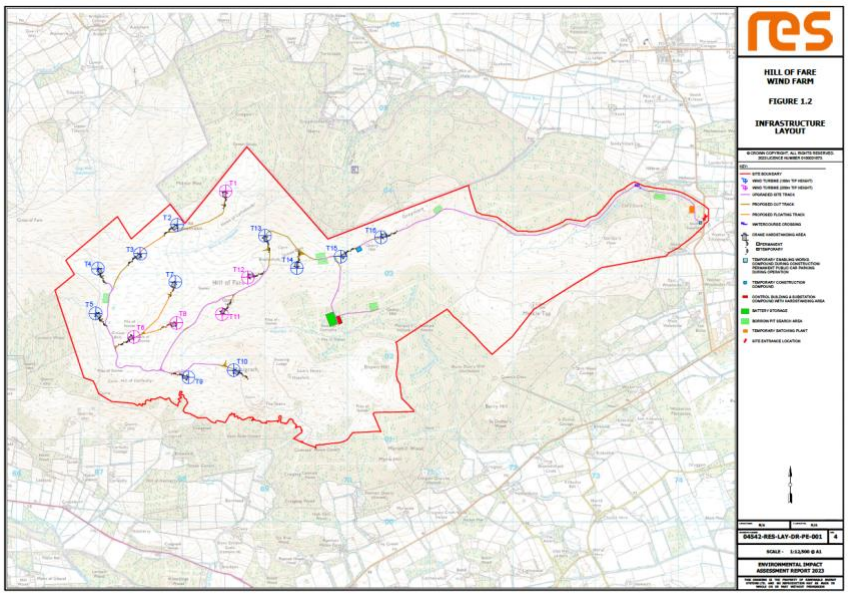

Figure 5.2: Infrastructure layout (taken from Figure 1.2, EIAR Volume 2)

Access tracks are planned to be 4.5m wide though there will be some abnormal load turning heads built, which will be wider. Most tracks will be excavated, but where peat depths are >1m, they will be "floated" over the peat (e.g., between T6-T7 and T6-T8). Some will also be "cut" (e.g., between T13-T14-T15).

A "floating" road on peat in its simplest form is a road that is constructed directly on top of the peat relying on the strength of the in-situ peat for its support. The road does not actually "float" on the peat. The settlement of a floating road can affect the hydrology of the bog by cutting off drainage paths and compacting the peat below (Floating Roads on Peat: A report into good practice design, construction and use of floating roads on peat with particular reference to windfarm developments in Scotland, SNH, 2010).

Figure 5.3 shows the PWS infrastructure with a total of 8 catchment areas. The HOF collection tanks in Figure 5.1 are located to the East of the site and are highlighted in purple.

No assessment has been made of the impact of 17.6km of 4.5m wide tracks shown in Figure 5.2 on the catchment areas shown in Figure 5.3. These including some "floating" tracks on deep peat. The risks are unknown which is not acceptable in an area of PWS.

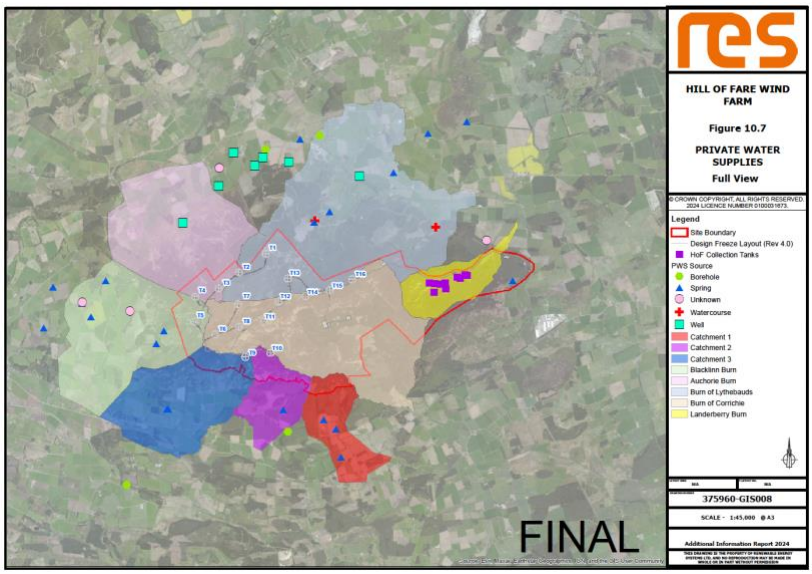

Figure 5.3: PWS infrastructure (taken from Figure 10.7, EIAR Volume 2)

HOFWIG conclusions

No risk assessment has been made of subsidence of the upgraded track close to the collection tanks, despite this being highly likely on peatland. It is possible in due course that the track depth will exceed the 1m limit set by SEPA to limit buffer zones around the collection tanks to 100m. We conclude that 250m buffer zones would be more appropriate to minimise impacts on PWS.

No general assessment has been made of the impact of 17.6km of 4.5m wide tracks on the other catchment areas across the site. This includes "floating" tracks on deep peat. We conclude that the risks are unknown in an area of PWS which is not acceptable.

Impact on groundwater flow and groundwater quality

SEPA objection/request

Collection tanks are within 100m of construction activities <1m in depth and are groundwater fed, not "near surface water' as indicated by the developer. SEPA requested a **bespoke qualitative and quantitative risk assessment** which demonstrates that the proposals do not have a significant impact on the groundwater flow and groundwater quality feeding the Dunecht Estate collection tanks.

RES response

RES provided a risk assessment in Table 2.4 of the AIR Appendix 1.

HOFWIG analysis

The risk assessments provided by RES for the Dunecht Estate PWS **are qualitative only**, and they under-estimate the impact on PWS:

- "*Track located at 35m up-gradient from collection chamber 6 at NJ 72863 03526, unlikely to significantly interfere with flow to PWS intake*". There is no evidence as to why it is unlikely to significantly interfere with the flow.
- "*Only collection tank no. 7 is considered hydrologically disconnected*". The remainder have not been commented on so we must assume they are or may be hydrologically connected including no. 6 which is within the 100 m buffer zone. If this is the case, then the proposed development would severely impact PWS.

- "*The track upgrades have the potential to impact only 10% of the overall catchment*", however this encompasses six of the ten collection tanks in the catchment area and is very close to two others. The area of the overall catchment affected is irrelevant. It is the proximity of the collection tanks that results in a high risk to the PWS.
- "*Increased sediment loading could result from construction works particularly during heavy rainfall given the proximity to the proposed track upgrades at the easternmost collection chambers*". This would seriously impact PWS and is unacceptable.

HOFWIG conclusion

The risk assessments provided by RES for the Dunecht Estate PWS are qualitative only despite the request from SEPA to provide a "*bespoke qualitative and quantitative risk assessment",* and they under-estimate the impact on PWS.

Impact on Braeside

SEPA objection/request

Braeside PWS is directly down gradient of turbines 4 and 5 and may have hydraulic continuity to construction works. SEPA requested confirmation of the source of this PWS and demonstration that the proposals will not have a significant impact on the groundwater flow and groundwater quality feeding to the source of this PWS.

RES response

RES have only provided an updated map and no further information.

HOFWIG analysis/conclusion

We conclude that RES has not addressed the issues raised by SEPA**.**

6. RED KITE ASSESSMENT SUMMARY – AIR and APPENDIX 5

General observations

The last paragraph in the AIR Appendix 5 states that: "*it is proposed that as part of the operational protocol for the Proposed Development all operational staff will be instructed to maintain a watch for bird carcasses when working on the windfarm. Should any bird carcasses be located, windfarm staff will report these to the client who will in turn report the collision to NatureScot via their online form.*"

What will the developer do should they find any bird carcasses, particularly red kite carcasses? Will they take action to mitigate any further deaths? If so, what actions will they take?

Cumulative Impact on red kite population

NatureScot and RSPB objection

Both NatureScot and RSPB expressed concerns that the windfarm could have significant cumulative impacts on the red kite population from predicted collisions.

Both noted that the most up to date collision risk figures from the Glendye windfarm had not been included in the modelling, which showed a higher collision rate than assumed for the Hill of Fare windfarm (1.3 birds/annum compared to 0.48-0.72 birds/annum). RSPB stated that without the inclusion of these data, the predicted impacts on red kite are expected to increase the worst-case cumulative collision rate to >2/annum.

Furthermore, RSPB pointed out that several existing windfarms in the area have no collision risk assessments, some of which started operations before the reintroduction of red kites to the area. "*The significant change in the population of this species over recent years is not therefore reflected in the available collision risk figures and the cumulative effect is likely to be conservative.*"

RES response

Collision rate estimates for Glendye Wind Farm were updated and a revised cumulative collision risk assessment provided, resulting in an estimated collision loss of ca. 2.5 birds/annum.

Despite the level of additional mortality on the Aberdeenshire and Angus red kite population, the AI report concludes that "*favourable conservation status can still be attained/maintained over the long-term. The unmitigated impact of cumulative collisions on the Aberdeenshire and Angus population continued to be considered of low magnitude, and thus minor adverse and not significant in the context of the EIA regulations*".

HOFWIG analysis

<u>Insufficient good quality data to make a proper assessment</u>

Table 1 of AIR Appendix 5 lists 21 other windfarms in the Aberdeenshire and Angus area, of which 13 are operational, 5 are consented, 2 are under application and 1 is being appealed. Of these, only 3 windfarms (i.e., 14%) have red kite data available and none of these are operational.

We note that most bird studies to date have assessed the effects of windfarms with turbines <100 m high, while considerably larger turbines are being built today (Tolvanen, 2023). The wind turbines for the proposed development are up to 200m to blade tip with a hub height of 122m. As well as being much taller, the blades spin much faster and they displace more air space. A blade with a rotor diameter of 172m, for example, gives a swept area of 23,235 m^2. Turbines for the proposed development will be inherently more dangerous for red kite and other soaring birds.

There are many well-known problems with the bird (and bat) survey methods, and conclusions reached should be treated with caution. For example, it's very hard for people to estimate precisely where birds are flying in relation to the turbines, especially as these surveys are often carried out at quite a distance from the turbines. Surveys are also usually carried out when weather conditions are good, but most collisions are likely when weather conditions are poor (e.g., fog/low cloud) and collision rates will almost always be under-estimates.

The collection of accurate long-term data on wind-farm collisions at onshore sites is pitiful bearing in mind the wind industry is now decades old. The ecological consultancy BSG Ecology in the Ornithological Chapter for Clachindarroch II near Huntly (consented June 2023) state: "*Robust monitoring of bird mortality at windfarms is uncommon, and collisions are under recorded. There will also be biases in the data, as windfarms in some parts of Europe are more frequently and effectively monitored than others, and bird species show differences in abundance across their range which may influence their likelihood of encountering windfarms.*" (9.7.78)

Concerns about Glendye Windfarm assessment

Reliance on the Glendye windfarm collision risk calculations is not recommended. Whilst the Glendye windfarm falls partially within 20 km of the proposed development and so is relatively nearby with respect to the red kite population, there were a lot of issues with the ornithological surveys (ECU00000676). The RSPB and NatureScot both complained about them, and both strongly opposed the Glendye development.

NatureScot, in their letter dated 16 October 2020 to the Glendye inquiry regarding red kite risk calculations, stated:

- "*There remain significant concerns about the quality of the survey work undertaken. In particular, the under-taking of vantage point watches and moorland bird surveys while gas guns and other bird scaring devices were in use. These activities which are specifically designed to influence bird behaviour could result in unreliable baseline date which could under-represent bird activity on the site.*"
- "*There remains some confusion as to the data used to calculate the collision risk. For example, in AI Appendix 4.2: Ornithology Surveys 2019-2020, the red kite collision risk calculation information on page 34 states that VP 2a has a total of 3327.41 seconds at risk height. However there seems to be records for individual days which exceed this total, for example 24/10/2019 VP2a seems to have recorded 9,180 seconds at risk height. We request that this anomaly is explained, and confirmation is provided that the collision risk results in the Additional Information are correct. We note we raised concerns about the reliability of the collision risk data in our previous response*." We can find no evidence that this issue has been resolved.

RSPB, in their letter dated 14 October 2020 to the Glendye inquiry stated:

- "*The robustness of the ornithological surveys given the presence of bird scaring devices during many surveys and issues with access to carry out viewpoint surveys.*"
- *"Collision risk and Population Viability Analysis. <u>There is considerable uncertainty as to what factors will influence the populations over the considerable time scale of 30 years (the proposed windfarm operational lifetime), in particular anthropogenic factors such as land use changes and illegal persecution. As such, it is impossible to have confidence in predictions of absolute population size after such lengths of time</u> and we therefore recommend reliance on measures of relative population size, or counterfactual metrics, in particular the Counterfactual of Population Size (CPS). The reason CPS is appropriate is due to it being relatively insensitive to the uncertainty around the magnitude, variability, and trends of demographic rates in the model from which it is calculated. As the same*

uncertainties apply to both the impacted and unimpacted scenarios, it can be considered robust despite the scale of these uncertainties. In response to previous RSPB advice advocating CPS6 both JNCC and MSS commissioned reviews of PVA output metrics, and the results of these reviews agreed that counterfactuals were the most appropriate metrics and are routinely advised by SNCBs during scoping for UK offshore windfarms. As such, without presenting counterfactual metrics, it is not possible for conclusions on the extent of population scale impacts to be made. Therefore, although population modelling has been carried out for kite, we do not agree that the information in the EIA and AI shows that the proposal will not adversely affect the population of the three species highlighted here; golden eagle, white-tailed eagle and red kite. The predicted collision risk as a result of the proposed development is also especially high, with around 73 birds from these 3 species estimated to be killed over its 30-year operational life."

HOFWIG conclusion

We conclude that there are insufficient good quality data from local windfarms, including Glendye, to make a proper assessment of the impact of windfarms on endangered raptors like red kite, and the precautionary principle should apply.

7. CULTURAL HERITAGE ASSESSMENT SUMMARY - RES AIR APPENDIX 6-8

Introduction

Neolithic and Early Bronze Age burial mounds and megaliths are often the most visible and tangible links to prehistory in the Scottish countryside. Despite losses due to transformation of the landscape at the end of the 18th century, this remains the case in Aberdeenshire. Recumbent stone circles (RSC) with their massive slabs set between flanking uprights, contribute to the unique character of north-east Scotland. "The Neolithic and Bronze Age Landscape" (Chapter 5, by Angela Gannon, Stratford Halliday, John Sherriff, and Adam Welfare)[1], examines the significance of burial mounds and megaliths, including stone circles, in detail. The authors state that "*the briefest examination of any of these monuments reveals some role in relationship to the landscape, from conspicuous burial-cairns heaped up on skylines, to the more subtle sitings of the recumbent stone circles, often commanding spectacular vistas from less prominent positions*.'

The recumbent stone circles of this area are one of the most distinctive categories of megalithic monuments in the British Isles. Indeed, a recently published article in the Journal Nature (https://doi.org/10.1038/s41586-024-07652-1)[2] suggests a northeast Scotland provenance of the altar stone of the Neolithic standing stone circle at Stonehenge, adding further importance to preservation of the Aberdeenshire stone circles and their relationship with the landscape. The authors suggest that the Altar Stone was anthropogenically transported to Stonehenge from NE Scotland, consistent with evidence of Neolithic inhabitation in this region.

What makes the recumbent stone circles unique is the large stone 'recumbent' (often several tonnes in weight) that lies horizontally between two large 'flankers'. The recumbent is invariably placed south-west or in the southern arc of the circle. This is the case for both Sunhoney (SM44) and Christchurch (Midmar, SM32) stone circles. Before Caledonia[3] provides a detailed study of the Aberdeenshire RSCs. Sunhoney Stone Circle is believed to be one of the oldest RSCs from ca. 2,000BC. The work of C.L.N Ruggles and H.A.W. Burl,[6] suggested that due to the height of the horizon viewed across the recumbent stone and flankers, the Sunhoney Stone Circle is aligned with the gap between the Meikle Tap and Greymore of the Hill of Fare, the place where the southern moon at its minor setting would descend. They conclude that while the exact purpose of the RSCs cannot be ascertained, there is a definite connection between the orientation of the RSCs in a broadly SW direction and the horizon. With the likelihood that the RSCs had an Irish connection, it is possible that their builders followed the tradition of creating a 'Megalithic window'. When the whole horizon above the recumbents is considered, they conclude that there are more definitive indications of an interest in the rising or setting of a major or minor standstill Moon, with an orientation on the southern Moon being of major importance to RSC builders. In the case of Sunhoney and Midmar RSCs, the 'Megalithic window' is focused on the Moon's trajectory above the Hill of Fare. The erection of 180/200m turbines across the top of this Hill would therefore have a major, significant detrimental effect on the archaeological significance of these RSCs.

In http://www.ancient-wisdom.com/recumbentcircles.htm,[4] the authors present research which has shown that the orientation and length of the recumbents suggests that they were meant as a 'frame for viewing the rising and setting of the moon at certain times.'

They go on to discuss what may be the earliest primitive version of an RSC, identified in 2013 in the shape of a 10,000-year-old arc of wooden post holes mirroring the function of the recumbent and flankers. The location, close to Crathes Castle, places it in the region of the largest concentration of RSCs, which all lie on a latitude which offers a narrow distance between the moon's extreme setting points, such that they can be easily framed.

In an interview for the BBC (https://www.bbc.co.uk/news/uk-scotland-north-east-orkney-shetland-23286928)[4], the archaeologists suggest that the monument discovered at Crathes Castle may be the world's oldest lunar calendar and that the relationship with the local landscape (in this case the hills towards the Slug Road) is important. This Mesolithic "calendar" is thousands of years older than previously known formal time-measuring monuments created in Mesopotamia. The pit alignment also aligns on the Midwinter sunrise and local hills to provide the hunter-gatherers with an annual "astronomic correction" in order to better follow the passage of time and changing seasons.

Vince Gaffney, Professor of Landscape Archaeology at Birmingham, led the analysis project. He said: "*The evidence suggests that hunter-gatherer societies in Scotland had both the need and sophistication to track time across the years, to correct for seasonal drift of the lunar year and that this occurred nearly 5,000 years before the first formal calendars known in the Near East.*

"In doing so, this illustrates one important step towards the formal construction of time and therefore history itself."

NTS archaeologist Dr Shannon Fraser said: "*This is a remarkable monument, which is so far unique in Britain. Our excavations revealed a fascinating glimpse into the cultural lives of people some 10,000 years ago - and now this latest discovery further enriches our understanding of their relationship with time and the heavens*."

An illustration of how the pits would have worked in shown in Figure 7.1.

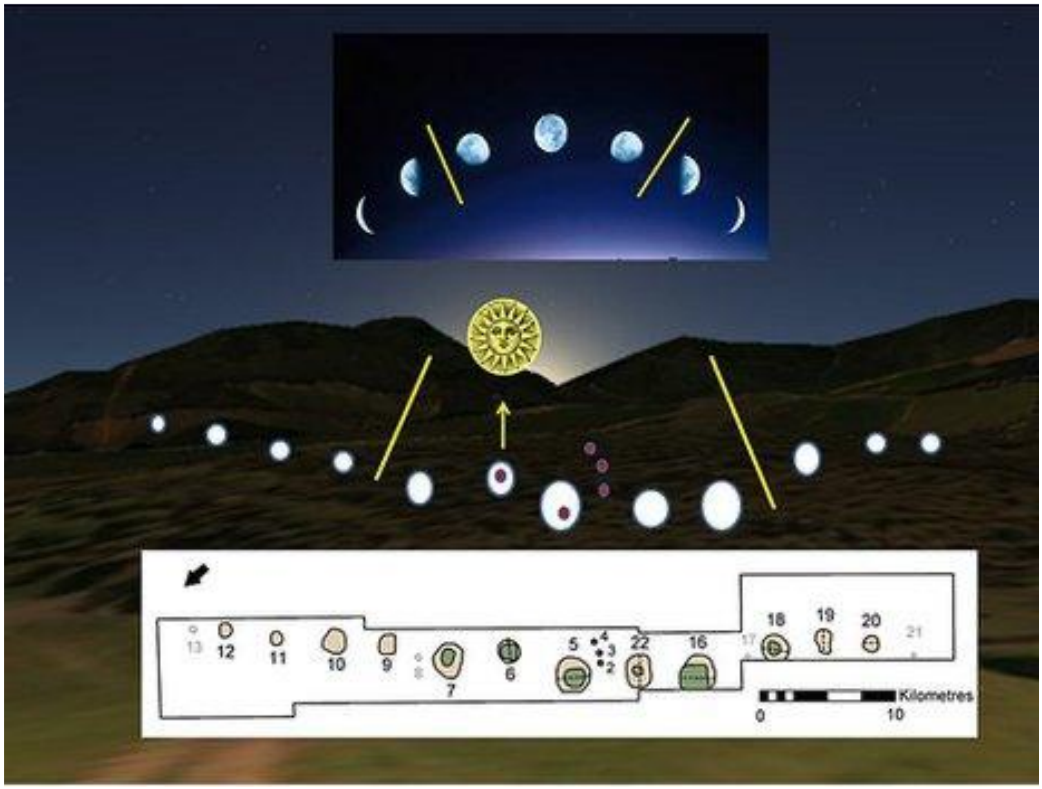

Figure 7.1: An illustration of how the pits would have worked

Over the years, there has been much speculation about the purpose of the RSCs.

The recumbent stone and its flankers are always on the southern arc of the stone circle, framing the horizon and southern sky. Stone circles, stone rows and standing stones perhaps formed a link to the ever-changing skyscape of Sun, Moon, and stars, defining patterns that confirmed and reaffirmed the changing of the seasons. Others have argued that the recumbent and flanking stones form a framework through which to view the rising or setting of the Major

Standstill Moon that occurs every 18.6 years. At that point, the Moon dips towards the recumbent; and they have maintained that cup-marks (cup-shaped hollows between 10 and 50 mm in diameter) on some recumbents, flankers, and the immediately adjacent stones at twelve of the surviving recumbent stone circles, cluster at points where the Major Standstill Moon rises or sets.

Ancient peoples might have used these circles to record the seasons or the passage of the sun and moon. They may have hosted funerary pyres or ceremonial bonfires.

Others have speculated[7] on a repeated, geometrical pattern found amongst the ground plan of an RSC, consisting of four of the circle stones that, if they were to be joined by imaginary straight lines, would form a rectangular pattern which is comparable with Stonehenge's famous 'Station Stones' rectangle. The Aberdeenshire pattern has been referred to as the "Station Stones rectangles of Aberdeenshire" and, significantly, these Scottish rectangles capture the same astronomical alignments as not only one and another, but also those at Stonehenge.

If a person followed the directions of a Station Stone's astronomical alignment from one stone circle and then set off walking in that very same direction across the landscape, they would be travelling along the route of the "longer" alignment and eventually they will arrive at another stone circle, which itself would point towards further RSCs. One of the implications of this observation is that the circles could synchronise both time and direction across a very large and broad area of the landscape. In short, this network of RSCs enabled the people to observe the same calendar: thus, allowing the potential for them to meet at specific times of the year and at precise positions in the landscape.

Amid the speculation, we may never know the actual purpose of the RSCs but with the historic and emerging links to the archaeology of Stonehenge, it is crucial that the integrity of these monuments in their landscape is protected to allow further unadulterated exploration in the future.

RES, through the SLR Reports, seek to diminish the archaeological and cultural significance of these local monuments through selective interpretation of the available research and ignoring any suggested link between the RSCs and the surrounding landscape, in particular, the Hill of Fare.

Context of objections to cultural heritage assessment

The HOFWIG Objection Document, January 2024, provides reasons for objections to 'EIAR Chapter 7 – Cultural Heritage Assessment', related to **NPF4 Policy 7 (Historic assets and places) and Policy 11 (Energy).**

Since the submission of the RES EIAR and the HOFWIG Objection document, a number of statutory consultees have formally objected to the windfarm application. These can be found on the ECU website (ECU00004592) under 'Consultations'. One of these is from Historic Environment Scotland (HES) who state:

*We **object** to the application because of the impact it will have on the setting of two scheduled monuments. The monuments are known as Sunhoney, stone circle 240m NW of (SM44) and Christchurch Stone Circle and Standing Stone, Midmar (SM32). We have identified a significant adverse impact on the integrity of the settings of these scheduled monuments. This is therefore contrary to National Planning Framework 4, Policy 7h. The impact on these scheduled monuments raises issues in the national interest for our remit.*

In their AIR, RES include a report prepared by SLR (trading as Vectos (North) Limited) (SLR) in response to the HES objection of 30 April 2024. SLR set about rebutting the HES objection points and while they quote various pieces of literature to support their opinions, they do not provide reference to their sources. It is difficult to opine on the validity of the SLR responses without

reference to the original publications. Indeed, it is possible to conclude that they have been selective in the information they have referred to, often overlooking equally valid and important research.

Basis of the SLR report

SLR say

"Information reported herein may be based on the interpretation of public domain data collected by SLR, and/or information supplied by the Client and/or its other advisors and associates. "

"These data have been accepted in good faith as being accurate and valid."

"Information, advice, recommendations and opinions in this document should only be relied upon in the context of the whole document and any documents referenced explicitly herein and should then only be used within the context of the appointment"

"SLR shall not be liable for the use of or reliance on any information, advice, recommendations and opinions in this document for any purpose by any person other than the Client."

HOFWIG comment

The SLR "Basis of Report" section, states that they get information from the public domain. They accept this information "in good faith" and if it is wrong, they (SLR) are not liable. They mention documents referenced explicitly, yet the report does not contain details of the citations used. They ignore and/or do not cite much of the research in the Introduction to this response, in particular, that which relates to the relationship between the RSCs, the landscape, and lunar cycles.

Introduction to SLR report

SLR say

"SLR Consulting …. submit this clarification in response to the Historic Environment Scotland."

"Extensive consultation with HES occurred prior to submission and HES were kept up to date of design changes made prior to and during EIA."

HOFWIG Comment

This is not clarification, it is a document attempting to mitigate their lack of appreciation and understanding of the importance of the historic sites, and the impact a windfarm would have on them.

This "extensive consultation" with HES resulted in an SLR report that was "misleading and inaccurate" (HOFWIG Objection document January 2024): it assessed the impact on

- Midmar Castle at the foot of the hill, a 600-year-old "A" listed building, as 'minor'
- two other assets as 'moderate'
- a further 13 assets as 'minor to none'

Their assessment of the impact on the Christchurch (Midmar) 4,000-year-old stone circle, which is dominated by the Hill of Fare as 'moderate', is not in keeping with the significance given to it in previous research, including the publications referred to above and in the References, below.

The expertise of the authors of the SLR report is questionable and if they have any appreciation or passion for history at all. Details are not provided of the qualifications and expertise of the authors of the report.

Historic Environment Scotland (HES) Objections

SLR say

"….it is politely noted here that when reviewing the consultation from the scoping opinion, the minutes as agreed by HES and the enhancement position, there is little to no advice given in regard to Christchurch Stone Circle (SM32) beyond reiteration of the potential impacts upon the monument. Much further emphasis was placed by HES upon monuments SM44, SM57 and Listed Building LB16262."

HOFWIG Comment

SLR were commissioned by RES to carry out a Cultural Heritage assessment. They did this while consulting with HES, ACAS and Torphins Community Council.

All SLR had to do was look at the scheduled monuments and listed buildings in the area, work out which were the most important and then assess the impact on those sites of the 180/200m high wind turbines. SLR now seek to blame their under assessment on HES, rather than on their own lack of due diligence.

We suggest that the Christchurch (Midmar) recumbent stone circle has been overlooked by SLR and RES as it is closest to the proposed windfarm and likely to be most severely impacted. Sunhoney RSC as one of the oldest, most cup-marked and its clear relationship to the Hill of Fare have been ignored.

Sunhoney Stone Circle (SM44)

HES conclusion to the initial EIA report from SLR/RES

"Based on the information provided, we conclude that the impact of the proposed development on the integrity of the setting of the monument would be significantly adverse and a significant effect in EIA terms. This is because the proposed turbines would impact on key factors of setting that contribute to its cultural significance, thereby reducing the ability to understand, appreciate and experience the monument within its setting."

"The only way for the applicant to avoid the impact on the monument entirely would be ***to withdraw the application****. …this is not likely to be the preferred option for the applicant."*

SLR say

"It is generally accepted that Sunhoney (SM44) is unique and a well-preserved example of a monument of its kind… "

"HES's primary argument on the proposed development near the Sunhoney stone circle hinges on the assertion that the turbines would disrupt key views and the cultural significance of the site."

"In summary SLR feel that the setting of the monument would be retained such that integrity would be preserved should the proposed development be granted consent."

HOFWIG comment

SLR diminish the importance of Sunhoney (SM44). SLR contradicts HES and argues the minutiae concerning:

- the definition of 'open', 'rural' and 'non-rural', which is a distraction
- the angles of approach to the circle from various directions
- the vista framed by the Orthostats and the original use of such stone circles, which are purely academic

The trees surrounding the stone circle are discussed by both HES and SLR. Are the views "open" or "enclosed", do they act as a screen, or are they part of the experience?

Although SLR uses them to mitigate the impact, this is not relevant; the experience of the Sunhoney stone circle with all its views, is fantastic, amazing, and that sense of awe will be destroyed by the dominance of dynamic rotating machines 200 meters tall towering over this ancient monument, with or without the trees, summer or winter.

SLR also argues that since electricity pylons are visible from the monument, additional wind turbines are perfectly acceptable, especially very large ones (Onshore Wind Policy Statement, OWPS). The archaeological and cultural significance of the monuments is disregarded.

SLR quotes from the OWPS about benefits to rural economies. In the context of the impact on historical monuments of national importance, the impact on the economy is irrelevant.

SLR say

"The symbolic and experiential aspects, along with the internal features like the cairn and the arrangement of stones, would remain intact, thus mitigating the perceived impact on the monument's cultural significance."

HOFWIG comment

SLR are saying that they are not interfering physically with the stone circle; that this will mitigate any impact from the turbines; and the impact of the wind turbines is only perceived. As discussed earlier, the relationship between the recumbent stone and the flankers is important, creating a 'Megalithic window' framing lunar and solar events.

The impact of the windfarm in terms of landscape and visual impact and noise will be very real, not perceived. Not physically interfering with the stone circle does not mitigate these effects on this nationally important Neolithic stone circle. It will destroy the aspect of its place both historically, physically, and spiritually.

The SLR 3-D (Figure 3.1) model videos show a variety of sunrises and sunsets at key points in the solar year. We note that

1. Figure 3.1 shows the turbines as very small, or very far away. Both Midmar and Sunhoney RSCs are in close proximity to the Hill of Fare, such that the turbines will dominate the views and tower over the RSCs. We challenge the authenticity of the models presented.
2. Research which links the orientation of the RSCs to the landscape relates to lunar cycles, not solar. SLR have not produced any analysis of the lunar cycles relative to the position of the turbines and the RSCs. It is likely that the turbines will be positioned between the southern Moon and the recumbent stones and their 'Megalithic windows'.

Christchurch Stone Circle (SM32)

HES's conclusion to the initial EIA report from SLR/RES

"In our view, there would be a significant adverse impact from the proposed turbines on one of the key views looking south-west from the monument."

"…the impacts are still at a level that we consider contrary to policy. We have not been able to identify mitigation which would effectively reduce the level of impact on the setting of this scheduled monument to a level that would not raise issues of national interest."

"Based on the information provided, we conclude that the impact of the proposed development on the integrity of the setting of the monument would be significantly adverse and a significant effect in EIA terms."

SLR say

- *"…. SLR would emphasise that the addition of this churchyard is negative."*
- *"…. with the addition of a gravel path along many of the stones"*
- *"Recent interpretations suggest that RSCs may prioritize inward experiences, such as the interplay of shadows and light during celestial events, over outward views of the landscape."*
- *"… while long-distance visual changes might occur."*

Therefore, SLR contends that while long-distance visual changes might occur with the proposed development, they do not fundamentally diminish the ability to appreciate, understand or experience the asset's cultural significance as a pivotal hub for understanding ancient astronomy, ritualistic traditions, and spiritual beliefs in northeastern Scotland.

HOFWIG comment

This Midmar RSC is probably the best known in Aberdeenshire. It has been enhanced by the construction in 1787 of Midmar Parish Kirk, a church that is itself a listed building, creating a fusion of ancient and new religions. At that time, local people believed that the RSC was a religious Druid site and believed this to be an earlier form of Christianity. The co-location of the Church enhanced the significance of the RSC.

The gravel path SLR comment on is the same type found at Stonehenge, further emphasising the importance of further exploration of the links between the NE Scotland, Orkney, and Stonehenge in Neolithic times.

SLR presents the idea that "extensive research" has shown that there will be little impact, and, as with Sunhoney, specifically refer to the views across the recumbent stone, avoiding mentioning the views as a whole experience. The work of Ruggles and Burl[6] concludes that the RSC "Megalithic window" is focused on the Moon's trajectory across the local horizon, in this case, the Hill of Fare.

Furthermore, SLR maintains that since the "interactions with celestial bodies" or "the lunar cycle" will not be obstructed, then there is no real impact. This is incorrect, particularly in autumn and winter when the sun passes low along the ridge of the hill from east to west. Similarly, due to the proximity of the RSCs to the Hill of Fare, the turbines will be located between the RSCs and the Moon in the night sky. Again, the potential significance of the orientation of the RSCs and lunar cycles is ignored.

Barmekin of Echt, fort, Barmekin Hill (SM57)

HES's conclusion to the initial EIA report from SLR/RES

"....as this aspect has not been assessed in the EIA Report and is not demonstrated by visualisations. Therefore, you may wish to consider whether sufficient information has been provided by the applicant to demonstrate any such impacts. "

"Taking all of the above into account, we have concluded that there would be an adverse impact on the setting of the monument. However, we are content that these impacts are not likely to have significant adverse impacts on the integrity of the setting of the monument and do not raise issues of national interest."

SLR's say

Nothing.

HOFWIG comment

Although HES have conceded that the Hill of Fare windfarm is "*not likely to have significant adverse impacts on the integrity of Barmekin Hill",* we disagree.

There will be a lesser impact due to distance, but the elevation of the fort gives it a magnificent view of the Hill of Fare range, from Echt towards Torphins, a view not unfamiliar to the peoples of the past. Standing at the top, on a crisp winter's morning, one can capture the wisps of a "broken stone age dawn", an appreciation of a time that will be lost with this very modern, and very large construction**.**

The significance of the Hill of Fare in the local landscape is recognised and valued by other local groups, including the Baillies of Bennachie, with 5,000 members, who have objected to the windfarm (see https://www.energyconsents.scot/ApplicationDetails.aspx?cr=ECU00004592&T=4).

Midmar Castle (LB16262)

HES's response to the initial EIA report from SLR/RES

"We consider that the proposed development could significantly impact the setting of Midmar Castle."

While we think that these impacts have the potential to be significant, we do not consider the impact of the proposed turbines on the setting of Midmar Castle is likely to raise issues of national significance.

"The EIA Report does not include visualisations of affected views to the castle with the proposed development behind it. It also does not include visualisations from the interior which we understand is due to restricted access. Based on the information provided, it is difficult to fully assess the likely impacts of the proposal on the setting of Midmar Castle."

"However, we consider there is potential for significant effects."

SLR say

Nothing.

HOFWIG comment

Midmar Castle, with its geographical position will perhaps have less visual impact from the windfarm than the other three detailed above. But there will be some.

HES noted that SLR did not supply a visualisation of the turbines from the castle, nor from the interior, access to which was not gained.

Furthermore they state without them, "*…it is difficult to fully assess the likely impacts on ….Midmar Castle."*

We note that HES have not pressed SLR for these.

HES also state "*we consider there is potential for significant effects".* In addition to the impact on the landscape setting of Midmar castle, there are also likely to be significant noise effects due to the proximity of a number of turbines to the Castle.

HES Conclusions

SLR say

"SLR…recommended that HES reconsider their objection on both monuments."

"SLR recommend further consultation and a potential accompanied site visit with HES"

HOFWIG Comment

SLR are pressurising HES to reverse its objection, without offering any evidence or analysis to support this, and offer a site visit as a further opportunity to do so.

It is critically important that the developers and HES regard the area as something more than a collection of randomly place listed buildings and monuments. Three of the above assets are within a few hundred meters of each other. HES have focused on two stone circles and an "A" listed Castle, all within a few hundred meters of each other. An extract from the objection document 2024 reads:

"*The area bounded by Midmar Kirk, Sunhoney, and Midmar Castle, approximately 1800m by 900m can be considered an area of Nationally important historic interest. In total this relatively small area includes six scheduled monuments, three "A" listed sites, four "B" listed sites, three sites of local historic interest, two dwellings (now removed from the list), and a war memorial."*

Surely this is a case where the area is far more than the sum of its parts. Legislation may require an assessment of individual assets, but the impact (of a windfarm) on this relatively small area as a whole, with its plethora of historical structures, will be quite overwhelming, and a detriment to the Nation's interests.

References

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8. **UPDATE OF NOISE ASSESSMENT GUIDELINES (ETSU-R-97)**

The guidance for assessing and rating of noise from windfarms, ETSU-R-97 is nearly 30 years old and written by the onshore wind industry for the industry.

Because it is old and councils are still getting complaints, the four UK Governments paid for an independent noise consultant, WSP, to review the guidance. WSP reported in February 2023 and highlighted several shortcomings. The Department for Energy Security and Net Zero (DESNZ) have stated, under Freedom of information, that the guidance "would benefit from targeted updates" and that the previous government have contracted Noise Consultants Ltd to update ETSU-R-97 by Spring 2025.

The WSP key recommendations relate to Amplitude Modulation, where it does not adequately address the adverse impact (which increases noise annoyance) and the noise limits are based on outdated or insubstantial evidence. Notably, controlling values for night-time noise levels should not be higher than during the day. The night-time noise level in ETSU-R-97 is 43dB, high for quiet countryside settings, whereas the WHO standard is much lower at 30dB. The areas around the Hill of Fare have been recorded much lower again at around 15-20dB and frequently much lower. A 10dB is a doubling (or halving) of loudness. ±3dB is normally perceptible.

We note that 23-28dB is a significant difference when you are trying to get to sleep!

The RES Noise Impact Assessment also uses the assumption in their calculations that the ground absorption factor is 0.5, this allows RES to achieve the setback distances from turbines to houses they are stating, however, when the ground is covered in ice and compacted snow the ground becomes a fully reflective surface and make a nonsense of the Noise Impact Assessment calculations for several weeks in the year.

In addition, leading edge erosion on the blades will increase noise levels with time as the aerodynamic sound sources change.

We suggest that RES are expecting complaints to be made about noise, because the only planning conditions they have proposed in their application are related to noise. Furthermore, we suggest that complaints will be forthcoming from anyone living within 2-3 miles from the turbines – perhaps even further – at least some xx homes.

The precautionary principle should be applied to the Hill of Fare windfarm application because, as stated by the DESNZ in the same FOI response, "decision makers considering applications for consent may choose to depart from existing policy and guidance if there is a rational justification for doing so". We maintain that the arguments made above are rational.

If the development is pushed through, against democratic principles, the Council should reject the suggested condition as it is biased for the developer. We recommend that the Environmental Health Department write a more balanced condition where the operator of the site isn't forewarned of complaints so that a more accurate picture of the reality can be captured and responded to quickly.

HOFWIG
September 2024